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PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Clinical Contributions to the Pathology, Diagnosis, and Treatment of Certain Chronic Diseases of the Heart.* By CHARLES RITCHIE, M.D., late Senior Physician to the Royal Infirmary, Glasgow. (Continued from Vol. lxxii. p. 339.)

IN my former communication I spoke of two generic forms of chronic disease of the heart;—one, a lesion of the capacity of the organ, having its initiative in obstructed circulation of the capillary subdivisions of the pulmonary artery, which lesion, primarily in the right heart, gradually, by the pressure of this on the aorta, occasioned disease in the left heart, and eventually in most of the other organs; and, second, another form in which the lesion was one of the structure of the aorta, or of the left heart, in the first instance, but in which the right heart and systemic veins and viscera in other parts became diseased in a secondary way.

I proceeded to speak of the first of those forms under the designation of simple congestive, or dextral disease of the heart, and proposed to consider it under the four divisions of its earlier, its transition, and its concluding stages, and its complications.

The early stage was alleged to be constituted by varying degrees of chronic bronchitis, emphysema of the lungs, and distensibility of the right heart, which latter terminated more or less rapidly according to the frequency and severity of the bronchial congestion, in a certain amount of permanent dilatation of the ca-

vities and openings of the right heart. In the present communication, I would offer some observations on the mechanism, symptoms, and treatment of

B, Simple congestive or dextral disease of the heart in its transition stage. And first, in reference to the mechanism or mode by which this transition stage is formed, I propose to inquire what are the probable changes which an habitually distended and overloaded right heart will either immediately or prospectively occasion on the left side of the organ.

On looking at a normal heart injected, in reference to this point, it will be perceived that there is,—

1st, Pressure exerted by the column of blood passing along the upper part of the right ventricle, and the pulmonary artery, on the septum of the heart.

2d, The pressure of the right and posterior aspects of the pulmonary artery on the left side of the root of the aorta.

3d, The pressure of the upper part of the right ventricle on the anterior aspect of the aorta.

4th, The pressure of the right auricle on the right side of the aorta.

5th, Pressure of the right branch of the pulmonary artery on the aorta.

In a healthy heart the surfaces now referred to are so many points rather of contact than of pressure; but, in proportion as the balance of the circulation is disturbed, and the elasticity of the right heart is diminished by habitual engorgement, the principle of gravitation exerts less or more of its natural influence. And, accordingly, on examining such a heart distended by blood or injection, it will be found that, besides that there is a certain amount of pressure maintained on the septum, the exterior of the root of the aorta is strongly indented by the united weight on it of the upper portions of the overloaded right auricle and ventricle, and of the whole of the dilated pulmonary artery, while the circumference of the interior of its orifice is diminished more or less below the average.

When dextral or simple congestive disease has run its entire course, it is, during life, distinguished, in addition to an assemblage of rational signs, by the presence of a double bellows murmur sound over the left heart; and after death it is always found that, united with the pathological changes in the right side of the heart, there are hypertrophy, and still more marked dilatation of the left side, along with contraction in the aortic, and dilatation in the mitral orifice,—the structure of the valves and of the endocardium, at the same time, remaining healthy.

It is inconceivable that such radical alterations can be accomplished at once, or otherwise than in a very gradual and progressive way. And, accordingly, there is for common a comparatively

slow and stealthy aggravation of all the symptoms in such patients, spread sometimes over a period of years, and having interwoven with it the course and history of repeated acute attacks. In many, during some such attack, the transition from the first to the second stage of the disease may be demonstrated as taking place under our immediate and actual observation, at once by the augmenting pulmonic and commencing systemic engorgement, and by the sudden occurrence of a systolic murmur in the left heart, or of a marked irregularity or intermission in the arterial pulse. In certain instances, also, instead of a murmur, the natural systolic sound will be found at first only stronger, rougher, more prolonged, and more deeply toned than before; and in not a few such patients this description of first sound is converted, on the occurrence of any cause which hurries the circulation, and, of course, which increases the obstruction, into a harsh, grating, and often into a perfectly-formed bellows murmur; and, in some again, this abnormal preponderance of the first sound is at its commencement observed only at the left nipple; while, at the right, it is the second sound which still remains most conspicuous;—thus showing a relation in the progression of the symptoms, with the amount of obstacle in the aortic orifice.

It seems reasonable to believe that the precise character of the transformations which are wrought on the left heart in this disease will receive modification in different individuals, according to incidental circumstances, as the greater or less resisting power of the constitution of the patient, and also, perhaps, the varying point of chief pressure of the one heart on the other. Thus, in some, at a certain but indefinite period after the commencement of the symptoms of lesion of the bronchial vessels, and of the right heart, in which the early stage of the disease consists, there is the sudden accession, in the course of some relapse, of palpitation of the heart and throbbing of the carotids, neither of which are normally essential to any stage of the affection; and in some such early cases, which prove fatal, the left ventricle is observed to be hypertrophied only, without any dilatation. It has seemed to me that the first effect of the pressure of the right heart in those individuals is the excitement of resistive efforts in the ventricle, and the consequent growth of its walls. Again, in others, and those also in whom there had for some time obtained a strongly marked lengthening of the second sound of the heart over the aortic orifice, a sudden accession of irregular pulse, such as is the token of a want of uniformity in the supply of blood by the mitral opening, is the prominent new feature which the case assumes; and I have thought it possible that with such, the yielding of the fibres of the left ventricle had been more remarkable than their resistance, and that simple dilatation of the ventricle

and of its auricular opening were therefore among the earliest of the changes being accomplished. This inference is sanctioned by the many examples in this affection of the left ventricle being converted into a flaccid bag, and its auricular communication enlarged to twice its proper size, which are met with on dissection; and also by the fact, that in some of the patients at this stage, in whom a prolongation of the second sound of the heart is the chief physical sign observed at the aortic orifice, when the circulation is quiet, great intermission of the pulse arises when this is disturbed.

Again, the production of both the kinds of transformation of the ventricle to which reference has now been made,—of thickening and of dilatation,—appears often to be intimated by the symptoms during life, the murmur, to whatever extent developed, being in one series of cases heard most intense over the aortic orifice;—as if in such the ventricle had still its energies aroused to overcome the superincumbent pressure; and, in another, the left ventricular foramen being the centre of the systolic sound, as if, in that series, the resistance at the aorta was either positively or relatively so great, that the stream was being directed backward on the auricle.

Lastly, in other instances, the conditions here stated are observed to alternate; the large vessels at one time, and the left auricle at another, being the centre of the murmur, at different times, in the same patient; and to this corresponds the most frequent appearance of the parts after death, namely, dilatation, with some thickening of the ventricular walls.

In tracing the changes in the structure of the left heart now referred to, I may be permitted to mention that, in respect to the aorta, my habit was to pass the stethoscope along from over the origin of the vessel at the sternal edge of the third left intercostal space across to the right side of the sternum as high as the second rib; and the *innominata* was examined under the proximal end of the left clavicle. In this affection I rarely followed the aorta along the left side of the dorsal spine; but when, as often happened, its sounds or those of the *innominata* were masked by bronchitic noises, or by the interposition of emphysematous lung, the carotids supplied the information which was required. Most usually both cardiac sounds, but certainly the morbid one, will be heard with distinctness in the neck. And the fact of the repetition in that situation of pure aortic pathological sounds, affords us not only the means of distinguishing these from such as are either mitral or pericarditic, and of detecting them, when, although fully developed, they are yet obscured in the præcordia by bronchitic rhonchi, or pericardial effusion, but also, of establishing a correct diagnosis in those cases in which, from the feebleness of the murmurs, they are not well heard over the site of the left ventricle. In many patients the degree of departure in either sound

from the standard of health, is for a long time inconsiderable, and the depth of the aortic orifice from the surface, or some other cause, may in such individuals prevent a ready recognition of anything in the physical signs which is abnormal. Now, I presume, it is on the obvious principle that the loudest noise is the farthest carried, that in such case the disordered aortic sound, whatever it may be, will be the chief stethoscopic phenomenon in the neck. At the heart it may not be easily distinguished from its accompanying healthy sound, or from itself in a state of absolute integrity, but at the neck it stands out prominently distinct from both.

In reference to mitral sounds, I found it to be borne out by observation, that, if the sounds were heard with most distinctness along a space bounded by the upper edge of the fourth rib, the pectoral edge of the axilla, and along the outer and inferior aspects of the nipple of the left side, then the main seat of the disease was in the corresponding auriculo-ventricular foramen. The evidence was complete, when the murmur so heard was diastolic, that emitted from other portions of the heart being systolic; or if, when itself systolic, it could yet be separated by the ear from the true systole of the heart by a sensible but most minute line of interval, forming with it something like a parallel or double systolic sound; or, lastly, when merged in and continuous with the natural ventricular sound, nothing corresponding to the murmur could be discerned in the aorta.

With these observations premised, I shall now detail some examples of what I esteem the transition stage of dextral or simple congestive disease of the heart. And first, I shall adduce some examples of the state under consideration in which the symptoms pursued the course that is most common and usual.

Case 8.—*Bronchitic and emphysematous lungs; prolonged second cardiac sound, and striking symptoms of pulmonary congestion, succeeded by aggravation of the symptoms, a mitral systolic sound, and death. Example of regurgitation along pulmonary artery, and afterwards by aorta, and by mitral valves.*

Elizabeth Morrison, aged 40, unmarried, a hawker, admitted January 15, 1847. This woman has had short cough for many years, and dyspnoea for twelve months. Eight days since, after exposure to cold, she became affected with pain along the right side, from the spine of ilium to shoulder. She is pigeon-breasted; the thorax is emphysematous, and precordial dulness lost. Over anterior region of the thorax the respiratory murmur is unusually loud; beneath clavicles the breathing is bronchial, and accompanied by rough crepitation. Posteriorly the murmur is generally sonorous or rough. Resonance of voice much increased at apices of both lungs, but especially at inner end of left clavicle. The second heart sound is prolonged and rough. The pulse is 84; appetite good; tongue white; bowels regular; menses natural. Pain of

side is excited by motion or sudden pressure, but relieved by steady support, so that she prefers to lie on the pained side.

Three grains of calomel, two grains of opium in powder, one grain of potassio-tartrate of antimony, and one scruple of extract of hyoseyamus, were directed to be formed into twelve pills, one of which to be taken every six hours. Sinapism to breast.

On the 17th, 12 grains of powder of squill, one drachm nitrate of potash, and two drachms bitartrate of potash, were ordered to be mixed and divided into twelve papers, one of which to be taken every four hours.

18th, Half a pill to be taken every four hours.

20th, Second cardiac sound heard prolonged and harsh over the site of the aorta, and is the only sound audible in neck; face leaden-coloured; inspirations 38; vesicular murmur absent throughout; respiration subcrepitant in lower, and sibilant or sonorous in upper parts; liver congested; belly tympanitic and obscurely fluctuant; frequent dyspnœa with syncope in erect position.

To take, every second hour, half an ounce of a mixture, consisting of one drachm of carbonate of ammonia, and one ounce of spirit of nitrous ether in six ounces of water.

22d, Lividity of lips; loss of vision in an erect posture; dyspnœa; copious viscid expectoration; meteorism of bowels; palpitation of heart; pulse 96; pulsations in neck single; mouth sore.

Omit the pills; apply blisters in succession to different parts of thorax. To have two ounces of gin daily; continue the rest.

Feb. 1st, Face continues bloated and livid; a systolic murmur well heard around whole of outer segment of left mamma, and also over sternum, but not in situation of aortic valves, has appeared.

The gin to be omitted, the other remedies to be continued.

5th, Pulsations of heart feeble and without sound; pulse imperceptible at wrist; appears nearly moribund.

To have half an ounce of gin every hour till she rallies.

7th, Patient's heat became restored after last report; but not having been seen in the interval, the gin was persevered in, and symptoms of congestion of the brain took place, for which a blister was applied, and her appearance to-day is improved.

To have one scruple of nitrate of potash, largely diluted with water, every four hours. Gin to be diminished to four ounces daily.

8th, Death at six P.M.

Inspection—Pleuræ free from adhesion. A moderate quantity of serum in each sac. Lungs emphysematous, not collapsing on exposure, and presenting some inflated vesicles on their

surface. Tissue crepitant throughout, except at dependent parts, where there is much œdema. Bronchial lining reddened, and covered with thick mucus, which is purulent in large tubes.

Heart dilated and hypertrophied; weight, fifteen ounces. The right auriculo-ventricular opening permits the transmission of four fingers with ease; the left is nearly as large. The valves healthy in structure; aortic and pulmonic valves also unaltered in structure, but admit of slow regurgitation of fluid; pericardium natural.

Liver small, rather pale, and more brittle than usual.

Spleen normal.

Left kidney weighed eight ounces and a half, and right seven ounces and a half, and both were in the first stage of granular degeneration.

Case 9.—*Emphysematous lungs; bronchitis after delivery; prolongation and harshness of second cardiac sound; a relapse and accession of a continuous mitral sound and of anasarca; recovery.*

Janet Allan, aged 38, a widow, admitted February 23, 1847, was confined six weeks ago, and having risen too early, she four weeks since became affected with cough and shortness of breath. These symptoms continue; they prevent her lying with her head low, and are most troublesome at night; denies having been previously subject to any chest complaint; but the chest is rounded, and its percussion clear. The sounds emitted by the heart are loud, the second has a harsh character, and the jugular veins are dilated; the breathing is everywhere loud anteriorly, and above it is quite bronchial. On right side in front there is also moist crepitation of various degrees of fineness; posteriorly there is frequent sonorous rattle. Much vocal resonance all round tops of lungs. Ankles and feet have been œdematous for a fortnight; urine in natural quantity, not albuminous; pulse 120, feeble; expectoration frothy, partly viscid; appetite impaired; bowels said to be regular; sleeps badly; skin sallow; considerable debility; mammæ distended.

Blood to be drawn from upper part of thorax by cupping to four ounces; to have sinapisms applied daily between the shoulders, and under clavicles; and to take twenty-five grains of ipecacuan, as an emetic. Potassio-tartrate of antimony, one grain; nitrate of potash, two drachms: mix, and form into twelve powders, one to be taken every three hours.

25th, Take of sulphuric ether, tincture of castor, of each, two drachms; mix; to have the half instantly, the other in three hours. To have two ounces of gin daily.

26th, Saccharated carbonate of iron, nitrate of potash, of each one drachm; mix, and divide into twelve papers; one to be taken three times daily; continue the others.

March 1st, Œdema of legs continues.

Omit the powder of tartrate of antimony and nitre ; add to each of the powders of carbonate of iron, one grain of squill, and continue to use as before.

3d, Sulphate of magnesia, two ounces ; nitrate of potash, bitartrate of potash, of each half an ounce ; water, one pound and a half ; dissolve ; two ounces of the solution to be taken every four hours ; omit the gin ; continue the rest.

9th, To take half an ounce of cod liver oil morning and evening.

13th, Dismissed relieved.

April 7, 1847, Re-admitted ; continued pretty well till twelve days ago, when, after exposure to cold and fatigue, feet again became swelled ; œdema has since involved the whole of lower extremities, and there is also effusion into peritoneal sac ; is still subject to nocturnal exacerbations of dyspnœa and palpitation, during which she cannot keep her head low ; physical signs are as before, excepting that the harshness of second heart sound is more marked, particularly at middle of sternum ; pulse 108, feeble ; tongue fair ; some thirst ; appetite good ; bowels said to be regular, and quantity of urine natural.

To have half a drachm of compound powder of jalap morning and evening ; also, one grain of powder of squill, and five of nitre, and the same quantity of cream of tartar, every six hours.

8th, To have three ounces of gin.

9th, To have one twelfth of a grain of powder of elaterium added to each dose of compound jalap powder.

13th, Gin to be diminished to two ounces daily.

15th, A rough continuous murmur is heard around whole of left mamma, from third costal cartilage anteriorly, to pectoral edge of axilla, and increasing in the latter direction ; over the *arteria innominata* a diastolic sound only is heard.

18th, Omit the gin, and continue every thing else.

23d, Omit all the medicine, and repeat the gin.

25th, Turpentine enema.

27th, Repeat the compound powder of jalap, with elaterium.

28th, Turpentine enema.

29th, Increased dyspnœa and anasarca.

Take of squill 12 grains ; mercury with chalk, powder of ipecacuan, of each four grains ; nitre, two drachms ; mix, and divide into twelve papers, one of which to be taken every three hours.

May 4th, Omit the gin.

10th, To have three ounces of gin daily.

12th, Much increase of anasarca, with extended and tumultuous action of the heart. Pulse 120.

Omit the gin. To take three-fourths of a grain of calomel, and

one-fourth of a grain of opium, every three hours; continue the diuretic powders, and give a drachm of nitrous ether every two or three hours.

17th, Kidneys have begun to act powerfully, and patient is quite relieved.

To take the calomel and opium every six hours only; to have two ounces of infusion of quassia three times daily; to continue the diuretic medicine.

26th, Dismissed relieved.

In both of the foregoing cases there was an initial condition of chronic catarrh, and of dilatation of the air-cells, succeeded immediately before admission by acute symptoms indicative of pulmonary congestion, bronchitis, and engorgement of the right heart. In both the most prominent physical sign at first was the prolongation and harshness of the diastolic sound of the heart, associated with feebleness of the radial pulse. The exhaustion of the vital powers,—as shown by these symptoms, and by the single diastolic heart sound heard in the neck and *arteria innominata*, the disposition to syncope, the meteorism of the bowels, and the apparent call for stimulus,—was in each also early noticed. In both patients, too, at a time distinguished by the arrest of the urinary and other secretions,—circumstances which strongly indicate the venous engorgement of the general viscera,—and by great lividity of the face, some previous palpitation, and much dyspnoea; when the left ventricle was receiving continuously, by the enlarged mitral opening, more than it could expel,—at the same moment that its own stream was returning on it from the aorta at every diastole,—and when, from increasing feebleness, it had also become less competent to overcome the aortic obstruction, a systolic murmur best heard in the vicinity of the mitral valve,—the external sign of regurgitation into the left auricle, became conspicuous. In one of the parties, the failure in the energy of the heart, as shown in the feebleness of its natural sounds, the extinction of the diseased murmur, and the loss of pulse was great. The congestion also of the kidneys had attained the maximum degree. These circumstances are adverse to the success of diuretics. In the other patient, who recovered, the structural changes in the heart,—namely, enlargement of its cavities and auriculo-ventricular openings,—may not have differed greatly from those in the patient that died; but the powers of life were in greater integrity, and the tubular structure of the kidneys perhaps less compressed, and every menacing symptom vanished instantly on the secretion of urine being restored.

Such are the most ordinary aspects which the disease under consideration progressively assumes. But I have said that there is an early period of this transition course in which, more remark-

ably in some constitutions than in others, the efforts of the left ventricle are strongly exerted towards the removal of the obstruction, and that, under such circumstances, thickening of the walls of that side of the heart is commonly induced.

The following appear to be examples of this variety.

Case 10.—*Chronic bronchitis, paroxysmal dyspnœa, palpitations, cerebral congestion, spasmodic twitches, anasarca, stupor, death; dilatation of right, and hypertrophy of left ventricle.*

Henry O'Neil, aged 29, a weaver, admitted 9th January 1830, complains of severe cough, and scanty expectoration of yellow matter, attended with a sense of oppression at the *scrobiculus cordis*. Cough is most severe during night. Distressing dyspnœa occurs in paroxysms at irregular intervals, but chiefly during night, when, awaking suddenly from sleep, he feels a distressing tightness about his chest, as if he were bound with cords. At the beginning of the paroxysms he has a harsh, dry cough, which, lasting for some time, an expectoration of tough, viscid mucus commences, which gradually becomes copious, and affords relief. Respiration is much affected by the state of the atmosphere. He cannot assume the horizontal position. He has palpitation in region of heart, and a feeling as if something were ascending from that to the head, at which time, also, he becomes confused, and has vertigo and *tinnitus aurium*. Sleeps ill; appetite deficient; tongue foul; bowels costive; pulse 84; skin natural. For about the last three years has been subject to cough and dyspnœa, which of late have become aggravated.

To have one of ounce castor oil.

10th, As at report.

A blister to be applied over the breast; and an issue afterwards to be established. A cough mixture consisting of mucilage with laudanum and tincture of squill.

13th, Cough and dyspnœa aggravated. Face anxious and colour dusky. Pain of side.

Twelve leeches to be applied over the seat of the pain.

15th, Pain of side abated. Dyspnœa continues distressing at night.

Three grains of sulphate of quinine and two grains of opium to be made into a pill with syrup of squill, and given at the hour of composing to rest.

16th, Spasmodic twitches all over his body. Is occasionally incoherent. Complains of beating within the head.

The hair to be removed, and a blister applied to the scalp.

17th, Few spasmodic twitches; dyspnœa moderate; anasarca of limbs.

He was directed to take three times daily half an ounce of a

mixture consisting of eight ounces of infusion of foxglove and one ounce of tincture of squill.

18th, Still more incoherent ; pulse feeble. Takes no food.

To have one ounce of gin in water every second hour. Allowed eight ounces.

19th, Urine one pound. Three stools from salts.

Death on the 21st.

Inspection.—Bronchial tubes much inflamed, especially at the principal divisions, and in some places their mucous membrane was thickened. Heart was much dilated, particularly the right ventricle. Left ventricle was hypertrophied ; the valves were natural.

In the pericardium were about eight ounces of fluid, and in the pleuræ four.

In this case there was initiatory bronchitis and dyspnœa of three years' duration. Where an intelligent care to avoid exposure to cold is observed by the patient, or in cases in which the pulmonary congestion is kept in abeyance by an habitual copious expectoration, the occurrence of disease in the left heart is often protracted to a very long period. But in labourers out of doors, and the working class generally, the whole duration often of the fully perfected disease does not occupy more than three or four years.

The sense of girding and oppression at the ensiform cartilage, of which O'Neil complained, is a common symptom, and has appeared to me to arise sometimes from the violent action of the diaphragm, and at others from the engorgement of the heart, or of the liver, or of the pressure of the former on the latter. Whatever truth may be in such conjectures, the symptom is always accompanied by augmented movements of the diaphragm, which in process of time occasion a deep persistent depression of the ensiform cartilage and lower end of the sternum, which remains a visible and strongly-marked sign of the laborious efforts, with which the breathing in such subjects has been habitually carried on.

The increase of cough and dyspnœa during the night are also very uniform symptoms ; and appear to me to depend in a great measure on the relative tardiness of the heart's pulsations during the night as compared with the day. The circumstance of position does not explain it, as, in patients who cannot recline, but require to be retained in a sitting posture constantly, the nocturnal aggravation of the dyspnœa and cough is often remarkable. The greater warmth, and consequent rarity, of the atmosphere, and diminution in the quantity of its oxygen, as well as its greater mechanical mixture with impurities in the night than in the day, may have something to do with these symptoms ; yet I believe the greater pulmonary plethora which arises in a state of mental and physical quiescence is their more frequent cause. The aggre-

gate number of pulsations at the wrist in certain observations made by Mr Grieve, one of my clerks, on some cardiac cases, was for the day 7682, and, in the same patients for the night, it was no more than 7347, giving an excess of 335 contractions of the heart during the excitement of the day as compared with the night. In whatever way we explain this fact, it is of use to remember it in giving opium or digitalis to such patients. If seen during even an ordinary sleep, the hue of the countenance will be observed to have become darker, and in some cases the extreme parts, as the tips of the nose and ears, are found deeply livid. The irritability of the heart when thus diseased is easily exhausted, and the patient quieted with even a moderate dose of opium, may have the action of this organ fatally arrested during sleep; or, in the case of digitalis, syncope may terminate his existence in the midst of some very moderate muscular effort.

In another individual, the subject of the next case, the hypertrophy of the left ventricle, as in the cases just quoted, was very considerable, and the palpitation and precordial dulness were also greatly more striking than is usual in simple congestive cardiac disease; and, in such circumstances, we will be more easily induced to hazard the employment of sedative treatment. The case proves, that it is not always safe to employ digitalis, however, simply because there are symptoms present of apparent high activity of the heart.

Case 11.—*Great dyspnœa, lividity of countenance, and anasarca; right heart much dilated, and left greatly hypertrophied; valves sound.*

John Duvonnay, aged 37, a labourer, admitted on the 12th January 1837. This man complains of urgent dyspnœa, in general preventing him from assuming the horizontal posture; severe cough, with copious frothy mucous expectoration. He has pain and much uneasiness in the region of the heart, and palpitation, which is more or less severe according to the exertion he makes. An evident deformity of the chest is observed; the lower left ribs protruding much more than the right. Slight precordial dulness, and increased and diffused action of heart, are also recognised; sounds clear and distinct. Anasarca of lower limbs and of the chest. The face is swollen, and the cheeks and lips are very livid. The abdomen is distended, but does not fluctuate very distinctly.

The general health is much impaired; little appetite; some thirst; sleeps badly. The patient inclines to lie on the left side. Pulse 92 when in bed, and pretty regular. Tongue thickly furred, but moist. Makes little water; has uneasiness in lumbar region, somewhat increased by pressure. He was a patient in this hospital about nine years since with a similar affection, and when dismissed was greatly relieved. He remained in tolerable health till

about eighteen months since, when the dyspnœa and palpitation again attacked him. Dropsical swelling supervened six weeks ago. Has had no particular treatment for some time.

To have an anodyne draught.

13th, Pulse after he has been in the erect position about 110. In other respects as at report.

To take three times daily half an ounce of the infusion of fox-glove; and every eight hours one pill consisting of one grain of calomel and one grain of squill.

15th, Dyspnœa increased. Great lividity of face; pulse very feeble. Urine turbid and in greater quantity.—Continue the same remedies.

16th, Vomiting after a fit of coughing; slight stupor. Pulse scarcely perceptible.—Omit the remedies.

17th, Death at 4 A. M.

Inspection.—The pericardium contained about four ounces of muddy serum, and there were several slight deposits of lymph on its inner surface. The heart was considerably enlarged; the right ventricle very much dilated, and its walls remarkably thin. The left ventricle was also enlarged, and its parietes were at least six times as thick as those of right. All the valves were perfectly sound.

Parenchyma of lungs engorged; redness and thickening of inner surface of bronchi.

Liver very firm.

The augmented and extended cardiac impulse noted in this man's case, combined with the dulness of the part on percussion, afforded good evidence of hypertrophy of the left ventricle; but the clearness and distinctness of the heart's sounds, and the extent of range in the radial pulse from 92 when the man reclined, to 110 when he stood, were equally conclusive proofs that an enlarged or dilated and enfeebled state of the cavities was the dominant condition. The use of sedatives in such circumstances is always hurtful.

It will be remarked that this man preferred to rest on his left side. This is the general rule in simple congestive cases; and *decubitus* on the back or right side can seldom be well borne. I have supposed that in sinistral *decubitus* not only was there no inconvenience felt from the approximation of the heart to the ribs, so considerable a cushion of emphysematous lung being generally interposed, but that in this position also, the egress of blood from the pulmonary artery was rendered more easy. On such a patient assuming the supine posture, the united pressure of the right heart and enlarged pulmonary artery bears immediately on the root of the aorta. Remarkable exceptions to the former of those general circumstances are, however, occasioned by accidental complications in the lungs. Thus acute pain in the left side, or se-

vere bronchitis and copious effusion into the bronchia of the right lung, or into its pleura, may greatly modify the position.

Case 12.—*Chronic Bronchitis, palpitation, and anasarca; dilated heart, hypertrophy of left ventricle, valves sound.*

Widow Boag, aged 60, admitted February 10th, 1837. This woman has severe cough, rather copious, muco-purulent expectoration, and some uneasiness in right hypochondriac, and in both lumbar regions on pressure; sleeps ill; much thirst; general anasarca; urine scanty; general health impaired; pulse 84; tongue pretty clean; palpitation and dyspnœa on exertion. There is a strong impulsion at the lower part of the sternum, and in the præcordial region; and the sounds of heart can be heard nearly on all parts of thorax. A slight bellows murmur accompanies the second sound. Says that the dyspnœa has troubled her for about eighteen months, and that the palpitation and swelling only began about three weeks since.

13th, Symptoms rather aggravated, and pulse more feeble.

To take, at the hour of composing to rest, a draught, consisting of half a drachm of sulphuric ether, two drachms of camphorated tincture of opium, and one ounce and a half of peppermint water; and, next morning, half an ounce of bitartrate of potass (cream of tartar).

14th, Died.

Autopsy.—The heart was very much enlarged, and there was slight hypertrophy of the left ventricle; all the valves were sound.

Case 13.—*Bronchitis after delivery, dyspnœa, lividity, anasarca, and recovery; relapse and death; dilatation of right, and concentric hypertrophy of left heart.*

Marion Brown, aged 40, a weaver, married, admitted April 23, 1847. Two months ago this woman was delivered in the eighth month of pregnancy. The feet had been œdematous, and continued so after delivery. In a few days she was exposed to cold, and became affected with severe cough, which has continued since. Within the last two weeks anasarca has become general. The abdomen is large but soft, and not fluctuant. The whole of left side of thorax is dull on percussion, and, on applying the stethoscope, nothing but a very faint and distant respiratory sound is audible. On right side percussion is clear; respiration is harsh and sibilant. About middle of posterior aspect of this side also there is an occasional appearance of pleuritic friction sound. Has not had any pain here, or in any part of left side. Since the supervention of the general anasarca, patient has also suffered from violent dyspnœa. At present inspirations are 38. Decubitus on left side; face and lips livid. Pulse 104, feeble. No abnormal sound in heart's action, but there is much turgescence of the veins of the neck. Tongue dry; much thirst; appetite bad; bowels said to be regular; urine scanty. She denies having been subject to cough previous to present illness, or having been dropsical before.

To have every four hours half a drachm of the compound jalap powder, and the diuretic powder without digitalis.*

25th, Urine slightly albuminous.

To each dose of the compound jalap powder let there be added one-tenth of a grain of elaterium.

26th, To take one-fourth of the pill of calomel and opium every second hour; † and half an ounce of the mixture of carbonate of ammonia every third hour. ‡

29th, A blister to be applied over the sternum, and the blistered surface to be dressed with mercurial ointment.

30th, To take, for alleviating the cough, the hospital pectoral mixture. §

May 1st, Mouth sore; pulsation in both jugulars; prolonged diastolic sound remarkable over right ventricle; occasional decubitus on right side. Urine four pounds. Swelling limited to feet and hands.

Pills of calomel and opium to be given up. Other remedies to be continued.

7th, Pills of calomel and opium to be resumed.

10th, Pills to be given up. Other remedies to be continued. A blister to be applied over chest.

28th, Dismissed relieved.

June 24th, Readmitted with much dyspnoea, general anasarca, and coldness of extremities. Pulse gone.

To have immediately six ounces of port wine.

25th, Dyspnoea continues, but she is otherwise better.

A blister to be applied over the region of the heart. To have every fourth hour the third part of a pill of calomel and opium. A turpentine enema to be administered.

26th, Pulse can hardly be counted, and is intermitting and irregular; tympanites less; respiratory murmur and sonorousness on percussion gone in whole of left side of thorax; gums pale; inspirations 48; no jugular pulse. Continue.

27th. Died last night.

Inspection on the 28th.—Body much emaciated. Right thorax contained about twenty ounces of serum; lung adhered to ribs posteriorly; tubes somewhat dilated. The left side of the thorax contained fifty ounces of dark-coloured serum. The pleura was thickened and rough from extensive deposits of lymph.

The pericardium contained ten ounces of serum. Heart of a

* The formula for this powder in the Glasgow Royal Infirmary is,—Cream of tartar, one scruple; nitre, ten grains; powder of squill, one grain; powder of digitalis, half a grain. Mix.

† Each of these pills contains two grains of calomel, and nearly half a grain of opium.

‡ This mixture consists of one drachm of carbonate of ammonia dissolved in eight ounces of water.

§ The pectoral mixture is made of one drachm of the tincture of henbane and four ounces of mucilage.

brown colour, and soft. Left heart in a state of concentric hypertrophy. Right heart dilated; auriculo-ventricular opening admitted easily the passage of five fingers; walls of auricle diaphanous.

It might have been supposed that the dulness on percussion over the left thorax in this patient arose from the œdema of the surface, produced by constant decubitus on that side, and also that the faintness of the respiration there was dependent on the emphysema, which might very reasonably be thought present in such a case. The inspection showed that a flake of lymph was the cause of both symptoms. The frequency of the inspirations,—in the first seizure 38 per minute only, and in the second 48,—is obviously a good deal correspondent to the degree of hindrance existing to the pulmonary circulation, and perhaps also in some measure proportioned to the smallness of the jet projected from the right ventricle. I found this last remark on the circumstance mentioned, that when the inspirations had risen to 48 per minute, the power of the right ventricle had become so enfeebled that the jugular pulse had ceased. The present case affords an easily intelligible explanation of this latter symptom. The right auricle and ventricle were substantially one cavity in consequence of the extreme enlargement of the tricuspid opening; and every contraction of the ventricle, while of ordinary strength, must have propelled a wave of blood into the auricle as certainly as into the pulmonary artery. The cessation of this symptom on the accession of great debility is an important fact. The force of the pulsations in the jugular veins in such patients may indeed be regarded as a fair measure of the tone and vigour of the heart, as the degree of venous pulsation varies with the state of the general strength. The rapid breathing, livid face, extreme thirst, feeble or lost pulse, and scanty secretion of urine, described in this woman, and which are often associated in similar cases with anxious, shrunk features, projecting eyes, wet skin and hair, and death-like coldness of the surface, sometimes forcibly recall the recollection of the collapse of Asiatic cholera; and the congestion in the right heart and general viscera in the two affections, present a pathological as well as a semiotic resemblance.

Case 14.—*Chronic bronchitis of ten years' standing; a wetting, followed by great pulmonary congestion, loud systolic sound of heart, palpitation, and death; dilated right heart, and hypertrophied left heart.*

Mary Corrigan, aged 22, unmarried, a mill-worker, admitted on the 2d November 1846. This patient had an attack of cold ten years ago, and often since has been more or less subject to cough and shortness of breath, especially during winter or close damp weather, but getting mitigated on the approach of summer. This summer the relief was less marked than usual, and the ge-

neral health has been for long very indifferent. Five days ago, after getting wet, had a shivering, followed by aggravation of the cough and dyspnoea, with some headach and great debility. The symptoms have increased since; and for the last three days she has spit blood. Has frequent fainting fits: breathing very difficult; face livid; extremities cold; pulse 132, feeble; inspirations 40; breathing abdominal.

All over thorax the vesicular murmur is supplanted, both in inspiration and expiration, by sibilous and sonorous rattles, except below, where these are moist. The heart's action is tumultuous, with some preponderance of first sound. Sputa viscid and bloody. Never had any dropsical affection. Catamenia regular.

To have immediately two ounces of wine. To take of the mixture of carbonate of ammonia, half an ounce every second hour. To eight ounces of the hospital pectoral mixture, let there be added one grain of tartrate of antimony; and of this let the patient take half an ounce every second hour.

3d, Hæmoptysis continues.

Twelve grains of tartrate of antimony to be dissolved in six ounces of water, and one scruple of solution of muriate of morphia to be added. Of this one drachm to be taken every hour; and after the third dose two drachms. To use the catechu mixture, if requisite.

5th, Hæmoptysis ceased; sputum opaque and nummular; pulse 108.

To take of the opiate antimonial solution only one drachm every hour.

6th, To take half of a pill of calomel and opium every third hour. Other medicines to be continued.

7th, Much mucous rattle, with dyspnoea, and inability to retain horizontal position.

Antimonial solution and cough mixture to be given up. Continue pills and mixture of carbonate of ammonia.

8th, To have six ounces of port wine.

11th, Wine to be increased to ten ounces daily. To take, as soon as possible, one ounce of the mixture of carbonate of ammonia, with half a drachm of sulphuric ether. The feet to be placed in warm water, containing mustard.

11th, Death took place at 4 P. M.

Inspection.—Both pleural cavities obliterated by adhesions of some standing. Tissue of lungs engorged with serum; and, on making sections, purulent matter exudes from the bronchi. A small part of lower edge of right lung in a state of red hepatization.

The heart was hypertrophied; and left ventricle was also considerably dilated. The organ weighed ten ounces.

Liver of great size and weight, and containing much blood.

Case 15.—*Bronchitis of one year, and palpitation of ten days' standing; effusion into thorax, and death. Great congestion of thoracic and abdominal viscera, with dilatation of right, and hypertrophy of left, heart.*

Alexander Mackenzie, aged 49, a sawyer, admitted on the 6th October 1847. A year ago this man had bronchitis, from which he made a partial recovery in about six months; and two weeks after, had renewal of symptoms, increasing in severity to the present date. In the last ten days he has become affected with palpitation of heart, increased by any exertion. He has at present loose cough, epigastric pains; and for two weeks past has sweated much at night, and suffered from headach. Face slightly flushed; skin hot, and moist; pulse 68, full, and somewhat soft; bowels slow.

Extensive cardiac dulness; and a double murmur is heard over left side of heart. Breathing harsh and sonorous over anterior aspect of both, but especially of right lung; and posteriorly on this side there is some moist crepitus, and dulness on percussion. Limbs anasarcaous. Belly tympanitic, slightly fluctuant, and very tender superiorly. Tongue moist, of a pink colour, slightly indented, and covered with a yellow fur. Gums spongy.

To have the third part of a calomel and opium pill every two hours; and half a drachm of compound powder of jalap morning and evening.

9th, Gums sore. Omit the pills.

11th, Urine continues scanty, of a deep orange colour. Specific gravity, 1.015, with acid reaction, and free from albumen.

To have a diuretic powder, without digitalis, every four hours, and the compound jalap powder to be continued night and morning.

15th, Over *arteria innominata*, and in situation of tricuspid valve, a single systolic blowing sound only is heard. At ascending aorta, middle of left ventricle, aortic valves, and edge of left pectoral muscle, in front of axilla, a soft full bellows murmur is heard with both sounds of heart, diminishing in fulness and intensity in the order in which the parts have been named.

To have five ounces of wine daily. Continue the diuretic and purgative powder.

17th, Some hemoptysis and epistaxis. A continuous or merged double murmur is heard to-day, both in neck and over *arteria innominata* and tricuspid valve. In other situations it is as at last report, excepting that it is stronger, although the patient complains of weakness and disposition to faint.

To omit the wine. To have half a drachm of taraxacum juice, and the same quantity of nitrous ether every six hours. A turpentine enema.

19th, Feelings more comfortable. A large full bellows mur-

mur accompanies both cardiac sounds in every part of heart and large vessels, save in the neck, where the murmur is harsh and continuous. Kidneys have not begun to act.

Continue the diuretic powders. A blister to be applied to left side of thorax. To have the thighs rubbed every six hours with a drachm of mercurial ointment.

20th, Died.

Inspection thirty-six hours after death.—A little serum was seen flowing from the eyes, nose, and mouth. Numerous purple discolorations over whole surface. No pulmonary dulness, but that of præcordia occupied a space of nearly five square inches. Some varicose veins of large size over abdomen, and those of neck and arms also distended.

The thorax contained fully a gallon of bloody serum. The left lung was thrust into upper and posterior part of thorax by the heart, which also encroached somewhat on right. No fluid was contained within pericardium.

The heart lay transversely, and its long diameter measured *in situ* eight inches. Inclusive of pericardium, its weight was thirty-one ounces avoirdupois. The coronary veins were greatly distended. The walls of the left ventricle were about an inch in thickness, and its cavity somewhat enlarged. The aortic orifice could not admit the passage of a larger body than the full-sized middle finger; that of the pulmonary artery was fully twice as large. The right auriculo-ventricular opening permitted the passage of four, and that of left side of three fingers. A few warts on aortic valves; the structure of the latter was healthy.

The right lung weighed nineteen, and the left seventeen ounces. The bronchia appeared large, and their lining thickened.

Abdomen contained about three-fourths of a gallon of pure serum.

The liver was as heavy as five pounds five ounces. Large lobe very soft and pulpy; smaller, dark-coloured and granular.

The spleen was fully ten inches in length, and weighed twenty-nine ounces and a-half. It was semifluid, of a deep purple colour, having imbedded in it a couple of patches of fatty-looking matter.

The right kidney weighed six and one fourth,—and left, six and one-half ounces,—and both were highly granulated, white, and pulpy, with here and there portions of a deep purple colour, interspersed with veins filled with red blood.

The modifications in the bellows sound, which were noticed in this patient under varying circumstances, are of some interest. The diastolic murmur was heard equally over the base of both ventricles; but in the aorta it extended a short way only on one occasion along the ascending vessel; and on another, when the strength was greater, it was observed as high as the carotid, but mixed or coalesced with the systolic bellows-sound. This

continuous murmur produced by the coalition of the two sounds of the heart must be carefully distinguished from the single sound which is heard in cases of great debility of the organ. The latter consists of the second sound only, the former of both ; and it is sometimes difficult to identify them. Thus, in certain cases of continuous murmur in weak nervous subjects, should the pulsations be rapid, the heart's sound is short, acute, and snapping, like what is heard in the collapse of typhus ; and it is only after a few days' rest, and when the frequency of the heart's action is moderated, that the sound becomes louder, more sustained, and having either its rasping or blowing character developed. This circumstance depends on the fact, that in very high degrees of obstruction murmurs are annihilated ; the increased velocity in the case in question being equivalent to such a degree of structural obstruction as is adequate to produce that effect. In other instances of continuous friction sound of the heart, the single lengthened murmur, after rest and other suitable treatment, is found broken down in certain parts of the organ, if not in all, into a double sound. This again, while it supplies us with a ready way of distinguishing a coalescent continuous cardiac sound from one that is strictly single,—which latter is usually though not universally the same in every part,—is a necessary effect of the composite structure of a continuous murmur, and a proof, also, that such murmur indicates a higher degree of lesion in the heart than is done by a double sound. In patients with the single sound of debility, a little excitement of the heart has sometimes the effect of restoring for a short time the systolic sound, which is that which is absent, while in certain cases of double cardiac sound the effect of a similar cause is to merge the two into a protracted continuous murmur.

The five cases last detailed are presented as examples of a frequent variety of the transition stage of simple congestive cardiac disease, in which the first indication of the involvement of the left ventricle is an increase of its action, attended by hypertrophy of its structure. In other cases the resistance of the systemic side of the heart to the pressure of the right heart on the aorta appears to give way at once, without any marked intervening tumultuary action, increased sound in the systole, or production of hypertrophy. A harsh prolonged diastolic sound, or sometimes a murmur, is heard during life in the aorta, accompanied sometimes by an intermittent, and in confirmed cases by a constant, systolic sound over the mitral orifice ; and after death the left ventricle is found softened, thinned, enlarged, and flabby, and the mitral opening more or less dilated. The following may serve as an example.

Case 16.—*Catarrhal habit, thorax resonant; parturition and bronchitis. On admission, preponderance of diastole, enlarged jugular veins and liver; 8th day, dyspnœa and œdema of feet; 11th day, intermission of pulse; 20th day, jugular pulse; 25th, increased dyspnœa; 41st, increased anasarca; 48th, still greater anasarca; 53d, some improvement; 65th, relapse; 68th, orthopnœa, and abscess in abdominal parietes; 71st, erythema of leg; 75th, death—dilated cavities and foramina of heart, excepting aortic, which was contracted.*

Anne Mulroney, married, aged 25, admitted on March 20th, 1847. Nine days ago this woman was delivered of her third child. She is said to have been in good health previously, and the labour was easy. Lochia continued for two hours only, and have not reappeared. Six days ago, not having left her bed, became affected with cough, tightness at throat and upper part of chest, and dyspnœa, with fever. Was blooded at the arm on the same day, and blistered over the trachea on that following, with temporary relief. At present the symptoms are again very severe. Breathing hurried and wheezing; face pale; mucous membrane of mouth sublivid. Pulse 130, very compressible. Much general debility. Percussion of chest elicits a clear sound. Loud, sonorous, and sibilant *rhonchi* heard all over both lungs, but most intensely on left side. These sounds are accompanied by loud and harsh respiration. Sputum rather scanty, semipurulent, and very tenacious. Second heart sound preponderates; jugular veins dilated. Is subject to colds, but had not any cough immediately before her confinement. Lower extremities are somewhat œdematous; has much thirst, some appetite; bowels slow; tongue clean. Abdomen is full and soft; tender in epigastrium, but not at all over the uterus.

To take every third hour half of a calomel and opium pill.

21st, To have every third hour half an ounce of the mixture of carbonate of ammonia. Pills of calomel and opium to be continued.

22d, To take every sixth hour only half a calomel and opium pill.

23d, Pills to be given up.

The belly to be carefully fomented with cloths wrung out of hot water; to take as soon as possible half an ounce of oil of turpentine in mucilage; which is to be repeated at the end of four hours, unless the bowels have acted.

After the operation of the turpentine, to take one grain of soft opium every fourth hour, unless sleep be induced.

26th, Pain limited to-day to right hypochondrium, where liver is found much enlarged, and very sensitive. Pulse 120, and feeble.

Three or four ounces of blood to be drawn by cupping from the space below the right mamma.

A sinapism to be applied to the right hypochondre, and afterwards warm fomentations.

To have the fourth part of a pill of calomel and opium every second hour. Other remedies to be abandoned.

29th, Dyspnœa, œdema of feet, and tumour of liver, continue. Pulse 108.

To have every sixth hour a dose of the diuretic powder without digitalis.

Powder of ipecacuan, twelve grains; extract of chamomile, two scruples; extract of aconite, one scruple; to be mixed, and made into twelve pills, of which, half of a pill is to be taken every sixth hour. Pills of calomel and opium to be given up.

31st, Cannot retain horizontal position. Œdema over whole of lower limbs. Diastolic sound extremely prolonged and rough. Much dulness along whole of left inferior thorax, with bronchial breathing.

To have, as soon as may be, half a drachm of compound jalap powder, with the eighth part of one grain of elaterium, and let it be repeated every third hour, until the bowels are freely emptied.

In the evening, if breathlessness continues, three ounces of blood drawn by cupping from the left side of the chest, at the part most uneasy. To take a draught of one scruple of sulphuric ether if requisite.

April 1st, Dyspnœa relieved; dulness of side continues, but without pneumonic crepitus. Pulse 96, soft and intermitting.

To have one ounce of the mixture of carbonate of ammonia every second hour; three ounces of port wine. Other remedies in the meantime to be given up.

8th, Wine to be reduced to two ounces.

Ten grains of saccharine carbonate of iron, and one grain and a-half of sulphate of quinine, to be made into a powder, to be taken morning and evening. Twelve powders to be prepared.

9th, Right jugular vein, which is much distended, the seat of pulsation throughout its course, arrested only by slight pressure at clavicle.

11th, Arrest of urinary secretion.

Medicines to be omitted. To take every fourth hour one diuretic powder without digitalis.

14th, Increase of dyspnœa; diastolic sound over aortic valves so prolonged and rough as to amount to an imperfect bruit.

To six drachms of the compound jalap powder, one grain of elaterium to be added, and the whole to be divided into twelve parts, one to be given every four hours, until evacuations take place.

21st, A blister to be applied to the breast.

27th, Seized last night with pain and constriction in region of heart; pulse 108; diastolic sound very long and grating; heart's impulse strong, especially at right side of sternum.

Stop the wine; and give twenty drops of antimonial wine every second hour.

May 2d, To have three ounces of gin.

7th, Much abdominal pain and anasarca.

Warm fomentations to be applied to the abdomen; and a turpentine enema to be administered.

27th, Orthopnoea; much dulness on percussion of left side.

29th, An ill matured small abscess, with much swelling and redness, has appeared along umbilicus; also erythematous redness and pain of left leg.

June 3d, Death.

5th, *Inspection*.—The general aspect of body is bloated and highly œdematous. *Head*,—Great vascularity of the membranes of the brain, and congestion of the sinuses; brain softer than natural. *Thorax*,—Both divisions contained much fluid; both lungs adhered posteriorly, and in both the bronchial membrane was thickened, vascular, and in some places rough. The *Pericardium* contained nine ounces of dark-coloured turbid serum. Heart when washed weighed thirteen ounces. Circumference at base, $13\frac{1}{2}$ inches; length of right ventricle, externally, $5\frac{1}{2}$ inches; long axis of right auricle, 5 inches, and its walls diaphanous.

The right side of heart constituted a single chamber nearly, from great widening of communicating foramen. The left ventricle converted into a flaccid bag, which might hold eight ounces of fluid. Aortic orifice admitted no more than a moderate-sized middle finger; mitral opening permitted the passage of four fingers. No disease in the valves except some attenuation.

Abdomen enlarged greatly from meteorism and effusion. Liver enlarged, congested, very friable, and unctuous. Capsule easily turned off from its surface. Kidneys also in an advanced stage of granular disease; weight of each, five ounces. Weight of spleen, six ounces.

In the foregoing case the woman appears, from the tendency to be affected by cold, the sonorousness of the thorax, and the dilatation of the jugular veins, to have had a measure of habitual congestion of the right heart at the period of her labour, and the constitutional disturbance occasioned by the milk fever on the third day was probably the cause of the acute pulmonary congestion, marked by cough, tightness in the bronchi, and dyspnoea which then occurred. The symptoms had an asthenic complexion from the time of admission (requiring ammonia, and not bearing calomel); and in proportion as the regurgitation on the right heart increased, the

liver got enlarged, the abdomen tumid, and the limbs anasarcaous. There was a temporary abatement of the urgent symptoms, from the use of remedies fitted to diminish the portal plethora, and to support the power of the heart; but these were instantly succeeded by aortic diastolic sound, return of dyspnoea, and pulsation in the jugulars, pointing out the successive reflux on the left ventricle, the lungs, and superior cava, which was permanently subsisting. Another temporary amelioration from similar treatment was followed by a return of all the symptoms, and death.

I.—*Simple Congestive or Dextral Disease of the Heart.*

C, In its concluding stage.

Having, in the previous observations on this form of chronic heart affection, treated of it in A, its initiatory or early stage, at which time the malady is limited to a condition of exclusively pulmonary congestion, with distension, or, at most, slight dilatation of the right heart; and, again, in B, its transition period, when the lentor of the capillary ramifications of the pulmonary vessels, and the dilatation of the right heart, having become persistent, the pressure of the latter on the aorta has led to the setting up of a like stretching and dilating process in the left heart;—it remains, in the present part, to describe the influence which the pressure on the aorta, here referred to, has, in at length inducing a highly-overloaded state of the general as well as of the pulmonary circulation.

The distinctive characters of this final stage of simple congestive disease of the heart have already been referred to more than once incidentally. It is constituted by an overloaded state both of the pulmonic vessels and systemic veins, by dilatation of all the cavities of the heart, and of all its openings, excepting the aortic, united to a greater or less amount of congestion, or of disorganization of most, if not of all the other viscera of the three great cavities. The right side of the heart is no longer only temporarily distended, but it is habitually dilated; the same is true also of the left; and the liver likewise is at first permanently engorged and enlarged. The degree of congestive growth in the latter organ often exceeds a third or a half, and even sometimes is equal nearly to as much again as its natural bulk. The seats of this engorgement are the lobuli, the hypertrophy of which is obvious to the naked eye. They are most developed at the superior part of the right lobe, and soon exchange the dusky-red colour, which they have at first, for one that is paler, till at length the organ assumes a yellowish colour throughout, and becomes friable, has a greasy aspect and soapy feel, and its peritoneal covering is thickened, and often easily separable. At a more advanced period, the organ not only ceases to acquire bulk, but begins to shrink; its

surface becomes indurated, uneven, fissured by indentations, corrugated, and occupied by thickened capsule or opaque bands; and its substance is either simply reduced from four or five pounds weight to two or less, and has become of very firm consistence; or it has acquired a mottled, variegated, or nutmeg aspect. In proportion as the liver becomes impervious to blood, from the changes in its structure now mentioned, it ceases to supply the overloaded heart with a convenient receptacle for its reflux blood; and should the causes of the cardiac congestion continue to operate, the lungs, the brain, the spleen, the mesenteric veins, or the kidneys, become consecutively or simultaneously engorged.

It is in such circumstances that hæmoptysis and pleuritis, or actual pneumonia, become complications of the disease; and that the lungs gradually acquire extended and often numerously-laminated adhesions to the costal pleuræ, by which their internal circulation is still farther encumbered, and their size often sensibly diminished. The spleen, also, at this conjuncture, occasionally swells out to an enormous bulk; and, in other instances, the mesenteric, the hæmorrhoidal, or the uterine veins, assume a species of safety-valve function, and, by the discharge of their contents, contribute temporarily to the relief of the cardiac plethora. It is thus also usual to find the kidneys in a state of simple engorgement and hypertrophy, with the liver in the same subject in the stage of atrophy. At this time the kidneys often weigh, particularly the left, six, seven, or more ounces. They are of a uniform red colour; their molecular structure is hypertrophied; and their secretion is commonly at first increased, and contains albumen, but gradually, should the patient live, both glands pass successively through the same changes as those sustained by the liver. Their texture is found greasy, partially anæmic; their granular structure obliterated; their capsules thickened, and less adherent; and, at length, they are reduced to a small size, are indurated, and changed into nearly a homogeneous yellowish-white structure. Coetaneous with these alterations, there are, of course, the general effusion of the serum of the blood into the cavities, and into the areolar tissue, the inability of diuretics to act, and a natural close to the morbid changes by death.

I subjoin the narratives of some additional examples of the affection when thus fully consummated.

Case 17.—*Cardiac symptoms for nine years; an attack of general dropsy two and a half years before the present; abdominal swelling four months before admission, at which latter time had heart symptoms and dropsy; great relief by treatment; re-admission; and death in five days.*

John Smith, a labourer, aged 43, admitted October 21, 1847. This man has been subject, for the last nine years, to palpitation

of the heart, and two and a half years ago, in consequence of exposure to cold and wet, he had general dropsy. After some treatment he is said to have had tolerable health, till four months since, when he became affected with swelling in the belly and limbs. The disturbance of the heart has become worse in the last two weeks, and he labours under great oppression at the breast, severe dyspnœa, some cough and expectoration. Obtuse angular decubitus on right side; cardiac dulness goes completely across sternum; heart's action irregular and intermittent; and heart's sounds obscured by a continuous murmur; sonorous breathing. The abdomen is large and tender over epigastric, right hypochondriac, and renal regions. Bowels regular; tongue moist and clean; pulse 100, small, irregular and intermittent; urine acid, slightly albuminous, of a deep brown colour, and suspending a light flocculent mucous cloud.

22d, Pulse, at heart, above 100, but so remarkably irregular, short, and rapid in its beats, that it cannot be enumerated; at wrist it is about 48, but can scarcely be counted; cardiac murmur is a plane sound, but is not easily heard owing to the emphysema, except when the heart lies on the diaphragm behind the xiphoid cartilage; dulness on percussion greater in sitting posture, but when he lies it is limited to about two square inches at the lower part of the sternum; œdema is confined chiefly to the face and neck, especially beneath the eyes; tongue cold and violet-coloured.

To have every fourth hour four grains of calomel, until the bowels are moved; to take every fourth hour the diuretic powder without digitalis.

Eight ounces of blood to be drawn, by cupping, from the epigastric and right hypochondriac regions.

The sinapised foot-bath for half an hour.

25th, Much catharsis after last report, with some relief to the dyspnœa; sinistral decubitus is still followed immediately by excessive cough, imperfect vision, and suspension of the breath; cough is chiefly laryngeal; liver projects a good deal at right side of umbilicus, and is indurated; some pulsatory swelling at top of sternum, and the jugular veins are greatly enlarged; an indistinct plane sound is still heard over whole of heart and in the neck.

To take every second hour the third part of one pill of calomel and opium, and continue the diuretic powder.

Nov. 1st, Urine from six to seven pounds.

To have six ounces of the solution of supernitrate of potass, and to take half an ounce every fourth hour; to continue diuretic powder.

18th, Soon after the kidneys had begun to act, all the symptoms

subsided; the patient could recline with ease on left side, and walk with agility and comfort; dismissed relieved.

27th, Re-admitted; four days after dismissal, and after renewed exposure to cold, most of his former symptoms returned. Anasarca is at present considerable; the belly is large, tympanitic, and fluctuant; much dyspnoea; dextral decubitus; heart's sounds are so tumultuous, rapid, and feeble, that they cannot be counted; but a plane or continuous rasping sound is heard over whole of heart; pulse at wrist 80, irregular and intermitting. Bowels slow; tongue moist, pale, and large.

To take the diuretic powder without digitalis every eighth hour.

Dec. 2d, Patient, without obvious cause, and while in bed, was seized this morning with a sudden sense of shock in the head, constriction of thorax, vertigo, and loss of vision, and died in the afternoon.

Inspection, thirty-six hours after death.—The upper aspect of thorax and the face were very œdematous, and stained by ecchymoses; the thorax and abdomen were filled with serum, that in the former bloody. The pericardium contained about two ounces of fluid, and the heart was observed to stretch more to right side than usual; its long diameter was eight inches, and its weight, inclusive of pericardium and vessels, two pounds ten ounces; the surface was pale. The walls of the right ventricle were about one fourth of an inch, and those of left about a whole inch in thickness; the cavity of the former could have held twelve, and that of the latter eight fluid ounces; the right auriculo-ventricular opening permitted the passage of all the fingers; that of the pulmonary artery of two laid horizontally. The left auriculo-ventricular opening admitted three and the aortic orifice one full-sized finger only. Some soft warts were observed on the valves of the aorta. These and other valves were without thickening.

Both lungs were highly emphysematous; a few adhesions were seen on the left, which weighed twenty-two ounces; while the right lung, in consequence of serous infiltration, weighed thirty ounces.

The liver was pale, smaller than common, of very firm con-texture, and weighed three pounds ten ounces. The spleen was soft and diffuent, and five ounces and a half in weight. The right kidney weighed seven ounces and a quarter, and left seven ounces, soft, vascular, and slightly marbled with white tissue.

Case 18.—*Chronic catarrh for four years; aggravation of symptoms for four months; recovery in five weeks. Readmission six weeks afterwards, with anasarca; great dyspnoea and hæmorrhoids; death in less than one month. Inspection.*

John Kelly, aged 30, a weaver, admitted November 5, 1846. This man had, in consequence of exposure to cold four years ago, an attack of catarrh, which left permanent cough. A twelve-

month afterwards the cough became very severe, and was accompanied by dyspnœa and hæmoptysis. He then came into hospital, and after being under treatment for nearly three months, was dismissed, a little cough only remaining. He continued in pretty good health until four months ago, when cough and dyspnœa became more troublesome, and have gradually been becoming worse since. On admission he is debilitated; complains of want of sleep; bowels slow; has some appetite, and tongue is pretty clean; pulse 74; breathing tranquil while he is at rest, but dyspnœa easily excited by change of posture or motion. The thoracic parietes are exceedingly distended and prominent; breathing abdominal; precordial dulness absent. Heart's sounds exceedingly faint; pulsations visible in epigastrium; scarcely perceptible to the hand over ribs. Sonorous, sibilant, or dry subcrepitant rattles are heard over almost every part of the chest, in some places accompanying inspiration alone, in others, both inspiration and expiration. They are loudest superiorly and in front; comparatively faint and distant over posterior surface of chest. Sputum frothy and slightly opaque. Lips of a rather dark colour, and surface inclined to become cold. No œdema.

Two ounces of sulphate of magnesia to be dissolved in one pint and a half of water, and the patient to take of this one large glassful every third hour until the bowels are moved. To have the feet immersed in hot water every evening.

15th, A blister to be applied over the breast bone for four hours. Twelve pills consisting each of one squill pill combined with one grain of ipecacuan; the patient to take one three times daily.

21st, Dyspnœa often urgent.

To smoke extract of stramonium. To rub over chest tartar-emetic ointment. To add to each of the pills half a grain of calomel and a quarter of a grain of opium, and continue as formerly.

Dec. 14th, Dismissed relieved.

Jan. 26th, 1847, Readmitted—complaining of cough, dyspnœa, great anasarca, some ascites and meteorism of bowels; face purple and swollen; pulse 116; sputum semipurulent and tenacious; respiratory sounds very faint; cardiac sounds heard extensively even behind; bowels loose; hemorrhoids bleed.

To have three ounces of gin daily. To take the diuretic powder without digitalis, every sixth hour. To use imperial for drink. To have three drachms of castor oil every second night.

Feb. 2d, Grating diastolic sound heard only about two inches nearer sternum than left mammilla; much coldness of surface; pulse scarcely perceptible at wrist; heart's sounds feeble.

Gin to be increased to six ounces; vessels filled with hot water to be placed around person.

Increased anasarca and oppression, with tendency to sleep.

To each dose of the diuretic powder one grain of squill to be added; and one to be taken every third hour.

Six grains of calomel and as much electuary of catechu as will form it into twelve pills; of which one to be taken every fourth hour; other remedies to be continued.

13th, Gin has been lessened to four ounces daily for last two days. There is greatly-increased lividity of surface, with feeble heart sounds, and great preponderance of second. Much swelling of inferior extremities.

Gin to be increased to eight ounces.

19th, Sphacelus of right thigh with serous exudation, and death on 20th.

Inspection.—The lungs adherent universally by old adhesions; they were infiltrated with serum, and highly emphysematous. The bronchial lining was stained throughout of a deep red colour; some blood, but no pus, was effused within the tubes. The bronchial glands were enlarged. The heart weighed eighteen ounces. The left ventricle and other cavities were enlarged. The aortic orifice did not transmit two fingers. The auricular openings each transmitted three. The valves were healthy.

The liver was small, weighing only twenty ounces. The proper capsule was thick, firm, and opaque; its substance pale and very dense. The spleen weighed five ounces and a-half. Tissue quite black, but of moderate consistence.

The kidneys were granular; surface rough, and of a liver-brown colour; their texture was easily broken down. That of right side weighed six, that of left six ounces and a half.

Peritoneal sac contained upwards of four pounds of highly-coloured serum.

Case 19.—*Puerperal albuminuria probably of some standing; followed during another pregnancy by bronchitis of nine months' duration; and, after parturition, by anasarca; continuous rubbing sound over whole of heart; dyspnœa, progressive increase of symptoms, and death, in two and a-half months. Inspection.*

Mrs Pollock, aged 40, admitted 5th October 1846. This woman has been pregnant five times; first time twenty years since, and the last three weeks. On every occasion had dropsical swelling of the lower extremities, which always disappeared after delivery, till the present time, when it has continued greatly to increase. Nine months ago, in consequence of exposure to cold, she was seized with catarrhal symptoms, which continue, having become worse about six weeks since. Anasarca general; abdomen tympanitic, and also fluctuant. Retches much; has palpitation increased by exertion, and accompanied by vertigo and confused vision. The heart sounds are obscured by a continuous murmur, which is heard indifferently at edge of axilla,

and at the cartilages of the third ribs on both sides. Diffluent purulent expectoration, with diaphragmatic breathing. Sibulous, intermingled with sonorous rattles, and some moist crepitous rattle over thorax. Pulse 92. Tongue purple, with white coating. Urine slightly albuminous; specific gravity 1.023, slightly acid, and of a deep orange colour.

To have the fourth part of a pill of calomel and opium every third hour. To take the diuretic powder without digitalis every eighth hour. To have two scruples of the compound jalap powder every sixth hour.

11th, To have half a drachm of compound jalap powder every third hour till the bowels are moved. To take the diuretic powder every fourth hour.

17th, Immediately after last report the gums became slightly tumid, and the diuretics began to act, the urine averaging about eight pounds and a-half daily, with much relief of the breathing. For last three days the dyspnoea has become permanently so much aggravated as to compel her to remain erect. The thorax is resonant throughout, except in the cardiac region, the dulness in which stretches from mesial line of sternum, along the level of the third and seventh ribs, to outer aspect of mamma. Sputum opaque and nummular; respiration diaphragmatic; starts frequently from sleep, with sense of suffocation. The cardiac impulse gone; heart sounds ringing over ventricle, with great harshness of the diastolic over aortic orifice. There is no murmur accompanying the sounds, except in the neck, where there is a continuous soufflé. Cannot recline on right side. Pulse 108.

To omit calomel and opium pills, and the diuretic powder. A blister to be applied over the sternum. To have daily four ounces of port wine. Half a drachm of iodide of potassium to be dissolved in four drachms of tincture of cantharides; and ten minims of the solution to be taken in water three times daily.

23d, Cardiac dulness continues, except under mamma, where there are resonance and tumultuous pulsation.

Repeat the blister over sternum. The solution of tincture of cantharides and iodide to be increased to fifteen minims three times daily.

Nov. 3d, Urine, which, after last report, remained at about ten pounds daily, has become more scanty.

The diuretic powder every four hours, and continue other remedies.

8th, Respiration natural, and she can recline horizontally on either side. General feelings improved; but the legs and thighs continue to be much swollen; and there is a distinct murmur over both sounds of the heart, which are coalesced into a continuous single sound.

To have half an ounce of bitartrate of potass morning and evening. Other medicines to be continued.

23d, Increase of anasarca and chest symptoms for some days. Double cardiac murmur heard over mitral and aortic regions. The liver projects in the epigastrium, and is hardened. General dropsy great. Urine about eight pounds.

On the 8th, she is reported as suffering under serious increase of all the symptoms, with œdematous engorgement of the left lung (the side on which she reclined when she could do so), and expectoration of intensely white and glutinous sputa, mixed with innumerable minute bullæ. The calomel and opium, solution of carbonate of ammonia, and a daily allowance of gin, were resorted to; and her existence was protracted till the 19th December, when she died.

Inspection.—The thorax contained four gallons of light amber-coloured serum. The right lung was twenty-two ounces in weight; the left sixteen ounces. An abscess, of the size of a small billiard ball, was situated in posterior part of the latter, and communicated with the bronchi, which were very generally congested and thickened in their inner lining.

The pericardium occupied a large part of chest; its diameter across was $7\frac{1}{2}$ inches, and it contained about four ounces of serum. The size of the heart itself was equal to about that of the subject's two clenched fists. All the cavities were dilated, and the walls slightly thickened, but the valves were healthy. Both auriculo-ventricular openings admitted the easy transit of three full-sized fingers, the pulmonary artery of the index and middle fingers, and the aorta of the thumb. The weight of the organ was twenty ounces.

The abdomen contained about eight gallons of fluid. The liver was of large size, and weighed seventy ounces; the capsule was opaque at various points, and substance of gland soft and granular. Spleen highly engorged, and weighed nine ounces.

The united weight of both kidneys only eight ounces. They were small, hard, and blanched in their whole structure.

In reviewing the foregoing cases, in connection with the other details of this inquiry, the extent of pathological change, to which a varicose condition of the capillary pulmonic vessels gives origin in every organ nearly of the body, appears most remarkable, and is also fraught with practical importance. In reference to acute cases, the justice of such a statement will fully appear, when the numerous and severe complications, with which the attacks of the advanced disease are uniformly accompanied, are considered, the limits of these being often in reality those only of the organization. But, besides these, a respectable proportion of our consultations in the summer months is formed of cases in which the

symptoms submitted to medical observation and treatment have, either immediately or through the intervention of a second organ, the origin in question, although, because the urgency, and perhaps the presence, of the bronchial irritation have passed away, this is probably not even suspected. I need only refer here to the examples of headach, *tinnitus aurium*, deafness, and other signs of serious injury in the cerebro-spinal axis with which we are thus conversant, or to the multiplied forms of circulatory and splanchnic disease, which, from the same source, come under our notice.

Another point of much interest in the history of dextral disease of the heart is, that every secondary alteration or lesion which occurs in its course involves within it a remedial principle or sanative effort, however imperfect. The structural changes which are set up, become practically serious additions to the severity of the case, although, abstractly, they each appear to grow spontaneously out of a curative action, for the alleviation of some preceding morbid condition. Thus the progressive dilatation in succession of the pulmonary artery, right heart, great systemic veins, and portal system, which is the essential feature of the fully-formed disease, is at once an immediate effect of the pulmonary lentor, and also an obvious mode of relieving this. The overloaded right heart ultimately obstructs the circulation of the left; but it primarily relieves the vascular engorgement of the respiratory system. The distension in the sinuses of the brain, of the liver, the spleen, the intestines, and kidneys, which at length occasions most disastrous changes in the capillary extremities of these respective vessels, affords for long most invaluable relief to the overstretched and oppressed right side of the heart. And it seems to proceed from the operation of a similar law, and in the first instance with the effect of bringing also a certain amount of corresponding relief, that the blood itself becomes successively disburdened, sometimes of a portion of its whole contents, as by an attack of hæmoptysis, a cerebral, a jecoral, a uterine, or other hemorrhage; or, more frequently, of one or more of its constituent parts, as its fat, its albumen, or its serum. The profuse sweatings, accompanied, when the arterialization of the blood in the lungs is greatly hindered, by excessive coldness of the surface; and the extreme diuresis, sometimes passing into actual diabetes; and, lastly, the catharsis;—all of which occur in certain instances of simple cardiac congestion, appear to belong to the same category, and furnish important suggestions in regard to the proper indications of treatment in this affection.

A specialty in all of the complications of dextral cardiac disease, to which attention has been here directed, is, that they are thus sequences as well as complications. In this respect they differ from complications in a more ordinary sense, in that they constitute

extensions of the primitive malady rather than distinct and separate diseases. They are new members, but still integrant parts, of the original morbid condition, which had its point of departure in the minute blood-vessels of the air-cells of the lungs. Thus, in the man Smith (case 17), the albuminuria, which was plainly, —as shown by the enlarged, heavy, and vascular state of the kidneys,—in its first stage only at the time that the parent disease was in its last, the new element of granular kidneys was at once a complication and a sequence or effect; while, in the woman Pollock (case 19), the dextral disease of the heart was accidentally engrafted on an individual labouring previously under albuminuria from other causes. In this patient the structural lesions of the liver and kidneys were respectively the very reverse of what is the ordinary arrangement, or of what obtained in Smith. The liver was enlarged to seventy ounces, and the kidneys were shrunk to an average of four ounces each, their tissues being indurated as well as atrophied; that is, the former viscus was in the first stage only of granular and adipose degeneration, instead of being, as is usual at the termination of simple congestive cardiac disease, in the last, while the kidneys presented the most advanced form of this disorganisation, rather than any of its earlier varieties.

With these remarks premised, I shall, in the succeeding part of this memoir, offer a few illustrations of the different terminations or complications of dextral disease of the heart, with some observations on its most appropriate treatment.

(To be continued.)

ART. II.—*Medical Remarks on Emigrant Ships to North America*. By THOMAS STRATTON, M. D. Edin.; Surgeon R. N.; Memb. Edinburgh R. I. Clinical Soc.; Memb. Toronto Medico-Chirurgical Soc.; Memb. Montreal Natural History Soc.; Corresp. Memb. Quebec Literary and Historical Soc.; Hon. Memb. Highland Soc. of Canada, &c. ✓

IN the Edinb. Med. and Surg. Journal for July 1848, volume seventieth, I gave an account of the ocean-plague which made victims of so many of the emigrants to Canada in 1847, and I suggested various improvements in the way of managing emigration. My observations on these subjects passed through seven editions; they appeared in Dr Hall's Montreal Medical Journal, in three Montreal newspapers, in Simmonds' Colonial Magazine (London), and in pamphlet form. Of this last edition, copies were sent to Earl Grey, colonial secretary; Mr Hawes, M.P.,