was uninjured. No pulsation could be detected. Another portion of bone was removed and then the membranes rose up and pulsated freely. There was very troublesome hæmorrhage from a large anterior branch of the meningeal artery. This was allowed to bleed, a drainage-tube being introduced beneath the flap. Recovery was rapid and uneventful.

Within a day or two of the operation the most marked and gratifying change occurred in the patient's mental condition. He became intelligent and lively, and his face assumed a bright expression, quite different from the heavy, apathetic, and somewhat morose expression which he had previously shown. He got up in a fortnight, and left for the country in three weeks. He could walk straight, confidently, and well. He could sign his name "as well as ever," and despite my remonstrance he conducted some business rationally and well. The knee-jerks were still weak. His wife and other relations regarded him as quite restored to his natural mental state. The return of his power of writing was very remarkable, for whereas before the operation he could merely make a series of barely decipherable up and down strokes after it he could write clearly and well. Dr. Shaw again saw him two weeks after the operation when the improvement was very striking. The face had regained an intelligent expression, the pupils were equal, and the walking power, as far as it could be tested, was as usual. The improvement in the handwriting was most marked and we possess specimens of his signature made just before and soon after the operation.

Fits of an epileptiform nature, severe pains in the head, and mental disturbances are all found in these curious and interesting cases. In some cases mere thickening of the bone is found and in others a depressed fracture previously quite unsuspected. In others, again, the membranes have been found thickened, and cystic formations, the remains of old blood extravasations, have been detected. The bone should be freely removed, but unless there be a very definite reason it is better not to incise the dura mater in these cases. Should any suspicion of cerebral abscess be present in the mind of the operator the brain beneath should always be explored in the usual manner. "The case," writes Dr. Shaw, "shows the good results of early operation before the pressure which undoubtedly existed was able to effect wasting changes. The reappearance of pulsation in the brain after the removal of the bone was very striking."

Cavendish-place, W.

A METHOD OF EXAMINING THE PULMONARY APEX.

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IN a former communication¹ I described certain methods of physical diagnosis chiefly applicable to the bases of the lungs and it is now proposed to describe a method of examining the pulmonary apices designed to yield trustworthy indications of the very earliest stage of phthisis. It is commonly recognised that certain general symptoms—e.g., anæmia, indigestion, and evening temperature—may be the only evidences of the commencement of tuberculous deposit in the lung: no really trustworthy data being afforded by the conventional methods of examination. The procedure about to be described may materially assist in the detection of such cases.

In addition to a large number of clinical examinations, I have made a number of observations on the cadaver by sections and otherwise, with a view to determine the relationship of parts and the exact positions of intervening structures. In this part of the work I am much indebted to Braune's Atlas and to some remarkably constructed myographical plates by E. W. Tuson of the Middlesex Hospital, published in 1825.

The height to which the apices of the lungs rise varies somewhat. Lying above and between the insertions of the sterno-mastoid, in the curve of the subclavian artery, they reach on an average from one inch to one and a half inches above the clavicles. In some cases they

reach two inches. The extreme apex is free and unsupported by bone, but below this the pulmonary tissue is bound down by the rigid first rib. Trustworthy observations show that the right apex is a shade higher than the left, but this makes little appreciable difference in practical work. The area now to be considered is situated entirely above the clavicles, extending from these bones to the level of the second dorsal spine, and so includes the entire posterior apical region of the upper lobe.

The method is as follows: first, all the resonant area above the clavicles is "percussed out." Percussion is begun at the clavicular attachment of the outer head of the sterno-mastoid and continued upwards, just outside the border of the muscle. Finger-to-finger percussion may be employed, but I generally use a vulcanite rod pleximeter, the contact or chest-piece of which is about half an inch in diameter. The stroke must be very gentle and its direction vertical, or even rather away from the muscle. It will be found that at a certain point above the clavicle the note changes from resonant to dull. This point is marked off with a dermograph. It may be mentioned, that although the apex of the lung lies farther forward than the outer edge of the muscle, percussion over the muscle itself is useless owing to the proximity of the larynx. It is essential that the patient hold his head erect without any deviation or rotation to either side. Next, percussion is similarly made along the inner border of the trapezius (which is sufficiently evident in most persons) and the point at the side of the neck where resonance ceases is similarly marked off. So, proceeding backwards, percussion is made in an upward direction until the upper limit of resonance is determined all round and the line LR (Fig. 1) is brought out. In

FIG. 1.

percussing the parts outside the inner border of the trapezius firm pressure should be made with the finger or pleximeter and the stroke should be fairly forcible owing to the thickness of the tissues (chiefly fat, trapezius, and levator anguli scapulæ). If a pleximeter be used, its contact extremity should be long and narrow.

The upper line or limit of resonance being obtained, the outermost or lower limit of resonance is next mapped out. Percussion is begun over the inner third of the clavicle and continued outwards along the bone. About its outer third the note will change. It may be observed that to elicit this change of note mediate percussion (finger-to-finger) is better than direct. By successively percussing in the same direction the outer limit of resonance is brought out (OLR in Fig. 1). It will now be observed that the upper line of resonance passes obliquely upwards, crosses the interval between the sterno-mastoid and trapezius, still taking an upward direction, until its highest point is reached. It then continues almost on the same level for some little distance, and takes a course downwards to end at the first dorsal spine. The outer line of resonance forms nearly the arc of a circle whose convexity is inwards. In this way the upper and outer limits of the apical area are determined; the anterior limit is the clavicle and the posterior limit is a line drawn outwards from the second dorsal spine to meet the posterior end of the outer line of resonance. Such a line

¹ THE LANCET, May 31st, 1902, p. 1526.

passes beneath the superior angle of the scapula. We have thus the apical region as a somewhat quadrilateral area, mapped out by these different lines.

This area falls to be divided into certain segments. The first or anterior segment (A, Fig. 1) is bounded behind by the inner edge of the trapezius and is thus entirely included in the posterior triangle of the neck. The disposition of the other segments will be best appreciated by a reference to Fig. 2. Here it will be observed that a square is formed on

FIG. 2.

the line which joins the seventh cervical and second dorsal spines. It will be found that normally the upper line of resonance runs from the first dorsal spine to the upper and outer angle of the square. From this angle a line is drawn parallel to that along the inner border of the trapezius. These lines include the middle segment (B). The posterior segment (C) lies behind and below this, while the vertebral segment (D) is formed by the lower part of the square.

The key to the detection of incipient disease in one or other apex is familiarity with the physical signs yielded in health. There are certain phenomena which are common to both apices, but the signs elicited from the individual segments differ on the two sides. Not only is this so, but each segment on either side yields certain modifications in the physical signs which are distinctive of itself, and these are uniform over the entire segment.

In health the upper and lower limits of resonance practically correspond in position on the two sides, provided there be no flaw in the bodily conformation. A slight deviation may be present in the respective positions of the two upper lines, owing to the slightly greater height of the right apex. Allowance should be made for this in conducting examinations, but it rarely occurs as a disturbing element. The distances between the upper and outer lines of resonance should be measured from fixed points on either side and compared. This is an important consideration in the investigation of disease.

If the pleximeter be placed immediately above the upper line of resonance, and percussion be made during quiet breathing or after a forcible expiration, it will generally be found that if a deep inspiration be taken and the breath held, the percussion tone will change from dull to resonant—that is to say, there is an extension of resonance upwards due to inflation of the apex. A quarter of an inch is about the limit of this excursion, which is represented by the dotted line in Fig. 3. Sometimes considerable delicacy of technique is requisite to elicit the phenomenon, and in stout flabby persons it may not be obtainable. In thin muscular subjects with strong lungs it is very evident. Its importance lies in this, that it be equally produced on both sides. Owing to the fixity of the first rib no such extension of resonance is produced at the outer line.

In determining the physical signs over the individual segments it is important to note the condition of the patient.

Very lean subjects yield signs which might mean disease in stout ones. It is useful to begin by palpating the various segments and comparing the two sides. Then the characters of the breath sounds, vocal resonance, and whispering resonance are noted and compared. The whispering resonance is of high importance and should never be omitted in any examination.

It is generally recognised that normally the expiration sound (which is always "bronchial" in character) is commonly heard over the right apex, at least on deep breathing, and that the vocal resonance is considerably louder than over the left apex. This is true both as regards males and females. But such general terms of expression are inadequate and misleading. It is necessary to consider each individual case separately from the results obtained in the individual segments.

It cannot be too strongly insisted on that it is only by adopting a standard of comparison that any accuracy can be obtained. Such a standard may be defined as follows. Over the anterior segments the auscultatory signs (breath sounds, vocal resonance, and whispering resonance) are most intense, those over the right segment being more marked than those over the left. Over the middle and posterior segments on the left side the whispered voice should be inaudible and on deep breathing the expiration should likewise be inaudible, or at least very faint and of short duration. Exceptions to this only occur in the case of very lean or very young individuals, in whom both phenomena may be present. It is to be premised, however, that the patient is instructed not to blow his breath out forcibly, but rather to "let it go." On this side also the vocal resonance is more pronounced over the middle than over the posterior segment. On the right side both the whispered voice resonance and the expiration sound—at least in deep breathing—are normally present over the middle and posterior segments, while the vocal resonance is nearly equal over both segments and considerably louder than over the corresponding segments on the left side. The vertebral segments have characters peculiar to themselves. Variations are common, which are, however, devoid of any important significance. Commonly they present bronchial breathing, bronchophorous voice, and whispering bronchophony (not whispering pectoriloquy). The sounds are sharp

FIG. 3.

and "empty" (Skoda) and are due to direct conduction from the larynx through the solid tissues. They are most pronounced on the right side.

Now, if the pulmonary apices be examined in this fractional and comparative manner any deviation from the normal standard, any evident disproportion either in respect of characters common to both sides or to the individual segments, may be justly regarded as a ground for suspicion. As early indications of abnormality the following points are to be noted: 1. Failure of the upper line of resonance on one or

other side to ascend during a deep inspiration. 2. A lowering of the upper line of resonance in whole or in part as compared with that on the opposite side. Posteriorly, for instance, the line may occupy the position shown in Fig. 2 (right side), or the fall may be evident only at the anterior extremity, or it may be general all along the line. In estimating this a slight allowance is to be made in favour of the left side but only in that portion of it anterior to the vertebral segment. It should also be ascertained that the line on one side is not abnormally high from emphysema. 3. Indistinct definition of the upper or outer lines of resonance—the resonant and dull areas merging more or less into each other. 4. Inward displacement of the outer line of resonance. Should one or more of these signs be present it may be possible to detect some deficiency in the excursion of the diaphragm on the same side.

The results obtained by percussion are next compared with those of palpation and auscultation. The points for consideration are chiefly these: 1. The breath sounds disproportionately feeble in one or other of the anterior segments (especially if the right side approximates to the left). 2. Any approximation in intensity in the vocal resonance on the left side to that on the right, either generally or in one or other segment. 3. The presence of whispering resonance and expiratory breath sound over the middle or posterior segment on the left side, noting specially the pitch and duration of expiration; if present on quiet breathing, and comparing with the same segment on the opposite side. 4. A discrepancy in the characters of the physical signs over different parts of the same segment; as already mentioned, the signs over each segment should be uniform throughout. 5. Encroachment of the signs pertaining to one segment or another—applying more particularly to the left side, as, for instance, bronchial breathing and bronchophony extending beyond the margin of the vertebral segment.

It is most usual when examining the apices in this way to find any abnormality with regard to the lines of resonance existing alongside some change in the normal character of a segment or segments: thus immobility of the upper line of resonance may coexist with weak breath sounds in the anterior segment, or a fall in the highest part of the line on the left side with the presence of expiration sound and whispering resonance in the middle segment. On the right side the results of percussion are more especially valuable, as the auscultatory signs by themselves are less definite there. We note that the delimitation of the percussion areas may be verified by (1) the vocal and whispering resonances, and (2) "transsonance." A stethoscope with a small chest-piece (three-quarters of an inch in diameter) should be used.² It is moved along the segments in such a manner that each successive application partially overlaps the last. At the limits of resonance the sounds will change. "Transsonance" is a form of auscultatory percussion which is recommended by Abrams. A bone, such as a vertebra or the manubrium sterni, is directly struck with the finger or a hammer while the stethoscope is moved along the parts to be demarcated, the same point being struck all the while. A change of tone occurs in passing to a part of different density. By "transsonance" we may also compare one apex with another.

It has been pointed out that the auscultatory phenomena over the right apex are less trustworthy, but in addition to the aids just described there is another not to be lost sight of. It is, that in cases of disease the difference in the expiration sound in quiet and deep breathing respectively is much less marked than in health. In disease the bronchial type may be equally well marked in both forms of breathing. This is a feature which is of general application.

Occasionally in healthy lungs one hears a few crepitations over the apex (usually in the anterior segment) which are atelectatic in character. They only occur in the end of the first deep inspirations taken, and disappear completely after, it may be, one or two inspirations. They differ in character from those due to tubercle, being also more numerous. Tuberculous crepitation, on the other hand, is always persistent.

It sometimes happens that a tuberculous apex becomes hyper-resonant, either from local emphysema or relaxation of the pulmonary tissue. A difference in the position or in the capability of movement of the line of resonance may

then be found on that side, and other differences may be detected in the normal relationships of the auscultatory signs over the segments. It is very easy to diagnose a healed tuberculous focus in the apex by this method.

Although little else has been attempted in this communication than to outline the technique employed, its successful application in individual cases is entirely a matter of practice and, it may be added, of patience.

Henrietta-street, W.

A RARE FORM OF PURPURA.

By H. LAING GORDON, M.D., C.M. EDIN.

THE case described below offers, in the present state of knowledge, little more than a pretty subject for academic discussion; but an account of this unusual variety of an uncommon form of disease may supply useful facts or hints to investigators of the nature of purpura.

It does not appear that so far the clinical appearances of the disease or pathological investigation have demonstrated its origin, although they have stimulated ingenuity in grouping and classification. There will be no small difficulty in fitting this case into one particular group. The term "purpura," indeed, describes it inadequately, while to call it "Henoch's purpura" is like putting a fat *cache-pot* on a narrow shelf. The bestowal of Henoch's name on a rare group of cases gives them a fictitious importance; the symptoms he described as "added to purpura and articular swellings"—viz., vomiting, intestinal hæmorrhage, and colic—are probably due to internal extravasations of blood; and if this be so, "Henoch's purpura" is revealed as a severe form of ordinary purpura. The necropsy on Silbermann's patient referred to in the article "Purpura" in Allbutt's "System of Medicine"¹ tends to confirm this view. Henoch himself wrote only of "Eine eigenthümliche Form von Purpura," using an adjective which might qualify every case of purpura described since he wrote. The case to be narrated exhibited the symptoms described by Henoch, added to purpura and articular swelling, but had other severe symptoms superadded which did not appear to be attributable to extravasation. An opinion on the origin of a group of symptoms must be, failing definite evidence, a mere individual impression. Dogmatism is a snare but deprecation is craven, and so, in the absence of any specific organism to spare us the use of vague terms, my impression would ticket this case as either "nervous" or "rheumatic."

The patient, a boy, aged 14 years, known to me as being nervous and abnormally sensitive, persevering at work and plucky in games, was taken ill on Feb. 27th, 1901, complaining of pain and stiffness in the limbs and a rash on the legs. These symptoms disappeared in the morning but returned the next evening with increased severity, so that on March 1st the head-master of the boarding-school in which the boy was a pupil asked me to see him. There was no history of previous rheumatism or of any recent illness except slight sickness and transient earache on Feb. 23rd. I found the patient complaining of pain and tenderness in the knees, ankles, elbows, and wrists without heat or swelling. The temperature was normal and the pulse was 78; a slight fur was present on the tongue. The extensor surfaces of both legs, the inner surface of the thighs, and the outer aspect of the elbows were dotted thickly with a purpuric rash, some spots being red, unraised, and recent, others having begun already to fade, while all were indifferent to pressure. The diagnosis of "purpura rheumatica" seemed to be clear, but the same evening (March 1st) the onset of colic and hæmorrhage from the bowels proved it to be premature. In 24 hours over a pint of blood was lost; happily this symptom did not recur. On the 2nd and 3rd there was no more purpura, but on the 3rd the anterior aspect of each ankle was a mass of urticaria, while the pain was moving from joint to joint. The dorsum of each foot was tender and enormously swollen on the 2nd, but on the 3rd this had disappeared completely, giving place to similar conditions of the elbows and wrists. On the 3rd the colic also returned with repeated nausea and vomiting of bile; the abdomen was tender all over. The patient's helplessness on the same day was increased by sudden tenderness

² Obtainable by unscrewing the ivory chest-piece of the flexible binaural stethoscope.

¹ Allbutt's System of Medicine, vol. v., p. 582.