adherence to *any* given plan of medical reform, until opportunity have been afforded the profession of ascertaining the *number* and *nature* of the bills which are likely to be submitted to parliament.

The council are furthermore of opinion, that a strenuous effort should be made to procure the introduction into the legislature of *ONE BILL, and of one ONLY*. With this end in view, and in the hope of adapting such bill, as far as possible, to the exigencies both of the public and of the profession, they give their cordial assent to the proposal of the British Medical Association, that delegates should be chosen by the different associations, to meet in London for the purpose of advancing the progress of medical legislation in the next session of parliament.

A letter having been read from the secretary of the British Medical Association, relative to the appointment of delegates, it was resolved *unanimously*, on the motion of Sir JOHN FIFE, of Newcastle, seconded by Dr. BROWN, of Sunderland, "That this council do authorize their secretary to proceed to London, as a delegate from this association, appointed to cooperate with the representatives of other medical associations of the United Kingdom, in promoting the advancement of medical legislation."

SOUTH-EASTERN MEDICAL ASSOCIATION OF IRELAND.

ON Thursday, the 12th inst. a large and influential meeting of "the legally-qualified medical practitioners of the counties of Waterford, Kilkenny, South Tipperary, and Wexford," was held at the Middle Ball Room, Town Hall, Waterford, to consider the present position of the medical profession with respect to the vaccination act, and the prospects of the medical charities, and also to consider the propriety of forming a South-Eastern Medical Association, to include the above counties. Alderman POOLE, M.D. was unanimously called to the chair; and Drs. PURCELL and MACKESY were requested to act as secretaries.

Several resolutions, expressive of confidence in the Irish Medical Association, &c. were passed, and some very excellent discourses were pronounced. Amongst the resolutions were the following:—

"That we consider Mr. Warburton to be entitled to the best thanks of the medical profession, for having first devised a comprehensive measure for its organization and reform; and that without pledging ourselves to the special details of the bill, we approve of the *principles* of registration, the *adoption* of the representative system, and the connection of the profession with the state.

"That we, the medical practitioners of the counties and cities of Waterford and Kilkenny, and of the counties of South Tipperary and Wexford, do now constitute ourselves into an association, to be denominated the South-Eastern Medical Association, to have for its objects the advancement of the profession of medicine, both in its social and scientific relations, and the increasing the utility of its members to society. That Dr. Poole be the first president; Drs. Mackesy, of Waterford, and Burgess, of Clonmel, be the first vice-presidents; and Dr. J. F. Purcell, of Carrick-on-Suir, and Dr. J. P. Mackesy, of Waterford, be the first secretaries; and that a committee, consisting of the president, vice-presidents, and secretaries, and Drs. Connolly, Craufield, Cane, Quinlan, Boxwell, and Christian, be empowered to draw up regulations for the guidance of the society."—*Waterford Chronicle*.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

MOTIONS AND SOUNDS OF THE HEART.

THE following are the conclusions drawn by the committees for 1838-39 and 1839-40, which were appointed to investigate and experiment upon the motions and sounds

of the heart. We extract them from the able report of Dr. Clendinning.

MOTIONS.

1. That the order of the motions of the auricles and ventricles is by continuous succession rather than by alternation of actions. The auricles contract abruptly after the rest or pause, and the ventricles immediately after the auricles, without any distinct interval between the successive systoles; and the diastoles of the cavities follow in somewhat similar order, viz. the auricular diastole coinciding with the ventricular systole, and continuing after; and the true rest or pause of the heart being constituted by the diastoles of auricles and ventricles together, and in reality, though not in a manner sensible externally, ceasing on the recurrence of the auricular systole: and this rhythm of the motions seems to be universal and common to warm and cold-blooded animals.*

2. That the visible systolic and diastolic motions are first perceived at the bases or fixed parts of the cavities, viz. in the auricles at the sinuses, and in the ventricles at the fundus cordis, and that the apices of the auricles and ventricles, or free parts, are brought into full action after the other parts, and only just before the supervention of the opposite and next succeeding condition of the cavities respectively, whether that condition be systole or diastole.

3. That in systole the heart is diminished in all its dimensions (except only in such regions or parts of the organs as may have been previously compressed or collapsed, during the unresisting flaccidity of the diastole), and that its long axis in particular is strikingly and invariably shortened.

4. That the normal systolic action of the auricles is energetic and almost instantaneous, and quite universal: the manifestations of contraction in the appendix perceptibly succeeding to those of contraction in the sinus, although by a very minute interval; and that the normal auricular diastole is gradual, continuous, and wholly passive, and is effected by an influx of blood from the cava progressively distending the cavity from sinus to apex, and from the termination of one systole of the cavity to the commencement of the succeeding one.

5. That the systole of the ventricles is gradual in its development, and complex in its phenomena: part of these phenomena being attributable to contraction in the muscular parietes, and part to reaction on the part of the fluids. By the muscular contraction the heart is made to compress the blood, which resists in all directions alike, and thrusts out the previously flattened, depressed, or collapsed sides of the ventricles, and effectuates in great part that shortening of the organ that is required to admit of closure of the auri-ventricular valves: and this reaction of the fluids mainly contributes, under certain favouring circumstances of position, &c. to cause the motion that has been described as tilting of the apex, &c. which motion is principally (the reporter believes exclusively) a result of the elevation of the long axis of the heart in systole, caused by the assumption of a convex or globular form in the central parts of the organ, instead of the superiorly and inferiorly or laterally compressed state of the previous diastole.

With respect to diastole, it appears that the ventricular diastole or dilatation is wholly passive, exerting no influence over the venous current, or the motions of the arterial valves, and is partly effected by an influx of blood from the veins commencing at the moment of relaxation of the ventricles, and continuing until the succeeding systole, and reinforced immediately before the latter by an abrupt influx from the auricles.

* The only exception noted to the reporter, from books or observation, seems apparent rather than real, viz. an alternation of action, as noted by Lancisi, in the chick *in ovo*, and by several observers, for example, in cases of very rapid cardiac action. In such cases the diastoles have been so hurried and short (owing, no doubt, to very rapid and copious influx from the veins) that the systoles of the ventricles have been closely approximated to each other, and the intervening rest been apparently suppressed, and an apparent alternation of systole and diastole without intervening rest been produced.

6. That the pulsations of the veins are of two kinds at least in some animals, viz. both active and passive; and the latter or passive pulsations, which, on the authority of Haller, may be held to exist in all animals, are attributable to reflux from the auricles in their systole.

7. The præcordial throb or pulsation is caused, immediately, by the undulation of the blood in its resistance to sudden muscular compression in the systole of the ventricles. This reaction of the fluids is first perceived about the fundus of the ventricles, and last about the apex, towards which it seems to be propagated by a continuous undulation from the fundus with extreme rapidity. In consequence of this reaction of the blood, the heart's sides are rendered convex, instead of compressed or flattened as in diastole, and are, in the middle parts more especially, heaved outwards from the central axis abruptly and with great force. Thus on all parts of the surface of the organ an impulse is felt in systole, which is greatest there where, in addition to passive flaccidity of walls, there has been collapse in the diastole (viz. the central parts), and which is least where such collapse has previously been wanting or slight (viz. the apex). This cardiac impulse is usually perceived, in the healthy subject, over the apex only, owing to its being absorbed and neutralized over other parts of the heart by an interposed thick mass of spongy lung.

The heart does not oscillate on the aorta, or move to and fro in the chest from systole to diastole, and *vice versa*; nor does it suffer any changes in consequence of its own efforts, and exclusively of movements of the lungs and diaphragm, excepting in its shape and size, and in the thickness and tension of its parietes, and the capacities of its cavities. The doctrine that the præcordial pulsation is caused by a blow received by the ribs, in consequence of the heart's "jumping" (*Αλμα*, Hippocrates) or striking against them ("pectus ferit," Harvey—"Costam ictu percutit," Haller, &c. &c.) appears to be superfluous with a view to explanation of phenomena (notwithstanding the ingenious illustrations of the ancient opinion by Senac and Hunter), and to be substantially unfounded in point of fact.

8. That the arterial diastole or pulse, almost every where outside of the pericardium, perceptibly succeeds to the cardiac systole, though near the heart the interval between them is very brief, and, to unpractised observers, difficult to distinguish.

SOUNDS.

9. That the first sound of the heart depends partly, but in a slight degree, on the abrupt closure and transitory tension of the auri-ventricular valves, which gives to this sound much of its sharp well-defined beginning; but that the first sound is mainly attributable to cardiac muscular tension alone, and that its prolonged duration is owing in great part to the progressive character of the full systolic effort from fundus to apex; and that this sound is in no degree attributable to any blow or stroke of the heart against the ribs.

10. That the auricular systole is attended by an intrinsic sound resembling that of the ventricles, but more short, obtuse, and feeble. This auricular systolic sound is often difficult of detection, even on the naked heart, and with tolerably vigorous action of the auricles, owing to its being, to the inexperienced ear, absorbed in, or masked by, the immediately succeeding and much louder systolic ventricular sound.

11. That the sounds of friction in pericarditis may, when well marked and under ordinary circumstances, be expected to be double at least, and they may be not improbably triple or more. In its systole each cavity of the heart moves so as to cause a friction of its attached lamina in one direction against the adjacent lamina of the pericardium; and in its diastole a pericardial friction is caused by each cavity in an opposite direction; and as the auricular appendices move to and fro independently of the ventricles, the normal pericardial frictions must be, as

direct observation shows them to be, quadruple, or double with the auricles, and double with the ventricles. If, therefore, those frictions were rendered sonorous by the interposition of any rough substances between the rubbing surfaces (as lymph for example), and supposing the heart's actions sufficiently vigorous, we might, under ordinary circumstances, anticipate with confidence a duplication of murmurs at least, one systolic and one diastolic. Now this duplication of sounds must be the principal element in the acoustic diagnosis of pericarditis, since effused lymph may be of any thickness, consistence, extent, &c. &c., and may be situated on any portion of the heart's surface between its nearest part and its furthest, and may, therefore, cause friction sounds of the most variable seat, depth, and character. But, of course, another physical means of distinction of great importance remains, viz. the comparatively equable diffusion of the sounds of pericardial friction all around the seat of attrition rather than in any one or exclusive direction.

12. That the sounds of the structurally healthy heart are much liable to modification by deviations from the normal standard in the condition of the fluids, and in the order and force and equability of action of the *carnæ columnæ*, and other contractile parts governing or influencing the action of the valves and the closure and opening again of the orifices of the ventricles; and this dependence of the heart's sounds on conditions material or dynamic, wholly excluding structural defect, is so considerable that the second sound may, in the normal heart, for a time be very variously modified, or masked by strange murmurs, or even apparently suppressed, in consequence of hæmorrhage, or from the introduction of poison into the veins; and the first cardiac sound, though never wholly wanting during the active existence of the heart, may still, under similar circumstances to those just referred to, present various abnormal features; may, *ex. gr.*, be as short as the second sound, or be attended or followed by anomalous murmurs, and be otherwise strikingly modified.

13. Other conclusions, more or less satisfactorily deducible, as the reporter conceives, from the facts stated, are, that the peculiar sounds occurring in pericarditis, and attributable to pericardial frictions, are not referable only to vascular turgescence, or to abnormal dryness, &c. of the pericardium, but to lymph effused by and adhering to that membrane, or other similar obstacle to the easy and noiseless gliding over each other of the adjacent parts of the pericardium.

14. That the ventricles are of equal capacity during life, and that the inequality usually met with after death is an illusion, as explained long since by Harvey.

15. That the suction influence upon the venous circulation, attributed to inspiration by various writers, is well founded.

16. That the action of the long muscles, and more especially those of the abdominal parietes, is attended with an intrinsic sound. The notice of this fact by the reporter has been rendered necessary in consequence of some attempts at verification, and some criticisms on an experiment of the London committee for 1836-7, published in the last edition of Doctor Hope's excellent work on the heart.

17. That the sounds of the heart, like the motions, are governed by the same law in all warm-blooded animals hitherto examined, and probably in all kinds whatsoever, viz. that the first sound in all animals is longer and obtuser, and the second sound shorter and sharper; that those sounds are, as in the human heart, respectively systolic and diastolic; that their causation likewise follows the same law as those of man, the first sound being mainly muscular, and the second exclusively valvular; likewise that there is the same causation and mutual relation of the cardiac and arterial pulsations.

JOHN CLENDINNING.