roaring so as to frighten her out of her wits, his argument would be something like that which follows:—"We all know that the best means of removing the defect you labour under, consists in leaving all parts of the body free from restraints, in throwing every part into its natural action, as much as the strength of the patient will allow; therefore I advise you to lie down flat on your back, to lie quite still for a very long time every day, besides the time that you may naturally be in that situation at night while you are asleep; I advise you to do this, because, while you are thus lying down, you will have no exercise; but instead of obtaining that, in combination with the good effects of air, you will acquire that debility which falls upon sick people who are necessarily confined to their beds, and this is the best method that can be adopted to cure the defect under which you labour."

Risum teneatis. Yet this is the only syllogism or inference that can be drawn from the lecture of this cynosure in modern surgery.

To be more serious; I shall venture to affirm that all spinal curvatures, except those which are produced by caries of the vertebræ, are occasioned by the improper positions of the bones with respect to each other, into which they are thrown in consequence of the relaxed state of the ligaments, and when these distortions have once begun, they are kept up and increased by the deranged or unnatural action of all the muscles which connect them together. This being the case, it will follow, of course, that the only effectual method of cure must be to restore the bones to their natural situations, the ligaments to their natural strength, and the muscles to their natural actions. Now I call upon our *Ursa Major* to demonstrate, if he can, how these effects are to be produced by laying a patient flat upon his back for a long time, either upon an inclined plane, or in a position that is perfectly horizontal. "I can call spirits from the vasty deep," Shakspeare makes one of his characters say: "but if you call them, will they answer you?" says the respondent. In this case, certainly not, is my reply; because there is no man existing who is better qualified than *Ursa Major* to demonstrate any fact in anatomy, physiology, or pathology; and I am quite certain that, if he will take the view of the subject that I have given, he will acknowledge that no benefit either has been, or can be, derived from this practice which has been so universally followed; and it certainly is not to the credit of modern science that it has been suffered to retain its influence so long.

Dr. Vernière is the first professional writer who has placed this practice in the light in which it ought to be seen; he has

described it with much truth; he has, likewise, justly touched upon the principle which should be acted upon in curing these curvatures; but, I agree with you, that it is very improbable that the modification of the principle which he has suggested, should be adopted with a beneficial effect. The trivial practices that he recommends are founded upon a just idea of the causes of the defect that he proposes to remedy, and, if acted upon, will have a tendency to remove, or, at least, diminish it; but instead of such practices, a firm and decided mode of treatment, rationally and steadily applied, is the only course to be followed with a rational chance of success. I have, for a long time, been employed in the successful practice of curing that as well as other malformations. As much time must elapse before I can arrange all the facts that I have collected, I will, if you will favour it by insertion, arrange an epitome of the general system of the treatment that I have adopted for the cure of these defects, which, I trust, will convey some useful information to a portion of your readers.

I am, Sir, yours, &c.

T. SHELDRAKE.

43, Allsop Terrace, New Road.

ON THE PHYSIOLOGY OF THE EAR.

By Mr. T. WILLIAMS.

THERE is not an organ in the animal body more remarkably distinguished by peculiar apparatus than the ear, and its physiology is as imperfect as its structure is elaborate. Even the auricle or external ear, though naturally exposed to general observance, has never been explained on acoustic principles. Boerhaave has attempted to prove that every radiation of sound which falls on the surface of the external pinna, must, ultimately, traverse the meatus auditorius; and all will agree that the office of the auricle is purely mechanical, and must assuredly tend to magnify sound; but it is not enough merely to accumulate the sonorous rays, and thus to increase the acoustic sensation, or render the organ *acute*; the power of hearing *distinctly* is also a faculty essentially requisite. Now, although the artificial ear-trumpet, or auricle of the artisan, magnifies sounds, it invariably renders them somewhat confused; it does not represent the sonorous vibrations as received through the medium of the natural auricle. Herman suggested the following queries:—On what principle is the natural auricle constructed? In what does the auricle differ in structure from the ear-trumpet? But, before we attempt to resolve these inquiries, we may make a slight allusion to the laws of acoustics.

Sonorous bodies are such as, by an act of

collision, have the property of preserving a continuous vibration. Dull bodies are such as are limited in the power of oscillation, and only retain a momentary sound. Now, the vibrations of the media of sound are described as analogous to the radiations of light, differing only inasmuch as one is entirely a motion of oscillation, and the other a continued transition of particles. They are emitted in the form of pulsating cones, which proceed in rectilinear directions, and which are subject, when impeded, to the general laws of reflection.

Now, if when sonorous rays impinge on the membrana tympani, they do not correspond, i.e. if they do not strike the membrane at the very same instant, they will necessarily cause a plurality of sounds; but it is evident that from every single pulsation of the auditory medium, unity of sound ought even to result. Is not the auricle of the human ear conformed to this physical principle? And is it not to the neglect of the same, that we ought to attribute the imperfection of the ear-trumpet? It is perfectly impossible that the sonorous radiations which suffer great reflections from the sides of this instrument, and those which proceed comparatively direct, can reach their destinations in equal times; hence must arise discordance in sounds; but is not the auricle of the ear so peculiarly constructed, as not merely to collect the vibrations, but also to effect their simultaneous convergence? Is not such a provision absolutely required, to prevent indistinct and fallacious impressions?

ON THE TYMPANUM.

The epithet tympanum is derived from a Greek term, which signifies a *drum*; and the musical drum has not only been considered analogous to the tympanum in structure, but also in its physical properties. Now the ordinary drum is distinguished by its sonorous powers. By a single stroke made on its vibrating pelt, a thousand may strike in succession on the tympanum; *but if the tympanum also be a vibrating drum, these sonorous rays must again be multiplied!* But, in this respect, the ear and the drum are remarkably dissimilar. The main intention of the latter, is to multiply sounds by frequent vibrations; while that of the former is truly to represent the number of vibrations of surrounding bodies; and as, in their functions, we perceive an important disparity, so also their structures are adapted; and if the membrane of the tympanum, or any other part of the auditory organ, do really possess the power of vibration, it is limited in the same as a mere conductor. This truth we endeavour to show in the sequel. The method on which the pelt of a drum is

adjusted and stretched on the rim of the barrel, is plainly conducive to free oscillation; but such is not the state of the membrana tympani; we observe the manubrium, or handle of the malleus, pressing on its centre; this is far from increasing its tendency to vibrate. It is much the best means to annul such a property. Let the pelts of a drum be impressed in a similar manner, and the reader will discover, on making the experiment, a striking diminution of vibratory power; yet the membrana tympani, the bones, and also the parietes of the ear, may vibrate in consequence of violent concussion, and then the sound will continue when the primary cause is suspended. And it is also a fact well worthy of remark, that when the mind is unprepared for a loud detonation, this noxious effect is especially produced. This would seem to indicate not only that the muscles of the ear do exercise the faculty of modifying sound, but also that they are subject to the control of the will.

ON THE OSSICULA AUDITUS.

The magnitude of sound produced on any drum, will ever be found (*ceteris paribus*) in the combined ratio of the force of the stroke and the size of the organ. But we observe that even without the advantages of the external ear, ossicula auditus, and the membrane of the tympanum, an acute sense of hearing may still be retained. But although, in such a case, the sense be acute, the sounds are confused; hence we observe, that although nature has shown a disposition to magnify sound, it is her paramount aim to ensure its distinctness. To this important end, the ossicula auditus are adjusted in the tympanum.

All the bones of the tympanum being supposed to be invested with a tremulous property, physiologists describe the ossicula auditus as the ordinary conductors of sound. But the proper conductor of sound from the external ear to the foramen ovalis, is the air of the tympanum, and it were easy to prove that this medium alone is amply sufficient; and so far from the osseous chain being designed to promote the transmission of sounds, it will probably be found to decrease their intensity in the act of averting discordant vibrations.

When a pulsation of a medium of sound has impinged on the membrane of the tympanum, the whole chain of bones will instantly relax, and while the handle of the malleus will then but slightly compress the membrana tympani, the membrane of the foramen ovalis will be partially relieved of the pressure of the stapes, and thus it is prepared for the sonorous impulse. The membrane of the tympanum having thus been impressed by a single pulsation, it will resume

its position by its own elasticity, and the agency of muscles; again the handle of the malleus passes firmly on its surface, again the stapes is re-adjusted on the membrana ovalis, and further vibration is perfectly prevented, not only in the membrana tympani and ossicula auditus, but also in the liquor of coturnicus. Thus having preconceived that the ultimate intention of the auditory faculty is to learn the vibrations of external objects, the writer has induced the position that the middle ear of animals ought never to vibrate like the artificial drum; but that for every single pulsation that strikes on the tympanum, only one should be transmitted to the sensitive nerve, and thus be productive of single perception, and that this negative quality is secured to the ear by the ossicula auditus and their muscular adjuncts.

COLLEGE OF PHYSICIANS AND DRs. HARRISON
AND GORDON SMITH.

To Dr. Harrison.

Hampstead, June 27, 1829.

MY DEAR SIR,—I have read with great satisfaction your article, published in *THE LANCET* of this day; and I cannot better devote a leisure hour than to the purpose of addressing a few lines to you on its most important subject,—on what you have, with perfect truth and great felicity of language, denominated “*THE SACRED CAUSE*”—not only of the physicians of England, but of science and humanity.

In the sixth paragraph of your paper there are expressions of dissatisfaction, as to the treatment your anxious and laborious conflict met with from those who were bound, *by every tie of honour and consistency*, to have countenanced and supported you. In the dignified censure there conveyed, I know that I am *not* included; and I believe you are satisfied, that if I had not expended my pecuniary resources upon a great public object, (connected with professional improvement,) I should have felt a *pride*, at least, if not a *pleasure*, in standing the whole brunt of the action in your place.

I need not tell you, (though every reader of this communication may not be equally well informed on the subject,) that I was not one of those who went “forward, during the contest, to enlighten the public with their profound lucubrations on college affairs, in order to display their own learning and private wishes.” *Forward* I certainly went; I was the editor of a medical journal at the rise of your warfare, and took a hearty and a well-founded part with you. You know that I did myself a very great injury by the course I adopted. You know that I have made, at least, one *FELLOW* my implacable and dastardly foe by my conduct; and others

have gone, *as far as they durst*, in showing me their resentment. But I am not the man to be moved by these things, and I possess the power of healing a disease very generally thought incurable, I mean that of restoring people to the possession of their senses where they voluntarily lose sight of them; and several restorations of this nature are now in progress. It was only yesterday evening that I got at the bottom of a long-suspected story of this *Fellow's* malignity, and a proper occasion will arrive for exhibiting him in his naked *distortion*.

However, this is digression. We, the independent physicians of England, owe you a multitude of thanks. If I again call myself their *organ*, I shall be plastered in *The Medical Gazette*; and as I have the most profound respect for the talented and liberal gentlemen who conduct that sprightly journal, I must restrict myself to return *my own personal acknowledgments*, with a positive disclaimer as to any official delegation. The truth is, the independents and I have had no meeting or correspondence now for nearly two years, and I am very highly displeased with them; in fact, I feel pretty much as you do with regard to them. They have run away from the field, and deserve our contempt. Still, perhaps, we ought to make allowances for the weakness of *physical* nature, and the terrific name of *law*! This latter having now been detected to be a mere scarecrow, as far as the redoubted College is concerned, I hope our friends will recall their courage, and, as there is no longer any danger, proffer that aid of which we stand no longer in need.

There are two points I intended to have drawn the attention of the profession to, in the course of my animadversions on the arrogance and usurpation of the College, when I was interrupted by ill health. The journal of which I was editor has since fallen into the hands of those who have neither talent nor honesty for the argument. In fact, I was (as you know) *robbed* of it in a very extraordinary manner, of which the professional public shall, ere long, be gratified with a detail. One of the points it is hardly requisite to state; let me, however, go so far towards bringing it under notice as to say, that throughout the contest you and I (if you will allow my pronoun to stand so near your own) have expressed and conducted ourselves like *gentlemen*. It is true that the Fellows do not invite us to their *conversaziones*; but they have the art of collecting a great number of *fools* there, one of whom I got into a very serious scrape at the Old Bailey, chiefly in consequence of the part he contributed towards the amusement of one of these very distinguished *soirées*.

The other point never has been stated, and I avail myself of the opportunity to