

Correspondence.

"Audi alteram partem."

ADAPTATION OF THE EYE TO DISTANCES.

To the Editor of THE LANCET.

SIR,—In reference to an able communication appearing in THE LANCET of July 26, 1851, by G. Rainey, Esq., on the very interesting and abstruse subject of the "Adaptation of the Organ of Vision to Different Distances," although much appreciating and admiring several of the views therein entertained, and notwithstanding also the high advantages which the author enjoys for investigations direct or comparative, nevertheless I cannot forbear regarding the structures in question as being seemingly inadequate, through their delicacy and limited sphere of activity, to the function assigned, especially as the surrounding textures appear adapted to the performance of a more effective agency. As in the execution of the said functions, supposing, for instance, an equal capability of the two sources—viz., the one ascribed by Mr. Rainey, and the other about to be adduced, it appears hardly plausible that a feeble power should outvie a stronger, or that the one attached to a basis of soft and mobile structure should predominate over another whose basis is extensive, osseous, and fixed; and I trust I do not misconceive Mr. Rainey in ascribing to the ciliary muscle an exclusive agency.

Having some time ago contemplated this high and interesting object of inquiry, I cannot otherwise than regard the several muscles attached to and enclosing the eyeball, in the ordinary course of their activity, as mainly instrumental to this function—i.e., of effecting alterations in the length of the visual axis, as also of that of imparting a directive agency. Hence, under the two views thus subjected, wide differences exist, especially in the opposite directions in their mode of action: Mr. Rainey esteeming the ciliary muscle, when active, to draw forward and centrally the choroid, thus elongating the visual axis, and leaving the cornea and sclerotic investments undisturbed; while, on the other hand, the views now propounded recognise a retraction of the globe in mass in comparative illimitable degree, affecting all the deeper structures accordingly, and shortening the axis; a source, at the least, of disturbance, which may well be imagined to present an insuperable counterpart to the delicate action and yielding supports of these structures, to which Mr. Rainey ascribes the great and exclusive source of adjustment.

Under either case of influence with respect to measurement of axis, there yet appears a mechanism needed to afford a rectilinear adjustment of such axis amidst the several composing structures—i.e., a centrellizing as well as a telescopic agency; and a part of that mechanism to which Mr. Rainey invites attention, as an exclusive source of longitudinal adjustment, appears somewhat of that description, well adapted to suffice that secondary function which seems so inevitably indispensable—viz., that of effecting such rectilinear adjustment: a *part* only of that complicated action which embraces or comprehends, first, a directive motion of the axis; secondly, the focal adjustment of such axis in point of length; and thirdly, a necessary rectilinear adjustment of such axis passing through structures and media of various densities and curvatures of surface.

Experiment fully satisfies that the external muscles possess power, and effect in almost every movement, disturbance or commotion amidst the deep structures of the eye. In prosecuting observations on muscæ volitantes, in their constant and vast normal diffusion throughout the internal structures of this organ, alterations in the apparent magnitude of these corpuscles or cells, (which constitute muscæ by their assemblage,) consequent upon muscular tension or relaxation during the efforts to fix attention, give ample evidence of the agency of the muscles of the orbit in affecting the measurement in length of the line of axis, *or in producing a distad or proximad influence on the position of the several planes disposed vertically thereon*; and I am as equally assured that in rapid lateral movements of the globe its several contained structures thus disposed in planes vertical to the line of axis, are so far *evidently displaced laterally* by muscular action as to require an appreciable interval of time before perfect adjustment to the line of axis really does occur: this latter being evidenced in the *oscillatory motions* observed amidst muscæ disposed on different planes, affected by lateral muscular motion—remarks which in no small degree accord with the results of anatomical investigation, and the descriptions given of the laminated and mobile condition of parts constituting the deeper structures of the optical mechanism.

I am in no wise willing to detract aught from the valuable observations and laborious investigations which the communication in question evinces, but I do think that the importance of the external muscles as the proper agent in this work of adjustment has been much overlooked by authors—which to me appears so self-evident, that I should be somewhat reluctant eagerly to acquiesce in views ascribing a function to other structures, which appear so feebly capable of antagonizing such powerful sources of disturbance from without. I reject not that the connexion between the choroid and sclerotic is not so generally close but that a limited amount of motion is admissible through the agency of the ciliary muscle upon the choroid, both forwards and towards the centre, thus quitting somewhat its relations to the sclerotic, and affording interspace sufficing the reception of the expressed contents of the vessels of the ciliary processes, *if not in fact breaking off, in some degree, the first impulses of muscular action from without*; but it is equally undeniable that when the external structures are acted upon by any degree of compression or retraction, the deeper coats also, as well as central bodies, must necessarily participate in such influence to a degree which I think the ciliary muscle alone can scarcely overcome, so as to constitute an efficient agent of exclusive adjustment of the longitudinal axis.

We recognise readily the power of volition in effecting variable degrees of muscular contraction, as in walking, running, leaping, &c., and the force and rapidity of blows are also dependent upon modified impulses of volition; and thus seeing that the will alone is an influential agent of great and variable power, and effects the required adjustments for consentaneous and harmonious action, it were folly to deny such agency as being capable of producing that equable tension of the muscles of the orbit, which, while imparting a directive influence, do also exert that compression and varied degree of retraction shortening or lengthening the axis of vision to the required limit for the perception of objects near or remote, which volition urges to the survey of, and thus controls the mechanism of its own energies.

I am, Sir, your most obedient servant,

Hull, July, 1851.

WILLIAM HENDRY, M.R.C.S.

THE AUSTRIAN REMEDY FOR CHOLERA.

To the Editor of THE LANCET.

SIR,—I have just perused, with feelings of the greatest satisfaction, the letter in your last number, from the celebrated analytical chemist, Mr. Herapath of Bristol, on the Austrian remedy for Asiatic cholera: inasmuch as I find it strongly confirmatory of the views, pathological and therapeutic, which I have long entertained of that appalling malady.

It appears, by Mr. Herapath's analysis, that this foreign specific (as it is termed) consists essentially of sulphuric and nitric acids—the former bearing the largest proportion.

Mr. Herapath says, however, that he never before heard of such a plan of treatment; and speaks of it as if it had never before been heard of in this country. In this he is unconsciously in error. I believe I may say without vanity, that to myself belongs the merit (if merit it may be called) of having first suggested, in the pages of a British medical journal, the exhibition of sulphuric acid in the treatment of cholera; and of testing and satisfactorily proving its efficacy in a large number of cases. It is true that I almost always associated it with other remedial measures. And should another visitation at any time occur (which God forbid) I should certainly again do so; as my views of the therapeutical indications of this disease are not consistent with the hypothesis of their fulfilment by one remedy alone. These adjutant remedies were Dr. Ayre's calomel treatment, and, in certain cases, sponging with nitro-hydrochloric acid.

In the months of August and September, 1849, during the extreme prevalence of the epidemic, I constantly advocated this system. In your number for the 11th of August in that year, you gave insertion to a communication of mine in your columns, on the treatment of cholera, from which I extract the following:—"2. That the patient drink rice-water ice-cold and *strongly acidulated with sulphuric acid*. The acid fulfils two important indications; neutralizing the free alkali secreted by the stomach, and tending to destroy the intensely negative condition of the gastric membrane." I subsequently carried out these views of treatment extensively in practice, and with *very great success*. The results were, for the most part, given in THE LANCET for Jan. 26, 1850; and were shortly afterwards more fully and perfectly embodied in a pamphlet which I published on the subject. It there appears, that of cases