

*George Taylor*  
**ZOONOMIA;**  
OR,  
THE LAWS  
OF  
**ORGANIC LIFE.**

IN FOUR VOLUMES.

By *ERASMUS DARWIN, M.D. F.R.S.*

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*Principiò cœlum, ac terras, camposque liquentes,  
Lucentemque globum lunæ, titaniaque astra,  
Spiritus intùs alit, totamque infusa per artus  
Mens agitat molem, et magno se corpore miscet.*

*VIRG. ÆN. vi.*

Earth, on whose lap a thousand nations tread,  
And Ocean, brooding his prolific bed,  
Night's changeful orb, blue pole, and silvery zones,  
Where other worlds encircle other suns,  
One mind inhabits, one diffusive Soul  
Wields the large limbs, and mingles with the whole.

**V O L. IV.**

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frequently follows great exertion, as in Sect. XXXIV. 1. 7. Thus some parts of the system may cease to obey the will, as in common paralysis; others may cease to be obedient to sensation, as in the impotency of age; others to irritation, as in scirrhus viscera; and others to association, as in impediment of speech; yet though all these may become inexcitable, or dead, in respect to that kind of stimulus, which has previously exhausted them, whether of volition, or sensation, or irritation, or association, they may still in many cases be excited by the others.

### SPECIES.

1. *Lassitudo*. Fatigue or weariness after much voluntary exertion. From the too great expenditure of sensorial power the muscles are with difficulty brought again into voluntary contraction; and seem to require a greater quantity or energy of volition for this purpose. At the same time they still remain obedient to the stimulus of agreeable sensation, as appears in tired dancers finding a renovation of their aptitude to motion on the acquisition of an agreeable partner; or from a tired child riding on a gold-headed cane, as in Sect. XXXIV. 2. 6. These muscles are likewise still obedient to the sensorial power of association, because the motions when thus excited,

cited, are performed in their designed directions; and are not broken into variety of gesticulation, as in St. Vitus's dance.

A lassitude likewise frequently occurs with yawning at the beginning of ague-fits; where the production of sensorial power in the brain is less than its expenditure. For in this case the torpor may either originate in the brain, or the torpor of some distant parts of the system may by sympathy affect the brain, though in a less proportionate degree than the parts primarily affected.

2. *Vacillatio senilis.* Some elderly people acquire a see-saw motion of their bodies from one side to the other, as they sit, like the oscillation of a pendulum. By these motions the muscles, which preserve the perpendicularity of the body, are alternately quiescent, and exerted; and are thus less liable to fatigue or exhaustion. This therefore resembles the tremors of old people above mentioned, and not those spasmodic movements of the face or limbs, which are called tricks, described in Class IV. 3. 2. 2. which originate from excess of sensorial power, or from efforts to relieve disagreeable sensation, and are afterwards continued by habit.

3. *Tremor senilis.* Tremor of old age consists of a perpetual trembling of the hands, or of the  
 I 3 head,

complaints, and this repeatedly; which I was led to ascribe to their being in their infancy surrounded with menial attendants, who had flattered them into the exertions they then used. And that in their riper years, they became torpid for want of this stimulus, and could not amuse themselves by any voluntary employment; but required ever after, either to be amused by other people, or to be flattered into activity. This I suppose, in the other sex, to have supplied one source of ennui and suicide. See Class III. 1. 2. 11.

9. *Catalepsis* is sometimes used for fixed spasmodic contractions or tetanus, as described in Sect. XXXIV. 1. 5. and in Class III. 1. 1. 13. but is properly simply an inaptitude to muscular motion, the limbs remaining in any attitude in which they are placed. One patient whom I saw in this situation, had taken much mercury, and appeared universally torpid. He sat in a chair in any posture he was put, and held a glass to his mouth for many minutes without attempting to drink, or withdrawing his hand. He never spoke, and it was at first necessary to compel him to drink broth; he recovered in a few weeks without relapse.

10. *Hemiplegia*. Palsy of one side consists in the total disobedience of the affected muscles to the  
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the power of volition. As the voluntary motions are not perpetually exerted, there is little sensorial power accumulated during their quiescence, whence they are less liable to recover from torpor, and are thus more frequently left paralytic, or disobedient to the power of volition, though they are sometimes still alive to painful sensation, as to the prick of a pin, and to heat; also to irritation, as in stretching and yawning; or to electric shocks. Where the paralysis is complete the patient seems gradually to learn to use his limbs over again by repeated efforts, as in infancy; and, as time is required for this purpose, it becomes difficult to know, whether the cure is owing to the effect of medicines, or to the repeated efforts of the voluntary power.

The dispute, whether the nerves decussate or cross each other before they leave the cavities of the skull or spine, seems to be decided in the affirmative by comparative anatomy; as the optic nerves of some fish have been shewn evidently to cross each other; as seen by Haller, *Elem. Physiol.* t. v. p. 349. Hence the application of blisters or of ether, or of warm fomentations, should be on the side of the head opposite to that of the affected muscles. This subject should nevertheless be nicely determined, before any one should trepan for the hydrocephalus internus, when the disease is shewn to exist only on one side of the brain, by a squinting affecting but one eye;

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as proposed in Class I. 2. 5. 4. Dr. Sommering has shewn, that a true decussation of the optic nerves in the human subject actually exists, Elem. of Physiology by Blumenbach, translated by C. Caldwell, Philadelphia. This further appears probable from the oblique direction and insertion of each optic nerve, into the side of the eye next to the nose, in a direct line from the opposite side of the brain.

The vomiting, which generally attends the attack of hemiplegia, is mentioned in Sect. XX. 8. and is similar to that attending vertigo in sea-sickness, and at the commencement of some fevers. Black stools sometimes attend the commencement of hemiplegia, which is probably an effusion of blood from the biliary duct, where the liver is previously affected; or some blood may be derived to the intestines by its escaping from the vena cava into the receptacle of chyle during the distress of the paralytic attack; and may be conveyed from thence into the intestines by the retrograde motions of the lacteals; as probably sometimes happens in diabetes. See Sect. XXVII. 2. Palsy of one side of the face is mentioned in Class II. 1. 4. 6. Paralysis of the lacteals, of the liver, and of the veins, which are described in Sect. XXVIII. XXX. and XXVII. do not belong to this class, as they are not diseases of voluntary motions.

M. M. The electric sparks and shocks, if used  
early

early in the disease, are frequently of service. A purge of aloes, or calomel. A vomit. Blister. Saline draughts. Then the bark. Mercurial ointment or sublimate, where the liver is evidently diseased; or where the gutta rosea has previously existed. Sudden alarm. Frequent voluntary efforts. Externally ether. Volatile alcali. Fomentation on the head. Friction. When children, who have suffered a hemiplegia, begin to use the affected arm, the other hand should be tied up for half an hour three or four times a day; which obliges them at their play to use more frequent voluntary efforts with the diseased limb, and thus sooner to restore the disordered associations of motion.

In hemiplegia, as well as toward the end of some fevers with great debility, the parts about the loins are liable to mortify by the pressure of a continued recumbency upon them, and in part by the friction of those parts against the sheet, as the patient slides down again after being frequently raised higher in his bed, to prevent which a pillow should be put beneath the undersheet half way down the bed, as in Class II. 1. 2. 4. A solution of sugar of lead, or white lead in fine powder, or a cerate of lapis calaminaris contributes to heal or to prevent these excoriations. But the most efficacious preventive consists in the patient's wearing a pair of linen drawers; by which means when he lies in his

bed, the friction will be between the sheet and his drawers, not between the sheet and his skin; and this greater friction will in general prevent his sliding down in bed, when his head and shoulders are raised on more pillows, which will on this account also contribute much to his comfort; this is also worthy the attention of those dropfical patients, who are necessitated to lie with the head raised high in bed.

When these patients have any difficulty of swallowing, they should be raised up when any fluid is put into the mouth, lest it should suffocate them. See Apoplexia, No. 16. Nor should young children be fed as they lie on their backs, as they are then obliged to swallow as much as the nurse pleases; like one of the punishments formerly used in the inquisition, where the delinquent was made to swallow many quarts of water, as he was chained down on his back, and was suffocated by it.

In paralysis of the wrists from lead, Mr. Clutterbuck has lately published some successful cases of the use of mercurial ointment. See Colica Saturnina, I. 2. 4. 8. See Class III. 2. 1. 4.

Dr. J. Alderson has lately much recommended the leaves of rhus toxicodendron (sumach), from i. gr. to iv. of the dried powder to be taken three or four times a day. Essay on Rhus Toxic. Johnson, London, 1793. But it is difficult to know what medicine is of service, as the move-

ments of the muscles must again be learned, as in infancy, by frequent efforts.

11. *Paraplegia*. A palsy of the lower half of the body divided horizontally. Animals may be conceived to have double bodies, one half in general resembling so exactly the other, and being supplied with separate sets of nerves; this gives rise to hemiplegia, or palsy of one half of the body divided vertically; but the paraplegia, or palsy of the lower parts of the system, depends on an injury of the spinal marrow, or that part of the brain which is contained in the vertebræ of the back; by which all the nerves situated below the injured part are deprived of their nutriment, or precluded from doing their proper offices; and the muscles, to which they are derived, are in consequence disobedient to the power of volition.

This sometimes occurs from an external injury, as a fall from an eminence; of which I saw a deplorable instance, where the bladder and rectum, as well as the lower limbs, were deprived of so much of their powers of motion, as depended on volition or sensation; but I suppose not of that part of it, which depends on irritation. In the same manner as the voluntary muscles in hemiplegia are sometimes brought into action by irritation, as in stretching or *pandiculation*, described in Sect. VII. 1. 3.

But

But the most frequent cause of paraplegia is from a protuberance of one of the spinal vertebræ; which is owing to the innutrition or softness of bones, described in Class I. 2. 2. 17. The cure of this deplorable disease is frequently effected by the stimulus of an issue placed on each side of the prominent spine, as first published by Mr. Pott. The other means recommended in softness of bones should also be attended to; both in respect to the internal medicines, and to the mechanical methods of supporting, or extending the spine; which last, however, in this case requires particular caution.

12. *Somnus.* In sleep all voluntary power is suspended, see Sect. XVIII. An unusual quantity of sleep is often produced by weakness. In this case small doses of opium, wine, and bark, may be given with advantage. For the periods of sleep, see Class IV. 2. 4. 1.

The subsequent ingenious observations on the frequency of the pulse, which sometimes occurs in sleep, are copied from a letter of Dr. Currie of Liverpool to the author.

“ Though rest in general perhaps renders the healthy pulse slower, yet under certain circumstances the contrary is the truth. A full meal without wine or other strong liquor does not increase the frequency of my pulse, while I sit upright, and have my attention engaged. But if I

ter of an inch long, must be rolled up so as to be about the size of a crow-quill; this must be applied immediately below the eyelash on the outside of the eye, and must be kept on by another plaster over it. This will then act as a slight compression on the tumour under the eyelash, and will prevent the hairs from touching the eye-ball. In a week or two the compression will diminish the tumor it lies over, and cure this painful deformity.

10. *Oscitatio et pandiculatio.* Yawning and stretching of the limbs is produced either by a long inactivity of the muscles now brought into action, as sometimes happens after sleep, or after listening a long time to a dull narrative; or it is produced by a too long continued action of the antagonist muscles. In the former case there is an accumulation of sensorial power during the quiescence of the muscles now brought into action; which probably constitutes the pain or wearisomeness of a continued attitude. In the latter case there is an exhaustion of sensorial power in the muscles, which have lately been acting violently, and a consequent accumulation in the muscles, which are antagonists to them, and which were at rest.

These involuntary motions are often seen in paralytic limbs, which are at the same time completely disobedient to the will; and are frequently observable in very young children; and from  
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thence we may conclude, that these motions are learnt before nativity; as puppies are seen to open their mouths before the membranes are broken. See Sect. XVI. 2.

Where these motions are observed in limbs otherwise paralytic, it is an indication that electric shocks may be employed with advantage, as the excitability of the limb by irritation is not extinct, though it be disobedient both to volition and sensation.

11. *Tenesmus* consists in violent and frequent ineffectual efforts to discharge the contents of the rectum, owing to pain of the sphincter. The pain is produced by indurated feces, or by some acrid material, as the acidity of indigested aliment; and the efforts are attended with mucus from the pained membrane. The feces must sometimes be taken away by the end of a marrow-spoon, as cathartics and even clysters will pass without removing them. It is sometimes caused by sympathy with the urethra, when there is a stone at the neck of the bladder. See Class II. 2. 2. 7. and IV. 1. 2. 8.

M. M. Fomentation, an enema with mucilage and laudanum.

The common exclusion of the feces from the rectum is a process similar to this, except that the muscles of the sphincter ani, and those of the abdomen, which act along with them by the combined