concur in proving, in plethoric individuals, this superabundance of fluid in the circulating system; the turgescence of the skin, the fulness of the vessels, the development of the veins, the redness of the tissues, all indicate the presence of an abnormal quantity of blood in the capillaries. Is there not also a connexion between the tendency to active hæmorrhages and this state?—and may not this tendency be an effort of nature to relieve the overloaded vascular system? Do not the cerebral symptoms indicate the presence of too large a quantity of blood in the cranial cavity? May not the dyspnœa too, be explained by the necessity of more frequent respiration to oxygenize in the same time a greater amount of blood, as also the palpitations, by a too rapid repletion of the heart, which is compelled to contract with more energy in order to transmit the circulating fluid into its vessels?

And are not all these disorders better explained by supposing them to arise from a surfeit, as it were, of the vascular system than from simple augmentation of the globules? In reasoning upon this latter hypothesis, we are constrained to admit that their diminution produces the same symptoms as their augmentation, (cephalgia, vertigo, &c.,) which it is difficult to believe; whilst in admitting our theory, that individuals in whom the blood is less rich in globules may also be plethoric, (that is, have an excess of blood,) there is no difficulty whatever.

The existence of plethora in cases where there is a diminution of the globules, is an incontrovertible fact. All the chlorotic individuals that we have bled, presented, without exception, the characteristic symptoms of plethora, combined with those of chlorosis. The issue, moreover, justified our prognosis, for all the patients were relieved by the bleeding, as also by the preparations of iron afterwards. Again, in pregnancy there is frequent necessity for bleeding, by reason of the development of plethora, which is so frequently present, and of the existence of which there can be no doubt; it is, moreover, well known that by this proceeding the symptoms are relieved, while in most cases the analysis of the blood shows a diminution, (often considerable,) in the proportion of the globules.

In short, it appears that our proposition is just, and that plethora ought rather to be attributed to an excess in the mass of blood, whatever may be the composition of that fluid,—an excess which may show itself alone, or be combined with various other morbid states.

(To be continued.)

CASE OF DISEASE OF THE HEART, WITH OBSERVATIONS.

By GEORGE FIFE, M.D., Physician to the Sunderland and Bishop Wearmouth Infirmary.

The case which forms the subject of the following remarks seems deserving of attention on many accounts:—These are, its tendency to elucidate a question in physiology, which has long been and still is a subject of controversy; the decided evidence of the value of auscultation, if not its actual necessity, in the correct diagnosis of the diseases of the heart; and the correspondence which exists between the physical signs, as observed during life, and the anatomical changes met with after death, and upon which these signs so manifestly depended. On each of these heads it will be necessary hereafter to offer a few observations, I will now, therefore, as concisely as possible, relate the symptoms, physical signs, inferences drawn from them, and the appearances met with on dissection, by which the accuracy of such inferences was most satisfactorily established.

Miss J—, so far as auscultation was concerned, had for a considerable period suffered from unequivocal symptoms of diseased heart, for which she was under the medical charge of my valued friend Mr. Kennedy, of South Shields. At the time when I visited her along with him, she laboured under the following symptoms:—Countenance pale and occasionally livid; lips livid; eyeballs prominent; dyspnœa urgent; occasionally severe pain of the chest, especially on the left side; palpitation; secretions tolerably regular; œdema of lower extremities.

Physical Signs.—Sounds of the heart heard over a greatly increased space, both to the right side of the sternum and left side of the chest; impulse universally stronger than natural; blowing sound nearly constant; first sound and rhythm absent on the left side; pulse small, frequent, and intermittent, synchronous at both wrists.

The inferences drawn, and of which a memorandum was made previously to our proceeding to the *post-mortem* examination were the following:—General enlargement of the heart; thickening of the semilunar valves of the aorta; dilatation of the aorta; disease of the mitral valves; and effusion into the pericardium and chest. Mr. Kennedy had for some time maintained that there was contraction of the left auriculo-ventricular opening.

Post-mortem appearances.—Heart enormously enlarged, in which all the cavities appeared to participate, without, however, any appreciable thinning of their parietes; the left ventricle very large. The auriculo-ventricular opening on the left side presented an indurated ring, and one portion of the valve was nearly occupied by a dense firm body, which not only contracted the opening, but at the same time effectually prevented the perfect closure of the valve. The semilunar valves were thickened, and somewhat indurated, though not in a state of either cartilaginous or ossific degeneration. The aorta, from its origin to its arch, was so much dilated as to form a large pouch; no apparent change of structure in the coats of the artery. The pericardium was closely and extensively adherent to the heart. Great effusion of sero-sanguinolent fluid into the left side of the chest, by which

the heart was displaced and pushed to the right side, and the left lung compressed into a very small space.

Remarks.—That the symptoms related would alone enable a man of ordinary experience to determine that the case was one of cardiac disease, is unquestionable; but that he could, without the aid of auscultation, or other physical examination, form anything like a correct opinion of the real nature and extent of the disease, is, to say the least, to me a matter of extreme doubt, as there is not a single symptom which I have not met with in mere functional derangement of the heart, in cases of chlorosis and hysteria. When, however, to the careful investigation of symptoms, the physical signs are added, all uncertainty as to the nature of the disease is removed, and we are enabled not only to determine the extent of the existing mischief, but most commonly, (as in the present case,) also, its precise seat. In other words, what symptoms indicate as a reasonable conjecture, physical signs point out as a well defined and positive fact.

The circumstance which renders this case more interesting, if not important, is the relation which it bears to physiology. The sounds of the heart have long been, and still are, the basis of considerable diversity of opinion amongst the most enlightened members of our profession. This fact must suffice as an excuse for any prolixity of which I may now be guilty; as although it may appear at first sight to be a purely theoretical subject, it is, on further examination, found to be of no less practical importance. And on the latter ground only, do I now enter into the discussion, being thoroughly convinced of the evil arising from mere hypothetical indulgence in matters, where facts may be found which are amply sufficient to demonstrate that, which the most ingenious experiments and the deductions of the experimentalist are wholly inadequate to accomplish. Such facts will frequently be met with on comparing the phenomena of disease with the structural changes met with on dissection, after death; and the comparison of these with the healthy functions of the same organs during life, and the healthy structure of the organs where they have not been the seat of disease. How far the present case is calculated to answer this great practical purpose it will now be my object to show, and in order to do so, I will at once ask how the sounds of the heart are produced?

In answering this question, it will be necessary to enter in some measure on the consideration of the physiology of the circulation, as although, doubtless, perfectly well known to all, there are some points which claim our especial attention. What these are, I will now as briefly as possible state, in order to justify me in the affirmation, that since the year 1825, I have never entertained a doubt that the sounds of the heart were produced by, and mainly dependent on, the action of the valves; in which opinion I am happy to have the support of so deservedly high an authority as Dr. Hope.

We find then that the circulation is carried on by a series of movements of the heart, and that such movements are accompanied by certain sounds, in regard to the production of which very opposite opinions have been entertained. According to one of these opinions, the first sound is to be attributed to the action of the valves, whilst the other as positively assigns it to muscular action. On each of these opinions it is now

proposed to offer a few remarks, although it is impossible to do any thing like justice to the subject in such narrow limits as must necessarily regulate the length of this paper.

Let us now briefly consider the nature of the first sound. We find it to consist of a *click*, followed by a murmur, to which the term *bruit musculaire* has been given, both by Dr. Hope and others, who have followed the immortal Laennec. This click, though less distinct than that of the second sound, is still sufficiently defined to justify the use of the word which I have applied to it. The murmur or prolonged sound I have never doubted, as dependent conjointly on the muscular apparatus, constituting the walls of the ventricle, and probably in part the simple contraction thereof. All I mean to contend for is, that the commencement of the first sound is to be attributed to the closure of the auriculo-ventricular valves. This seems to be confirmed by an admission of Dr. Hope, in the last edition of his admirable and truly philosophical work, to the following effect, viz.,—that in cases of dilatation with thinning of the parietes of the ventricle, the *bruit-musculaire* is absent, “causing the first sound to be identical with the second,” which is now generally admitted to be purely valvular, and caused entirely by the sudden pressure of the arterial column of blood upon the semilunar valves, by which they are suddenly closed, and the reflux of blood into the ventricle during its diastole effectually prevented. As to the opinion, that the second sound was to be attributed to the contraction of the auricle, it is hardly to be entertained at the present day, being disproved alike by experiment and observation. Hence it appears quite unnecessary to dilate upon what has been already stated. It is still less requisite to entertain Majendie's notion of the sounds being attributable to the percussion of the heart's apex against the thoracic parietes. If we now examine the above statements in connexion with the physical signs present during the life of the patient, we have pathological evidence of their physiological truth, and when the post-mortem appearances are similarly applied, we have abundant anatomical confirmation of the pathology of the case.

Enough having been said to demonstrate the value of mediate auscultation in heart disease, I will pass on to the consideration of the inferences drawn, with the view of showing how far they were correct, and in what respects they were either defective or redundant. For this end it may be sufficient to state wherein the post-mortem appearances consisted with the diagnosis, and on what such diagnosis rested, and afterwards to comment upon those which had either escaped observation or did not accord with it.

1st. Dilatation of the cavities of the heart, with hypertrophy of their parietes, was obviously present, and was evident during life from the increased space over which the heart was heard, and the increase of its impulse.

2nd. Dilatation of the aorta was expected from the pulsation at the upper part of the sternum, and an obscure murmur; also from the dyspnoea being present, even in the sitting or erect posture, although increased on the patient lying down.

3rd. That the semilunar valves were merely in a state of thickening or induration, without either ossific-

or cartilaginous degeneration, was inferred from the second sound being slightly impaired in acuteness, without the sound indicative of decided valvular disease being audible.—(*Bruit de Scie.*)

4th. The disease of the left auriculo-ventricular orifice was manifest, not only from the blowing sound being present, but also from the absence of the first sound and rhythm.

Mr. Kennedy, in whose acumen and practice in physical diagnosis I have reason to place great confidence, predicted that we should find the orifice contracted, whilst I attributed the phenomena to the imperfect action of the valves only, induced by disease of their structure. Dissection proved that the circumference of the orifice was surrounded by a ring of induration, nearly of the firmness of cartilage, and that one portion of the valve was almost occupied by a similar change. In explanation of this slight difference, it is right to say that Mr. Kennedy was in the habit of frequently examining the case with the stethoscope, whereas I did not do so more than three times in four or five months.

So far then, we find, that in every respect, the inferences drawn during life were in strict accordance with the physical signs and anatomical changes of structure, met with on dissection. It now remains for me to notice the only opinion which can at all be regarded as inaccurate, and which was deduced not from auscultation, but from general symptoms. I allude to the effusion supposed to exist in the pericardium and chest. In the pericardium no fluid existed, but on the contrary, that membranous sac was so closely and generally adherent to the heart, as almost to serve the office of an additional tunic, and to which I have no doubt, the greatly increased impulse was in some measure to be ascribed; as although the parietes were decidedly somewhat thickened, they were at the same time softer than natural. The effusion into the left thoracic cavity was enormous, as already stated, and such fact was legitimately inferred from the orthopnoea which attended the change to the recumbent posture.

Further remarks appear unnecessary, and I shall therefore content myself with concluding that the case related proves the positions which I assumed at the commencement of this brief paper.

GEORGE FIFE, M.D.

Sunderland, June, 1845.

ON ULCERS OF THE CORNEA.

By W. WHITE COOPER, Esq., F.R.C.S., Senior Surgeon to the North London Ophthalmic Institution, &c.

Ulceration of the cornea is one of the diseases of the eye most common amongst the lower classes, and it is by no means infrequent in the higher orders. Some forms are exceedingly intractable, especially in children, and the disease will go on, week after week, and month after month, sometimes better, at other times worse, until the patience of the surgeon is worn out, and the friends of the child are in despair. As I have had considerable experience in the treatment of these affections, I venture to offer a few practical remarks, hoping that they may not be altogether useless.

Ulcers are very commonly attendant upon strumous ophthalmia, of which a characteristic symptom is intolerance of light, and it is often extremely difficult

to obtain a satisfactory view of the eye. If the patient be a child, he is sure to resist any attempt to open the eye; he will struggle, and fight, and scream, most furiously, and if we endeavour to raise the lid, the chances are, that it becomes everted, and that the cornea will be so completely concealed by it, that its surface cannot be seen. All this, too, produces congestion of the eye, so that even if we do obtain a view, a fair opinion cannot be formed as to the state of matters, and it must not be forgotten that if the ulcer be deep, serious mischief may arise if much violence is made use of in the examination. There are two modes which I have found to obviate all these inconveniences. Either to make the examination whilst the child is asleep, when we can open the eye with ease, and see it in a natural condition—I mean not congested by excitement—or if such an opportunity does not offer, I turn the child with its back, or its side, to the light, and then, shading the eye with my hand, I soothe the child, and attract its attention to some object, by which means, and the exercise of a little patience, I seldom fail in attaining my object.

Ulcers assume a variety of aspects according to circumstances. The superficial laminae only of the cornea may be implicated, or the entire substance may be penetrated. An ulcer may be perfectly clear and transparent, as if a piece had been chipped out of the cornea, or the surface may be covered with opaque matter, and a cluster of vessels be seen running from the margin of the cornea to the ulcer. In this latter form the eye is irritable, there is intolerance of light, the conjunctiva is more or less congested, and the general symptoms are those of inflammation of the organ. If, however, there is neither vascularity nor irritability, and the surface of the ulcer is simply opaque, we may regard it as healing, for the opacity is caused by effusion of lymph, which ultimately fills up the cavity. The formation and bursting of pustules and phlyctenulae is one of the most frequent sources of ulcers, and I have seen some very formidable instances succeeding to small-pox. They are common too after scarlatina and measles. That peculiar inflammation of the sclerotic, called rheumatic ophthalmia, is often attended with the formation of troublesome superficial ulceration, which destroys the conjunctival covering of the cornea, and spreads extensively, but does not penetrate into the substance of that tunic.

Whatever may be the character of the ulcer, it is very desirable to put a stop to its progress, and promote its healing with the least possible delay. If it be inflammatory, the application of a few leeches will be of service, and the bowels should be freely opened; a blister may be applied behind the ear, and relief will be afforded by frequent fomentations with warm water. When the acute symptoms have subsided, a weak solution of nitrate of silver will be the best application, beginning with one grain to the ounce of distilled water, and gradually increasing the strength to four grains. A full drop of this should be placed in the eye twice a day, by drawing down the lower lid and gently sweeping a large camel-hair brush, loaded with the solution, along the fold between the lid and the globe, whence the fluid will be instantly carried over the cornea.

The treatment of the transparent ulcer should be directed to the removing, as far as possible, of that