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With an APPENDIX.

“ From the consideration of antient as well as modern time, it appears that
“ the *cause* of CRITICS is the same with that of wit, learning, and good
“ sense.”

SHAFTESBURY.

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THE
MONTHLY REVIEW,

For SEPTEMBER, 1794.

ART. I. *Zoonomia; or the Laws of Organic Life*. Vol. I. By Erasmus Darwin, M. D. F. R. S. Author of the Botanic Garden. 4to. pp. 586. 1l. 5s. Boards. Johnson. 1794.

IN few things do men of reading and inquiry differ more than in the manner in which they are affected toward a *new system*. While some peruse with avidity every promising attempt to establish a general theory of a science in which they are interested, enter into it with ardour, and feel great pleasure in following all the mazes of plausible and ingenious speculation, even if, on the whole, they cannot admit its truth; others, on the contrary,—more impressed with the experience of former failures, than sanguine in their expectations of new success, aware of all the numerous inlets to mistake and delusion, and dreading the interference of fancy when truth alone is the object,—receive with coldness every effort which promises more than they expect to see realized, and are perfectly contented to postpone their examination till the public voice has given consequence and authority to the attempt.

It is probable that the reception of the work before us will greatly depend on the proportion of the above two classes among those who pay attention to its subject. Its author is well known as an ingenious philosopher, of extensive knowledge and large inquiry; he is also equally known as a poet, distinguished beyond most of his contemporaries by the boldness of his imagination; and his characters of poet and philosopher have been singularly blended in the same performance. It is easy, therefore, to judge what will be the various impressions on different minds on the appearance of a work under his name, which promises an endeavour of vast extent and moment, 'to reduce the facts relating to *animal life* into classes, orders, genera and species; and, by comparing them with each other, to unravel the theory of diseases.' With respect to ourselves, we would, as much as possible, keep down all prepossessions on the occasion;

sion; and we conceive that we shall best perform our duty to the author and the public by proceeding immediately to an analytical view of the whole performance, leaving our readers afterward to determine how far its facts and reasonings in the detail may be worthy of their attention.

After a short *preface*, in which we are acquainted that the greatest part of the work has lain by the writer during twenty years, he commences with

SECT. I. OF MOTION. The motions of matter are arranged under three classes; those belonging to gravitation, to chemistry, and to life. The latter, comprehending all animal and vegetable motions, are the subject of this work.

S. 2. EXPLANATIONS and DEFINITIONS. This section begins with a general view of the animal economy; of which the most remarkable opinion is, that the immediate organs of sense probably consist of moving fibrils, having a power of contraction like that of muscles. *Sensorium* is used to signify not only all sentient parts, but the living principle residing throughout the body. By *idea* is meant those notions of external things with which the organs of sense bring us acquainted, and it is defined to be a contraction, or motion, or configuration, of the fibres of those organs. *Sensual motion* is used as synonymous with it. *Perception* includes both the action of the organ, and our attention to it. *Sensation* is used to express pleasure or pain in its active state alone. Ideas of *recollection* are those voluntarily recalled—those of *suggestion* come from habit. *Association* is a society of things in some respect similar, and does not include the connection of cause and effect. All the definitions of this section are afterward more particularly explained.

The business of the 3d section is to shew, by experiment, that the organs of sense possess a power of motion, and that these motions constitute our ideas; also that ideas of the imagination consist in a renewal of these motions. The first experiments adduced to this purpose relate to optical spectra. One of the assertions most worthy of accurate investigation in this section is, that, when an organ of sense is totally destroyed, the ideas which were received by that organ perish with it. This, indeed, ought to follow from the writer's hypothesis, and he gives some instances of the fact: but we are scarcely prepared to receive it as a general truth.

S. 4. lays down the *laws of animal causation*, afterward to be exemplified.

S. 5. enumerates the *four faculties or motions of the sensorium*, irritation, sensation, volition, and association. They are thus defined: *Irritation* is an exertion or change of some extreme part of the sensorium residing in the muscles or organs of sense,

sense, in consequence of the appulses of external bodies. *Sensation* is an exertion or change of the central parts of the sensorium, or of the whole of it, *beginning* at some of the extreme parts. *Volition* is an exertion or change of the central parts, *terminating* in the extreme parts. *Association* is an exertion or change of some extreme part of the sensorium, in consequence of some antecedent or attendant fibrous contractions. The above faculties are also called *sensorial motions*.

S. 6. describes *four classes of fibrous motions*, which are contractions of the fibrous parts, correspondent with and caused by the four sensorial motions above-mentioned. They are in consequence denominated *irritative, sensitive, voluntary, and associate fibrous motions*.

S. 7. treats of *irritative motions*, noticing the different modes in which they are excited, the modifications that they undergo, and the association of other motions with those brought on by the primary irritation. It is also observed that irritative ideas often exist without our attention to them; as when, though lost in thought, we avoid a tree or bench that stands in the way of our walk.

S. 8. concerning *sensitive motions*, observes that they were originally excited by irritation, are occasionally obedient to volition, and have other motions associated with them.

S. 9. on *voluntary motions*, states them to have been originally excited by irritations. Ideas of recollection are a class of these voluntary motions, on which Reason, or the act of comparing different ideas, depends. Voluntary motions are occasionally causable by sensations, made obedient to irritations, and associated with other motions.

S. 10. is on *associate motions*. Muscular, sensitive, and voluntary motions and ideas, excited in trains or tribes, become associated, and have ever after a tendency to arise simultaneously, or in succession.

Some *additional observations on the sensorial powers*, in *sect. II.* relate to the various kinds of stimulation, as adapted to different parts; to sensation and volition, desire and aversion, voluntary actions and associations. It is asserted that the activity of the power of volition produces the great difference between men and brutes.

S. 12. treats of *stimulus, sensorial exertion, and fibrous contraction*. The latter is first considered. In order to bring the particles of a muscular fibre to that nearer approximation in which its contraction consists, some other agent is necessary, which is the spirit of animation or sensorial power. After animal fibres have for some time been excited into contraction, a relaxation succeeds, even though the exciting cause

4 Darwin's *Zoonomia*; or the *Laws of Organic Life*.

continues to act. This appears to be owing to an expenditure or diminution of the spirit of animation previously resident in the fibres. It is succeeded, after a certain interval, by a new contraction, and this interval is less in weak than in strong subjects; which accounts for the quick pulse in fevers with debility: yet the contraction itself is performed with more velocity in strong than in weak subjects. After a fibre has been excited to contraction, and the sensorial power ceases to act, the last situation or configuration of it continues, unless disturbed by some extraneous cause. A contraction somewhat greater than usual produces pleasure; one still greater produces pain. As, in every contraction of a fibre, there is an expenditure of the spirit of animation, increased action diminishes the propensity to activity; on the contrary, less fibrous contraction than usual causes an accumulation of the spirit of animation, and increased propensity to activity. Hence the capability of being excited to action is perpetually fluctuating. When much and permanently above or below the natural standard, it becomes a disease. In sensorial exertion, three things are to be observed; the stimulus, the sensorial power, and the contractile fibre. An external stimulus first brings into action the faculty called irritation, which causes contraction of the fibres, and this, if perceived, produces pleasure or pain; this is another stimulus capable of causing contraction by the sensorial faculty termed sensation; or it introduces desire or aversion, which excites another faculty termed volition, which may act as another stimulus; and, in conjunction with all these, the other sensorial faculty, termed association, may be called into action. The word *stimulus* may therefore be properly applied to any of the above four causes exciting the four sensorial powers into exertion; and the quantity of motion produced in any part of the system will be as the quantity of stimulus and the quantity of sensorial power residing in the fibres. Where these are great, *strength* is produced; where deficient, *weakness*. If, the quantity of sensorial power remaining the same, that of stimulus be lessened, a weakness of contractions ensues, which may be termed *debility from defect of stimulus*; if, the quantity of stimulus remaining the same, that of sensorial power be lessened, *debility from defect of sensorial power* is the consequence. The former is the *direct* debility of Dr. Brown; the latter, the *indirect*. On these principles, with that of the exhaustion of the spirit of animation by fibrous contractions, and its renovation and accumulation on quiescence, the phenomena of fevers, and various other corporeal affections, are developed. Some remarks relative to medical practice close this section, which are either derived from the above theory, or, at least, are

made happily to coincide with it. From these, we shall copy what the writer terms two *golden rules* respecting the application of stimuli. In fevers with debility, when wine or beer are exhibited, if the pulse becomes slower, the stimulus is of a proper quantity, and should be repeated every two or three hours, or when the pulse has again become quicker. In chronical debility brought on by hard drinking, the patient should be directed to omit a fourth part of his accustomed quantity of vinous spirit. If, in a fortnight's time, his appetite increases, he should omit another fourth part: but, if this farther diminution impairs the appetite, he should remain where he is. At the same time, flesh-meat is recommended, with Peruvian bark and steel in small quantities between meals, and opium with rhubarb at night.

S. 13. relates to *vegetable animation*. Some of the well-known facts respecting the irritability of plants are here mentioned. Their secretions are compared to those of animals; and the individuality of every bud on a tree is asserted. Next, the marks of sensibility shewn by the sexual parts of plants are recited, and the writer does not scruple to ascribe the *passion of love* to pistils and anthers; thus seriously maintaining, as a philosopher, opinions which we conceived to be the sport of a poetic imagination in his beautiful work entitled *The Loves of the Plants*. He touches on the curious inquiry whether vegetables have *ideas* of external things? which, from arguments that seem to prove them possessed of a common sensorium, he is inclined to answer in the affirmative.

S. 14. on *the production of ideas*, goes over the several organs of the senses, and the manner in which objects affect them: but, in so very concise a discussion, we cannot expect much new elucidation of points which, singly, have cost much labour to many philosophers. Besides the usual enumeration of senses, he adds the senses or appetites of hunger, thirst, heat, extension, the want of fresh air, animal love, and the suckling of children.

The 15th session, on *the classes of ideas*, is purely metaphysical, and offers nothing new to the informed reader.

S. 16. on *instinct*, is very curious and entertaining, but will probably by many be thought fanciful and inconclusive. Its general purpose is to shew that the blind impulse in animals, to actions the reason and consequences of which are not seen, (which we usually call instinct,) does not in reality exist,—but that early unmarked associations or previous experience have been the true causes of those actions. He traces these associations and acquirements in the early motions, sensations, and tastes, of animals. Thus, our sense of beauty he derives from

the various pleasurable sensations originally experienced by the infant from the mother's breast, whence all forms analogous to it become afterward sources of a kind of recollected delight. Even the natural expressions of the passions, according to him, spring from original associations. Thus, a disagreeable irritation of the lachrymal ducts in the nose from cold dry air being one of the first pains in infants, and occasioning a discharge of tears and distortion of countenance, emotions of grief are ever after accompanied by those bodily changes. On the other hand, the first lively pleasure of the infant arising from the fragrant odour of the mother's milk, which titillates the same ducts and produces a flux of tears, this sensation being likewise accompanied by affection to the mother, *tender pleasure* is afterward expressed by a profusion of tears. These examples, with others of a like nature, will probably appear fanciful enough to many who admit the force of association in more decisive instances. As to those actions of brute animals connected with their preservation and multiplication, which are generally called *instinctive*, Dr. D. adduces numerous facts to prove that design and experience mingle with many of them, and that brutes are capable of processes like reasoning: but we think that he has by no means shewn either that *all*, or the most necessary of them, have such an origin. Some of the most decisive examples of instinct, which seem totally inexplicable on other principles, he passes over in a very slight and unsatisfactory manner. Thus that extraordinary and extensive fact of the webs spun by many kinds of caterpillars before their change into the aurelia state, which could not possibly be owing to experience or instruction, since they are creatures of a season which never knew a parent, is very lamely dismissed, by saying that 'our ignorance of their manner of life, and even of the number of their senses, totally precludes us from understanding the means by which they acquire this knowledge.' We presume that the manner of life of no animal is better known than that of a silkworm.

The *catenation of motions* is the subject of *sect.* 17th. These are produced by irritations, sensations, or volitions. Their cause, probably, is the property of animal motions to proceed some time after they are excited, though the exciting object be removed. The laws of these catenations are laid down and exemplified in this section with much ingenuity. One of the principal exemplifications is drawn from the process of learning music.

S. 18. describes *sleep* and all its phenomena; and much acuteness is displayed by the author in shewing how the suspension of the power of volition, and the increase of energy in the other sensorial

sensorial powers, owing to the consequent accumulation of the spirit of animation, operate in producing all the varied and wonderful circumstances which occur during that state of the body.

Reverie is the subject of *sect.* 19. It is made to include somnambulism, and to partake of epilepsy or catalepsy. Complete reverie is characterized by the continuance of all the motions but those which are excited by the stimuli of external objects.

S. 20. treats of *vertigo*. It is first observed that, as we determine our perpendicularity of position by the apparent motions of objects, whatever prevents or disorders our judgment in this respect makes us liable to fall, or induces vertigo. Also, when irritative motions or sounds, which usually are unnoticed by the mind, become from any cause the objects of sensation or attention, the confusion thus made in the ordinary catenations or circles of ideas excites vertiginous affections. In vertigo, the sensitive and voluntary motions continue undisturbed.

Drunkennes is the subject of *sect.* 21. It increases the irritative motions by internal stimulation, and thus gives a great additional quantity of pleasurable sensation, producing many sensitive motions. By these effects, the associated trains are disturbed and confused, volition is gradually impaired, and is at length totally suspended, with temporary apoplexy.

S. 22. treats of *propensity to motion, repetition, and imitation*. Propensity to action is produced by accumulation of sensorial power in cases in which its expenditure is less than usual. Repetition of motions gives pleasure on account of the superior ease with which they are performed by combining habit with stimulus. The propensity to imitation is derived from the greater ease with which we perform that action which is already imitated by the fibres of the retina, than a new one. Imitation is therefore a repetition by one set of fibres of motions already begun by another set. The Doctor extends this principle to account for certain morbid phenomena, in which, disease is propagated from one part of the body to another, apparently without any direct communication of morbid matter. This section seems to us to abound beyond most with fine-spun speculation.

S. 23. Of the *circulatory system*. The author now proceeds to illustrate some of the phenomena of diseases, and to trace out their methods of cure. In his account of the circulatory system, he affirms that heat is given out by all glandular secretions in consequence of the chemical changes which the fluids undergo; and he instances the heat felt in the cheeks on blushing, as of that kind. He supposes the red veins to be absorbing vessels like the lymphatics, and to receive the blood from the arteries in that mode. He conceives that the motions of

the fluids are carried on by means of two stimuli; one a pleasurable sensation exciting the mouth of the vessel to seize what is presented, which he calls *glandular appetency*; the other a kind of aversion, urging the heart and arteries to push forward the blood which they have received; and he thinks that both these sensations were originally felt in the embryo, though by habit they have been lost, and the irritation alone remains.

S. 24. *Of the secretions of saliva, and of tears, and of the lachrymal sac.* These secretions are well known to afford examples of the influence of sensation over corporeal actions, and therefore are ready exemplifications of our author's theories. We cannot, however, agree with him in his assertion that the lachrymal sac, with its puncta and nasal duct, is a complete gland; since, though the tears be absorbed at one end and discharged at the other, they undergo no *change* in the passage. The tears are *separated* from the blood by a real gland, the lachrymal; and the other organs are only a contrivance for their conveyance.

S. 25. *on the stomach and intestines*, gives a general account of the principles of their ordinary motions, and also of their inverted motions, occasioned by stronger stimuli than usual, by disgustful ideas, or by volition. Various other cases of inverted motion are mentioned, as likewise the sympathy of motions between the stomach and heart.

S. 26. *of the capillary glands and membranes*, supports the opinion that the capillary vessels are in effect glands, and that the minuter membranes are inorganic.

S. 27. *on hæmorrhages*, begins by proving the veins to be properly absorbent vessels, which take up blood from the glands and capillaries, after it has undergone the proper secretions. On this foundation, hæmorrhages are divided into two kinds; one, in which the glandular or capillary action is too powerfully exerted; the other, in which the absorbent power of the veins is diminished, or a branch of them is become paralytic.

S. 28. *Of the paralysis of the absorbent system.* A paralysis of the absorbents of the stomach and intestines is supposed to be the cause of the atrophy of hard drinkers; and this, not only from the defect of nutriment taken into the system, but from the increased action of the remainder of the absorbent system, consequent on the less expenditure of sensorial power on the lacteal part. The immediate cause of the dropsy is a paralysis of some other branches of the absorbent system. As a lymphatic vessel usually consists of a long neck and a glandular belly, the author conceives that each of these parts may be separately palsied; and to the paralysis of the glandular part, while the mouth continues to absorb, he imputes scrofula. Surely, hypotheris

thesis can scarcely proceed to a more fanciful conclusion than this!

S. 29. concerning *the retrograde motions of the absorbent system*, is a translation of part of a Latin thesis written by late Mr. Charles Darwin, and published in 1780. Its purpose is to account for various phenomena of disease, on the supposition that, in a vitiated state of the system, some irritations, either direct or sympathetic, produce a regurgitation of the fluids in the lymphatics, and an effusion of them in certain cavities. On this hypothesis, he accounts for diabetès, dropsies, diarrhœas, and other diseases; and various cases are adduced, supposed to illustrate the point. However ingenious this theory may be, we are to observe that the retrograde motion in the lymphatics is no more than a mere hypothesis, no experiment having yet proved that such a thing at all takes place; and it surely is difficult to conceive how a greater stimulus applied to the lacteals, for instance, and inciting them to stronger *direct* action, should by sympathy occasion an *inverted* action of the lymphatics of the bladder.

S. 30. relates to *paralysis of the liver and kidneys*. Too great stimulation of the bile-ducts, from the use of spirituous liquors, is a cause of their succeeding diminished irritability; whence the bile ceases to be found in the intestines, and by its regurgitation causes a species of jaundice. A case is given, in which an indolent jaundice, possibly of this species, was removed by smart shocks of electricity passed through the region of the liver. This affection of the bile-ducts also occasions those accumulations of bile which produce gall-stones. Another disease of the liver proceeds from a paralysis of its secretory vessels, in which little or no bile is secreted; and a similarity of the organ is an operation of the same cause. Similar diseases to all these exist in the kidneys, from similar causes.

S. 31. treats of *temperaments*; by which term the author means a permanent predisposition to certain classes of diseases. They are divided into, 1. The temperament of decreased irritability; 2. The temperament of sensibility; 3. That of increased voluntariness; 4. That of increased association. It is evident that the notion of these temperaments is deduced from the preceding theory of the source of our ideas; and it would be very difficult to exemplify them in individuals with any precision.

S. 32. on *diseases of irritation*, being fundamental in the pathology of fevers, and designed to set entirely aside the doctrine of spasm, ought to be well understood by an inquirer into the systems of our author; yet such is its intricacy and subtilty that we despair of giving our readers clear ideas of it in an abstract.

The points chiefly laboured are, to shew how temporary quiescence from the want of accustomed stimuli may cause the accumulation of sensorial power; and to deduce, from the changes of action and sensation in the arterial and glandular systems, the phenomena attending the hot and cold fits of fever. The fevers mentioned in this section are called the *irritative*, and are divided into those with a strong, and those with a weak, pulse, answering to the synocha and the typhus mitior of nosologists. The practical conclusion from the whole is, that fever-fits are *not* an effort of Nature to relieve herself, and therefore should always be prevented or diminished as much as possible.

§. 33. relates to the *diseases of sensation*. When to the febrile motions from irritation are added others from sensation, what the author calls *sensitive fever* is produced; which is likewise of two classes, according to the arterial strength or debility accompanying them; those with a strong pulse give the synocha or inflammatory fever; those with a weak pulse, the typhus gravior, or putrid fever. A variety of curious hypotheses relative to the nature of inflammation, the generation of matter, and the nature of contagion, are given in this section; which, as connected with the general theory, cannot be stated to any advantage apart. We shall only mention, as a specimen, that it is maintained that the variolous matter in natural contagion does not enter the blood, but acts by means of sensitive association between the stomach and skin, which excites particular motions of the cuticular capillaries, producing the eruption.

Diseases of volition are the subject of *sect. 34*. The author uses the term *volition* in a sense different from the common acceptance. When desire or aversion produces any action of the muscular fibres, or of the organs of sense, they are termed *volition*, and the consequent actions *voluntary*, though they may be such as it is out of our power to prevent, and therefore such as in common language are called *involuntary*. Various examples are adduced in this section to prove how voluntary motions are at first employed for the purpose of relieving pain; how, by association, they afterward become independent of the will; and how, in some cases, they arise to epilepsy and convulsion. In certain constitutions, violent exertions of the ideas of the mind are employed for the same purpose, which constitutes madness. The principle, on which relief in all these cases is obtained, is by expending a portion of the sensorial power on such motions and exertions.

§. 35. relates to *diseases of association*. In explaining sympathy, or consent of parts, the Doctor considers a tribe or train of actions as divided into two parts, one of which consists of the primary

primary or original motions, the other of the secondary or sympathetic. The different and even opposite modes, in which one of these trains may affect the other, are considered in this section; and supposed exemplifications of each are adduced. It may be easily imagined that the speculations, in which the author indulges on this subject, are not among the least abstruse and subtle.

S. 36. On the periods of diseases. Intermiſſion and recurrence in muscular actions naturally proceed from the exhaustion and accumulation of sensorial power. These changes, combined with the periods of our diurnal habits, or of heat and cold, or with the solar and lunar periods, are the causes of the periods of fevers. A variety of instances are given of the solar and lunar periods of diseases; and the doctrine of critical days is, by hypothesis, connected with this influence.

ſect. 37. treats of digestion, secretion, and nutrition. The chemical laws of accretion and increase seem to our author inapplicable to animal bodies, whence he looks for them in the laws of animation. The lacteals absorb the chyle, and the glands and pores the nutritious particles belonging to them, by animal selection or appetency, put into action by stimulus. The whole animal solids, having been originally formed of the extremities of nerves, require an apposition of particles of a similar kind for their nutrition, which are probably applied during the elongation of the filaments. Old age and decay proceed from the want of irritability.

ſect. 38. treats of the oxygenation of the blood in the lungs, and in the placenta. The author adopts the opinion of those who suppose that the blood in the lungs receives oxygen from the air; and also that the placenta is a sort of respiratory organ, furnishing oxygen to the blood of the foetus. The arguments for this latter opinion are derived from the theses of Dr. James Jeffrey and Dr. Forester French.

Generation is the subject of ſect. 39. So many ingenious men have already lost themselves and bewildered their readers in their conjectures respecting this mysterious function, that it would be extraordinary if a new guess should solve its difficulties. A very slight sketch of Dr. D.'s notions on the subject will probably satisfy most of our readers. He imagines that the embryo is the produce of the male alone, and that the female only gives it lodgment and nutrition. He does not, however, suppose its first rudiments to be a miniature of the future animal, but merely a simple living filament, which receives all its parts by accretion. This fibril, dropping among the nutritive particles prepared by the female, is stimulated to action; and, bending into the form of a ring, embraces one of these particles, and

and coalesces with it. This new organization acquires new irritabilities, chooses or rejects other particles offered to it, has sensation superadded to it, and, in process of time, the powers of association and volition. The living filament, being a part of the father, has certain propensities belonging to him, which give the basis of a similarity of structure; and this is altered or modified by the nutritive particles derived from the mother. Other alterations proceed from the imagination of the father at the instant of generation,—the extremities of the seminal glands imitating the motions of the organs of sense; and thus the sex of the embryo is produced, which is male or female, according as the image of the one or the other of these organs predominated in the father's imagination at the critical period. All augmentations are in consequence of an irritation or sensation of a peculiar kind, which may be termed *animal appetency*, which seeks the particles that it wants; and this operates even after birth, and, in the innumerable series of ages, has produced all the diversities of forms in animals, accommodated to their different modes of life:—for the author supposes a perpetual progress toward perfection in all animated beings, and imagines that none of them are at present as they originally existed, but have gradually arrived at the state in which we now see them, from that of a simple and uniform living filament.

We shall make no remarks on this system; referring to the work itself such of our readers as are disposed to take pleasure in viewing the progress of an ingenious fancy in working up a little fact with abundance of conjecture, into that product of mental generation called an *hypothesis*. What an acquisition would such a system have been to Mr. Shandy!

SECT. 40. contains an essay on the *ocular spectra* of light and colours, by Dr. R. W. Darwin of Shrewsbury, reprinted from the *Phil. Transf.* vol. lxxvi. p. 313*.

Had it been our purpose rather to amuse cursory readers, than to give a connected and scientific view of the whole of this performance, we should have found it an easy task to fill our pages with much curious matter relative to natural, moral, and medical history, interspersed through many of its sections. All who have read the very miscellaneous *notes* of the author's *Botanic Garden* will be sufficiently acquainted with his happy art of enlivening philosophical reasonings and speculations with entertaining and sprightly narratives. The style of writing in many parts of this work is perfectly similar, and cannot fail of giving pleasure to those who have been delighted with the

* See Review, vol. lxxvi. p. 197.

perusal of the former. This source of gratification, however, we shall leave untouched, to repay those who purchase it by studying the volume at large: but we cannot refrain from the temptation of making our dry article more palatable, by transcribing the complimentary verses prefixed to the work; which are not only an object of curiosity as a perfect imitation of Dr. D.'s poetical style in its very best manner, but are extremely beautiful in themselves, and illustrative of the *system*.

‘ To ERASMUS DARWIN, on his Work entitled ZOOLOGIA. By Dewhurst Billsborrow.

‘ HAIL TO THE BARD! who sung, from chaos hurl'd
How suns and planets form'd the whirling world;
How sphere on sphere Earth's hidden strata bend,
And caves of rock her central fires defend;
Where gems new-born their twinkling eyes unfold,
And young ores shoot in arborescent gold.

‘ How the fair flower, by Zephyr woo'd, unfurls
Its panting leaves, and waves its azure curls;
Or spreads in gay undress its lucid form
To meet the sun, and shuts it to the storm;
While in green veins impassion'd eddies move,
And Beauty kindles into life and love.

‘ How the first embryo-fibre, sphere, or cube,
Lives in new forms,—a line,—a ring,—a tube;
Clos'd in the womb with limbs unfinished laves,
Sips with rude mouth the salutary waves;
Seeks round its cell the sanguine streams, that pass,
And drinks with crimson gills the vital gas;
Weaves with soft threads the blue meand'ring vein,
The heart's red concave, and the silver brain;
Leads the long nerve, expands th' impatient sense,
And clothes in silken skin the nascent ens.

‘ Erewhile, emerging from its liquid bed,
It lifts in gelid air its nodding head;
The light's first dawn with trembling eye-lid hails,
With lungs untaught arrests the balmy gales;
Tries its new tongue in tones unknown, and hears
The strange vibrations with unpractic'd ears.
Seeks with spread hands the bosom's velvet orbs,
With closing lips the milky fount absorbs;
And, as compress'd the dulcet streams distill,
Drinks warmth and fragrance from the living rill;
Eyes with mute rapture every waving line,
Prints with adoring kiss the Paphian shrine,
And learns, 'ere long, the perfect form confess,
Ideal Beauty from its mother's breast.

‘ Now in strong lines, with bolder tints design'd,
You sketch ideas, and pourtray the mind;
Teach how fine atoms of impinging light
To ceaseless change the visual sense excite;

While the bright lens collects the rays that swerve,
 And bends their focus on the moving nerve.
 How thoughts to thoughts are link'd with viewless chains,
 Tribes leading tribes, and trains pursuing trains;
 With shadowy trident how volition guides,
 Surge after surge, his intellectual tides;
 Or, Queen of Sleep, Imagination roves
 With frantic sorrows, or delirious loves.

Go on, O FRIEND! explore with eagle eye;
 Where wrapp'd in night retiring causes lie;
 Trace their slight bands, their secret haunts betray,
 And give new wonders to the beam of day,
 Till, link by link with step aspiring trod,
 You climb from nature to the throne of God.

—So saw the patriarch, with admiring eyes,
 From earth to heav'n a golden ladder rise;
 Involv'd in clouds, the mystic scale ascends,
 And brutes and angels crowd the distant ends.*

* *Trinity Coll. Cambridge, Jan. 1, 1794.*³

ART. II. *Letters to a Young Man, Part II**. Occasioned by Mr. Evanston's Treatise on the Dissonance of the Four generally received Evangelists. By Joseph Priestley, LL.D. F.R.S. 8vo. pp. 172. 2s. 6d. sewed. Johnson. 1793.

IT may be regarded as a presumptive proof that Mr. Evanston's late attack on the authenticity of three of the gospels is not generally esteemed formidable, that, of the whole body of the clergy appointed by the state as guardians of the faith, no one has thought it necessary to step forward in defence of these sacred writings; and that this task has been suffered to be first undertaken by a writer who has been repeatedly complimented with the appellation of the Heresiarch of the present age. This is the more surprising, as it must be well known that Dr. Priestley, though unquestionably a sincere and zealous Christian, would undertake the vindication of the Evangelists on principles which the orthodox churches have never admitted. A reply to Mr. Evanston, which gives up the inspiration of the Evangelists, and rejects the narrative of the miraculous conception, will hardly satisfy those divines who have made the articles of the English church the standard of their belief. However, till a more satisfactory answer, on higher grounds, is given to Mr. Evanston's objections, the whole Christian world must acknowledge itself under obligations to Dr. Priestley, for having maintained, with so much ability and success, the credit of those writings, which are the first and only authentic records of our holy religion.

* For the First Part, see Review, July 1792, p. 357.