

Posthumous tracts / now first translated from the Latin of Emanuel Swedenborg. By James John Garth Wilkinson.

Contributors

Swedenborg, Emanuel, 1688-1772.

Wilkinson, James John Garth, 1812-1899.

Publication/Creation

London : W. Newbery; Boston : O. Clapp, 1847.

Persistent URL

<https://wellcomecollection.org/works/k9wbmurh>

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

m
e | 3

l. 23

63302/B

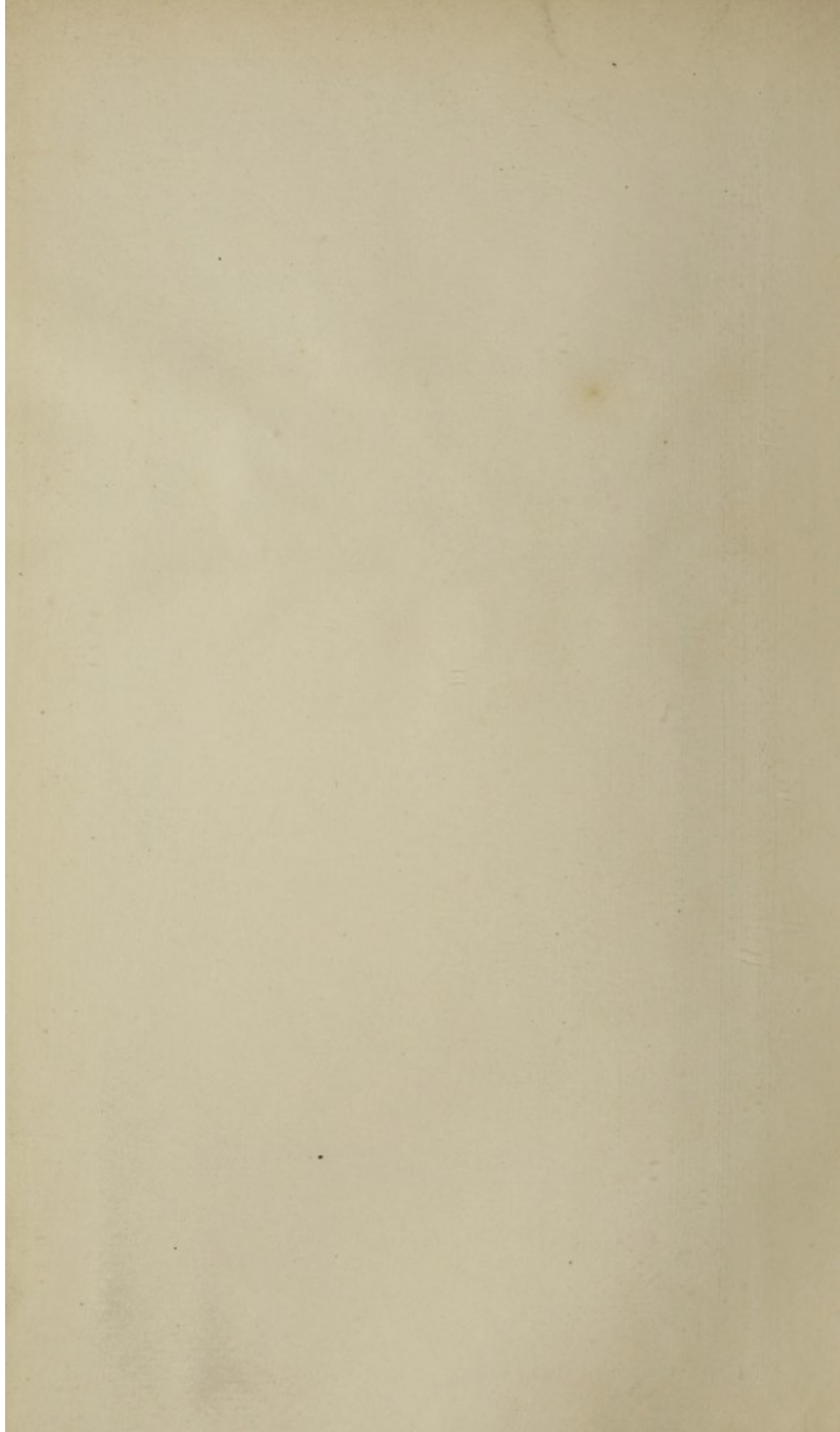
The Library of the
Wellcome Institute for
the History of Medicine

MEDICAL SOCIETY
OF
LONDON
DEPOSIT

Accession Number

Press Mark

SWEDENBORG, G.



POSTHUMOUS TRACTS.

61 .5. 2.

LONDON :
PRINTED BY WALTON AND MITCHELL,
Wardour-street, Oxford-street.

176

POSTHUMOUS TRACTS,

NOW FIRST TRANSLATED FROM THE LATIN

OF

EMANUEL SWEDENBORG,

LATE MEMBER OF THE HOUSE OF NOBLES IN THE ROYAL DIET OF SWEDEN,
ASSESSOR OF THE ROYAL METALLIC COLLEGE OF SWEDEN,
FELLOW OF THE ROYAL ACADEMY OF SCIENCES OF UPSALA, AND OF THE ROYAL ACADEMY OF SCIENCES
OF STOCKHOLM,
CORRESPONDING MEMBER OF THE IMPERIAL ACADEMY OF SCIENCES OF ST. PETERSBURG.

BY

JAMES JOHN GARTH WILKINSON,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS OF LONDON.

LONDON:

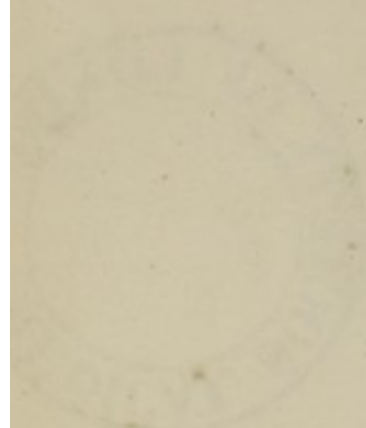
WILLIAM NEWBERY, 6, KING STREET, HOLBORN;

OTIS CLAPP, SCHOOL STREET, BOSTON, U. S.

1847.



POSTHUMOUS TRACTS



EMANUEL SWEDENBORG

JAMES JOHN BARTHOLOMEW

LONDON

JOHN KENNEDY & CO. LTD. 10, ST. MARK'S PLACE, LONDON, E.C. 4.



CONTENTS.

The way to a Knowledge of the Soul.....	1
Faith and Good Works	7
The Red Blood.....	17
The Animal Spirit	39
Sensation or the Passion of the Body.....	59
The Origin and Propagation of the Soul	71
Action	79
Fragment on the Soul	107



CONTENTS

i	Introduction
1	Chapter I. The History of the United States
11	Chapter II. The Constitution of the United States
21	Chapter III. The Federal Government
31	Chapter IV. The State Governments
41	Chapter V. The Local Governments
51	Chapter VI. The Judiciary
61	Chapter VII. The Executive
71	Chapter VIII. The Legislative
81	Chapter IX. The Military
91	Chapter X. The Navy
101	Chapter XI. The Air Force
111	Chapter XII. The Space Program
121	Chapter XIII. The Atomic Energy
131	Chapter XIV. The Environmental Protection
141	Chapter XV. The Social Security
151	Chapter XVI. The Health Care
161	Chapter XVII. The Education
171	Chapter XVIII. The Labor Union
181	Chapter XIX. The Foreign Relations
191	Chapter XX. The International Law
201	Chapter XXI. The Human Rights
211	Chapter XXII. The Women's Movement
221	Chapter XXIII. The Civil Rights
231	Chapter XXIV. The Gay and Lesbian Rights
241	Chapter XXV. The Disability Rights
251	Chapter XXVI. The Elderly Rights
261	Chapter XXVII. The Children's Rights
271	Chapter XXVIII. The Animal Rights
281	Chapter XXIX. The Environmental Rights
291	Chapter XXX. The Future of the United States

ADVERTISEMENT.

FOR an account of the *MSS.* of Swedenborg in which these *Posthumous Tracts* are found, the reader is referred to the Latin Edition of them, just published by the SWEDENBORG ASSOCIATION, and edited by the Translator of the present volume.

LABORATORY

For an account of the work of the laboratory in which
these experiments have been carried out, the reader is referred
to the last edition of the book published by the
American Association and edited by the President
of the present session.

THE WAY TO A KNOWLEDGE OF THE SOUL.

THE WAY TO A KNOWLEDGE OF THE WORLD

The way to a knowledge of the Soul.

SEVERAL years have now elapsed since I first conceived the design of working out the problems of *rational psychology*, or what amounts to the same thing, of investigating the essence and faculties of the human soul and internal senses ; but hitherto the extreme difficulty of the subject, coupled with the vast amount of preliminary knowledge which is requisite, have warned me against treading prematurely in this direction ; for much must previously be reduced to a clear statement and a distinct order. Certain it is, that those who are but superficially informed in the elements of the sciences, or even well acquainted with one or two separate branches of knowledge, and who notwithstanding are rash enough to enter upon this field, in consequence of their ignorance of many and in some cases of the leading means, will but exert an unprofitable subtlety for the most part on empty questions, and only discuss ingenious trifles ; and according to their natural endowments, and the manner in which these are cultivated and enlightened, or as it often happens, obscured by the few sciences which such persons possess, they will involve grave truths in thorny discussions, which can have no effect upon the brains, but to occasion differences and quarrels, which no judge is competent to settle, from the trivial nature of the matter upon which the acumen and subtlety are expended. The present subject, however, is too important to be so treated : it is no arena for foils, but for naked weapons. To complete the single science of the soul, all the sciences are required that the world has ever eliminated or developed. If any shall undertake the task with less than all, it must be with the certainty of dis-

covering in the end that he is destitute of the instruments, and unequal to the toils, of so vast a work. The points which he requires, but of which unhappily he is ignorant, he must perforce obtain from himself or coin from his own mind, that is to say, he must use the imagination to supply the place of real knowledge; and how prone to error the imagination is if left to its own guidance, without the continual advice of experience, and the precepts of a true philosophy, is perfectly well known to even the least instructed. Let the reader only make the attempt for a short distance, and he will soon find himself retreating with his standards, and obliged to bring up fresh forces, before he can profitably return to the field where the peculiar battle must be won.

If we wish to deserve success in the study, it will in the first place be necessary to spare no pains, but to exert the mind to the utmost, in clearing and winning those particulars which closely surround and are subordinate to the subject in hand. The anatomy of the body, the anatomy of animal bodies in general, and especially of the cerebrum, cerebellum, medulla oblongata and spinal marrow, and also of the nerves, must open the avenues which lead to it. Without a thorough command of these portals, it is in vain to hope to penetrate the recesses of nature's temple. It is impossible to divine what nature is in the invisible sphere, excepting from what she is in the visible; or what she is in causes, excepting from what she is in those effects which ultimately strike some one of the senses. Just so it is impossible to know the nature of the inner action of the mind, without examining the face of the mind, that is to say, without investigating the brains and marrows of the mind. And even then it will still be impossible to guess how the soul unfolds her powers, without having studied the relations and connexions of all the viscera of the body,* as well as the organs of the external senses, which contribute in their degree to enable those of the internal senses to undergo that development which will open them to the soul.

“Nature exists in totality in the smallest objects,” as Mal-

* Swedenborg does not regard the brain as a part of the body, but by the viscera of the body he means those of the chest and abdomen.—(Tr.)

pighi well observes in his Treatise on the Silkworm.* Whatever is presented to the eyes and to the organs of the other senses, consists of series of things beginning with the smallest, and multiplied through many degrees or stages, and which at length, after they attain to a certain considerable magnitude, appear to us as the least of things; in consequence of which it is usual at first to regard them as boundaries and causes, though far from being this, they but hide or mask real causes. For this reason, no further assistance is to be expected from them, than as supplying the mind with ultimate effects, from which it may pass to principles by an analysis of its own; besides which they are the only means that the mind can judge from *per nexum* or by relation. The path however is difficult and steep. If we confine ourselves to a few facts and phenomena, we form an idea of causes in conformity with these alone; though nothing is gained or proved, unless all the facts which surround the subject both nearly and remotely, are also in accordance, and give their consent to the same effect. And when the truth is found, consent is never absent, for truth wins the suffrage of all phenomena. All things in the world are connected, because all things spring from a single most universal principle. Hence the truth on no subject can be said to be declared, unless all things eagerly confirm it. And thus whatever results we are now to arrive at in treating of the brain, must be confirmed by all that depends upon the brain, that is to say, by the whole body, including all the viscera, organs, parts, solids and fluids; also by the records of disease, whether of the body or the mind; and furthermore by the details of experimental chemistry and physics, and the entire cohort of the other arts; inasmuch as animal nature in her domain passes in the most perfect manner through all the arts to obtain the effects that she desires. Such is the connexion of all the sciences requisite to explore the powers of the animal machine alone, that the absence of but one of them is sufficient to deprive the chain of the link which suspends it, or to leave it too feeble to bear any weight.

Nor is it enough to acquire a knowledge of all the sciences,

* "Cum enim tota in minimis existat natura, si alicubi, magis equidem in *insectorum* moleculis id deprehendi par fuerit." *De Bombyce*, p. 1, fol., Londin., 1687.—(Tr.)

or even of rational philosophy in its various departments, unless we can reduce all things to higher and higher generalizations; or of all the sciences form one science, sufficiently comprehensive to embrace all. The one science to which we allude, and which we denominate the Mathematical Philosophy of Universals, although hitherto unknown to the world, is still of possible attainment: and it is our wish, if ease and tranquillity of mind be granted, ourselves to lay its foundations. Without its assistance, it is idle to hope to arrive at a knowledge of the soul; for this science is the philosophy, not of the mind, but of the soul (the mind is to be developed up to the soul, which latter admits of no development); in other words, it is the analysis whereby the soul comprehends its own objects. As however this science, as we said before, is altogether unknown, and it will therefore perhaps be thought fruitless to endeavor to acquire it, so before we give a statement of its principles, we shall by no means venture dogmatically to declare its use; but shall be content with observing, that without its help it will be easier to reach the moon than to explore the soul.

FAITH AND GOOD WORKS.

WITH AND GOOD WORKS

Faith and Good Works.

THERE can be no doubt that it is faith which saves, and not works separate from faith; but, where there is a possibility of doing good works, the question is, *whether faith will save without them*, according to the dogma of the Lutherans. We reply that the affirmative seems compatible neither with the divine word of revelation, nor with human reason; both of which lead rather to the conclusion, that *faith without works is a nullity; and were it anything, would condemn, not save.*

First let us hear the *Holy Scripture*. Our Savior inculcated nothing more zealously, than the duty of loving our neighbor; for he says that whoever does not love his neighbor, cannot love God, which amounts to saying, that he who does not do good works cannot have faith. In the sermon on the mount, the sum and conclusion of the whole is this, that the tree which bringeth not forth good fruits, is hewn down and cast into the fire; for the tree is known by its fruits. In pronouncing the sentence of the last judgment, he says that the wicked are to be sent into hell, because they received not the stranger, clothed not the naked, and fed not the poor; but those who had done these good works, he admits into heaven. All his teaching abounds with similar instances; as in the parable of the ten virgins with the oil in their lamps; in the parable of the sower; of the talents; &c., &c., &c.

The apostles testify to the same effect. John, in his epistle, urges almost exclusively the duties of love to God and the neighbor; upon which, as Christ himself teaches us, hang all the law and the prophets. James makes open protestation of the

heinousness of faith without good works, and describes it as devilish. So also the rest of the apostles. Paul, in his epistle to the Romans, says that *it is faith which saves*, but not actions, meaning thereby, not actions without faith; but Luther, in his translation of the Bible, has added to the words of the apostle, "*faith without works*," though the latter phrase is not to be found in the sacred text; and I believe that Luther never committed a greater sin than when he made this interpolation: but God be the judge. Certain it is, that on examining and weighing all the grounds, it must appear, that faith without works is rather condemnatory than saving. Let us see therefore the meaning of the several terms, *action*, *will*, *principle of the will*, *faith*, and lastly, *love*.

Action is nothing but the execution or effect of the will, or it is the will itself at work. Separately considered it is no more than a mechanical thing, inasmuch as it is bodily or corporeal, and nearly resembling the effect of a machine; but the essence of the action is the will in the effect; so that action may be called perpetual will, much as motion is called perpetual effort by writers on physics. In man therefore will and action are coincident, since for action to be, will must be involved in it as an essence. Similar actions, or even the same action, may consist with a different will; and similar wills, or the same will, with a different action; in the same way as a similar motion may proceed from different efforts; or as the effort may be similar, and yet a different motion may result from it; for resisting media and circumstances determine or difference the motion resulting from the same effort. But to return to action; it is evident in all our human societies, that action is not regarded as action, but as will. Suppose that three men profess the same veneration for a monarch, all prostrating themselves at his feet, or bowing to the ground in his presence, or lauding his virtues to the skies; but one, with the will or wish to deceive him, the second with a view to his own reward, the third, to display in a befitting manner the honest veneration of his heart. The action of all three is the same; yet it is not the same when viewed from the will, which is heterogeneous or different in each. Therefore when the king has discovered the will of each, he hates the action of the one, and loves that of the other;

and his hatred for the former is all the greater, in proportion as the action nearly assimilates to the action of those who display the outward signs of a real inward veneration. Nothing therefore is here considered in the action, gesture, motion of the body, or speech, but the will alone; which shews that action may properly be termed perpetual will, as motion may be termed perpetual effort.

The *will* also proceeds from principles, or from a principle, of its own, as action proceeds from will. There may be different principles to a single will, as different wills to a single action; in which respect the principle is considered as determinant and efficient, and the action as the determinate and effect; the will being the mean between the two. Therefore action is no other than the principle alone; for the cause of the cause is also the cause of the thing caused. Thus relatively action is nothing but a mechanical thing, like the motion of a machine; and the will is like the effort in the motion; and it is the principle alone which constitutes the essence of action, because it constitutes the essence of will; for by the common rule, there are all the essentials in effort that there are in motion, or what amounts to the same, there are all the essentials in will that there are in action. We repeat then that the principle is the only thing that constitutes the essence of action, because it constitutes the essence of will. Hence in civilized life all actions are examined and estimated by their *principles*, or in other words, by their intentions, or the ends for which they are willed and done. Moreover in common discourse the word will is used synonymously with principle or intention, being regarded as an identical term. Will, however, is the distinctive property of man, who alone is privileged to will from antecedent principles, or from a foregone intuition of ends: it does not exist in the brute creation.

The word *principle* implies whatever determines the will, and gives it a characteristic quality. There are principles which are *physical*, that is to say, proper to the body and the blood; such are the different affections of the animus, the pleasures of the same, the allurements of the external senses, the delights of the world, &c. There are also *rational* principles, or principles that regard an end, and which relatively thereto, viewed

in conjunction with means, determine and enter the will, which thenceforth is properly denominated will. Again, there are principles that govern the will, which may be called *divine* principles; where the end that should determine the will to action is too ulterior to terminate in this life. This principle, however, belongs to a higher degree, and is of a sublimer character; for it does not depend upon ourselves, and it governs all other principles; so that indeed it must not be considered as a principle, but as a superior will. Yet as it ultimately enters the human will, and determines it, so it may be designated as a principle ascribable to God.

Faith is that peculiar faculty in man whereby he believes in Almighty God, in Christ the Savior of the world, and in all that the revealed Word of the Sacred Scripture dictates: consequently it is a principle of the will, but divine, or ascribable to God alone. When faith as a principle enters the will, and thereafter the action, then the action is not considered as action but as faith.

Love exactly keeps pace with faith, for whoever has faith amounting to confidence in God, has also the accompaniment of love as inseparable from faith; for the grace of God is universal, in that when He gives faith he also gives love, and the love increases in the same degree as the faith; and when the faith is conjoined with love, it then for the first time constitutes saving or true faith. Historical faith, however, is only the science or knowledge of what really is, and even the devils have it, for they know that there is a God Who is such as He is described in the Holy Scriptures: but this cannot justly be termed faith, but knowledge. We must therefore separate this meaning of faith, which arises entirely from the double signification of terms, from saving faith, which is faith conjoined with love. Thus faith and love are in these respects one, for granting the one, the other is granted also; and notwithstanding that each appears to be distinct, yet the two are so united, that God gives love in the same degree as faith; and with love, confidence; and with confidence, veneration, and acknowledgment of his grace. Thus as love is the principle of the will, so it is the essence of action.

Let us now argue on these premises. What then is will?—

When one can do what one wishes. And what is endeavor?—When the subject can effect what it endeavors. It may be called will and endeavor when doing and effecting are impossible; but if the means of doing are conceded, and no action takes place, will and endeavor cannot be accounted real, but rather are mere abstractions. To take a vulgar illustration. We may say that this tendon possesses an elastic power, or an endeavor to recover itself after being flexed; and so long as resistance hinders, it is in a perpetual effort and *nisus* to act or react. But when it has the power and opportunity to act, and yet does not act, what endeavor or elastic force has it? It is clear that it has none; and this from the fact, that it does not act when the removal of all resistance enables it to do so. And if it can, and does not, it is a sign that it counteracts its own endeavor, and has in it principles contrary to the endeavor, or which restrain, and destroy, its elasticity. Consequently, when it does not act, elasticity or endeavor cannot be predicated of it, or if predicated, the elasticity must be regarded as destroyed by a contrary principle. The same holds of faith and action. Faith is a principle of the will, and the will is the principle of action. If action does not ensue when it can, what becomes of the will? It is either an abstraction or nonentity, or else it is influenced by a principle opposed to faith. The tree then is known only by the fruit, and faith by works, according to the impressive words of our Savior and the apostles; but not by itself without good works; for this is contrary to the Word of God.

This may be illustrated still more adequately by other than merely physical similes, like that which we lately borrowed from the tendons; thus it may be illustrated by love, friendship, and an infinity of other affections, which enter the will, to constitute its principles. The simile already adopted is however sufficient, as being of a physical character, it the better impresses the senses, which are within the sphere of physics. For this reason it is that comparisons derived from trees, from oil, from seed, from fields, and from feasts, are made use of to illustrate the same subject in the Holy Scripture. The comparison is more closely appropriate than at first might be supposed. Indeed the will cannot be more fitly compared, than with endeavor, and action, than with motion. Only add living

force, which is the predicate of the soul, to endeavor, and you have will; and by adding the same to motion as an effect, you have action: and so forth.

It follows therefore, that the doctrine that *faith without works saves*, is contrary to reason; but that the doctrine that *faith in works saves*, is in conformity to reason. In a certain sense indeed it may be true, that *faith saves, and not works*, that is to say, if the works are regarded as separate from faith, for then, theologically, they are not good works. Also that *true faith saves, when there is no power or possibility of doing good works*. For in this case the will of the faith may be compared to an endeavor which cannot pass into act, on account of the resistance being equal to the effort put forth by the subject: like the elasticity of a flexed tendon, which constantly reacts, or tends to act, but there may be a resistance equal to the endeavor, which restrains it from acting. However, as soon as the resistance is removed, or the impossibility subtracted, action takes place. It will indeed rarely if ever happen that saving faith will find it absolutely impossible to act; provided it clearly endeavors to act, removing as it were impossibilities; in which case that one mite which the poor widow casts into the treasury, will be of more avail than the golden gifts of the rich. Moreover God supplies possibilities to prove our faith; possibilities fitted to individuals; thus he allowed Abraham to offer up his son; to say nothing of numberless other instances which are to be found in the Sacred Scriptures.

There is then no doubt remaining, that love to God involves love to the neighbor. Love to the neighbor is identical with the performance of good works, or with loving him in reality, that is to say, with performing towards him the duties of love, without which love is a nullity. In the same way self-love not only involves wishing well to oneself, but also doing well. Therefore if instead of love to the neighbor we make use of its equivalent or value, namely, the performance of good works, we shall find that saving faith, which cannot be separated from love to God, necessarily involves good actions, or the actual exercise of love to the members of the society in which we live. It is all the same whether it be to those who are loved by God, or to those who are not loved. For it is impossible to say who

are loved by God, and who are not ; for a good soul may exist in a bad body ; and *vice versâ* ; as there are many examples to shew. To judge of others therefore belongs to God alone, and not to us ; wherefore God has said, "*Judge not, that ye be not judged.*" Thus if from a principle of love to God, or from true faith, we only do our duty to our neighbor who has need of our services, we have done enough ; and we have no right to be partial in our benefits, as if one individual was more loved of God than another ; for in such a judgment we are almost sure to be deceived. Our province lies in judging of actions, with a view to the conservation of society ; but it is reserved for God to judge of the principles of action. It is assigned to us to pronounce sentence on our fellow men, and to condemn the body to merited punishment, or even to death itself ; but the soul is always left to the judgment of the omniscient God.

The *conclusion* is, that there is no love to God if there be none to the neighbor ; or that there is no faith, if there be no works ; and that if there be love or faith apart from works, they are destroyed by various principles contrary to the love of God and to genuine faith ; and in this way love and faith are what condemn us. Therefore *faith without works* is a phrase involving a contradiction ; a phrase in which the predicate ignores the subject ; a position of something from nothing, of the possible from the impossible ; a distinction inadmissible in this life. In the future life, love to God may be said to exist without the performance of the duties of love to the neighbor. True ; but in this case love and faith are not considered as saving ; for the soul is already either saved or condemned ; and all the means, which consist in doing the duties of love to the neighbor,* are taken away, because the body, which is the subject of action, is extinct. Therefore sumptuous Dives wished to return to life, that he might be able to minister to poor Lazarus.

* But on this subject see the author's work on *Heaven and Hell*, on the Occupations of the Angels in Heaven, where it is shewn that "every one there performs a use ; for the Lord's kingdom is a kingdom of uses." Also that in heaven there are ecclesiastical, civil and domestic uses ; and that the employments there are too abundant for enumeration, those on earth being few in comparison : furthermore that man after death is in a perfect human form, and possessed of *all the senses*, memory, thought, and affection, that he had in the world ; and that when he enters the other life, he is in a body, as he was in the world.—(Tr.)

THE RED BLOOD.

N.B. The Blood contains all organic forms from the primary spiritual to the ultimate angular, and in this respect is the compendium and complex of all the forms of nature.

THE RED BLOOD.

CHAPTER I.

The blood is that thick, red, heavy humor which circulates through the heart, arteries, and veins.

The blood is palpably distinguished from the other humors of the body by its redness alone. The vessels through which it runs are the arteries and veins. The heart, comprising the two auricles and the two ventricles, is the first and last term, or the starting point and goal, where both the blood and the vessels meet. The circulating current runs from the left ventricle of the heart to the great artery or aorta, and to the lesser arteries; from the arteries to the smallest veins, and to the grand vein; from the veins to the right auricle and ventricle of the heart, and thence, through the lungs, to the left auricle. This circle and gyre constitutes the great sphere of the heart; and the vessels collectively constitute the arterial and venous system, or the heart in the largest sense; for the heart is as it were most present in every point of all the arteries, and in every point of all the veins; the vessels being its channels of determination, or rays of operation.

CHAPTER II.

The parts of the genuine or red blood are spherical in shape, and consist of globules surrounded with serum.

The fluid mass which gushes out when a vein is opened, is

all denominated blood ; but the pure and genuine blood is distinguished by its intense redness. The blood is surrounded by a serum or water of various degrees of pellucidity, and which is sometimes turbid, gray or glaucous, yellow, brown, or greenish, and full of saline and urinous elements. We are here, however, speaking only of the pure and genuine blood, which consists of round globules, as shewn by the microscope. The figure of the blood particles was unknown to the ancients ; their internal form or structure is even now unknown to us ; it begins however to be somewhat plainer, from the revelations of the microscope ; although obscurity still preponderates. Nevertheless, we know enough to enable us to judge from what we see, of the other particulars which are beyond our vision.

CHAPTER III.

Each blood globule contains within it, and carries in its bosom, details more numerous than the eye can ever discover, or the mind conceive.

There is abundant experience at the present day, to prove that the blood globule is not uniform, simple, or devoid of parts. Indeed it admits of resolution or disintegration. In the capillaries it actually divides into lesser globules, and these into least, which are so minute as to escape our vision. When the blood is exposed to a moderate heat, and so distilled, it is converted into an ardent spirit, with oils and phlegm ; moreover when the globule is resolved, it yields a large quantity of volatile salts, which crystallize under the form of a regular vegetation. The more considerable parts which come over, are shewn by the microscope to consist of triangular and square corpuscles. To this extent the high experience of microscopic vision has really penetrated. And we may augur from it, that details more multiple and more perfect still, lie hidden in the lesser globules, and again in the least. These however we cannot expect to see distinctly, for we are unable to see the globules that contain them ; as when we cannot see some small insect, which equals only the minutest ray of microscopic light, it

would be in vain to expect to see its little viscera, or the structure of its exquisitely fine members. Now the case is the same with the blood-globule; although from what we have found and know it is sufficiently certain, that if all its contents could be discovered, and if it could be magnified to the size of the human brain, an infinity of new details would come to light, and nevertheless an infinity would still remain unseen. For the blood is the repository and the seminary of all things in the body, and contains in act whatever has preceded it in the kingdom, and in potency whatever comes after it, or will come after it. For this reason it is, that the universal body is sick when the blood is sick, and *vice versa*; and that in the greater number of diseases, it is sufficient to find a medicine for the blood alone, to restore the body to health.

CHAPTER IV.

The red blood globule admits of division into six lesser and pellucid globules.

Six lesser globules have been actually seen in one large blood globule; and indeed the mode in which they are united, and the relative position which they occupy to each other, have been described and drawn, and wax models representing the whole have been constructed. Moreover, the several lesser globules have been seen in the act of separating from the compound body; in which case their pellucidity was manifest, and as they came away from the red globule, they were observed to penetrate the capillary vessels. Furthermore experience has shewn, that these prior or simpler globules are themselves divisible into still lesser ones, and even into least, where sight can follow them no longer. All these particulars must be received as true, because the observer,* and the witnesses to his observations, are worthy of credit. Now as the parts of the red blood admit of division into simpler parts, it follows that the latter, which are the prior and simpler constituents of the

* Leeuwenhoek. — (Tr.)

blood particles, are not the red blood, but constitute a purer, inner, and more perfect blood. The change in color will not alter the essence, nor consequently the name. Like the red blood, this pellucid blood circulates through vessels, and pursues its course where the grosser fluid cannot follow. We therefore term this humor, which consists of pellucid spheres, the purer or middle blood.

CHAPTER V.

In the red blood globule there are also a number of saline and urinous particles, of different shapes.

Besides the lesser pellucid globules which constitute the large globule of the red blood, there are also in the blood, certain angular, or saline and earthy parts. These also have been seen and described, yet only those that are square or cubical; the others perhaps being too minute for observation. It may however be inferred that each red globule contains triangular as well as cubical forms, from the consideration, that when the six lesser globules are in their full whirl and speed of fluxion, they could not cohere together, were there not intrinsic means provided to strengthen and hold them in combination. The blood globules are flexible and soft, and capable of being extended in length to two or three times their diameter. And although they admit of being extended, and even divided, yet they are all of equal size. Which is a plain enough proof, that they have some fulcrum, support and stay, to ensure their cohesion under the compound form. The particles of salts, both the primitive and the compound, are angular forms; that is to say, they are inert and figured, or consist of extremely minute trigons and cubes, hollowed out so as exactly to fit the convexity of fluent and active parts; being made and formed with a view to combining or copulating with round particles, which are the genuine parts of motion; to temper and moderate their activity, and to cause them to combine further, by successive degrees, into new and more compound forms. Therefore in order that the six globules may unite and cohere in one, they must have

a little cube in the middle with six sides and eight angles, and with each of its sides hollowed out: and if any humor, however intense its fluxion, comes into the mould of these hollow sides, it will of necessity fall into globules, each of a size and convexity answering to the size and concavity of the side. But to make the globules firm and tight, still other and lesser parts, and these of a triangular form, must be fitted to the several angles or angular interstices, of which there are eight; and when these triangles are properly inserted, the whole will then be a stable compound. The cube in the middle which serves as the basement or stylobate of the compound globule, is no other than a particle of common salt. The triangular forms are volatile and urinous salts. Of the latter the ardent spirits are composed, as well as all the various species of oils which the blood yields on distillation. Particles of the kind float about in the serum, and are thereby supplied or offered to the blood. And that these are indeed the constituents which escape in large quantities from the blood when it is resolved or disintegrated, is clear from the crystalline vegetation which they then go to form; also from the little cubes that have been observed, when this process takes place; and from similar cubes being found in the caput mortuum after blood is distilled. And further from the consideration, that without an application of parts like what we have mentioned, composition would be impossible; and above all, the red blood could never be the repository of the humors which precede it, and the seminary of those which follow it. On the other hand, by the mutual application of the triangular, cubic, and round forms, we have not only a firm and coherent globule, but one which is spherical, voluble, flexible, fluid, adapted to any straitness of passage, soluble, ruddy, heavy, warm, and embracing the prior elements of the whole mineral and vegetable kingdoms; all of which in a moment spontaneously glide into one to form it, and it holds and keeps them all on the happiest terms of mutual compact, and arranged in the most admirable order; while the spirituous substance, which resides in the lesser globules, is the single principle which reigns in the assemblage.

CHAPTER VI.

The redness of the blood arises from the interposition in each globule of salino-volatile particles.

If in the middle of the blood globule there be a stay or fulcrum consisting of a little cube with six sides and eight angles, and if each angular interstice which is left between the lesser globules, have minute trigons and cubes inserted in it, that is to say, salino-urinous particles—in this case it is impossible that redness should not be produced. Color is the modification and variegation of the rays of light, and the red species cannot fail to arise, wherever the rays pass through an object thus regularly interpolated with trigons and cubes; for as they fall,—as they are incident,—they penetrate with perpetual refraction to the little cube which fulfils the place of a centre, and there undergoing repercussion, they gyrate with a giddy whirl around the lesser globules which lie at the sides. Thus much is known with certainty, that nothing produces the various kinds and forms of shaded light with greater distinctness or in more exquisite purity, than volatile, urinous and alkaline salts, or than sulphurs, inasmuch as all these are in reality triangular corpuscles, or prisms and quadrangles, excavated laterally: which when they are distributed or packed in an orderly manner so as to form a compound body, are sure to result in a general modification of light, either red, green, or yellow, and to display a surface that is really distinct and comprehensible only under the condition of a general visual perception. The result is different when the proportion of light or rather whiteness in the sphere is less, under which circumstances green or blue are generated; but yellow, when the proportion is greater. This is proved by the transmission of the solar rays through glass globes, through bubbles of water, and through steam, also through prisms variously placed; by the phenomenon of colors in those places where shade begins to be markedly discriminated by light; by various chemical mixtures and precipitations; by the whole vegetable kingdom, so richly adorned with colored objects; and by an infinity of other instances; from a careful survey of all

of which it is very clear that there is nothing at all real* in color. On the same principles it is also evident why the blood is more or less red at different times and in different individuals, and why is it sometimes comparatively pale, yellow, or green, or even tinged with unseemly black.

CHAPTER VII.

The gravity of the red blood results from the same saline and urinous particles which are contained in the globules.

The red blood is heavier than water, in which when placed it sinks to the bottom. The cause of its gravity necessarily lies in parts endowed with *vis inertiae* and resistance, as are all those which are angular and terrestrial, or which belong to the mineral kingdom. The force that determines the gravity of bodies evidently resides in the purest circumambient atmospheres, which press all points of non-elastic bodies with perfectly active force and unerring direction towards the general centre. Thus gravity or centripetency originates from cosmical substances destitute of both gravity and levity. It follows that the salino-urinous and volatile particles in the blood globules, of which we spoke above, are the proximate causes of the gravity of the blood. Therefore the quantity of these particles may be inferred from the gravity of the blood. And it would be worth while to institute a comparison between similar volumes of the red and of the purer blood. The heavier blood is for the most part harder, because impregnated with a superabundance of earthy elements; while the lighter blood is relatively soft, as well as tinged with a more grateful redness.

* In asserting that color is not real, the author means that color is not a thing (*res*), but the modification of a thing.—(*Tr.*)

CHAPTER VIII.

The warmth of the blood differs in different cases, and arises from different causes.

Animal life in its most essential form gives the blood its proper or peculiar heat, which is intimately latent in the fundamental constitution of all its parts; but this heat is a mild warmth, which kindly and gently fosters the viscera, and lights up the fires of all the laboratories scattered through the system, for the due performance of their various works. This is sometimes increased even to fervid intensity by the movements of the animus, or by disease of the body, and withers the parched and exhausted viscera. At other times it falls and fails, often to such an extent, that the members of the frame shiver from its absence. Thus as soon as the blood is taken from its native veins, it loses its heat, and begins to die, to be converted into clot and sanies, and to thicken into a viscid and pultaceous slime. The proper heat of the blood is then of the mildest kind; greater in youth than at other periods, and even sensible to the touch; but in its intense degree amounting to febrile ardor. But there is no keener excitant of heat than volatile urinous matters, such as lie in the bosom of sulphurs, bitumens, resins, and of various kinds of wax, oil, spirits, nitres, and vegetables. And there is nothing which more speedily and naturally promotes it, than the auras of the world, and their analogues, the spirituous fluids of the animal kingdom. By consequence heat has no readier generator than the blood, which lodges both the volatile urinous and sulphurous matters we have mentioned, and the animal spirit, entering into intimate union and consort with them. Thus the natural heat increases with the increase of the spirituous fluid, including its volatile adjuncts, as during childhood; it decreases with the decrease of the same, as in old age; it varies as the character of the blood is altered by the vast diversity of causes which affect it; it is perpetuated by the continual resolution and combination of the particles, as well as by the continual exercitation of the blood by the brains. Thus it appears that there is nothing real in heat, fire, flame, or cold, but that they are the affections and qualities of substances either vibrating and gyrating, or on the other hand, at rest.

CHAPTER IX.

The genuine blood is relatively soft, and admits of extension and division; and its softness arises from the purer and white blood which lies in the red globules.

It is now so well established by microscopic observation, that the genuine blood is soft and flexible, and may be extended in length to twice or thrice its breadth, as well as divided into parts, that no room is left to doubt of the fact. The microscopists have seen the blood globule in the capillaries compressed into an oblong or oval figure, and ultimately broken up into a number of other particles and globules. But if the proofs which instructs us of the softness, extensility and divisibility of the globules of blood, be sufficiently ample to make doubt impossible, we have to enquire into the cause of the phenomena. And here the same experience shews, that the lesser globules, of which each larger globule contains six, are the parts that yield, inasmuch as they may be drawn out till they form a kind of thread, while the larger globule only admits of being compressed. Hence the cause of the flexibility resides in the lesser globules, but not in the salino-urinous and sulphurous particles, which latter are hard, inert and passive, and only made use of as means of combination. Those lesser globules that constitute the purer blood, and those that constitute the animal spirit, are so soft and flexible as to yield to the smallest impulse, to the least assailable force. The perfection of the entities of nature's purer sphere lies in their pliability, in their suffering and doing, undergoing passion and exercising action, proportionally and correspondently; or in representing the most perfect forces of nature; which cannot be done by hardness and gravity, inasmuch as hard bodies absorb and extinguish influences and forces; while on the other hand elasticity and a yielding nature, and passive power equal to active, suffer no force to be lost, but receive it, and give it forth again in all its integrity to the neighboring parts as well as to the universal volume. Moreover, if the perfection of the purer entities consists in mutability of state, it follows that they must be soft, yielding and flexible; or active to the same degree as passive; otherwise they could not accom-

modate themselves to all the various forces ; and the soul could neither feel, imagine, think, nor discriminate the minute differences in represented objects, which are all of them forms : neither could the animal spirit run through the fibres, and determine into act whatever the mind endeavors and wishes. Therefore the purer blood and the animal spirit, which is again a simpler humor of the animal kingdom, are the causes of the flexibility observed in the blood globules. And it is evident from this in what the composition of the blood globules consists.

CHAPTER X.

In the living body the red blood undergoes perpetual dissolution, purification and renewal.

We have shewn that the globules of the red blood are dissolved into lesser and pellucid globules ; that they are recomposed or renewed follows from this, that the quantity of blood in the veins and arteries remains the same notwithstanding. This resolution and recomposition of the blood produces that circulation which we term the circle of life ; a circulation from the vessels to the fibres, and from the fibres to the vessels. Thus the blood loses nothing by death or dissolution, but only in every instance returns to its first essence and nature ; and from this again reverts to its general, or to its last or ultimate form. But when the compound body is dissolved, or the red blood dies, it does not cease to exist, but always returns to a purer life, and is gathered to its parent, the soul. So each moment life and death alternate in us, and every particle of the blood represents the general condition of the body. Indeed were it not for the continual dissolution and renovation of the blood, the food would be useless to the body. For fresh elements require to be constantly taken into the system to compose the blood anew, as obsolete and antiquated matters are thrown out. Therefore it is that the blood is always surrounded with an abundance of serum, to supply and offer these elements. Moreover it requires to be continually purified, to serve all the uses of animal nature, *i.e.*, to give birth to the numerous humors

with which the viscera abound. Again it must be dissolved and renewed in order to be purified, and to be always in a state of fitness and adaptability; for when too hard or compact, it will yield or give out nothing, and will never open its bosom treasures. Thus the fortune and happy condition of bodily life consist in the softness and divisibility, and not in the hardness, of the blood. Whatever is vital, is soft, patient and yielding. It is the contrary of vital, if hard, sluggish and inert.

CHAPTER XI.

The globule of the red blood contains within it the purer blood and the animal spirit, and the latter, the purest essence of the body, that is to say, the soul; whereby the red blood is a spirituous and animated humor.

The blood is the repository of all the prior or purer humors in the body, and the seminary of all the posterior or grosser; wherefore it contains the prior in actuality, and the posterior in potency. The animal spirit descends from the very essence and substance of the soul; the purer or middle blood from the animal spirit; and the red blood from the purer. It is only by this succession and derivation that the soul can be present to the several parts of the body; for to be present with all, it must be involved in all in the above order. The intimate principle then that lies in the depth of the red blood, is the very essence of the soul, which in ruling and determining the blood, rules also and determines all that depends upon the blood. Unless the blood contained within it the prior animal essences, the members of the prior sphere could never provide for those of the posterior, nor the posterior be related to the prior, nor would there be any mutual respectiveness, dependence, harmony, or real correspondence. Therefore the blood is spirituous and animated.

CHAPTER XII.

The red blood partakes almost equally of the soul and the body, and may be termed both spiritual and material.

The blood partakes of the soul, inasmuch as it involves the purer blood; this, the animal spirit; and this again, the prime essence or the soul. It partakes of the body at the same time, inasmuch as it contains earthy, inert and saline particles, which give it gravity, color, a comparatively hard consistence, and other attributes, which are the qualities of mere body, and attach to material things: besides which, the blood-globules are of a circular form, and in this way also are bodily. The quantity of space which the soul and the body occupy respectively in the blood globule, may also be calculated, by comparing the internal space filled by the little saline cube, and the angular interstices containing the smaller trigons, with the space of the globules; though it is to be observed that there are most pure elements of a similar but purer nature in these very globules, to give their frame-work strength, to temper their activity, and to fix their volatility.

CHAPTER XIII.

The red blood may be called the bodily soul.

Considered in itself the blood is not the soul, but the soul is in it; on which condition alone can the soul govern and determine the ultimate forms which are so far removed from it. Nature is ever acting on her own rules and measured proportions. To act on the parts of the last sphere, she must act through those of the middle sphere, and be with them, and in them. Thus as the blood is the soul's vicegerent in the ultimates of the kingdom, so it may be termed the bodily soul, and subsidiary lieutenant force; particularly in those subjects that allow themselves to be governed by the body, and not by the spirit; such for example as brute animals, and their likenesses in human society. In these, instead of the soul governing the body, the blood and the body have dominion over the soul.

CHAPTER XIV.

There is a common and obscure life in the red blood.

The soul is the only vital essence, or the only essence in which life abides; all other things owe their possession of life to the soul. Such is the case with the blood, in the inmost of which the soul dwells, with life in its train. The blood, however, is but the general or common mansion of the soul, and is not distinctly determined by fibres, and therefore its life is obscure, destitute of sense and all intellectual faculty. Essential determination, or form, is what causes us to live distinctly and individually. Thus from the form we may infer the peculiar life, and hence also the peculiar life of the blood, which becomes a little more distinct in being determined by the arteries and veins; although it never reaches the point which may be called sensual life.

CHAPTER XV.

From the red blood we may judge of the nature of the purer blood; and from the purer blood, the nature of the animal spirit; and from the animal spirit, that of the soul; with the help, however, of the doctrine of forms, order and degrees.

We may judge by the visible and the ultimate of the invisible and the prior, or by the compound of the simple. Compounds can have nothing truly essential in them but the first essence. The nature of the red blood is exposed to sight, but not the nature of the purer blood; still less, of the animal spirit. We may however infer from the former the peculiar essences of the two latter. This way of exploring the invisible and occult parts of nature, constitutes the analytic method; but it is quite requisite to possess the experience of the senses, as well as guiding sciences, or sciences to deliver the laws and order by which nature proceeds, or by which her followers are

to proceed. This order appears to dictate, that if there are salino-urinous elements in the red blood, there ought to be similar, but more pure, simple and perfect elements in the white blood, although no eye-sight, however keen, can possibly discover them; and again, that there ought to be similar elements, but most simple and most perfect, in the animal spirit. Otherwise there would be no derivation of one essence from the other, no distinction of one from the other. The degrees of perfection, however, in these and similar entities cannot be explored without a doctrine of forms. In the meantime, from what we have stated it is evident, how greatly the experience of the senses contributes to the discovery of nature's secrets, and that without it we cannot rise to a knowledge of the parts of the higher and simpler spheres.

CHAPTER XVI.

There are three orders of blood, the gross blood, the purer, and the purest.

The red blood is properly termed the blood; but the purer blood not so properly, because it is not red but white; again, the purest blood is the animal spirit. The soul presides over these several fluids; the soul, which is not blood, but the first, inmost, highest, simplest and most perfect essence of the blood, and the life of all. The red blood derives its principal essence from the minuter globules which lie in it, and therefore a volume of such globules cannot fail to be designated blood. The same applies to the animal spirits, which are involved in the purer blood. All these varieties then are denominated bloods, which is also usual in the Holy Scripture. The substantial and essential principle remains the same, while the particulars that vary the notion are mere accidents. If the blood is not denominated from its redness, gravity and crassitude, but from its inner nature, then both the one and the other of these fluids is blood; not so if it be denominated from the before mentioned accidents. In themselves these bloods are indeed most distinct; for they are really and actually dis-

tinguished in the body, and yet they exist simultaneously and together in the red humor; hence, for distinction's sake, they require to be signified by different names: and if in no other way, yet always by varying predicates of perfection. Thus we may say that the animal spirit is the first blood, the highest, inmost, simplest, purest, most perfect; that the white or middle blood is prior to and higher than the red, and likewise more inward, simple, pure, and perfect: but that the red blood is the last, lowest, outermost, the compound blood, the relatively gross and imperfect, the ultimate, properly the blood. The same remarks apply to the vessels of the triple blood; for the simple fibres, the compound fibres, and the blood-vessels, mutually succeed and correspond to each other in the same manner and order.

CHAPTER XVII.

The fabric or form of the prior or purer blood is more perfect than the fabric and form of the posterior or grosser blood.

The form of the red blood globule is circular, for the globule is perfectly spherical, and rolls in circles in the vessels; and moreover it includes particles of an angular form. Thus the form of the globules of the red blood is the ultimate and penultimate form. But the form of the globule of the purer blood is not circular or spherical, but spiral; as indeed may be inferred from the circumstance of these globules being oval, and therefore designated* as plano-oval; for the form of a spiral fluxion of parts engenders the external figure or form of an oval. Such is the case also with the cortical glands, which are at once spiral and vortical forms. But the form of the globules of the purest blood is the next higher form, or the vortical. For as the bloods themselves become simpler, so their forms become more perfect. The doctrine of forms, as well as experience, shews that such is the order, and such the ascent of perfections.

* By Leeuwenhoek.—(Tr.)

CHAPTER XVIII.

The three bloods reign both conjointly and separately in the animal body.

They reign conjointly in the red blood, for this has within it both the purer blood and the animal spirit; for which reason we have termed it the repository of the preceding fluids. Conjointly also in the purer blood, which has within it the animal spirit, and the latter, the soul. Each blood also reigns separately; namely, the animal spirit in its own fibres, the purer blood in its own, and the red blood in the vessels. All things in the organic body are thus at once separated and united; and each blood does its own work, and rules its own organism. On these conditions, and no other, can the soul form and govern the body in a just order and succession, and preside over and command it in the sphere of the veriest singulars, and universally at the same time. The more nearly conjoined then these reigning humors are in the red blood, and the more exquisitely discriminated from each other, the more perfect is the organism, and the more obedient all things are to the decisions of the soul. But as soon as ever the distinction and the union are lost and confounded, the sensation and action of the body become comparatively indistinct, indeterminate, unfelt and imperfect. For the above reasons, at every round of the circulation the red blood is resolved into the purer, and this, into the animal spirit; and then the red blood is again composed of the two latter. Thus the circle of life is carried on.

CHAPTER XIX.

The animal spirit acts on the blood, and the blood on the spirit, by means of the vessels and fibres; whence the alternate and reciprocal action of the muscles.

But this proposition need only be stated here. In a subsequent chapter we shall treat of the action of the muscles.

It may be observed, however, that without the discrimination of the humors which are the agents, there could be no reciprocal action, *i.e.* no simultaneous and successive action and reaction.

CHAPTER XX.

The state of the red blood depends upon the state of the purer blood, and the state of the latter upon that of the spirits.

The nature of any compound is according to the nature of that which exists substantially within it; for putting accidents out of sight, the compound derives its nature from that of the simples which it comprehends. The red blood indeed may be defiled with heterogeneous particles; but as the larger portion of it is resolved and recompounded during every round of the circulation, and its hard, or antiquated and indissoluble parts are rejected towards the liver and the gall bladder, so it is purified successively. Therefore so long as the animal spirit and the purer blood remain in their integrity, so long can any morbid state of the red blood, or of the body, be corrected, in which case nature is said to operate the cure. In this way the one flows into and influences the other, and the prior or inner sphere repairs whatever may have fallen into dilapidation in the posterior or the outer.

CHAPTER XXI.

Infinite changes of state happen to both the red and the purer blood.

We shewed in the Treatise on the Spirits, that the animal spirit undergoes infinite changes of state. This mutability of the spirits, this their intrinsic nature, all passes by derivation into the state and nature of the purer blood, and all the mutability and nature of the latter passes again into the state and nature of the red blood; for the state of the one depends by continuous influx upon that of the other. Many peculiar muta-

tions and varieties both in accidents and accessories, are also induced on the purer blood, all and each of which alter the state of the red blood. There are moreover peculiar changes of state in the red blood itself, that is to say, in accidents and accessories. By accidents we mean the situation, position and connexion of the parts which enter and constitute it, consequently the order, which results in the form and quality. The accessories on the other hand are those salino-urinous and sulphurous particles which are taken into the globule to give it coherence and composition. The mutations in the accidents, or in the situation and connexion of the genuine and essential parts, depend in general upon these accessories, and their quality and quantity: hence we have the blood relatively soft, hard, hot, cold, red, pale, or green; in a word, hence the circumstance that the blood is spurious, legitimate, or various. This shews how mutability increases in compounds, and with it, inconstancy and imperfection of various kinds. Each change of state in the simpler parts which lie within the others, induces a change in the compound, though not *vice versâ*; for there are proper or peculiar accidents, as well as accessories, in every composition. That the changes of state in the blood are infinite, or exceed all enumeration, may be shewn analytically and by calculation.

CHAPTER XXII.

The blood of one individual is never absolutely similar to the blood of another.

It was indicated above that the soul and animal spirit of no two individuals are ever absolutely similar or equal in their whole nature and accidents: it follows that the same remark is applicable also to the blood. For the nature of the animal spirit determines that of the purer blood; and this, that of the grosser or red blood. And the latter may be varied in infinite ways besides; for the blood of one subject is softer or harder than that of another; it is heavier or lighter, hotter or colder, paler, redder, or blacker. The globules also differ in size in different persons. Instead of the saline cube or octohedron, the place

of the fulcrum may be supplied by a dodecahedron, a hexagon, or a pentagon; which will give rise to a greater or lesser quantity of the purer globules, and to a variation in form. Instead of the urinous salts or subtle and volatile trigons, acids or more fixed salts may be inserted in the angular interstices, or elements of some other description, which will at once alter the state of the globule. The latter may be surrounded with other fragments and floating pieces of the most diverse kinds; and also with chyle and serum equally diverse; not to mention a number of other varieties which it would be tedious to particularize. The existence of these diversities in the different orders of blood, is proved by the common law, that there are as many different bodies, different actions, different dispositions, different minds, inclinations and temperaments, as there are heads and subjects; which induces me to believe, that not only is the blood of one individual not absolutely similar to that of another, but that it is never quite the same in the same subject at any two moments; for the mind, and the animus which depends upon the state of the animal spirits, are perpetually varying; and I further believe, that no two globules of blood are ever absolutely similar. I need not now mention the blood of land animals, birds, or fishes, in which the globules are differently formed, some being oval, surrounded with a thin surface or crust, white, naturally cold, &c., &c.

CHAPTER XXIII.

The red blood is the seminary of all the humors of the body.

"The humors of the body are the following: chyle, milk, blood, serum, lymph, animal spirit, saliva, the mucus of the mouth, bile—the liquor of the pancreas, stomach, intestines, œsophagus, brain, eyes, thorax, pericardium, abdomen, tunica vaginalis testis,—semen, the liquid of the prostate glands, the mucus of the nose, tonsils, joints, urethra, uterus, vagina, and Fallopian tubes,—the humor of the ova, and that in which the foetus swims, cerumen of the ears, urine, and sweat,"* and a

* A citation from Heister, *Comp. Anat.*, n. 34.—(Tr.)

number of others requiring to be specifically discriminated. It is clear from the very structure of the glands, in which these humors are prepared and elaborated for every use, that the red blood gives birth to nearly all of them. Indeed the glands are composed of nothing but vessels and fibres. The red blood and the purer enter them with their vessels, and the spirit, with its fibres; and then the humor issues forth reconstituted from the glands. This is conspicuously seen in the milk, semen, and saliva. In each of its spherules the blood comprehends mere principles and elements; consequently in potency and virtue it possesses all that is producible in the world by simple principles, elements and substances; in one word, all that is possible. The globule which holds within it these elements and determined unities, and this, so subordinated and coördinated, that it can be readily resolved into them one by one, cannot fail to procreate all species of humors in the universe; and this it actually does, because it is resolved or disintegrated during every round of the circulation. Hence in the nature of things no compound entity can possibly be more perfect than the blood. From this view of the bodily constitution of the blood, it follows that each blood-globule is a kind of microcosm, or contains in act all the series which preceded it, and in potency all which follow it; in potency therefore a whole human race, for the seed arises from the blood.

THE ANIMAL SPIRIT.

THE ANIMAL SPIRIT

THE ANIMAL SPIRIT.

CHAPTER I.

The animal spirit is that most pure humor which flows through the medullary fibres of the brain and the nervous fibres of the body.

This is the general opinion of the learned, as well as our own, and is confirmed by all the phenomena of the case. The existence of the animal spirits is unquestioned, as also that they are conceived in the brain, and sent down through its fibres into the fibres of the body, and ultimately into the motive fibres of the muscles. For without the ministration of the spirits, actions corresponding to the decisions of the soul could never be performed, nor could sensations be conveyed to the soul; and therefore when their descent is impeded, either at the fountain-head, which is the brain, or in the first streams, that is to say, in the medullary fibres, or in the nerves themselves, whether the impediment be the result of compression, division, erosion, or obstruction, the effect instantaneously ceases. Moreover, under the microscope, the fibres are presented as round and hollow cylinders, as if designed to convey a fluid; besides which, without they had a fluid in them, nothing whatever in the animal body would have either origin, progress, order, law, form, or life. The nature, however, of the medullary fibre, and also of the nervous, and the mode in which the latter is connected with the former, will be shewn in the Treatise on the Fibres. Now since it is indubitable that a species of fluid, or a very pure essence, permeates the fibres, the question is, how to name it. In general it is called the animal spirit, and likened to a most

pure honor, of such endowment, fluidity and perfection, as to glance through its own invisible fibres, comparatively as the blood runs through the blood-vessels.

CHAPTER II.

The animal spirit is conceived and prepared in the cortical gland, and flows out therefrom into the fibres.

It follows by the very connexion of causes, that the animal spirit cannot be conceived and excluded anywhere but in the cortical gland; which latter is the beginning and head of its own fibre, and the little brain of the same. If then the fibre springs from the gland, and the animal spirit is the spirit of the fibre, the fountain and womb of the spirits must be in the gland. The cortical gland then may deservedly be styled the most perfect model laboratory and chemical organ in the animal kingdom. Moreover according to anatomists this gland contains a little cavity, a simple chamber or ventricle, and has within its structure a pure medullary and cortical substance, whereby it is the most perfect exemplar of the grand brain. There is therefore no doubt that the spirit may be prepared in it. The means, however, and the art, whereby this preparation is effected, and the nature of the spirit produced,—these are the main tasks and difficulties of our exploration. The most learned anatomists, as well as the best authorities on physics, agree with us so far, and therefore ascribe a glandular character and construction to the cortex of the brain. For all the animal humors are elaborated in glands; and the finer and simpler the gland, the purer the humor; which in the highest case should be called not simply a humor, but the better and nobler essence of the humors of the body. Therefore it is designated by the peculiar and appropriate title of the animal spirits.

CHAPTER III.

The quality of the animal spirit may be known from the quality of the fibre that it permeates, and vice versâ.

Such is the correspondence which prevails throughout the animal kingdom, that the nature of one thing may be known from that of another; and this mode of inference is particularly available for the fluids, which permeate the fibres, vessels and ducts. The fibre is formed with a view to its fluid or spirit; the vessels, arterial and venous, are formed with a view to theirs, that is to say, to the blood; and the ducts are formed with a view to the other humors. All these parts from the earliest infancy are inaugurated into this conformity. So mutually are they accommodated to each other, the contained fluid to the containing fibre, or the containing tunic of the fibre, that they make conjointly one cause and one determination. But I forbear this train of argument. Certain it is that the anatomy of the fibre shews the possible character of the spirituous humor; but its internal nature we shall now investigate a little more deeply.

CHAPTER IV.

The animal spirit is the intermediate essence between the soul and the body; hence it is the mediatorial substance which provides for the communication of operations between the two.

This completely coincides with the received opinion of the learned on the essence of the animal spirits. There must be a middle or mediatorial substance to enable the soul to operate on the body. It would be against nature, and contrary to the order of things, if, notwithstanding the provision of a number of intermediate forms, the first form were to pass to and influence the last immediately. The soul is the first, highest, inmost, simplest, and most perfect essence and substance. The body is the last, lowest, most external, and most thoroughly compound

and imperfect substance. For the first then to operate upon the last, there must be a middle or intermediate that takes its nature from both. In other words, for the most perfect to act upon the imperfect, there must be a link of intercession, to take something from both the perfection of the one and the imperfection of the other. The animal spirit is such a link; and therefore where the animal spirit is wanting, the soul is powerless to govern the body in correspondence to its own operations. This is plain from actual effects and phenomena; the experimental demonstrations on the subject being rather superabundant than deficient. It will, however, be impossible to explain to ordinary comprehension how the animal spirit plays the part of a mediator between the soul and the body, unless we are previously acquainted with the definition of, and the distinction between, the soul and the body. We have already defined the soul, as well as the body. But to enable us to perceive the mediation here alluded to, we ought to know what fluids and fibres they are which determine the form and structure of the body. The first, the principal, and the proper essence and substance of the kingdom, is that which is termed the soul, or the souls'; the last is the red blood. The blood-vessels produce the ultimate form, *i. e.*, the form of the body. The organic structures are called into existence, fashioned and constructed, by mere vessels, and by mere fibres. The animal spirit is therefore the intermediate essence between the soul and the red blood. By this alone can the soul act upon the blood, that is to say, upon the body, which is determined by, and constructed of, fibres and blood-vessels.

CHAPTER V.

The animal spirit partakes of the essence of the soul, and of the essence of the body; that is to say, it is both spiritual and material.

The essence that is intermediate or mediatorial between the soul and the body, must take its nature from both. The soul is spiritual; the body is material. It follows that this animal

humor is both spiritual and material. Were it otherwise, the spiritual could never operate upon the material, or *vice versâ*. But how natures so different can be united in one subject, requires to be shewn; although that they are united, is clear from the body, including its viscera, and motory and sensory organs, all of which are animated, notwithstanding they are material.

CHAPTER VI.

*The animal spirit is identical with the purer, middle, and white blood.**

When the red blood globule is divided, disintegrated, or dissolved, other globules are set free, which are not red but white; and indeed according to the often repeated and clear experience of Leeuwenhoek, one globule of red blood gives birth under the above circumstances to six lesser globules of white blood or white humor. Not only have the lesser globules been seen, but their peculiar mode of cohesion, and also of separation, has actually been described, as well as the fact of these lesser globules sundering into others still smaller. To this point at the present day has our vision penetrated, so that we can no longer doubt of the existence of the lesser globules. The volume or humor consisting of them we term the white and middle blood, inasmuch as it arises immediately when the red blood globule is ruptured. This issue of pellucid blood must evidently spring from a source of its own, inasmuch as it is divisible and to the last degree flexible, and therefore cannot but consist of some very pure essence.

The identity between this purer blood and the animal spirit, we deduce from the circumstance of its permeating the minutest capillaries; of its winding its way into the cortical glands, from which it is derived into the fibres, and so accomplishes its circle; from its being of a sufficiently soft nature, perfectly yielding, also divisible, and capable of accommodating itself to

* [Note by the Author.] This requires alteration, for the spirit is distinct from the purer blood.

every fibre ; furthermore from the possibility of its being the intermediate between the soul and the red blood. The latter, that is to say, each globule of it, is in a manner the repository and complex of all the parts or forms antecedent to it in existence, and even derives its principal essence from the soul, being preëminently animate. If then the red blood has its prior essence from this pellucid blood, the latter would seem to have its prior essence from the soul or the primary substance. For it must have in it some deeper ground, something relatively excellent and prior, also higher, more intimate, simple, and perfect. And when phenomena are scanned more nearly, or seen in their causes, they confirm the same position with one accord.

CHAPTER VII.

As the animal spirit is conceived and prepared in the cortical glands, it follows that the spiritual and material principles meet in it.

To the end that the marriage of the soul and the body may have issue, and that the progeny may inherit the nature of both the parents, the latter must of necessity meet and combine in that chemical organ where the spirit is prepared. The organic form of the cortical gland, as specified above, contains a minute chamber or ventricle ; also a medullary substance of the purest kind ; and this, two-fold, or vascular and fibrous ; and moreover a simple cortical substance, which is the origin and beginning of simple fibres. By comparing the cortical gland in these particulars with the brain, which itself is a gland and a great chemical laboratory, we may to a certain extent illustrate the generation of the animal spirits ; or at all events so far establish it, that when the causes of the phenomena coincide, the above points will go a long way to persuade us.

CHAPTER VIII.

The simple fibre arising from its own simple cortex, pours into the minute cavity or chamber of the gland, a substance of the purest kind, which is conceived and born in the simple cortex, i. e., the substance of the soul. And the finest vessels, which constitute the other portion of this simple or vascular medulla, supply a lymph or serum of the purest nature, capable of containing the purer corpuscles, or the first sulphureo-saline elements. From the marriage of these two substances the animal spirit is born.

To understand these positions, it will be necessary to make ourselves familiar with the construction of the cortical gland. We have given a description of it above, where we have shewn, that the simple substance termed the soul, is conceived and born by a transcendent process in the simple cortex; and that the simple fibres are its channels of determination, or the rays of its intellectual light. If then this first substance is conceived in the simple cortex, it must be carried along its fibres wherever the latter are determined. Now that a very large part of the simple fibres terminates in the extremely minute cavity of the gland, is rendered highly probably by the analogy of the brain itself. Thus the medullary fibres of the brain, which commence their course from the cortical glands, end for the most part in the lateral ventricles,* where they exhale and de-

* This position of Swedenborg appears to be borne out by modern research, although his deduction has not yet been drawn by others. It is now generally admitted that each nervous fibre, including also the medullary fibres of the brain, proceeds singly, i. e., without real anastomosis, from its origin to its termination. But if we regard the whole brain as a cylinder, and compare its calibre with that of all the nerves which issue from it, and of the spinal marrow, the proportion will probably be as more than 100 to 1. A vast body of fibres must then terminate in the brain itself; and where therein but in the ventricles, the walls, sides, or ends of which consist for the most part of medullary substance? This consideration throws important experimental light on the existence of the animal spirit, as well as indeed upon the functions of the brain generally.—(Tr.)

posit their spirituous essence. The portion of fibres which does not terminate there, runs towards the medulla oblongata, to give origin to the nerves. The same appears to be the case with the simple fibres in the cortical gland, that most minute brain. Moreover the latter is a considerable mass relatively to the fibre to which it gives birth, which shews that it is not all spent upon the fibre. If then so large a portion of the fibre terminates in the little chamber of the gland, it follows that the very substance that is born in the simple cortex, must be derived to that chamber, and be poured thereinto; all indeed but the part that goes to form the medullary fibre.

The analogy of the brain shews likewise that the purest elements and sulphureo-saline principles of the serum, are conveyed into the same chamber by their own proper vessels. The medullary substance of the brain is twofold, viz., vascular and fibrous. In the lateral ventricles moreover we have the choroid plexuses, which consist entirely of vessels, or of interlacements and meshes of little arteries. From these a quantity of serum exudes into the ventricles, which mingled with the spirituous essence of the fibres, prepares the animal spirit to pass with facility into the red blood. A similar mode of construction and function appears to obtain in the cortical gland. The vascular substance that ramifies through the gland, terminates of necessity in the cavity thereof; for the beginning of the fibres is coincident with the end of the arteries. If then both the medullary substances, the vascular as well as the fibrous, terminate in the simple ventricle, chamber or cavity of the gland; and if the fibrous substance carries the purest animal essence, or the substance of the soul, and the other or medullary carries the sulphureo-saline or ethereal principles and elements, it follows that the contents of each are married in the little cavity, to give birth to that most noble offspring, the animal spirit, which partakes at once of a spiritual and a material essence.

But it will be asked where the subtle vessels come from which are inserted into the gland. Now, according to the idea we have suggested of the cortical gland, not only does the arterial vessel pass into the body of the gland with the purer blood, but the little coat of the same vessel also passes thither with the minute stamina or threads of which it is composed.

The threads dividing and ramifying through the gland, constitute the second or vascular substance of its medullary portion.

With regard to the origin of the vascular stamina, these, inasmuch as they pass into the gland, cannot arise immediately from its simple fibres, but must accompany the carotid arteries from the kingdom of the body: for the innermost tunic of the arteries, their membranous and fibrous tunic, is what ultimately remains, and enters the cortical gland. This innermost tunic of the arteries arises from what we term the corporeal fibres. For the truth is that all over the circumference of the body, underneath the cuticle, there are planted an infinity of glands with little mouths and efferent ducts, which exhale the subtlest effluvia of the body, and also imbibe similar but fresh effluvia from the bosom of the atmospheres and of the ether. Similar glandular congeries are also found in the stomach, lungs, and other parts of the system. From these subcutaneous or miliary glands, as well as others, proceed fine ducts, as it were corporeal fibres,* or fibres aspiring to the character of vessels, which weave the innermost coat of the arteries, and at last terminate in the cortical glands, the vascular substance of which they generate. That such is the production of the stamina which enter the cortical gland, is proved by the Sanctorian perspiration; by various morbid, pestilential and poisonous contagions; by the soothing and enlivening effects of spring breezes and exhalations; by the long continuance of life without either food or drink which is usual with certain animals especially; by the infinite pulmonary pipes of insects, which pervade all points of their viscera, nerves, and vessels, even to the innermost parts of the brain and spinal marrow; by the wonderful communication of the glands with the atmospheres, as noticed by Hippocrates; also by the ocean of effluvia surrounding us in the air and the ether. It may be inferred from the origin of these fibres or vascular stamina, that they carry no other than the elemental or material fluid, which in fact they imbibe from the atmospheres and the purest aliments. This then, married to the purest essence in the

* In the language of Swedenborg, the fibres proper belong to the brain, the vessels, to the body; but the fibres which arise in the skin, as the ultimate produce of the brain in the body, are termed corporeal or bodily fibres, and said to be *vascularum æmulæ*.—(Tr.)

minute pore or cavity of the cortical gland, produces the animal spirit here treated of.

And here we might shew by an infinity of experimental proofs, that these vessels imbibe a most pure serum of the nature above described, and transmit it towards the cortex ; and that this serum is impregnated with sulphureo-saline principles and elements ; also that these elements are so formed, as to fit and adapt themselves to that pure essence ; we might, we repeat, shew these points if this were the place to treat of the forms of these parts. The subject however is one that demands a separate treatise, which indeed we have bestowed upon it, but we must not venture to exhibit it here, as it would cause too long a digression.

CHAPTER IX.

There is also a perpetual circulation of the animal spirits from the cortical glands, through the medullary fibres of the brain and the nervous fibres of the body, into the blood vessels, and from the blood vessels or arteries back into the cortical glands, and so again into the fibres.

Besides the living source and spring of the animal spirits, there is also their perpetual circulation, which the most instructed of the learned have not only suspected to exist, but even appear to think they have rendered visible by their microscopes. The arterial vessel runs up to the cortical gland on the one hand, the medullary fibre issues from it on the other : in the gland itself there is a cavity, which like the chamber of a heart draws in the advancing blood, and sends it out into the fibre as its own little artery. Thus there is a perpetual circulation from the arterial vessels through the middle of the glands into the fibres. It is further observed, that the red blood never approaches the gland too near, so as to run into it, but only the white blood does this, that is to say, the red blood after it has undergone resolution, in which case it becomes identical with the animal spirit. The animation or alternate expansion and constriction of the glands, is the means whereby this blood is

attracted and expelled. Were it not for this circulation, the system of the fibres would never be accurately filled with the due supply of spirits, an immense abundance of which is momentarily required to enable the sensory and motory organs, and the several viscera, to perform their offices agreeably to the commands of the soul. The animal functions one and all cease in an instant, the machinery labors, and death usurps it, as soon as ever this circulation is arrested, either in the vessels, in the fibres, or in the glands. The purer blood which makes this circuit, brings also similar elements for recruiting the animal spirit.

CHAPTER X.

The soul apart from the animal spirit could never have constructed the simpler and middle organic forms of the body.

By the middle and simpler organic forms of the body, we mean those that the medullary fibre of the brain and the nervous fibre of the body are the only elements to enter and construct. Such for instance are the primitive cerebrum and cerebellum, the medulla oblongata and spinal marrow including all their delicate members and parts, the initiaments of the viscera, and also of the heart and the motory and sensory organs; in a word, all parts whatever to which the compound fibre runs. The whole of these in the primordial stages of formation, are engendered of the fibres alone, and not of the blood-vessels; according to the observations of Malpighi and others. The simple fibre apart from the compound which it forms by circumvolution, gives birth to no organic products; as neither does the soul, apart from the animal spirit, produce any issue excepting the simple cortex, which is the first of organic forms, and the nearest to the soul. Everything then that is organic, partakes of the simple and of the compound fibre, or of the spiritual and the material.

CHAPTER XI.

The soul apart from the animal spirit could never produce the heart; or the vessels, either arterial, or venous; or the red blood; or consequently the ultimate organic form of the body.

According to the theorems of our Treatise on the Fibre, it follows, that there is nothing substantial in the body but the soul and its fibre; *i.e.*, the simple fibre. The reason of this is, that the simple fibres by their determination form the medullary and nervous fibre; this in its turn, the blood-vessels, and these again in conjunction with the fibres form the glands, from which proceed ducts and emissary canals, as it were new fibres or new vessels. Of these then, namely, the fibres, vessels and ducts, the whole system of the body is constructed. Thus the blood-vessels cannot exist without the compound fibres, nor can the latter play the part of fibres without the animal spirit. So when the soul is about to inform or create its body, it has first to produce an intermediate spirit. Moreover the red blood itself has no existence without the same spirit, for this spirit is its principal essence. Accordingly when the red blood-globule is dissolved, it is resolved, according to our proposition, into the purer, middle or white blood, in a word, into the animal spirit.

CHAPTER XII.

Without the animal spirit the soul could determine nothing into action, and could do nothing in the body.

The action of the body depends on the nervous fibres and blood-vessels, which jointly construct the motive fibres. Both fibre and blood-vessel, that is to say, both the animal spirit and the red blood, enter into every muscle; according to the plain shewing of experience. The spirit and the blood are clearly the efficient causes of muscular action; this is proved by convulsions, tetanus, spasms, by paralytic, apoplectic, and epi-

leptic cases ; also by the circumstance that the action of the muscles is lost at once when the fibre or blood-vessel is divided, compressed, or obstructed. Therefore in order that action may proceed from the will, and the will which regards such action, from the choice of the mind, both the spirit and the blood are absolutely necessary. The spirit is the middle substance which is under the command of the soul, while the blood is the ultimate substance, whose duty it is to obey. The anatomy of the brain however teaches the manner in which the soul determines its will into action ; shewing in fact that this takes place by the constriction and expansion of the cortical glands, whereby the animal spirit is expressed into the fibres, and at length into the motive fibres of the body, just as the blood is expressed from the heart into the arteries ; and constantly the blood reacts, and recovers its state ; and in this way action becomes reciprocal.

CHAPTER XIII.

Without the animal spirit, the soul could feel none of the changes that happen to the body.

All the organs of the senses are provided with particular nerves. The eye is furnished with the optic nerves ; the ear with the auditory nerves of the seventh pair ; the tongue, with the gustatory nerves of the fifth and ninth pairs ; the nares with the olfactory nerves, which lie like teats on the front of the cerebrum. When these nerves are either divided, compressed, obstructed, or their action otherwise weakened, the particular sense to which they minister is instantly deprived of its sharpness in exact proportion to the extent of the violence or lesion. This is a piece of simple experience. The nerves, however, consist of medullary fibres, that is to say, of the fibres that arise from the cortical glands ; consequently there can be no actual sensation without the fluid and spirit of those fibres. And indeed sensations cannot ascend immediately to the soul ; they cannot rise thither without an internuncio like the animal spirit.

CHAPTER XIV.

The nature of the action and sensation, and even of the imagination and thought in an individual, are correspondent to the nature of the animal spirit and the circulation thereof in the body.

This is a consequence of the preceding theorems. If the soul cannot act in the body, or feel in the organs, without the animal spirit, it follows that the action and the sensation are correspondent and proportional to the animal spirit which produces them both. This is very manifest in drunkards, and in insane, idiotic and other subjects whose animal spirits are either contaminated, or else circulate irregularly, or too small or too large a supply of them is sent to the sensory and motory organs. The very speech, gait, countenance, even the eyes of such persons, clearly proclaim the state of the spirits, and shew that they are excited by various substances and the goads of alcohol; from the cross action of which disorder invades the speech and actions. The subject of the imagination, however, whose ideas are changes of state in the cortical gland, and of thought, the rational ideas whereof are similar changes of state occurring to the simple cortex—these subjects will be considered in the sequel. Meanwhile the nature of the imagination determines that of the sensation and action, which latter descend from imagination as their proximate cause.

CHAPTER XV.

The animal spirit makes us both spiritual and corporeal.

By the definition of the animal spirits, they partake both of the soul and the body. Moreover the nature of the spirit, including its circulation, determines the nature of action, sensation, imagination and thought. By consequence from the nature and quality of these spirits we derive the fact, that we are spiritual, and that we are corporeal or material. The more

of the soul there is in the spirits, the more spiritual we are, and *vice versâ*. Hence it appears that those who eat gross and impure food, and sink their minds in the earthy sphere, have an impure animal spirit, impregnated with material forms; which indeed experience shews to be the case.

CHAPTER XVI.

In the human microcosm, all that is above the animal spirit constitutes the inner man; and all that is below it, the outer.

The soul is above the animal spirit; the red blood and the still grosser humors are beneath. The soul is spiritual, and the soul's operation, whereby it regards the body, is celestial.* The blood on the other hand, as it abounds in saline elements, is for the most part corporeal. Both these natures, however, are contained in the spirit, which is equally near to both. The higher essence is also simpler, prior, more perfect, and at the same time more internal; the lower is relatively compound, posterior, imperfect, and external. Therefore the inner man is above the animal spirit, and more perfect than it; and the outer man is below it, or more imperfect. But the mode whereby the internal or spiritual operates upon the external or corporeal, will be explained in our Treatise on the Intercourse between the Soul and the Body.

* It is to be observed, that Swedenborg does not here use the terms *spiritual* and *celestial* in the sense in which they occur in his Theological Works; but with the signification which they bear in his *Animal Kingdom*, Vol. I., p. 126, where the perpetual vortical form is designated *celestial*, and the perpetual celestial, *spiritual*; the latter being therefore above the former.—(Tr.)

CHAPTER XVII.

The animal spirit is never absolutely similar in any two individuals ; on the contrary it is different in all the subjects of human society, and always different at different times in one and the same person.

Throughout the whole of human society the state of no two souls is ever absolutely similar ; and the same remark applies to the red blood as to the soul. It follows that the animal spirit can never be absolutely similar in any two cases. For the animal spirit is the middle or mediatorial essence, whereinto the soul flows from above, and the blood from below ; as already mentioned. Moreover the animus depends on the nature of the spirits ; wherefore there are as many varieties of the one as of the other. The truth of this is established by experience. We never meet with the same face, or the same speech, actions, or any other conditions, in any two persons, but the grounds of distinction are infinite. And as these forms cannot be engendered without the ministration of the spirits, and as in their production and construction they follow the quality, quantity and circulation of the latter, so it is evident that the spirit can never be absolutely equal or alike in any two instances. Consider also that the perfection of nature, the nature of nature, consists in the fact, that one thing is never identical with another in the whole range of its essentials and accidents. As for quality, the spirits are impregnated with vast numbers of sulphureo-saline elements, and which are more abundant in some subjects than others ; also with diverse other species of elements that they imbibe from the bosom of the atmosphere and from the inner parts of the food. Thus the causes of variety in this respect are infinite. The cortical gland also, which is the organ for the preparation of the spirits, differs in different subjects ; prepares the spirit differently in different subjects ; admitting thereinto, and mingling in the composition, a greater share of one nature in one case ; a less in another. The quantity also is various in every instance, as the spirit is elaborated and expended according to the requirements, uses, and necessities of

the body. It differs in fact in every case. Likewise the circulation of the spirits, which depends altogether upon natural necessity and rational use. For the cortical gland expands and contracts continually and variously ; consequently such a quantity of spirit is attracted from the vessels and expelled through the fibres, as the body including the sensory and motory organs requires. Thus the state of the circulation varies every moment in every man. And this is completely confirmed by the affections and ailments of the animus, and by the diseases of the body.

N.B. The purer blood is a different thing from the animal spirit. The former is the fluid that arises out of the resolution or disintegration of the red blood ; but the latter consists of the spirits, with volatile particles, comprising the first saline and sulphureous elements, inserted between them.

SENSATION OR THE PASSION OF THE BODY.

REMARKS ON THE FASHION OF THE BODY

SENSATION OR THE PASSION OF THE BODY.

CHAPTER I.

Sensations are external and internal.

The external or bodily senses are those of touch, taste, smell, hearing, and sight. Internal sensation consists in the perception or apperception of the objects that flow in from the organs of the external senses. Intimate sensation is identical with intellection or understanding, for the objects that are felt and perceived are also to be rationally understood. The innermost of all, or the principle of sensations, is the sense of the soul, and is identical with pure intellection or intelligence; for the endowments of sensation, perception, and intelligence, are due to the soul alone. As sensations are external and internal, so are their organs also. The organ of touch is coextensive with the circumference of the body. The tongue is the organ of taste. The membrane lining the nares and nasal cavities is the organ of smell. The ear is the organ of hearing, and the eye of sight. The cortical cerebrum, or the cortical substance of the cerebrum, is the organ of perception. But the organ of intellection or intimate sensation is that very pure or simple cortex contained in each cortical gland. These organs, the internal as well as the external, constitute sensoria, and of all the external the cerebrum is the common sensorium.

CHAPTER II.

External sensations communicate with internal, or the external sensories with the more internal and with the inmost, by means of the fibres.

The most slender knowledge of anatomy is sufficient to shew, that internal sensations effect their communication with external by means of the fibres. A fibre runs up from every point of the skin towards the spinal marrow, or the medulla oblongata; and this is why these fibres are termed sensorial, to distinguish them from the motory fibres. A fibre of the ninth, eighth, and fifth pairs of cerebral nerves runs from every point of the tongue. A fibre runs from the nares through the cribriform plate to the mammillary processes, which are affixed like bottles to the anterior part of the cerebrum. A fibre both of the portio dura and portio mollis of the seventh pair runs from the ear. The great optic nerve proceeds from the eye. These fibres run on until they reach their principles or sources, namely, the cortical glands. Internal sense resides of a certainty in these principles or glands, and is dependent on their changes of state. Simple fibres again are put forth by this gland to a certain still purer cortex, which we term the simple cortex, and on this hangs our intellection of all objects apperceived and felt. Thus by means of the fibres there is a continual communication between external sensations and internal. For this reason it is, that the senses languish and die away as soon as ever the intermeduating nerve is either divided, strained, or obstructed; as we know to be the case from innumerable facts occurring in disease.

CHAPTER III.

No sensation is possible without a convenient organic substance.

There can be no sight without an eye, no hearing without an ear, no taste without a tongue, no smell without a pituitary membrane. And as the external senses can have no existence without a suitable organic substance, in short, without organs,

so neither can the internal senses. The cortical gland is the organic substance of perception, and the simple cortex is the organ of intellection; as indicated above. It is absolutely repugnant to nature that a sensitive or intellectual principle should exist at all without a corresponding substance, inasmuch as sensations are but forces and modifications, which proceed from substances in action. Thus the soul is the only sentient and intelligent substance in the body.

CHAPTER IV.

The nature of the sensation is as that of the organic substance; and vice versâ.

The nature of the hearing determines the character of the ear; and the nature of sight that of the eye; and *vice versâ*, the nature of the ear determines the character of the hearing, and of the eye, that of the sight. The same remark applies in other cases. Thus in the inner sphere, the nature of the perception or imagination determines that of the cortical gland, which may be termed the internal eye or eyelet; and again, the nature of the intellection determines that of the simple cortex. And *vice versâ*. Wherefore all sensation corresponds and coincides with the state of its particular sensorium. If sensation belongs to an organ, it must necessarily exist according to the state of that organ.

CHAPTER V.

The nature of the external sensation is determined by the nature of the communication with the internal sensorium.

It is not the organ of external sensation that feels, but only the soul, for the soul understands what the sensation is. Consequently the organ of external sense is but the instrument for receiving the first advances and touch of objects, or the forces reaching the system. Thus it is that when the eye is closed, and the ear reposes, as during sleep, we still seem to see and hear; and that when the power of perceiving is lost in the brain, the external organs are at once deprived of sensation, though

not *vice versâ*. This causes our sensations to become either dull, acute, obscure, or distinct. It is evident from the diseases of the head, that sense varies with the state of the brain. Thus the fibre is either relaxed, as in sleep, or tightened and stretched, and raised and rendered distinct for sensation, as in the waking state; or is inflamed and heated, or else affected in some other way. From moment to moment the sense varies, with the state superinduced upon the fibres, or to which the fibres are reduced.

CHAPTER VI.

The form of the sensation is as the form of the organ.

If the organ be the substance, and the sensation the modification, and if no sensation is possible without an organic form, then it follows that the substantial form, namely, of the sensorium, must coincide with the form of the modification or sensation. Form may be predicated both of substance, and of forces and modifications. Form is constituted of essential determinations, which determinations are inconceivable apart from the idea of the coexistence or fluxion of individual things. If the latter are set in action, a form of modification is produced, which cannot fail to be similar to the form of the substances with their determinate fluxion. Therefore sight is as the form of the eye; hearing is as the form of the ear; perception and imagination are as the form of the cortical gland; and so forth. When the organ therefore alters, the sense resulting from it alters conformably. It would however be tedious to enquire into the peculiar form of each organ, and of the sensation resulting from it. The form of the eye and of sight is more perfect than that of the ear and of hearing. The form of the cortical gland, or the internal sight, is more perfect than the form of the eye, or the external sight. Thus the perfection of organic forms grows and rises by degrees all the way to the soul, which is the forms of forms in its own particular body, the informing principle of all its other forms. The more perfect forms are otherwise regarded as superior, prior, more simple, and more internal.

CHAPTER VII.

The internal sensation can exist and live without the external, but not vice versâ.

So long as the brain is uninjured, internal sensation, comprising perception and intellection, or imagination and thought, remains in its vigour, however the organs of the external senses may fail. The deaf and the blind can still reason and think. But as soon as the general sensorium or the brain is attacked, the organs are deprived of the faculty of feeling. The latter therefore depend upon the former, and not *vice versâ*. Hence it follows that:—

CHAPTER VIII.

It is the soul alone which feels, perceives and understands.

The soul is the pure intelligence and life of the body; the proper centre to which all the deeds that are done at the circumference are referred. The organic substances, however, or sensations, are subordinated to it. The first sensation after the soul is rational intellection, intellect or understanding, which is a mixed intelligence. Next under this comes perception; and beneath this again those five sentient powers mentioned above, viz., sight, hearing, taste, smell, and touch; which are the outermost substances or sensations, and proper to the body, although the distance of all from the soul is not alike, but one is nearer to it than another. Thus the soul is only accessible by degrees, and must be approached by a peculiar ladder. If any middle sensation is weakened or destroyed, the approach to the soul is to that extent hindered or cut off; though all the time the soul remains in its own centre and its own intelligence, without having any communication with the body. For example, hearing is not possible apart from a particular internal sight almost like eye-sight; the latter again is impossible apart from the intimate sight which constitutes thought; which in its turn, being a mixed intelligence, is impossible without a pure intelli-

gence : a mixed intelligence necessarily implies the existence of a pure intelligence above it. The consequence is, that there can be no sensation without the soul, which is the only part in the body that feels, as it is the only part that purely understands what is felt.

CHAPTER IX.

All sensation, both external and internal, is a passion; hence during sensation the soul is passive.

Before the eye can see, the object to be apprehended by sight, the representations and appearances, the variously combined colors and modifications of shade and light, must necessarily influence or flow into it. For the ear to hear, necessarily the sound must impinge on the tympanum and fenestæ. For the tongue to taste, sharp-pointed, saline and other particles must be provided, to strike the papillæ of the organ. Similar conditions are required in order for the nares to smell. All sense then takes place by touch; the touch being subtler, and merely involving forces and the forms of forces in the ear and eye, but comparatively heavy and gross in the tongue and nose; and heaviest and grossest of all in the skin and membranes, whose sense constitutes touch proper. There is then no sensation apart from touch, but sensation is produced in adaptation to the whole form of touch and tacitile objects: therefore it is not action but passion. The inner sensation, or first perception, is also a passion, but comparatively perfect and pure; for the internal sensorium perceives nothing but what comes from the external sensoria; and perceives them in such wise as the images and ideas flow in. The same is the case with intellection, which is intimate sensation, and depends upon perception as perception depends upon sensation. By this scale we advance to the soul, which alone feels because it alone understands. Hence the soul is passive during its feeling, or in its sense; and this is why it is delighted with the harmonies of things, and pained by their discords.

CHAPTER X.

The modifications of the air and ether in the world correspond to hearing and sight in the animated body: and these modifications live, and become sensations, the instant they come in contact with a sensorial organ conformable to them.

As are the modifications of the air, such are the modifications, *i.e.*, the tones, sounds or harmonies, of the ear. And as are the modifications of the ether, such are the images of sight. Modifications extraneous to the animate body are inanimate and dead, but as soon as they touch the body, they are transformed into sensations. This is why sensations are commonly called modifications, and organs are said to undergo modification. When modifications approach the very threshold of the body, at the moment they touch or breathe upon it, they partake instantaneously of the life of the soul, which feels what the peculiar modification is, and what it represents. And as every organ must undergo modification before it can feel, so it is passive, not active; that is to say, sensation is a passion and not an action.

CHAPTER XI.

The ideas of the memory are similar modifications to the images of sight, but fixed in the organs, whereby they present themselves to imagination and thought, as external objects present themselves to sight.

The memory is the field of images spread before the internal sense, (which images however are living, and constitute ideas,) as the visible world is the field spread before the external sense of sight. The images of the memory present themselves in this wise to imagination and thought. Therefore the internal sense as well as the external must be admitted to be passive; though passivity is especially predicated when modifications are insinuated immediately through the outermost avenues of the external senses.

CHAPTER XII.

By the instrumentality of sensations the soul desires to know what is going on in the world below it, whither it descends in forming the body, and the sensory and motory organs.

The soul, which is a spiritual and celestial form, can have no share in, and enjoy no consciousness of, those effects and phenomena that take place in a world so far away from it and so much beneath it, unless by the instrumentality of organs which are exactly conformable to the forces of that sphere, and unless there be a scale of organs and sensations, to admit of the descent from above to below, and *vice versâ*. The organic body is framed to meet the case. The scale or ladder has distinct steps or degrees, which make it possible to pass successively from one region to another. By this means nothing whatever can happen without the soul having a share in it. All sensation is raised from the lowest world to the soul as its heaven, and all action passes down to the lowest world from the soul as its heaven. Hence it is not what enters the soul that imperils it, but what comes forth from it; *i. e.*, not sensation, lust, or desire, but actions and effects. By touch the soul feels the presence of whatever in general comes against the body: by taste, it feels whatever is floating in water and other liquids: by smell, whatever is floating in the atmosphere: by hearing, all the modifications of the same atmosphere: by sight, the corresponding modifications of the ether, and all the beauty which the earth brings forth: by the innermost sense it feels whatever is done in the upper world, and in the region of causes and principles. And so forth.

CHAPTER XIII.

The organs of the external senses are constructed with the most elaborate reference to the whole form of forces and corresponding modifications.

The eye is exactly suited and made to the modification of the ether; the ear, to the modification of the air; the tongue,

to the forms of angular bodies ; so likewise the membrane of the nares. And that the cortical gland is fashioned to the form of the modifications of a higher ether, may be concluded from various phenomena. To mention only one or two specific arguments. The ear is furnished with the tympanum, with the fenestræ, with cylinders, with the cochlea, the malleus, and other machinery, which constitutes it the most perfect exemplar of acoustic art. So the eye in its orbit represents the master-piece of optics, being framed with express relation to all the nature of the influx of the solar rays. The same too may be said of the other sensories, in which nature's inmost secrets lie concealed and represented. The consequence is that the soul, which is the formative substance and force of the body, thoroughly knows, sees and enters into nature itself, and so moulds her instruments that they present not the slightest oppugnancy to the order and form of its fluxion. For the soul is in a manner above nature ; and hence is the science, art, order, and law of all lower things in the microcosm ; wherefore in acting from science, art, order, law, the soul acts from itself.

CHAPTER XIV.

* * * * *

THE ORIGIN AND PROPAGATION OF
THE SOUL.

THE ORIGIN AND PROGRESSION OF
THE SOUL

THE ORIGIN AND PROPAGATION OF THE SOUL.

CHAPTER I.

The soul of the offspring comes from the soul of the parent.

No one, I imagine, doubts that the first soul, I mean, the soul of the first man, was created by God immediately, and infused into a new body; in fact, that his soul, which perhaps was like a vegetable soul, or was not only spiritual, but natural too, was so purified as to acquire a spiritual essence and nature. The vegetative soul differs from the living souls of the animal kingdom, especially in the circumstance of being not only a spiritual but also a natural form; that is to say, in having the lower forms, as the first, second and third natural, added to it; but when these natural forms are cast off or separated, a pure spiritual form, such as the human, remains. But let us dismiss these speculations. Any one may frame guesses indeed, but let no son of earth pretend to penetrate into the mysteries of creation. Our only intention at present is to treat of the successive origin, or propagation and transmission, of souls from one body to another.

It will be impossible to doubt that the soul of the offspring comes originally from that of the parent, if we consider that the soul is all in all in the whole and in every part of the body, (it is all in all in the simple fibres, and is the principal and ruling essence in both the white and the red blood); that it is an essence so real that it alone is, lives, feels, acts; that the soul is the veriest creative and formative substance of the body, that is to say, the informing substance of all the organic forms, whereof

the body is the last. Without the soul or first form no organic forms could possibly be engendered or exist. Whatever is to undergo formation, or derivation, successively, must always begin from a first form. We shall be further confirmed in our view of the origin of the soul, by attending to visible phenomena: to the likeness to both parents which the common offspring exhibits both in mind, disposition and body; a likeness not merely observable in man, but in the brute creation; and even in the subjects of the vegetable kingdom, in so far that like procreates like. In the animal kingdom the image and likeness of the parent are transmitted to the children's children; nay, from Adam to his universal posterity. Moreover there is a general and specific, and even an individual likeness in families, which if it does not pass immediately to the next descendant, only runs onwards another stage, to the grandson or the great-grandson: while in each instance the family likeness is constantly preserved, which distinguishes it from other families. If then the organic body is the type, image and picture of the soul, and if the body originates from the soul or the first form, it follows that the soul of the offspring must be from the soul of the parent. This is again corroborated by the examination of the generative organs in both sexes, from which, if we follow their anatomy, and the visible experience of phenomena, we may clearly deduce the manner in which the first essence of the bloods is disposed for procreation or propagation. The soul, as we indicated above, consists of innumerable simple substances or first forms. Thus the soul of the parent is propagated in the offspring, although the whole of it is not transferred, but only such a share, or if we may be allowed the expression, such a minute portion, as will suffice for initiating the organic or corporeal forms.

CHAPTER II.

The soul of the offspring is conceived in the male, but clothed in successive order with the requisite organic forms of the posterior sphere, in a word, with the body, in the ovum and womb of the mother.

This proposition is plainly enough attested by the generative

organs when intimately examined and considered. It is proved, we say, by the spermatic arteries, veins and nerves; by the testicles and seminal vessels, and the epididymides attached to the upper border of the former; by the vesiculæ seminales or cellular receptacles; by the prostate glands at the neck of the bladder; by the urethra, and Cowper's and Littre's glands; by the seed itself, and the living animalcules it contains: moreover, by the corresponding organs in the female, as the uterus, the Fallopian tubes, the ovaries, and the other members; than all which, universal nature offers no more wonderful spectacle to human eyes. But the offices of the several organs of this series, can only be explained in our special Treatise on Generation. I may however state, that on opening them up into their causes, I seem to have discovered a connexion and progression in those causes which prove that the first rudiments of the brain are conceived in the organs of the male; and by the first rudiments, I mean the purer cortex contained afterwards in the cortical gland; and that the organic forms are projected from this as the initia ment of the body, and afterwards, so commenced, advance successively in the ovum and womb of the mother, thereby producing the body. This successive order is also proved by the growth of the little members of the chick in the egg. If the posterior forms are to be engendered by their first form, this must be accomplished successively. Nothing that involves coexistence can exist all at once or simultaneously. Did it so exist, the last organic forms could never arise from those next above them, nor these again from the first form. In short, the body could never exist from its brain, or the brain from its cortical glands, or these from their simple cortex, or this from its soul, which is the first, highest, inmost, simplest, and most perfect form. Without the cortex not a fibre is produced, and without the fibre no organic form.

CHAPTER III.

The simple animal substances or primary forms are conceived and excluded by a transcendent process in the simple cortex, and so the soul is procreated in every living creature.

The simple cortex, or that which is the intimate agent in

the cortical glands of the brain, is the first of the soul's organic forms, and its operation is intellectual or rational, being that of human thought. In this simple cortex and nowhere else can the first animal essence be conceived and procreated. Thought or the operation of this cortex is even spiritual in its nature, and actually undergoes infinite changes of state, containing as in a centre, and contemplating in a single simple idea, all things that there are in the body. As soon therefore as ever this form is conceived, it is conveyed into the simple fibres, and by them to the universal body; for the simple fibres dart from this cortex as rays of the soul's intellectual light. But this conception and generation are effected in a transcendent way. As the brain is the organ for the preparation of the red blood, so the cortical gland is the organ for the preparation of the purer blood or animal spirits; consequently the simple cortex is the organ for preparing the first essence of the blood or the first living essence. These cerebra and cerebellula mutually correspond to each other in succession. But as this generation is not effected by the cortex, but in the simple cortex, and this, by a transcendent process, so it will require to be investigated from the laws of order and by the doctrine of forms. Therefore the subject does not admit of a short statement.

CHAPTER IV.

The body and the animal kingdom are at an end as soon as ever this living spring and perennial source of the soul are arrested.

If in the whole body there be nothing substantial and alive but the soul, and if the soul be the one only substance that reigns universally in all singulars, and most singularly in its universe; and if it be the source from which all the organic forms are derived, including at last the ultimate form or the body: if moreover it be the principal and intimate essence of the animal spirits and the red blood, and so prolific as to afford initiaments for the propagation of new forms,—if all these predications of the soul be true, it will follow that it must arise unceasingly, in adaptation to all the uses and neces-

sities of the kingdom, and spring from the above source. This is clearly proved by failures of the spirits originating from a vast diversity of causes, and followed by ailing conditions of the animal mind, by dimness of sight, lipothymia, syncope, delirium, paralysis, stupor, sleep, loss of memory, languor of imagination, dullness of thought, indeterminateness of will, loss of desire, extinction of vital heat, premature old age, and an infinity of other effects.

ACTION.

1010A

ACTION.

CHAPTER I.

The action of the whole body, its viscera, and their parts, is performed by the motive fibres and the muscles.

THE early stages and successive growth of animal embryos, afford clear proofs that muscle and muscular action are ultimate determinations. The simple fibre which comes first of all, immediately that it springs from its natal cortex, forms or builds the medullary or nervous fibre by a process of convolution, and the latter again engenders the blood-vessel. This is in order that the nervous fibre and the blood-vessel may construct the motive fibre of which the muscle is composed. Thus the motive fibre, by means of which action is produced, is the last or ultimate determination. There is however the simpler motive fibre and the compound. The simpler is composed of nothing but nervous fibres and capillaries, the latter containing the purer blood. The compound is made up at one and the same time, of nervous fibres, capillary vessels, and of the vessels which carry the red blood. Both a nerve and an artery go to every muscle. Meanwhile, the universal body, the viscera of the body, and the parts of the viscera, are constructed of nothing but motive fibres; the reason of which is, that all things therein are born and made for some action, that the soul may be represented in a type by real actions in the extreme sphere; for the soul would never be justly manifested in the ultimate world, unless it became active by the muscles.

CHAPTER II.

The body is so articulated by the muscles, that there is no part without its peculiar motion and action.

The first inspection and contemplation of the animate body when stripped of its integuments, is sufficient to shew, that the whole frame is so distinct and articulate with muscles, as to represent all possible actions whatever that are conformable to the operations of the soul. The heart is in all respects a muscle, and so articulate, that it admits of being expanded, compressed, flexed and reflexed in a thousand ways; and its auricles the same. Likewise the lungs, the stomach, the intestines, the liver, the diaphragm, &c. Which shews that everything belonging to the body, everything corporeal, is also muscular, or what amounts to the same thing, is ready for motion and action. There is not a single artery but is begirt by muscular circles, to accommodate itself to the blood and the fluxion thereof. The same may be said of every fibril in every circle. This is very plain in the fibres, which are the minutest parts of the body. Every one of them enjoys its own peculiar activity, though on such conditions, that it is bound down to act for the community it belongs to at the same time as for itself. Such also is the condition of the parts of the whole body and all its viscera. Therefore whatever part therein is not active, cannot of right be regarded as living or animate; since it is the end of formation in every part, that such part should operate answerably to the force of the soul.

CHAPTER III.

Each individual part of the animated body has its own proper motion, and each action consists of an infinity of motions as its parts.*

That each, even the very least, individual part has its own peculiar activity, is a point which receives an especial attestation

* The translator has preferred to retain in general the term *animated* rather than to use the more English word *living*; because the former appears better to express

from the growth of the embryo in the womb, and of the chick in the egg. Each several fibre is so separated from its companion, at the same time that it is linked to it, and bound down to serve it, that it at once attends to its own interest and subserves the common weal. In the periods however of advancing life and old age, the fibres either grow together, or they are parted asunder, and confused and indistinct action is the result. Indeed when one part acts either separately from, or altogether unitedly with, another, there can be no liberty, and where there is not liberty there cannot be harmony. In proportion then as the viscera, and the parts of the viscera, are distinct and free, at the same time that they are unanimous and actually united in guarding the common weal, in the same proportion their state is perfect. These are in fact the only conditions on which the body can comply with the bidding of the mind, which operates in the highest sphere of singulars. This is corroborated by experience, for the obedience and soundness of the body are lost as soon as ever the parts either grow together, or separate from each other.

CHAPTER IV.

The character of the action is determined by the nature of the muscle.

If muscle be the instrument or organ of action, then it follows that the form of the action must depend upon the position, connexion and quality of the muscular fibres. A muscle consists of a fleshy belly and a tendon, which may be divided into other lesser parts exactly similar to the larger. The tendon too is partible into the same number of fibrils as the muscle. Furthermore the muscles are enveloped in several membranes of a thin and cellular nature. Both an artery and a nerve enter every muscle; and when the muscle undergoes motion and re-

that master idea of Swedenborg, that man is not a life, but an organism recipient of the One Life; and that the doctrine of pure life must be referred to theology, not to physiology or psychology, or any branch of philosophy; moreover that we look in vain in ourselves for a self-intelligent soul. See the Index to the *Economy of the Animal Kingdom*, article SOUL.—(Tr.)

laxation, the blood is reciprocally expressed from it, and attracted to it, with great force. The form of the muscle, and the form of the action, depend conspicuously on all these circumstances. The precise nature however of the several moving fibres has not yet been investigated. But meanwhile that the action is altogether dependent on the state of the muscle, is clearly shewn in paralysis, tetanus, spasms, and convulsions; and by the division, relaxation, tearing and obstruction of the fibre or the artery supplying the muscle. Therefore the form of the action is as the form of the muscle.

CHAPTER V.

The body lives in acting, and acts in living.

The body is said to die when it ceases to act; and the more perfectly it acts, the more perfectly it lives; therefore when a member is deprived of its action, it may be regarded as extinct. The body including its members is the ultimate form of the soul. The members are not alive, unless they live, that is, act, at the bidding of their mind. They are but ultimate determinations, which do nothing of themselves, but act from a higher power, which determines them, and has life in it. Hence action is the life of the muscles. This is the reason why death seizes the members, the limbs, and the muscles, in the first instance, and advances by degrees to the inner parts. For we cease to act before we cease to will to act, that is, to live.

CHAPTER VI.

Without the animal spirit, and without the blood, or without the fibre and the artery, no muscular action can exist.

This is clear from experience, since both a nerve and an artery enter every muscle. The nerve with its fibre vanishes altogether away in the muscle; while the artery divides and ramifies through its body in such a manner, that the muscle appears entirely arterial and sanguineous; besides which the

artery has a corresponding vein. Hence it appears that muscle is constructed entirely of arteries and veins; or contains no prevailing element besides the artery and vein, or in other words, besides the blood and the animal spirit. When therefore the artery or nerve are injured, divided, compressed, or relaxed, the action of the subject muscle is lost at once in proportion to the degree of the mischief. But our theoretical examination of the fibres and vessels, or of the animal spirits and the blood, shews us also how these two elements respectively flow in. The blood-vessel is in fact composed of nothing but fibres. When therefore the fibre acts, the artery is constricted, and the blood expelled; and when the fibre does not act, the blood rushes in, and recovers the artery. Hence the reciprocal action, or the action and reaction of the muscles. The blood is passive, and reagent against the spirit, which is active. The tissue of the motive fibre, however, cannot be made clear to the evidence of reason without a previous citation of experimental data.

CHAPTER VII.

There are three general sources of motion and action in the animal body; namely, the animation of the brain, the systole and diastole of the heart, and the respiration of the lungs; besides which there are many specific sources, and innumerable particular ones.

The actions of the animal body constitute an entire series, order, and form. They may be classed under superior universal, and inferior universal, or as general, specific, and individual. One is under another, and one is in another, just as is the case with substances; for action proceeds from substances as its instrumental causes. The animation of the cerebrum, cerebellum, medulla oblongata and spinal marrow, is the most universal source of motion and action in the body, and the whole nervous system, that is, the organic body, is inspired and vivified with its active spirit by this animation. The systole and diastole of the heart are a less universal source, since the motive

fibres of the heart as well as of the arteries and veins are dependent upon the inspiration of the nervous fibres. The respiration of the lungs is a source still lower in point of universality, and conspires both with the animation of the brains, and with the systole and diastole of the heart. The other motions of the body, or as we term them the special motions, may be likened to streams flowing from the above three sources or fountains. They comprise the motions of the several viscera and members. Every member has its own proper motion and proper action; and this is true whether we apply it to the stomach and the intestines, or to the liver, pancreas, and spleen, or to the arms, loins, feet, fingers, or toes; in short, as we said before, it is the case with all the members in the body. There are also particular motions in every viscus, motions for instance of the glands, vesicles and delicate muscles of which the entire member or viscus is composed. These motions again involve motions more particular still, as of the motive fibres in every the smallest muscle, and in every gland; of the arterial and venous vessels in these, of the nervous fibres in these, and of the simple fibres in these; and so forth. The bodily system is perfect in proportion as the singular activities are perfectly distinct, and yet conspire in finer harmony with the universal.

CHAPTER VIII.

Speech is the action of the tongue, larynx, trachea and lungs.

In the enunciation of the articulate sounds of the voice, the tongue, which is in all respects muscular, has to be folded in different ways, and the fauces also applied, while the chamber of the larynx is moulded after the nature of sound, and likewise the trachea. The lungs also which supply the air, are required to accommodate themselves to all the other parts. Thus innumerable motive fibres necessarily conspire to the articulation of a single sound. But the action of the tongue differs from that of the other members in no respects but velocity and volubility. The motions of one member may be extremely rapid, those of another slow and sluggish. This is shewn in birds

and insects, whose wings vibrate with such rapidity, that the alternating activity simulates continuous repose, and comes to the ear as a murmuring sound. The speech of the tongue comes from the same source as the other actions of the body.

CHAPTER IX.

The cortical glands in the cerebrum and cerebellum correspond to the motive fibres in the muscles of the body; consequently the action of the cortical glands corresponds to the action of the muscles.

The nervous fibre exists from the cortical gland, which latter therefore determines it. On the other hand the motive fibre of the muscle is the ultimate determination of the same fibre, for the latter terminates in it. Therefore the first and the last, or the two extremes, cannot but mutually correspond to each other. Thus the cortex of the cerebrum and cerebellum is the agent, and the fibre of the muscle is the patient, in other words, is obliged to act according to the force impressed by the efficient cause. The motive fibre is the cause of action; the cortical gland is the principle causing the fibre to act. Thus the whole action of the body comes forth from the active force of the cortical cerebrum and cerebellum.

CHAPTER X.

There is not a cortical gland in the cerebrum but corresponds to a particular motive fibre in the body.

A single medullary or nervous fibre proceeds from every cortical gland, which fibre is conveyed into the body to take a share in some sensation, or in the production of some action; consequently is conveyed to its correspondent motive fibre. One and the same fibre cannot perform two offices at its extremities, cannot influence two motive fibres, for an indistinct action would be the result. For this reason there is the same luxuriant supply of cortical glands in the cerebrum, cerebellum, medulla

oblongata, and spinal marrow, as there is of motive fibres in the body.

CHAPTER XI.

The cortical gland of the cerebrum and cerebellum cannot act on its corresponding motive fibre of the body, without an active or living force, that is to say, without expansion or constriction.*

Much the same may be said of the artery, which cannot act upon the blood, or through the blood upon the ultimate parts of the organization, without the active force of the heart, namely, its systole and diastole; for when the heart stops, the pulse and action of the blood cease. So also the cortical gland, which is the smallest type of a heart, a true corculum; and without the expansion and constriction of which, the animal spirit could never be expelled, or excite the motive fibre to act. Absolute repose in the principle must be followed by repose in the effect depending on the principle. But experience proves that the cortical glands respire and animate, and thereby drive the agent spirit into the extremes of the muscles. The cerebrum perpetually rises and subsides, or animates, which action can only begin in the cortical glands, and not immediately in the vessels and fibres. This is apparent from the phenomena of apoplexy, epilepsy, catalepsy, and the several diseases affecting the brain. The moment the arteries, or even the veins, of the brain are obstructed, and the cortical glands are from any cause deprived of room for action, the action of the muscles and the sensation of the organs cease.

CHAPTER XII.

The cerebrum is articulated and subdivided in such wise, that it can excite to action a greater or lesser number of the cortical glands, and so produce by the muscles any action that it pleases.

The cortex of the cerebrum is so divided and subdivided as

* See the note p. 4, above.—(Tr.)

to enable every several gland to expand and contract ; likewise a greater or smaller number of glands, or a complete group, or even the whole at once. Winding channels, furrows, depressed lines and free spaces intervene between its parts, and distinguish each partition. The cerebrum has the power of rendering active any fibres or forces that it chooses, and therefore the motive forces of the body. It follows that it can animate or excite to action an entire muscle at one time, part of a muscle at another, and a second muscle and a part of it simultaneously with the first : also that it can in a moment transfer the action from one muscle to another, and so produce the form of any action harmoniously and delightfully.

CHAPTER XII.*

Voluntary action is a special and particular animation or excitation of the cortical glands of the cerebrum, subordinate to its general animation.

The fact of the expansion and constriction of the whole cerebrum, in no wise hinders its parts also from expanding and constricting one by one in a different manner from the whole. No general motion or action ever hinders or prevents special and particular motions, but rather facilitates them. The circumstance of an organ being capable of rising and moving by itself, depends entirely on form, that is to say, on position and connexion of parts. The situation and connexion of the cortical parts of the cerebrum is such as to allow of this ; and hence its voluntary endowment. But when the cortical glands are as it were tied and compacted together, and their finest interstices and divisions obliterated, as in sleep, lethargy, carus, then this voluntary faculty or activity ceases. As soon however as they are again raised up, which takes place in waking, they all rouse to voluntary action. It is therefore the animation of the individual glands that produces action ; for by this animation the animal spirit is transmitted into the motive fibres wheresoever they are grouped or situated. It would therefore be a worthy enquiry to institute, where the cortical glands are situated in the brain that correspond to one or the other set of motive fibres

in the body ; *i. e.*, whether in the vertex of the brain, in its border, or in its very substance ?

CHAPTER XIII.

Spontaneous and natural action proceeds from the general animation of the cerebrum and cerebellum, undistinguished by any particular animation.

Spontaneous and natural action are opposed to voluntary ; the former being general, consequently indiscriminate, indistinct and obscure, while the latter is discriminate, distinct, and peculiarly the attribute of parts or singulars. The cerebellum is not divided into masses, limbs and groups of parts, all distinctly moveable, in the same manner as the cerebrum ; and hence it is that the action of the cerebellum is natural, but that of the cerebrum voluntary ; for the same reason also the action of the cerebrum is natural, because general, during sleep. The peculiarity, however, of the action of the brains in different animals, and of the actions of the medulla oblongata and spinal marrow, is amply shewn by the form and state, or by the situation, connexion, and coexistence of the cortical glands and the muscular fibres corresponding to them. It is the form which makes everything what we find it to be. Moreover the cortical glands of the cerebrum, enjoying, as they do, the power of separation, may be put on the stretch to any particular degree, as in the waking state. It is worthy of remark, that the general animation of both the cerebrum and cerebellum, causes the muscles all over the body, (with the exception of those of the lungs and heart,) although perpetually in action, to keep their equilibrium by means of their antagonists.

CHAPTER XIV.

Most of the muscles of the body are supplied with the fibre of both the cerebrum and cerebellum ; and hence are capable of both natural and voluntary action.

We may infer from the action of the limbs and muscles of the body, that the fibre of the cerebrum, or the voluntary mo-

tory fibre, hardly ever runs by itself to any muscle, but is most commonly associated with the fibres of the cerebellum. Thus in the waking state all the voluntary muscles stand in perfect readiness to execute the orders of the cerebrum, while during sleep they live under the auspices of the cerebellum. In fact I scarcely think there is a single voluntary muscle that is not supplied also by the fibre of the cerebellum. And in the head itself the fibres are commixed in this wise. The fibres of the cerebrum marvellously intertwine and clasp with the fibres of the cerebellum, first in the annular protuberance, next in the neighborhood of the testes, and lastly in the spinal marrow. Indeed they may be said to run in wedded pairs in every nerve and in every muscle. This is especially manifest in the lungs, which breathe by night as well as by day, whether the cerebrum is asleep or awake. So complete is the union of influences, that not a single act of respiration happens during the day, in which the natural and voluntary powers are not really commingled; as we may all observe by carefully attending to the play of our breathing. In fact respiration is exactly suited and proportional to the state of the cerebrum, including the animus and mind of that organ. Some of the viscera of the body, however, are purely influenced by the fibre of the cerebellum, as the pharynx, stomach, intestines, mesentery, heart, liver, pancreas, spleen, testicles, epididymides, &c. Other viscera again partake equally of the fibres of both the brains, as the trachea, lungs, and eyes: and there are others in which the fibre of the cerebrum prevails; as the muscles of the head, neck, chest, abdomen, arms, loins, legs, feet, fingers, &c.

CHAPTER XV.

Action is determined by the cortical glands by the process of expansion and constriction; nevertheless, the power that expands and constricts the glands, or excites them to act, resides within the glands themselves.

The expansion and constriction of the glands, causes the expression of the animal spirit into the nervous fibres, and

through them, into the motive fibres; and action is the result. In this way the gland is determinant of actions. The gland itself, however, must be determined by some relatively intimate and higher force, for it cannot determine itself. In the gland then there is a living element, which can will, enjoy power, and also act; that is to say, which can in a moment excite the glands to act in one distinctive manner. The cause of action is still therefore a matter for deeper enquiry, and when we institute such enquiry, we find a prior cause in a certain purer, more intimate and simple cortex, which is contained in the gland itself as in its own most diminutive brain. We have treated already of this simpler cortex, and shewn that our intellectual or rational mind resides in it, whose office it is to perceive, think, conclude, will, and determine into act. This gland is furnished besides with its own most simple fibrils and vessels, and assumes different states according to the changes of the mind. Therefore the mind itself is determinant of the action of the gland, and this, of the action of the muscles. But the first determinant of all is the soul, without whose consent nothing whatever can take place.

CHAPTER XVI.

We view and contemplate with the mind the whole action before it exists.

Compound actions exist by the motion of the different muscles, and of the different motive fibres therein. The muscles and fibres are determined by a higher power and force. This power and force reside in the cerebrum, which is the source whence actions are derived. The cerebrum has the power of thinking and willing; the body on the other hand has the power of acting, and of executing thoughts. Hence when the cerebrum is injured, obstructed, or clogged, the faculty of thinking and willing is lost; and therewith the faculty of acting is lost in the body; as we find in catalepsy, epilepsy, apoplexy, lethargy, and other diseases. And as the actions of the body proceed from the cerebrum, so they proceed undoubtedly from the mind of the cerebrum. Even speech itself, which is a joint action of

the tongue, lips, palate, larynx, trachea and lungs, never exists without premeditation, or a previous view of what is to be said : therefore the character of thought determines that of discourse. Walking, jumping, the tossing of the arms, gesticulation, change of countenance and expression, and other actions, are not of spontaneous origin, but come by command. The body, which is commanded, merely obeys. It follows that we embrace in the mind in the first instance the whole action of the body.

CHAPTER XVII.

An action is an idea of the mind represented in the body by the ministration of organs ; hence the whole body is moulded to the image of the operations of the mind.

The harmony subsisting on both sides between the mind and the body, has been a subject of anxious enquiry for many ages. We find every moment, as a matter of experience, that the organic frame rushes into action corresponding to the foregone ideas of the mind ; which proves that something which is incorporeal or immaterial, excites the heavy mass of the body to all the numerous acts and operations that it pleases. This cannot be ascribed to mere correspondence ; for action and motion never can exist without implying an active force actually impressed. It is clear from what has gone before, that there is no thought without a change of state ; and that this change of state takes place in the cortical gland, from which the fibres are derived ; also that the cortical gland must be actually expanded and constricted, to drive the animal spirit into the fibre of the cerebrum, and so into the motive fibre of the body. Experience completely establishes the fact, that the muscles are actually dilated and constricted, and the limbs in this way set in motion by means of the tendons. Hence it appears, that all things in the body are so framed as to act completely at the bidding of the mind ; *i.e.*, that the body is the image of the mind's operations. And thus in setting about to form or create its body from the ovum, the soul views in itself or its ideas, all those operations as already existing in act in the body ; the soul regards the body as if it

already saw, heard, tasted, spoke, walked, moved its arms and its fingers, and its viscera likewise, its heart, its stomach, its intestines. The result is an answerable organization, as the marking of the foetal body is the result of the imagination of the mother. Nature which is the instrumental cause, is so constituted, as to obey the spiritual essence in all things;* as also afterwards, when the body is entirely formed, in actions themselves. In the soul then there is everything in potency that there is in the body in act. The very body declares every moment that it is the image of the operations of its soul.

CHAPTER XVIII.

Any habitual action recurs in a manner spontaneously with the whole of its form by virtue of the mere force impressed by the mind, almost in the same manner as a natural action.

As appears from speech; for the tongue, the lips, the cavity of the mouth, and the trachea, fold and roll, without a moment's hesitation, to enable them to articulate the whole of the voice or sound. They run into actions that have become habitual; which actions, however, must have been often repeated and have become familiar previously. The like takes place in singing. So also the eye turns in a manner spontaneously to objects. And again the fingers run automatically over the strings of the lyre, or the harp. During the action of walking also, the feet and

* The above sentences involve an important doctrine in reference to nature as the habitation of human society. For as the body is constructed beforehand with express reference to all the natural actions that the individual will ever have occasion to perform; so nature, and the human organization considered as a part of nature and a mutable subject of the providential series, are constructed with a foregone reference to all the states, arts and requirements, that humanity, as a created thing and a compound individual, can possibly imply. The world then, in its fundamental conception, contains a promise of the express gratification of every good natural affection, every true natural thought, and every just sensual want in its minutest detail, and in its entirest compass. Neither the body nor the world are in themselves hindrances, but on the contrary means, to fulness of satisfaction and universal competence, *Quærite et Invenietis.*—(Tr.)

the footsteps once entering the way, go on without any further notice. Not to mention the gestures and actions of dancers, harlequins, actors, and other performers; in all of whom, however, every act must have been acquired, before it can be continued in this manner; after which habit becomes second nature. But the mode in which this is brought about, is explained by the anatomy of the cerebrum, medulla oblongata and spinal marrow. The cortical substance of the cerebrum sends down fibres innumerable to both these marrows, which it associates with their own proper fibres. Thus the medulla oblongata and spinal marrow are compelled to act at the bidding of the cerebrum or of the mind in the cerebrum. And when this harmony is well established by frequent use, then the ciceritious substances of these marrows, at the first sign from the cerebrum, rush into convenient actions, as if the cerebrum commanded them all. The precise organism, however, for carrying out this effect will be explained in the Parts on the Cerebrum.

CHAPTER XIX.

There is both internal action and external, and an actual harmony is established on both hands between them.

Internal action is thought and an attribute of the mind; but external action belongs to the body. Internal action or thought is performed in the innermost parts of the cerebrum, or in the purest organic or cortical substances; external action is performed in the outermost parts, or in the muscles of the body. Action is change of state; so also is thought; indeed the latter can have no existence apart from change of state in the cortical glands; nor yet can the action of the body, without a change of state in the muscles, and consequently in their motive fibres. Between these two actions a firm harmony is established by the fibres, which begin in the above-mentioned glands, and end in the muscles; so this harmony is actual. Even the manner in which the most delicate fibre with the most yielding spirit can produce such great and grave effects, may be understood if we consider, that in the whole muscle there is

nothing substantial but the fibre, and that during every act of expansion, this fibre expels the blood, which is gravitating or heavy, and during every act of constriction, admits it. As this is done in the infinite minimal points of the motive fibre, and hence in all points of the muscle, so of necessity it is done in the whole muscle, and implies the action of the whole muscle. The compound derives all its force from simple substances and forces. The exceeding minuteness, the nothingness, according to our ideas, of that which can move masses in space, may be concluded from all the effects of nature, nay, even demonstrated by calculation.

CHAPTER XX.

There can be no force without action, no action without change of state, no change of state without an idea of motion: that which thence results constitutes an effect.

According to the common rule, force supposes action; action supposes change of state; and change of state supposes fluxion, which cannot be conceived apart from the idea of motion; again motion supposes an effect. Thus the sufficient reason for the actuality of the effect is contained in active force as the efficient cause. The soul or the intellectual mind* is the supreme force of its kingdom, and cannot exist without thought, which is internal action. This action, viz., thought, supposes a change of state in the cortical gland. This change of state cannot be conceived without change of the essential determinations, or the form; and hence not without variation of position and nexus in the simple fibres and other substances in the beforementioned glands; or without the idea of motion. The result is sometimes termed an effect, sometimes a phenomenon. Therefore the effect of internal action is external action; and the effect of external action is that which is produced by action, and intended by the mind: thus the end coincides and conspires with the effect. But I say that there can be no change of state without an idea of motion. It is true there may be such change with-

* In the *Economy* the author makes a great distinction between the soul and the intellectual mind.—(Tr.)

out motion itself; for the existence of motion implies a centre, a circumference, different quarters, upwards, downwards, space or place; which cannot be predicated of the simplest forms; hence neither can motion, although the idea of motion may; but which idea, in accommodation to the understanding, must be fixed in objects that our senses can recognize as moved. Every entity has its distinctive quality from its form; from the same therefore it has the predicate of being either devoid of, or participant in, motion.

CHAPTER XXI.

As action is change of state or of coexistents, so there is purely natural action, there is animal action, and there is rational action or action proceeding from the understanding.

Purely natural action in itself is devoid of all end and understanding, and is in fact dead and blind, because it does not appear to be at all determined by intelligence. Such is the action of the wind upon the sails of a ship, the action of a wave upon a rock, of light upon the eye, &c., &c. The action of gravity is also an instance of purely natural action. Animal action, however, constitutes instinct, and is found even in the human race; proceeding indeed from an intelligent source, or from the soul; although as this action results from a particular necessity, and the mind is not made conscious of it, it is said to be purely animal. Rational action on the other hand is an adjunct to some end that is foreseen and intended; hence it is performed designedly and purposely, and constitutes proæretic action, in which we see the end before the effect, or conjoined to the effect in such a manner that apart from the end the effect is regarded as of no account.

CHAPTER XXII.

Rational action is that in which an end is at once intended and foreseen, and which is free, and completely represents an idea of the mind.

Rational action has effects, only in order that there may be

an end in the effect, or in order that the action may exist for an end. True intelligence, which is spiritual, regards the end for which it exists, and the end only. Thus the animal kingdom and the bodily system are formed, not for action alone, or for the effect of action, but for the end. The soul is in the intuition and estate of ends; the body of the soul, in the representation of effects, containing the ends which the soul contemplates. Effects are physical and bodily, and attended with motion; ends are spiritual, and devoid of motion. It is therefore necessary that the election of ends be free, in order that there may be an end to be produced by action, and that the action may be rational. Without election and liberty we should of course have necessity, resulting in animal or purely natural action; the subject being bound to one peculiar course of action; which is incompatible with rationality and voluntary power. Meanwhile when action is final, is for an end, the end so rules in the action, that the physical instrumentality which helps the end is almost lost sight of. Moreover we are so constituted as to be in profound ignorance of the mode whereby the idea of the mind, and the will, pass into action; in order that there may be nothing to prevent intuitions of ends from becoming actual. It follows from these considerations, that human actions are to be considered as spiritual and not bodily.

CHAPTER XXIII.

No action can exist but from a substance; consequently the nature of the substance determines that of the action: thus the substantial form coincides with the form of the action.

Internal action is the predicate of the cortical gland and its fibres, and thus it is the action of a substance; external action is the predicate of the muscle and its fibres, and thus it also is the action of a substance. Whether the substance to which action is attributed be simple or compound, it must be conceived as made up of an infinity of individual or simpler substances, which represent some form by their fluxion. In the

nature of things there is no substance without a form, and no form without an idea of fluxion; hence the character of the substance determines that of the form, and the substantial form coincides with the form of action. This is the reason why the peculiar form of the substance may be inferred from the form of the action, and *vice versâ*. No muscle can do otherwise than act agreeably to its form, that is to say, according to the connexion, situation and position, and quality, of its motive fibres, of its belly, of its tendon, and of its membranes. But the form of the action cannot be perfect, or answerable to the mind's idea, unless the fibres of one muscle are capable of being commanded, and with them certain of the fibres of some other muscle, and so of several; which when called forth into motion produce a compound action, that represents a new form of action.

CHAPTER XXIV.

*All the substances of the animal body are organic, and formed, subordinated and coördinated, to enable them to represent in action all the possible ideas of their mind.**

The very formation of the animal body manifestly indicates what forms of action are capable of being produced. The organic body is created for no other end, than to live in acting, and act in living, conformably to the operations of the mind. The lungs exist to respire, to draw in the elements of the atmo-

* *Their mind!* This form of expression is, it must be admitted, somewhat awkward, and yet, after long experience in translating these works of Swedenborg, we have never been able wholly to give it up, or to find an adequate substitute. The truth is, that the philosophy of this author is the only complete reconciliation which the world has seen, of the soul with the body, and of matter with spirit. Now the body is not independent of the soul, but on the contrary is *the body of the soul*, nor is the soul independent of the form of the body, but is, by that form, *the soul of the body*. This mutuality and interdependence are constantly expressed and implied by the author in these little words, *its body, their body, &c., &c.*, where we should be inclined simply to say, *the body*, and so forth. If the new phrase should have the effect of continually reminding the reader of the oneness of things spiritual with things natural, and of the presence of all things in each, it will be well worth while to sacrifice somewhat of idiomatic propriety to so important a use.—(Tr.)

sphere, and to accommodate themselves to all actions. The heart exists to put the blood in circulation. The arms, the feet, the fingers, the scapulæ, &c., are meant to enable us to be active inhabitants of the earth. The other members likewise. From all and each it is clear, that substances are formed in the first instance, and all for the use that the mind foresees and intends. The soul regards actions as ends, or as leading to ends, and arranges substances as instrumental causes, that such actions may come forth at its bidding. Thus in point of actions, the body is a genuine image of the operations of the mind.

CHAPTER XXV.

Actions are perfectly rational in proportion as the mind can the more purely regard the actions of its body, and the effects of those actions, as ends.

It is the mark of true rationality to have an end in view in all we do, or to do nothing without an end. Only an intelligent being can regard ends, and intend and promote them by actions. We are both spiritual, and corporeal or material creatures. The spirit respects ends alone, and in so doing, effects follow of their own accord; nature being so constituted as to serve the intelligent being as an instrumental cause. Nature is the handmaid of the spiritual essence or intelligence; for the lower form is submissive to the higher, and in fact produced by it, to comply with its bidding. Such is the relation of the body to the soul. When the spiritual dominates, the fruit of action is spiritual also; and the reverse is also true. We must carefully distinguish, however, between rational ends and natural ends. Truly rational ends have in view the salvation and happiness of the soul, while natural ends regard the delights and comforts of the body. In the former ends we foresee no effects unless we clothe our ideas with earthly images, and bring faith to bear; but in the latter ends we foresee effects because they please the external bodily senses.

CHAPTER XXVI.

Actions are perfectly rational in proportion as the mind views and comprehends a greater number of middle ends conspiring to an ultimate end, and so disposes and arranges them all as that the ultimate end shall necessarily come to pass.

This constitutes prudence. Some persons there are who entertain a very small number of ends at once, and seize upon the middle as if they were the ultimate ends. There are others who regard no end in universal nature as ultimate, but all natural ends as means to an ultimate end beyond nature; and these persons are more perfectly rational than the former, and their actions are likewise more rational. The comprehension or simultaneous regard of a number of ends that terminate in nature, is the predicate of intelligence; but the comprehension of spiritual ends, or of the ends of ends, is the predicate of wisdom. The first of these faculties is human; the latter is divine, and must be owned to be the gift of God; for of ourselves we are intelligent indeed, but not wise.

CHAPTER XXVII.

There can be no purely rational action but what proceeds from the all-wise providence of God.

Action can no more be predicated of God, than motion, of the soul. God is above all action, although without Him there is no action. There is no action without change of state, and no state without form; but in God there is neither form, nor state, still less change. All these predicates are far below the Divine Essence.* We cannot conceive of action or change of state in the soul without the idea of a fluxion of parts, and without an idea of motion, and yet the soul is devoid of parts, and devoid of motion. How then can we conceive and express

* There is, however, a Divine Human Essence in God, to which Form belongs preëminently: see the author's Theological Works for the correction of his statement in this place.—(Tr.)

the Divine Essence, which is as far removed from the predicates of action, as the action of the mind is removed from the predicates of motion. But as God is the true wisdom, and as He is the true end, from which all things originate, through which all things proceed, and to which all things tend; and as the universe is the world of the effects of His providence, so it follows, that there is no natural action even but descends from Him; for in God we live, and move, and have our being. Thus that action is purely rational that proceeds from the all-wise providence of God.

CHAPTER XXVIII.

Many actions are simulated, and answer to no idea of the mind; but nevertheless an intelligent observer, by considering the form of several actions, and their mutual bearings, may discover the mind or intention that lies in them.

The mind has many ideas, both successive and simultaneous, and many ideas are proposed to the will; yet none are determined into action but those that are the means to some prefigured and purposed end; the others do not go forth or transpire, being regarded as contrary to the end. Therefore, though the mind thinks one thing, and the body does another, still the action does not cease to be peculiarly an idea of the mind, although different from that which is proximate to the end. The mind, however, is brought to light when actions are properly surveyed one after another, or if they are reduced to a species of equation, and the idea of the ideas is evolved analytically therefrom; which process presupposes an intelligent and sagacious agent.

CHAPTER XXIX.

So long as we live in the body, our voluntary or rational actions are never pure, but on the contrary, always mixed.

Our understanding is not pure; and so neither is the will,

which is the finish and realization of the thoughts, or the ideas of the understanding. We perceive hardly anything more than what finds its way into the mind through the inlets of the external senses, and we desire hardly anything beyond those objects that flatter the senses and give pleasure to the body; hardly anything beyond earthly and natural gifts. And as we desire natural ends, which constitute the lusts of the animus, so the desires entertained of ends by the mind cannot fail to be impure. That spiritual principle which is involved in the understanding is scarcely known to be present otherwise than as a matter of mere contemplation, and is so enveloped in material ideas, that the desire of it is almost never the object that determines the will. Such mixture existing in one and the same mind, it is no wonder that our will or acts cannot possibly be termed pure. We even experience this in the state of our bodies. Our very will and voluntary powers, our desires and lusts, destroy the body and subvert its economy, and hurry it into disease, old age and death: the spiritual principle is the only resource for repairing the mischief.

CHAPTER XXX.

The thoughts of the mind are concentrated in a will, that embraces the mind's ideas, and to which will the actions of the body correspond.

According to the series of our rational mind and the mental operations, we in the first instance perceive the images of the senses;* we then turn them over on all sides, and revolve them, that is to say, think; and then from the stores of the memory we take out a number of ideas associated by similarity; afterwards we combine these scattered elements of thought, and reduce them to a particular form, which constitutes judgment: we then conclude that the ideas of the mind centred in the judgment, are to be determined into act, or to be represented by actions. This is what we term, a conclusion; and to this

* This scale of the mental faculties should be well attended to by the reader who desires to understand the author's metaphysics.—(Tr.)

conclusion a certain force is communicated to enable it to issue in action. This conclusion is a will. The will therefore involves in a concentrated form all the elements that there were in the thought and judgment, and in addition a force constantly acting to ensure determination to action.

CHAPTER XXXI.

Will may be regarded as parallel with effort, action being parallel with motion.

Any action which does not come from the will, or which contains no volition, is not a rational, but an animal or natural action; therefore will is perpetually present in rational action, as effort is perpetually present in motion. When will ceases, action ceases also; and the character of the will determines the character of the action; and the same remarks are applicable to the mutual relation of effort and motion. And hence it is that action is never looked at physically according to the form, but according to the will, that is to say, according to the ideas of the thought, and according to the intention or end. The action of two individuals may be perfectly similar, and yet not similar, if the will does not similarly correspond to it in both cases. Therefore what effort is relatively to motion, that will is relatively to action.

CHAPTER XXXII.

Will under the aspect of effort involves the various directions and velocities of action regarded as motion.

Experience proves the fact. For by a foregone will we are enabled to direct our actions to any object whatever, and to any effect, or end; and in like manner to determine them with any rapidity we please. To ensure the perfect form of action as a result, we can call into exercise one set of muscles at the same time with another; and one set of muscular fibres. This

is manifest in speech; thus we can heighten and we can lower the voice; we can accelerate our utterance, or bring it to a stop. And so also in our other actions.

CHAPTER XXXIII.

Unless the will be resisted, it breaks forth in undisguised action, as effort, in manifest motion.

Effort corresponds to will, motion to action, and resistance to impossibility. Force consists in a continual effort to action; and action constantly follows from force, unless resistance interposes. Impossibilities, of which, as of resistance, there are various degrees, are the resistances that curb and limit the will.

CHAPTER XXXIV.

The Founder of the universe has decreed in his Providence, that although the several parts endowed with force shall exert the effort to act, nevertheless they shall be resisted so far as to prevent them from acting otherwise than suitably to the order of nature. So also in the animal world.

Every particle of the air and ether has its own given force, but is resisted by its fellows and neighbors, and prevented from acting contrary to the order of nature; hence all things in the natural universe are in a state of equilibrium. So in the animal microcosm the will is the analogue of effort in the macrocosm; and this will is more or less coerced by impossibilities, which prevent it from breaking forth in actions. Thus infinite means are provided by the Founder of the universe for offering resistance to human wills; of which means we need only instance civil laws, and the forms of society, whereby individuals are kept within the bounds proper to their sphere.

CHAPTER XXXV.

The force that is contained in the will comes from the desire of some particular end, and thus gives birth to action.

Apart from the desire of an end, there is no will; for there must be force in will before will can properly exist; this same force, or this desire, rules also in thought and judgment themselves: therefore those who are destitute of all desire are devoid of will also. The desires of the mind are directed to an end, but those of the animus are lusts, and those of the body are pleasures; the desires of the soul, which are pure loves, preside over all the rest. Thus the heat and fire, nay, the life of our actions both internal and external, consists of mere desires, without which we should have no life in our actions, and no action in our lives.

FRAGMENT ON THE SOUL.

FRAGMENT OF THE SOUL

KIND READER !

I WAS for some time in doubt whether to comprize in a single volume all my long meditations on the soul and the body, and their reciprocal action and passion, or whether it would be better to divide the work into numbers, and publish it *seriatim*, after the manner of transactions. To declare the nature of the soul, to exhibit its state, to shew the mutual intercourse and action subsisting between it and the body, and the connexion of each with each in the bonds of harmony ; in other words, to display philosophically, analytically, geometrically, and anatomically, the entire animal kingdom and its parts, with the functions and offices of each,—this is a labor of some years, and must extend over several volumes. And as I suspected and indeed foresaw that it would be utterly impossible to accomplish so vast a work at one blow or with a single effort, and and that if I attempted this I should probably fail in the middle, and in despair of reaching my journey's end, should sink under the burden, or as the poet says :

Impatiens animi lasso pollice sisterem opus :

so, under the circumstances, I have thought it most prudent to divide the labor, and to take up my pen at short intervals, allowing myself occasionally a little respite, to draw breath, and enable me to attend to my other duties. For the mind is even as the pen : too much usage blunts its point, and wears away its fineness. Such, gentle reader, is the reason which will move me to recur at frequent intervals to the task I have prescribed for myself, and to intrude myself often upon your presence, probably not less than five or six times a year, with my publications, or as they may properly be called, Psychological Transactions. By this means, I hope, after a few years, to gain the end, and to be in a condition to declare the state of the soul, when its connexion with the body is dissolved by death, and it is left to its own disposal. In the meantime, most earnestly desiring for the reader both long life and well being, I remain, his very devoted and obedient servant,

I. S. E. G. O. F.

TRANSACTION I.

GENERAL REMARKS ON

THE SOUL,

AND THE HARMONY BETWEEN IT AND THE BODY.

§ 1.

The mind never reposes truly on any system concerning the intercourse and harmony between the mind and the body, if that system supposes an unknown, incomprehensible element. In all subordinate series of causes, from the first cause to the final event, we have no right to assume anything, unless its credibility be undoubted, and its truth ascertained. In a chain of argument, if there be one questionable link, the whole of the subsequent series depending thereupon, and the conclusion also, will be similarly questionable. If a number of unknown or occult elements exist in different parts of the chain, the doubt attaching in the end to the induction founded upon such premises, must be still more considerable. The interposition of the unknown quantity not only engenders and constitutes indistinctness and confusion in the general idea, but places every idea in ambiguity. Uncertainty is the parent of uncertainty. The bottom or foundation of a house determines the firmness of the superstructure. The strength of the first or middle link in a chain, determines the efficacy and power of the subsequent links, and of the chain itself, or the hook at its extremity, to sustain the weight which is required. The failure

of a single part amounts to a loss of power in the whole. As is the antecedent term in a syllogism, so is the conclusion; the major or minor must be demonstrated, for the other to be valid; for the validity of the consequences is in proportion to that of the premises. If of several numbers submitted to calculation, one be unknown, the sum or quotient formed by their addition or division will present the same constant character; an equal error will run through the aggregate or product to that in the separate constituent numbers. One dissonance present in a harmony will often produce the discord of the whole. In a word, the conclusion and the end must respect all the premises, otherwise the effect would not be similar to its causes. Where the means have no evident likeness to the antecedent causes, the end is placed in doubt, or assumed doubtfully. Where the connexion and quality of causes does not plainly appear in the progression of the means to the end, the hope of an effect to come is destroyed. This then is the hotbed of so many hypotheses, that in the analysis of causes, uncertainties are taken for certainties, and the mind attaches itself to the images of occult objects as to the spectral appearances of a dream. The consequence is, that such hypotheses are rejected on the same principle as they are acknowledged, and the affirmative and the infirmative, the negative side and the positive, make equal claim upon our credit. The truly rational mind, however, in no case depends upon the *ipse dixit* of the speaker, but upon the truth of what he says. The authority that is valid for it, is the truth of the matter. The soul, as the perpetual mover of the bodily machine, continually agitates the fibrils of its organs, and elicits or draws therefrom abundant images and signs, but only those which are similar * * * *

* * * * *

[Two pages of the MS. are lost at this point.]

* * * * to plant their standards. But as the judges themselves depend upon the ideas or images which they have, and these ideas and images upon their corresponding internal sensorial organs, and these again upon their external organs and external senses, and the senses upon their visible world, so we may easily foresee and guess what opinion will prevail. In fact the opinion is put forward and pronounced to suit the conceptions and enlist the applause of the vulgar, and to win the judgment founded upon the ideas of the organs. But the organs are ignorant of everything that outlies their particular sphere of sensation or perception. Yet on their testimony, on the faith of their declarations and proofs, the mind hesitates not to conclude, that whatever is internal to the minimal ray and unit of sensation in the aforesaid organs, must be the very simplest of things, and have originated from nothing; and that in this way the soul itself is not a compound but a simple substance, because its qualities are inaccessible to the organs of our senses. This opinion the vulgar applauds and subscribes. Nay, there are not wanting those who assume an attitude of menace, and use threatening expressions and ferocious gestures, against all who attempt to overpass the ordinary pale of knowledge, or who do not kindly take their own view of the question. Just as formerly was the case, when the learned began to suspect that the earth was not supported by columns, or fixed immoveably in the centre of the heavens, but rotates on its axis, as well as performs an annual revolution about the sun; and that the sun is stationary in the centre of the solar vortex. Or as when the mind, diving beneath the appearances of the senses, wisely concluded that our antipodes are subject to a pressure towards the centre of the earth, just as we, who are antipodes relatively to them, are subject to the same; and that all the radii running from that centre, are perpendicular. But those who are ambitious to be no wiser than their senses, proscribe the knowledge of principles like these, and they try to scare and prohibit the philosopher from their cherished haunts, wishing the evidence and decision of the senses to settle every question, and to be the limit of nature's depth and man's penetration; and the goal of all knowledge and wisdom to be set within the purely animal sphere, far from humanity and rationality. But the soul is

justly indignant, and will not suffer itself to be deceived and imposed upon by its senses. The soul, I say, rejects with disgust every occult quality, and every system founded upon qualities meant to be unknown; also feels it hard to live for ever among the old philosophers, with no opportunity of shaking off the yoke of ignorance. And so, putting the darkness aside, and communing with herself, the soul begins to say: Of whatsoever system thou beest the founder, thou must come with reiterated facts and demonstrations, or thou shalt not be trusted! And whatever appeals on other grounds, she regards as spectral and dreamy, although still she praises good and clever dreams, as such.

§ 2.

The mind does not repose in the system of Preëstablished Harmony, because it involves unknown incomprehensible elements and occult qualities. We may dismiss the systems of the old philosophers, and of the ages now passing into oblivion, which systems are partially exploded and outworn by time, and partially still in repute. Were we to spend our efforts in explaining and commenting upon them, we should court the destiny of Sisyphus, and be turning the same stone that our contemporaries, and especially our fathers, who worshipped the urns, and kissed with reverential lips the ashes of the ancients, have so often rolled round and round already. Besides, there are still writers who fancy that they are not losing the time that they bestow upon the old philosophy; and the reader can consult these writers, if he pleases. At the present day again other classes have arisen, who attempt to explain in a clear manner the mutual action and reaction of the body and the soul, either by Occasional Causes, or else by a peculiar Physical Influx; and think that in this wise the nature of the animal world, enveloped confessedly in many coverings, and beset by prodigious difficulties, is unswathed to its core, and laid bare to sight. It is, however, no part of our intention to take either side in this matter, so as to pronounce upon the disputants, or to shew the relative extent of their services in the investigation of the intercourse between the soul and the body.

At best this would be a thankless and barren task. Those who are imbued and preoccupied with principles of their own, are no longer free to think against them, or to appreciate reasons that impugn their own. Already in harness, like horses in a chariot, they drag their burden precisely whithersoever the reins direct them. Moreover, if we are desirous to form and elaborate principles by a geometrical and mechanical method, and afterwards to confirm them by experience, we are not bound in this case to take up the opinions and arguments of others, or to refute them; but only to represent causes, and to shew the connexion between principles and facts. For unless there be an analytical, philosophical, geometrical and mechanical nexus and coincidence between principles and experience, the principles are mere hallucinations and dreams of the brain. On the other hand, where this genuine connexion exists, the causes likewise represent themselves simultaneously in connexion and series, and we obviate all systematical and hypothetical arguments at once, and this so completely, that it would be lost time and pains to refute them. They are sufficiently disproved if causes and connexion are demonstrated. The truth lies in these, and cannot fail to be unique, and speaks loudly enough for itself, in the mere facts of demonstrating, and confirming by experience. There lies in demonstrations immense force; nay, they draw the mind to their side away from the influence of its very senses. However, let us see whether there be any prerogative advantages in the system of Preëstablished Harmony, as it is termed; whether it serves to conduct us to any deeper knowledge of the animal microcosm; and whether, therefore, by its means, we may enter, without any other foregone Delphian utterance and response, into the more secret penetralia and oracles of animal nature: or whether, on the other hand, it too is but an obscure soothsaying, and equally with other systems precipitates the mind into occult qualities, *i.e.*, mists and darkness. For certainly at the present day pre-established harmony comes as an unquestioned response from the philosophical tripod, filling the mouths of the prophets and the wise, who labor to explain by it the signification of many things, of the soul, of harmony, and of all the actions, laws, series and forces of the animal kingdom. Yea, it is undoubt-

edly this system that rules the present hour, and distances all competitors, like a lofty cypress growing from the sepulchre of Leibnitz, and in a few short years towering so far above the other trees. The following then is a brief statement of it.

There is in the soul a unique force, namely, a force representative of the universe, and this force produces all perceptions, which perceptions have their sufficient reason in a force representative of the universe. In other words, there is in the soul a series of perceptions and appetitions,* and therefore of volitions; but in the body a series of motions; and the two series harmonize and conspire, each with each, by virtue of the respective natures of the soul and the body. The above force is proper to the soul, independent of every external principle, and of the body itself, and thus it is the force by which the soul produces in one continued series all perceptions and appetitions. The soul would represent perceptions and appetitions in the same way that it now does, were there no body, or no visible world in existence. This force is bound to observe certain laws; consequently there are laws of perceptions, as well as of appetitions, and the law of sensations contains the essential determinations of the soul. And the law of imagination must have some share in the law of sensation, and *vice versâ*. There are also laws of appetite and antipathy in the soul. God has preëstablished a harmony between the soul and the body, insomuch that he has adjoined to the soul a body capable of undergoing series of motions agreeing with the perceptions and appetitions of the soul. He has not preëstablished any appetitions in the soul, but only a harmony between the motions excited in the body by the impressions made upon the sensory organs and the perceptions of the soul; or between the voluntary motions in the body and the appetitions of the soul; this, however, apart from any real dependence of the soul upon the body. The material ideas to which sensual ideas correspond, depend upon impressions made by sensible objects upon the sensory organs: and the voluntary motions that correspond to the appe-

* "The action of the internal principle that causes the change or the passage from one perception to another, may be termed an *appetition*." (Leibnitz, *La Monadologie*, n. 15.)—(Tr.)

titions of the soul, depend upon the motions of the nervous fluid circulating in the motory nerves. By virtue of the mechanism of the body there arise from the material ideas of sensible objects, motions answering to the volitions and appetitions of the soul; apart from any immediate extrinsic determination. Consequently from the series of motions in the body, a reason may be given for the origin of the perceptions and appetitions in the soul, and for the peculiar nature and quality of such perceptions and appetitions; and *vice versâ*. The presence of material ideas in the brain contributes in no respect whatever to produce them. Moreover, all these predicaments may be understood, without supposing the soul to exert any action on the body: nay, they all happen naturally; and even the fact of mutual intercourse may be intelligibly explained by the very nature of the soul and of the body. And nevertheless, the necessity of the motions that correspond in the body to the appetitions of the soul, does not deprive the soul of liberty. Lastly, the mechanism of the body is incomprehensible, though still a subject for probable arguments. It is also stated to be a tenet of Leibnitz, that all spirits collectively constitute the city of God, which is the moral world in the natural world; and that there is a perfect harmony between the physical kingdom of nature and the moral kingdom of grace. Not to mention several other doctrines, respecting which we refer the reader to the Master himself and his followers.

It is commonly known and admitted, that the soul is capable of exercising sensation, perception, appetite and will, and endowed with the power of producing all these as its own peculiar qualities: that between the soul and the body some relation is necessarily implied, which may be termed intercourse; inasmuch as material ideas, as they are called, are consentaneous with the sensations and perceptions of the soul, as also are the motions of the body with the appetitions and volitions of the soul: that the reason is given in perception, why both sensual and material ideas arise; and *vice versâ*: also that the said qualities of the soul have their own laws; and that there is a series on both hands, in the body as in the soul, agreeably to which, and in conformity to these laws, all these predicates

happen in successive order. And that in the sensory organs and the body there are similar modes and motions ; with many other particulars sanctioned by experience, and which our very senses plainly indicate to the soul, in so far as it is rational and conscious of the senses. Nay, these points are attested by effects upon which the soul is capable of reflecting. Those who have the least penetration, even though they be clowns, if they are not without the feeblest glimmer of reason, know perfectly well, that ideas and images are formed on the model of the objects that enter from the visible world through the organic inlets of the senses ; and that there is in the organs a species of remote sensation, which appears however to be a kind of proximate sensation : that motions are produced in the body by the instrumentality of the muscles, nerves and fluids ; and that all things have their given efficient causes, or active forces ; and the causes, given laws ; and so forth. But what then ? These are not occult or hidden points. They are presented to every soul by its senses, and the soul is bound to give credit to clear evidence, experience, and fact. They do not delay or stop any mind desirous of knowledge. But the mind, as we all know, longs to overpass such clear pieces of admitted knowledge. Of the existence of harmony she is fully aware, but the matter of enquiry is the quality of this same harmony. The mind is in no way stirred by the words, sensation and perception, the things to which they correspond being too well established to cause the slightest uneasiness of doubt. Nor yet by the assertion, that the soul exerts appetite and will, antipathy and aversion ; for nothing can be more frequent, than our wishing for what we like, and wishing for the absence of what we dislike. Nor does the mind raise the least doubt respecting ideas and images, as being formed with a reference of congruity to the perceptions of the soul ; and *vice versâ* : nor, therefore, the least doubt that the reason of the one is contained in the other, just as the reason of the quality of a causate lies in the cause. Nor again has the mind a moment's difficulty in admitting, that every affection and quality has its appointed laws ; because these laws, or the fact of their existence, is dictated to us by the variety and constancy of mutual operations subsisting between the body and the organs on the

one hand, and the soul on the other. Moreover the mind cannot deny the fact of series and connexion, and of a particular order, exhibited as one thing passes by successive stages into another; for we know that appetition cannot be present without previous perception, or will without previous appetition. The modes and motions in the sensory organs and the body are plain from every action and effect. We need not open our eyes widely to see these truths; any one may discern them by a sidelong glance. It follows from them, that the efficient sufficient causes, and forces, in the soul as well as in the body, must both be present, to create, or to accompany, the act or effect. The mind, however, will not dwell long on trite and obvious matters. She asks impatiently, as I opine, what these declarations point to. She asks whether they furnish a clear explanation of those subjects that she longs to know? whether the new system introduces us to any deeper knowledge of ourselves? That she feels and perceives, she knows already, because she *does* feel and *does* perceive. But she wants the cause; she desires to perceive the relation of quality. Judged by this requirement, what does she perceive? Is it enough to know that we perceive? Poor and barren would be the faculty of reason, if it only knew that it knew! And as the mind passes by a series or law, first from perception to appetition, and then to will, the soul feels the progression, but is unaware of the mode and moving principle, as well as of the causes which enable the transition to take place from one affection to another: and still it remains throughout in ignorance of itself, because in ignorance of causes, and the more will so remain, the more deeply and predeterminately* systematic it becomes. And when the question is put, what harmony is, and what the distinctive nature of harmony, and of laws, motions and forces, here again the mind knows nothing beyond the bare fact of the existence of forces, motions and laws. But it is not enough to be conscious of these and of itself, for this is an animal endowment, and it may indeed be predicated of the senses that they are conscious of objects presented to their organs. On the other hand, the rationality of the mind implies, that it also becomes

* *Præstabilitus.*

conscious of causes by its analytic faculty. But in proportion as the soul desires to bestir itself purely and wisely, and attempts with earnestness to extort from itself an account of its own operations and those of the body, in the same proportion the [preëstablished] system struggles and resists, and hinders all solicitous and deep enquiry. In fact it at once shuts the door in our faces, and opposes its bolts and bars to the mind desirous to advance into the sciences, and plants hedges and fences on every road and round every field, to prevent the traveller from proceeding. This system, we say, defends a harmony preëstablished by God, and forbids us to go further, by opposing an occult quality. And to hinder the mind from breaking through or leaping the fence, it affirms that all things are carried on apart from any mutual dependence, and entirely takes away the connexion between the soul and the body. The laws and series themselves, whether in the purest being, namely, the soul, or in the compound and material being, I mean, the body, it pronounces incomprehensible and impenetrable; consequently, not perhaps similar to those, although they are natural, that appear to exist in the visible world, and are reduced geometrically and mechanically to laws and rules. Forces likewise, of which there is but a single one in the soul, and that one, as we have seen, representative of the universe. Wherever the mind turns, it finds some occult barrier opposed to it. This prohibits it from knowing anything beyond what it chances to know experimentally. Stand on what bank or shore you please, an abyss is conjured up before you, at which perforce you shudder as at the yawning sea; until you are too glad to admit, that the soul, with all its rationality, perception and light, will perish and founder in a thick night of occult qualities, if it unfurls its canvass, or tempts the deep. Thus the system dissuades us all from putting forth upon the waters, as having itself neither oars nor rowers at command. Therefore on the other hand I shall do my best to shew, that this philosophy is stuffed with innumerable occult qualities and with nothing else, and aims to overwhelm the mind and blunt the intention; together with other points which I think it wise to pass untouched at present. But if the streams be thus arrested, and if we are to fly at once to the arms of ignorance as a refuge,

there is an end to all rational philosophy and psychology, nor can we move a step beyond that ordinary world which is obvious to the external senses. Then we must give up all hope of borrowing any light at any time from science and scientific experience, and of penetrating the causes of things or attaining wisdom. Moreover we must submit to the yoke of authority, and be sold into slavery, until the mind and philosophy almost lose the recollection of breathing the free and pure air of heaven. Oh! the hatred with which we have pursued the atoms of the ancient philosophers! Oh! the laughter and the hissing with which we have saluted their occult qualities, and driven them from the stage, and endeavoured to undermine and demolish their systems and inventions! With this view, at the present day, we have attempted to decorate the entire stage with experiments and phenomena, and to proffer the torch and light the way; simply that occult nature may be drawn from its abyss and den of refuge in human ignorance; because we are ashamed of living any longer in the spectral darkness of the ancients. On this account we endeavor to elicit all kinds of knowledge from experience, and to bathe our eyes in healing waters, to clear them of those specks and clouds that cover the pupil and obscure our sight. And even though we fail, yet are we supported by the hope, that at any rate our children's children, by our industry and effort, will enjoy the introspection denied to ourselves, and see deeper than we into nature, and the occult sphere of causes; inasmuch as we transmit to them numerous means and indications of knowledge, like blazing torches in the night of ignorance; and leave them our own possessions for an inheritance.

But dismissing these considerations, let us proceed to examine this system more exactly; to weigh it carefully in the balance; to open the fruit, and note the number and description of the occult qualities that it contains. Recurring to our preliminary abstract, the first point that presents itself, is the following: *There is in the soul a unique force, namely, a force representative of the universe.* For my part I find it difficult to explain without an interpreter, what, and of what nature, this unique, proper, essential and natural force, named representative of the universe, can be. My mind is perplexed as by an

obscure oracle when I ask myself the meaning of a representation of the universe by an efficient force. Nor am I long-sighted enough (perhaps adequate words were wanting to express or fully convey the author's meaning) to know what is intended by the soul having the power to produce an idea of the whole present universe, without guidance from an external and higher principle. It means, if I understand it aright, that the soul is the efficient sufficient cause of the whole of perception; or that it is a living tablet or mirror, with a power or force to represent the objects of the universe; or that there is a force in the animal mirror which causes everything to be represented after a universal manner; or that there is a bare force. I trust the reader will forgive me for trying to approximate to the meaning by a guess, and render it more clear to myself. But taking any of these explanations, without however admitting them, the upshot is, so far as perception is concerned, for it is plain beyond cavil, that there is in the soul a power of acting and perceiving: over and above this well-ascertained fact, all is occult quality.

This force produces all perceptions, which perceptions have their sufficient reason in a force representative of the universe. When one is in perplexity as to the nature and quality of this force representative of the universe, all the propositions resulting from it, are ambiguous and obscure in their meaning. Now no one knows its quality; nay, the reasoners are not agreed, whether there be a force representative of the universe and unique in its character, or the contrary; or whether such a force can produce perceptions, (which in this case it would owe to itself alone, and to no exterior power; although not originally so, yet principally so now; and consequently perceptions would be congenital or coexistent with such a force; inasmuch as the force is single or unique, and excludes the notion of dependence on the body, and nevertheless is sensible, because it perceives and is self-conscious). But I will not consider this in detail, because it is not my object to be studiously hostile, but only to indicate, that by means of this system all quality terminates in occult being. A simple man, little apt in expounding riddles, I confess I do not know the meaning of the same force producing, the same representing to itself, and the same

feeling and perceiving the thing represented ; or of the same force effecting, and comprehending the effect ; when yet this force is most simply single, and the soul a pure substance. Were belief an act of good will, I would cheerfully give mine ; but I am not acute or clever enough to see anything here beyond occult quality.

There is in the soul a series of perceptions and appetitions, and therefore of volitions ; but in the body a series of motions ; and the two series harmonize and conspire, each with each, by virtue of the respective natures of the soul and the body. This comes home to the understanding, and we all believe it fully. It is most true that there is in the soul a series of perceptions and appetitions, answering to the series of motions in the body ; and that these series harmonize, accord and coincide. It is a palpable truism, plain as if written on the sun, that we do perceive, that we do exert appetite, that we do undergo answerable motion ; and that these conditions follow each other in harmonious sequence. But in the very middle of all a singularly occult quality is left ; namely, the thing and quality designated by the natures of the soul and the body.

The above force is proper to the soul, independent of every external principle, and of the body itself ; and thus it is the force by which the soul produces in one continued series all perceptions and appetitions. I am still perplexed whether to believe or not, that according to the system, all these things coexist in the soul, and the soul lives in its own self-similar principle from the first moment of its existence to the last, when it is released from the body, and destined to live unfettered and free in its own peculiar state. And whether therefore it pays only by imputation the penalty of the motions performed by, and the deeds done in, the body ; which must be the case, if the soul is altogether independent of external principles, and of the body itself. Thus there must be the whole of the body's nature in it, such as it was when it existed. Consequently the soul must be an entity disconnected from causes, and nevertheless natural, and existing in the world. How then can it subsist, or perceive the thoughts of others either mediately or immediately ? How can it feel the delights of the world, or of heaven ; or in heaven the delights of the assembly of souls, or in the world the delights of congenial society ? How can it

feel the grace of God applicable to itself? how apply that grace with a sensation of love involving connexion and dependence? And how can moral actions possibly exist, when there can be nothing moral in them, beyond the harmony and concordance of the modes and motions of the body with the perceptions and appetitions of the soul? If souls can be affected neither outwardly or inwardly by their bodies, are then all souls of similar quality? To each of these questions I know not what to say, and I should be in ignorance of all, were I credulously to trust to the dicta of such an authority. The absolute independence of the soul proclaimed by this system, turns rational philosophy upside down, and this independence must either be rejected among occult qualities, or the whole moral world, and all moral actions whatever, together with the dependence of effects on their causes, generally and specifically, must be pronounced occult. If such conclusions as these should pass unquestioned and become ratified; if we believed them written in Jupiter's archives, it would thenceforth be vain and fruitless to spend any pains in the attempt to penetrate into qualities; far better would it have been that all who had hitherto expended the midnight oil in the search of causes, or had exhorted posterity to the effort, had erased their lines and consigned their papers to oblivion.

The soul would represent to itself perceptions and appetitions in the same way that it now does, were there no body, or no visible world in existence. That is to say, its state would be single or unique, and always identical and perfectly similar, both in the body and the world, and out of the body and the world; inasmuch as it would represent to itself its perceptions and appetitions in the same manner in the one case as in the other. I am afraid the proposition also involves, that the soul is neither in the body nor out of the body; neither in the world nor out of the world; or that it is universal, with no special engagement to, or conjunction with, the body; or that it is all one whether it be present or absent; or whether new souls are supernaturally created from day to day, or all souls have existed from all eternity; and that souls subsist in the same supernatural manner in which they existed at first; and consequently that the same must be predicated of a body formed for similar harmony. But meanwhile, as in this absolute independence,

I can see no connexion, and no cause, and no effect, so I am inclined and obliged to dismiss it too, like the rest, as the substance of a foreign world, among occult qualities.

This force is bound to observe certain laws ; consequently there are laws of perceptions, as well as of appetitions, and the law of sensations contains the essential determinations of the soul. All the actions of the body furnish signs and proofs by which we know full plainly, that there are laws belonging to the perceptions and appetitions of the soul ; and as the soul is self-conscious, and conscious of the actions of the body, we have no need of any extraordinary ability to comprehend these declarations. But the difficulty remains untouched. What is the nature of the laws, which can thus harmonize with those in the body ? We are conscious that the soul's force or actuality is subject to laws and rules, within which and to which it is limited ; but this being the case, I do not well see what becomes of its representation of the universe. But as nothing can be plainer than that force, perception and appetite really exist ; likewise sensation, essence and determination, all having their laws ; so in the foregoing statement we are raised not one jot beyond common experience ; for the knowledge of which we have no occasion to consult any oracular system. And we may remark, that the soul's rationality does not consist in the consciousness and perception of the actions of the body or the individual, but in the mind's power to form conclusions therefrom by a chain of reasoning, and wisely to educe the very quantities and qualities that are involved in causes. We know indeed that there is no appetite but has a cause, and that every cause must be connected with a prior cause ; consequently that there is a connexion of causes, before we desire what we perceive. Rationality therefore does not consist merely in knowing that we perceive and desire, but in the ability to trace the connexion of causes, and to conclude thereby what ought to be desired, and carried over into the will, and by its instrumentality into action and effect. The effect or fact of rationality perishes in the first instance, when having contracted habits by long custom and frequent indulgence, without any examination of causes, we no sooner perceive than we desire, no sooner desire than we will, and no sooner will than we commit to action ; when appe-

tite treads on the heels of perception, and will is simultaneous with appetite; and the volition with the effect: and so forth.

There is a law of imagination which must have some share in the law of sensation, and vice versâ. On this shewing, imagination would depend by its laws upon sensation; but this relation, so far as it involves any communication, is incompatible with a state in which each is independent of the other; inasmuch as ideas and images are as they are termed material, and the immediate property of the organs, and the organs belong to the body; and inasmuch as the before-mentioned ideas are harmonic with perceptions, as are the motions of the body with appetitions.

God has preëstablished a harmony between the soul and the body; insomuch that he has adjoined to the soul a body capable of undergoing series of motions agreeing with the perceptions and appetitions of the soul. We are all aware that there is a harmony between the body and the soul, and that the actions of the former follow connectedly from the perception and will of the latter. The mind, however, longs to examine the connexion or intercourse, and unwilling to rest in this lowest knowledge, or to submit to the dictatorship of the senses, requests the system to point out, or to shew the possibility of pointing out, the actual nature and quality of the above harmony, and of the intercourse also. The existence of the harmony and intercourse is undisputed; what is desired is, to have the opinion of the wise respecting the quality of the same. It is not questioned that the eye sees; but the point is, how does it see, and what are its forces and laws, and the modification and combination of the rays as they pass through the various structures of the organ? Again every one knows that the ear hears; but how, and by what instruments and means, the modulation of the air constituting sound is apprehended by that organ,—this is the matter requiring explanation. The harmonies of tone and tune are in our most common and public knowledge; but the nature of the harmonic laws and ratios, and the causes of the same,—these are pursuits worthy of experiment and understanding. Thus what we want in the system, is a precise account of the quality of harmony, and the interpretation of points that are at present obscure. To this our sapient author

replies, that harmony exists, that there is such a thing, and that God has preëstablished it between the soul and the body. In this way he dams the stream and prevents the issuing waters, and puts out and kills in a moment all desire and hope of knowledge, declaring that harmony is preëstablished, or what is the same thing, that the preëstablishment is an occult quality. If Themis had given it as an oracle that the primordial substances of the world were atoms, and that in these atoms there were an essence and forces whose laws were occult, and yet that there was a preëstablished harmony between the atoms and the compound substances of the world, would not later ages which were attempting to penetrate into the qualities of things, hand over the whole story to their comedians, as an amusing record, fit only to be put upon the stage? or resign it to other artificers, as the worn and useless body of Æson was given up to Medea for renovation? The cultivators of this system terminate all knowledge of our microcosm in their harmony, and encircle wisdom with a fence, to prevent any one from looking for the qualities of the soul, which cannot fail, like the harmony itself, to be preëstablished and occult. And if haply any be unwilling to stand as perpetual doorkeepers before the threshold, and should knock at the door, or dare to enter the house, there is no lack of haughty warders to order them away from the sacred premises, and to command them to betake their profane feet in another direction. But as the existence and the possibility of harmony are current pieces of knowledge, the system proceeds to tell us, that God has joined a body to the soul, and in the former therefore there must exist a consent of motions with the perceptions and appetitions of the latter. Nor can this be other than true, for every self-conscious being knows that the body does and effects what the soul desires and requires; and that actions and effects harmonize and conspire with their proper means and causes. However, the independence mentioned above, distracts the mind, and causes it to doubt, whether a harmony such as this can be assumed, implying concord during every moment and in every mode between two subjects and substances, without a connexion and dependence; except only with regard to the specification of perceptions, and the continuity of the time in which they happen,

together with the changes in the sensory organs. And as there are the most constant laws in the soul, and a single simple force that produces and represents all things, and likewise a constant harmony, constant because preëstablished by the Deity, so I do not see how in this case these can unite in a third term, and how the mind can thoroughly conspire with the body in unharmonious and discordant actions, totally at variance with the moral world; and this, so completely, as to feel unharmonious things as in consonance with it, and to desire them, keenly pursue them, and make them grounds of action. And unless the Almighty had given the mind a body answering to the harmony, or to the soul, how could the one coöperate with the other? Should we not otherwise have a harmony without harmony, a discordant concord, the soul being permanent in its state, obeying and willing to obey no other laws but its own: unless we suppose in the soul none but a force to the last degree passive, in which all things in the universe can be represented; and no active force to produce and represent, by its intrinsic means, the sensual ideas, and perceptions or appetitions, of which we become conscious by motions in the body, or by modes and mutations in the sensory organs. Hence in this way these also are precipitated into the same lake of ignorance and oblivion, into the same occult quality, with the harmony itself.

God has not preëstablished any appetitions in the soul, but only a harmony between the motions excited in the body by the impressions made upon the sensory organs, and the perceptions of the soul; or between the voluntary motions in the body, and the appetitions of the soul: this however apart from any real dependence of the soul upon the body. I shall not here entertain the question, how far these propositions are consistent with the foregoing, or with the system of preëstablishment; but shall content myself with denoting the number of unknown qualities involved in the above statement; the number of qualities destined to be for ever unknown, according to the dictation of this imposing system. Meantime, however, the conclusion is given, that there are perceptions in the soul, but that it has no preëstablished appetitions, there being in it therefore something not preëstablished, although it is a simple, single force that produces; and nevertheless, that this something is of the mind

or in the soul. I do not see where appetite comes from unless there be a previous perception ; or will, unless there be an antecedent appetite ; or these things at all, unless there be a previous force. If then there be a harmony between the modes in the sensory organs, and the resulting motions in the body and appetitions in the soul, it will follow that the soul does not exercise appetency or volition *per se*, but by the instrumentality of the organs, and if left to itself would have no determination or will, or would appetize or will all things universally, and direct choice and will to all things, *i.e.*, to nothing in particular. At this rate I cannot comprehend what there is in us that can desire and wish for moral good, or that can disagree and combat with the body ; I do not see what there is that can desire heaven, or the favor of God ; or that can feel love, or endeavor for, or aspire to, wisdom ; what there is to give life to perception, or to feel delight in it ; &c., &c. All these points will be obscure to me, so long as I do not know whether appetitions differ from harmony in not being preëstablished, but originate from impressions made upon the senses ; and so long as there is thought to be a harmony preëstablished by Deity between all the motions of the body, and the corresponding appetitions, whatever their nature be, in the soul : also so long as I am in doubt, whether there can possibly be harmonies in two subjects that actually are consentaneous with each other during every moment and in every mode, apart from any real interdependence. It requires a soothsayer to reconcile and explain these occult qualities.

The material ideas to which sensual ideas correspond, depend upon the impressions made by sensible objects upon the sensory organs : and the voluntary motions that correspond to the appetitions of the soul, depend upon the motions of the nervous fluid circulating in the motory nerves. These will be among the principal subjects to be discussed in my Transactions, and therefore I shall not dwell upon them at present. By virtue of the mechanism of the body there arise from the material ideas of sensible objects, motions answering to the volitions and appetitions of the soul ; apart from any immediate extrinsic determination. This also will be considered when we treat of the mechanism of the body and the corporeal motions.

Consequently from the series of motions in the body, a reason may be given for the origin of the perceptions and appetitions in the soul, and for the peculiar nature and quality of such perceptions and appetitions; and vice versâ. The presence of material ideas in the brain contributes in no respect whatever to produce them. I should be inclined to believe that from the series of motions in the body, a reason might be given why such or such perceptions arise in the soul, unless I were also told to think, that the presence of the ideas of the sensory organs contributes absolutely nothing to produce them: in which case what the one view joins, the other seems to separate. Where the reason to be rendered can possibly be, I know not, since the presence of the said ideas contributes in no way to produce the above perceptions and appetitions. The predicate seems to involve a contradiction; especially if there be the independence before spoken of, and if the soul and the body verily do not act upon each other by any connexion either of contiguity or continuity; and nevertheless, according to what we said before, the law of imagination must have some share in the law of sensation. Suppose the reason and share to be, that there are similar laws and series of perceptions and appetitions in the soul, as of motions in the organs and the body. What then is the reason, unless there be a connexion and real dependence and consequent consent, that the one acts simultaneously and instantly when the other does? And unless there be a connexion, and the one really disposes the other to act like itself at its intimation and will, what is the reason that we desire to day what yesterday we loathed? Unless there be a real dependence and connexion, what is the reason that the will precedes and enjoins the motions of the body; likewise that the soul obeys the motions of the body, at the very time that it perceives the contrary to be right? And unless there be a connexion and mutual action of the soul and the body, what is the reason that the perceptions and appetitions and corresponding motions are never exactly identical or similar in any two living subjects? And what is the reason, unless there be a connexion, and each affects each, that the frequent recurrence and performance of actions, causes the soul to contract a habit and as it were an instinct of perceiving, desiring and willing, and unconsciously

and spontaneously to repeat previous motions? Where but in connexion shall we look for the reason of the amazing correspondence of both the soul and the body in causes and effects? What means the harmony of the two, if the one lives independent of the other? Whence their concord and consent? It must be a sharp eye, such as could see affections in vacancy and nothingness, that discerns the presence of causes and effects, simultaneously with this independence: I freely confess I cannot even conceive such acuteness.

Moreover, *all these predicaments may be understood, without supposing the soul to exert any action on the body: nay, they all happen naturally; and even the fact of mutual intercourse may be intelligibly explained by the very nature of the soul and of the body.* It is at any rate beyond my comprehension, if no action or reaction of the soul upon the body be taken for granted, in what words these matters are to be explained, or how they are to be understood. If it is to be made intelligible by the nature of the two, that nature must at least be previously defined. And if it be defined as constituting in the soul a motive force, simple, single, peculiar, and representative of the universe, still the nature and the force are but one of the occult qualities already named. And I do not well see what can be the nature of one force, one limit and one end, and of no parts, in a perfectly simple being, which exists and subsists from nothing, in its own principle, and separate from the world. If the nature of the motions in the body be the sum, aggregate or product of many motive forces, or consist in a series of modes, or in modifications, still I do not see how on these principles, granting our system, the commerce between the soul and body is brought home to the understanding. The mere words nature, forces, modifications, contribute nothing to this end. Others then must exercise their subtler faculties on these points; to me they amount to an absolutely occult quality.

Nevertheless the necessity of the motions that correspond in the body to the appetitions of the soul, does not deprive the soul of liberty. As this subject requires a peculiarly deep consideration, I intend to treat it separately in one of my Transactions. *Lastly, the mechanism of the body is incomprehensible, though still a subject for probable arguments.* This is the aim of the

system, to make all motions, forces, determinations, laws and series, incomprehensible, and yet conjectural ; consequently to resolve all their predicates into occult qualities ; for it is not considered sufficient to term them natural. What service then has been done by, and what issue is involved in, this far-famed system, further than to make us ignorant of all the laws of our human kingdom, and content with the bare knowledge of their existence ? What other service than so to guard the code of the statutes and laws of nature, that it shall be kept shut for ever ; and to inflict the punishment of Tantalus upon whoever would dare to force its clasps, or to break the chain which binds it ? Such is the watchful vigilance of this boasted system !

If I am not mistaken there is ground to suppose, that *the principles of this system are taken from the method of fluxions or infinites, in fact, from the differential and integral calculus ;* in which the differences equal nothing, while both the constant and the variable integrals denote the motion, times, dimensions, lines, areas or bodies. And as there is no comparison between the indefinitely small and the integer, inasmuch as the one is as nothing, and the other is a quantity or a quality, so a harmony is supposed between them, and the same ratio of laws in the soul as in the body ; just as in the above analysis, the same mutual ratio of the differences as of the integers, which may be conjoined by analogies and harmonies, and the one be multiplied by the other, although there is no dependence of the one upon the other. Consequently there can be no ratio given between the differential and the integral, and so they may enter into the same equation and analysis ; and thus we may elicit from the one what there is in the other, or what is the value of the other. But the arguing from a pure calculus and analysis to real beings, is not valid.

To avoid however the appearance of intending to derogate utterly from the credit and authority of principles which are the mental offspring of the most refined brains and judgments, and which are received by the world as oracular dicta with respectful homage little short of worship ; to avoid this, *it is incumbent upon me, myself to propound principles of greater truth.* For no one ought to occupy the bench, or to give sentence therefrom, unless he be really learned in the law, and able, by

his knowledge, to settle the cause. It will therefore be my task, in the Transactions which are to follow, to shew the nature of the harmony subsisting in the animal microcosm, and of its forces, laws, series and motions. Of the merits of what I shall advance, let the reader be the judge.

But as I have accused the above system, (in which so many, and indeed nearly all qualities are preëstablished and incomprehensible,) of leading direct to ignorance of creation, so *it is necessary to bring to the bar some general action or effect of the body and the soul, and to examine it by the principles of this system*; in order that we may see and know with clearness, whether by following the rules systematically laid down, we are led to a knowledge of its causes, or whether on the other hand we are led away from light and knowledge to darkness and ignorance. The truth comes out in examples. Now in the whole range of the animal kingdom there is no more usual or familiar affection, than the desire for sexual intercourse, commonly called love, and if legitimate, connubial love. The question shall be, from what natural principle and cause does this affection arise? from what is it derived? If we are to abide in the above principles, we shall probably answer by system, that it arises from a force of appetite in the soul, to which corresponds a similar motion in the body, agreeably to laws, which are natural, and to a harmony, which is preëstablished between the soul and the body. Or what amounts to the same thing, from an occult force of appetite, to which corresponds a similar but incomprehensible motion in the body, agreeably to occult laws, and to a harmony occult to us: consequence love is an instinct, whose effect we experience, but of the subordination of its causes from first to last, we are ignorant. The further question may be put, what are the causes that it actually exists from, and what the means by which it is derived into the body, and passes into effect? It will probably be answered, by material ideas, to which correspond sensual ideas, and which depend on the impressions made by sensible objects on the sensory organs; and that thus arise motions that correspond to the appetitions of the soul, and to the motions of the nervous fluid circulating in the motory nerves; but apart from any real dependence of the appetitions in the soul upon the

motions in the body, except that the two harmonically correspond to each other. Still this other question arises, where does this instinct come from, to pass from perception into appetition, and so forth. The reply is, that by the proper and occult force of the soul, it comes into perception; from perception by occult ways and means into appetition; from appetition by an occult law into volition, which may comprehend occult series whereby it is produced; and therefore that to this volition, by an occult and preëstablished harmony, correspond occult series of motions in the body; motions which are incomprehensible, and arise, according to the occult nature of the body and the soul, from the occult forces of the body. Thus whithersoever we direct our steps, we are brought to a stop in algebraic words and symbols, which have no meaning, because they are the marks of occult quality, and which no wise man can heed. For what are force, ratio, law, series, or harmony of motion, without the knowledge of quality, but hollow sounds, of which we must gain the signification elsewhere from qualities of the same denomination: but whether and how they are suitable here, cannot be very evident, since the forces, motions, laws and series in the body are incomprehensible. And still more incomprehensible must be those similar series, &c., that harmoniously correspond to the former, and exist in the soul, in a force representative of the universe, and impenetrable to the understanding; since this force is the property of the soul independently of all extrinsic means, and the soul has these qualities supernaturally impressed upon it, inasmuch as it is a pure substance, made out of nothing.

But as all the above responses of the oracle involve an immediate refuge in systematic ignorance, it is impossible to ascertain either the point, importance, merit, or trustworthiness of the principles, or to know whether thousands of the like might not be raised up, by giving the soul room and opportunity to indulge its powers of fiction, on the delectable materials of its own ideas. And if faith and authority attach themselves to matters that are, and are to remain, unknown, such matters are straightway accepted as prophecies, oracles, and Sybil's leaves, and often exercise greater sway than plain proofs and facts, simply because no one has power or boldness

enough to dispute them. For if the mind be not furnished with any power of reasoning by the series and connexion of causes, or with any great amount of rational philosophy, these principles of ignorance lead it into sure captivity. In this state of things it would be vain to hope to see a rational psychology publicly established, or to attempt to bring out causes that lie hidden in the bosom of nature, from the numerous data and really exquisite experiments which the scientific world possesses at the present hour.

What would the ancients feel, could they rise from their graves, and revisit the learned world, when they heard that they had lost their cause, and that the moderns had pronounced in favor of a preëstablished harmony; in favor of substance attaching to nothingness; of force implanted and independent, and nevertheless coöperant; of the existence of qualities really similar to geometrical qualities in non-extended things; in favor of fictitious infinities in non-immaterials; of an empty universe, with bodies floating in it geometrically and mechanically by their own and implanted laws; in favor of the necessary occultness of the whole sphere of invisibles? Would not their anger be kindled against our schools, and would they not demand of us, by the laws of nature and reason, why we have thrown away their monads, to substitute a number of equally occult things.

They must indeed wonder, could they reappear upon the scene, or live over again in our times, that our age should be notable in great attempts, so remarkable for facts, that it can boast that the measures and modes of nature are all ascertained, and that nature herself, with her mysteries and secrets, is wholly in possession of the learned world; and yet that beyond her face and clothing nothing is known, but she lies in the bosom of her causes, more deeply out of sight than when she quite hid her countenance from an inexperienced age.

Meanwhile it must be confessed, that our contemporaries have spared no means, and omitted no opportunity, to elicit the forces and causes of nature by actual experiment from the world and from phenomena; also that the way of experiment exclusively has been chosen, precisely that in these respects we may exceed the desert of the ancients. The ancients indeed came to a stand-

still at the very threshold of the heavens ; but modern astronomers, with their feet upon the earth, have surveyed with curious gaze the inner chambers of the sky ; with telescopic vision have penetrated the secrets of the moon and the wandering stars, and recognized the valleys and mountains diversifying their surfaces with light and shade ; also have visited the satellites and moons of the planets, and numbered the spots on the sun ; and lastly by the exercise of the understanding, have traced in clear thought the diurnal rotation of the earth upon its axis, and its annual revolution round the sun ; and have discovered that the sun himself is stationary, contrary to the apparent shewing of experience, and to the opinion of the vulgar, who still assert the daily revolution round the earth of the whole starry heavens, as reposing on the credibility and dictate of the senses. Thus at the present day, as the poet sings, all the gates of heaven's golden halls are opened :

Reseratis aurea valvis atria tota patent :

and we are at home in that Olympus in which, to continue the comparison, the ancients were but strangers and sojourners. In this respect,—in the search and evolution of this deeper order of the mundane system,—how vast have been the services of our contemporaries,—of Copernicus, Kepler, Galileo, Tycho Brahe, De la Hire, Flamsted, Hevelius, and many more, all deserving to be raised to their own province of the skies with threefold honors and commendations, and as they have eclipsed the achievements, so to make dim the praise and outwear the renown of the ancients. And had these enquirers preceded the days of old astronomy, then had the ancients themselves sacrificed to their shades, and paid them the honors due from whoever was their posterity. Or note again the preëminence to which the talent of the present age has advanced the science of *geometry* and analysis—of geometry with its measures and analysis with its ratios ; observe how nearly it has reached that pinnacle beyond which it can scarcely hope to rise : and how from that loftiest elevation it looks down with comprehensive thought on the far-stretching plains and countries at its feet, and above all on those three mighty and most ample kingdoms, the mineral, the vegetable, and the animal, which it longs to

visit, and to exercise its art and science in their fields. Nay, to geometry no object is more priceless or desired, than the permission to be present in the secret councils of the queen and empress of those kingdoms, no other than nature herself, ever true to her own principles, of measure and harmonious modulation. For to the geometrical art and mind it belongs, to find the true result of proportions, numbers and symbols, and to bring forces and laws themselves to the bar of calculation;—to that calculus which it ever has ready to apply; and by means of which, as the poet says, it can split the least of coins, through a long series of ratios, into a hundred parts. If Archimedes, the unquestioned prince of Greek mathematicians, and the boast of his age and country; if Euclid, the most eminent geometer for many ages in the fertility of his resources and the keenness of his judgment, and who owed his greatness to his own unborrowed powers, and founded so illustrious a lineage of disciples; if these great men were now alive, with what earnest affection and delight would they regard the present century, and the geometers of this favored period; especially Leibnitz, crowned with the wreath of fame by his own compatriots; and Newton, towering above his countrymen, and conspicuous with the badges and reward of acknowledged and triumphant genius; also the brothers Bernouilli, and other successful mathematicians, who have either built up the analysis of infinites or fluxions, or have applied it with admirable skill to the art handed down from Euclid and Archimedes; thereby constituting a science of which the ancients afforded only a mere foretaste and slender fruits. In geometry, then, the ancient equally with the modern world deserves our praise; aye! and the one as well as the other aims to eternize the written labors of its chosen sons by its own peculiar memorials. It would occupy many pages were we to specify all the arts and sciences that our age has advanced to almost a prerogative degree of excellence; whether we regard those branches of knowledge which we have resuscitated and improved from the remains of ancient learning, or those conceived by modern genius, and brought into clear light by the modern understanding. But among the most memorable of these acquisitions we may mention those inventions of optics, which have taught us in this

late age to sharpen our vision, till now we can penetrate to forms and images that lie hidden in a world purer than our eyesight can attain ; and have given us a more discriminating light than hitherto for exploring the minimal fields of nature ; in short, have made objects nearer and more present to us, and diminished the impediments of space. Thus we can now make lenses and glasses, and duly polish them ; we can construct microscopes and telescopes, whereby the eye can bend its keen vision upon the minutest animalcules, and fixedly contemplate them ; although such animalcules were formerly less than the simplest ray of that organ ; and so by these appliances, there are innumerable things in the light of our day which entered into nothing but darkness with the ancients. And now we can measure with scientific glance in different parts of the vortex of our sky, the bodies that wander around the sun, and prove to be earths like our own ; as well as the moons, in ancient times unseen, which accompany them in their course. But to detail all our riches in this kind would exceed my space. Suffice it to say, that the preëminence of our age in these respects, is due not only to the English, but to the French, Germans and Italians, all which nations have given birth to great inventors and improvers of the methods of art and science, who are too firmly seated in their high position to need any praise of mine. Our contemporaries moreover have vindicated rational philosophy from its long grovelling among the trivial questions and learned dust of the schools, and have brought it forth on a new ground, to enjoy better opportunities and nobler objects. As the laurelled victor in this achievement we must mention the name of CHRISTIAN WOLFF, the greatest philosopher of our epoch, who disdaining the empty honors and fame that are gathered behind the shield of some illustrious leader, disdaining to wear the mere skin of the lion, has won his success with his own arm, and defends it by his own original prowess.

It now remains for us to close with nature where she lies hidden in her invisible and purer world, and no longer barely to celebrate her mystic rites, but to invite her in person to our chamber ; to lay aside the few draperies that remain, and give all her beauty to our gaze. Rational philosophy has already given us precise information respecting her forces, causes, modes,

reasons, laws, series, connexions, and so forth. *Geometry* with *analysis* has enabled us to contemplate her numbers, measures, degrees, moments, figures and dimensions. *Optics* has instructed us of her form, countenance and apparelling within the sphere of those rays that are less than the organism of our sight. *Physics, chemistry, and experimental psychology* have delivered her motions, actions and effects, as well in the elemental world of the atmospheres, as in the three kingdoms of the same world. It is now beyond her power to avoid the acumen of the learned, or to hide herself any longer in occult qualities, and suddenly to elude us. Almost her last garment is put aside, her last veil deposited; and she now demands of the present century some man of genius—his mind developed and corrected by experience, prepared by scientific and other culture, and possessing in an eminent degree the faculty of investigating causes, of reasoning connectedly, and of concluding definitely on the principles of series;—and when such an one comes, to him, I doubt not, she will betroth herself; and in favor of him will yield to the arrows of love, will own his alliance and partake his bed. Oh! that it were my happy office, to fling nuts to the crowd and head the torch-bearers on her marriage day!

§ 3.

The mind does not receive it for certain that the soul is a purely simple substance, unless it knows precisely what kind of simple substance. Having banished the atoms of the ancient philosophers from the stage of the learned world, (in fact, these atoms have died of mere old age, or only survive in the historical records of philosophy,) the moderns have adopted instead a theory of monads and simples as the primordial substances of the world. So fashionable has this become, that we hear of nothing from the pulpit and the professorial chair but mere simples, which are received with unanimous delight by applauding audiences. But were I to add my voice to the throng, I scarcely think that I should swell the estimation in which these favored entities are held; at any rate, so long as I am in igno-

rance of their nature and qualities, I should but contribute with the rest another element to a senseless sound.

And we are indeed confounded with the variety of monads and simples, of which a number is fabricated equal to meet the case of all the essences and substances purer than the organism of our senses. As soon as ever we are required to pass from the effect to the cause, we at once beat a retreat to the asylum of simple substances; and there we concentrate nearly all the qualities that we can possibly recognize in the effect. Rational souls are held to be simple substances, but in order that their peculiar attributes, essentials and qualities may be admitted, the simplists affirm that these substances are gifted with understanding and will. The souls of brutes are also regarded as simple substances, involving indeed an analogue of reason, but destitute of understanding and free will. Spirits also, no matter how numerous or how diverse, are all referred to the class of simple substances. The elements of the mundane system, and the primordial substances of the first creation, are also pronounced to be simple substances, to which the philosophers attach their peculiar attributes and essentials, which must continue the same while modes vary in succession; consequently they are regarded as persistent and capable of modification, or the subjects of intrinsic determinations, constant and variable. In a word, wherever series of things are observed in the world, there do these philosophers come before us with their simple substances, in which, as the principles of the former, we are desired to conceive an analogue of similar series. To every such substance in general and in particular they attribute efforts, forces, determinations, laws, series; or what amounts to the same thing, a certain proportional or analogue of the said qualities; with other predicates, which we must conceive and represent to ourselves abstractedly, purely, analytically, by the bare faculty of understanding and imagination. They assert that all entities and substances of the kind are begotten and produced from the same origin; viz., all from nothing; and nevertheless that there are affections in them, which affections are not of nothing, but suitable qualities of every essence whatever. Moreover, in these simples there are no parts, hence no limits separating parts, but within them all is pure, mere

essences with their proper forces, efforts and determinations, which nevertheless again are limited and finite, because natural, and subject to the restraint of their own distinctive laws: they are indivisible into points or parts, because intrinsically devoid of points or parts; but if divided, they would relapse into their pristine nothingness; furthermore, they are destitute of the degrees or quantities of quality, as well as of moments; or of dimension, measure, &c. * * * * *

[Here thirty-two pages of the MS. are wanting.]

* * * * * most averse to the truth; and this is the reason why rational philosophy is so often the source of errors, and why its most celebrated cultivators stray more widely from the right path than those who place their ultimate causes in mere causates. When reason abides in causes, at so great a remove from effects, it frequently inculcates upon the soul, with a power amounting to command, a belief in certain effects or consequences equal to the belief in the causes: as is the wont with systems of all kinds. But this by the way.

Meanwhile, in prosecuting the physiological argument we have no right at the very outset restlessly to enquire into the substance of the soul, with its proper forces and laws, that is to say, into the causes of effects, and at once to prophecy that the soul is generated immediately out of nothing, and is simpler than aught in nature; and thereupon to reason to the effects by a neat apparatus of consequences. To arrive in this wise at the truth of consequences would indeed suppose nothing short of a

divine understanding. Once possessed of this, the dark seeress, mindless of her tortuous riddles, shall utter the sayings of the time to come with prophetic certainty. But dismissing recon-dite principles, let us confine ourselves to enquiring, whether we are to regard the soul as in the world, or within the circle of nature, contrary to the opinion of our contemporaries, and to some of the lights of modern philosophy, who turn the soul out of the world, and give forth that it would be all the same if there were no world and no nature in existence. As soon as we have established that the soul is within the circle of nature, or belongs as an entity to the purest sphere of the sky, we may then proceed under the direction of philosophy to enquire into the nature of its motive causes, powers, laws, series and substances ; likewise into the connexion, relationship, and familiar bond that it establishes between itself and the organs of inferior rank, namely, the series constituting its body, and which it has evidently taken into the most close amity and kindredship. That the soul has the sceptre, and occupies the imperial throne, of the microcosm, she herself declares to us ; likewise that she orders the fortunes and provides for the welfare of her body ; and that her influence is paramount in works and actions, whether coming from the will, or whether derived from instinct without any appearance of an antecedent exercise of choice.

Now that the soul is really in the world, and within the circle of nature, is plain from the fact that the soul is in the bodily microcosm. But those who class it among the entities of no world, and would drive it, if they could, not only out of the world but out of its own kingdom,—they, we repeat, have the soul nowhere. Again, that *the soul is enclosed in the walls and limits of its kingdom in the body*, is manifest from this, that from the very earliest moment of embryonic formation, it begins to preside over the diminutive frame, and takes into its own hands the power over all parts and over all relations, in the womb, in the cradle, in the germ of foetal existence, in the dawn of tenderest infancy. Without an instant's delay it assumes the helm, and sits in the steersman's place, and by the guiding needle of its own nature shapes the whole course of the advancing vessel. Aye ! no sooner does its activity begin, than

with the first thread that is woven, it publicly constitutes itself the cause, the prince, the arbiter, and forms its own order of government, and guards as its own with watchful care the effects in the body; in the first instance those that come by nature, and afterwards as the state increases and the body grows up, it brings the affections of the body within the sphere of its reason. That the soul does attend to the affairs of the microcosm, and does promote its welfare,—this we know by our very senses, which borrow from it as the real agent and doer, that is to say, from its desires and decisions, the principle and the power of all their modes or mutations. Thus our consciousness of effects proclaims, that the soul is appointed over the body, and associated with the body; in other words, is enclosed in the brains, and engirded or enveloped by the skull. That it is the close companion of its body, and follows the traveller from place to place even to the ends of the earth—*si vel Indos petas vel Bactros*—that it sails with the navigator from every port, in all his voyages over the trackless ocean, nor ever deserts its peculiar kingdom and native country; this may be concluded abundantly from every effect, action, sense, desire, and from the power, determination and manner of its will. Wheresoever thou art, there thy soul is with thee, entering into all thy works. Thy soul is conscious of all thy movements. Thy soul is not another's, but distinctly thine. Whatever is thine is thy soul's also. Whatever is thy soul's, is thy body's, and thine. Whatever is predicated of thee, is predicated of one unanimous subject, or conjointly of the soul and the body. The cause and the causate, the efficient and the effect, endeavor and motion, will and action, the first term of the series and the last—all stand for one cause. The whole microcosm is one series, although it consists of numberless connected parts, all different, but all unanimous. Such being the closeness of connexion, therefore all the parts breathe a common purpose, and live together in series and combination; every part being sentient, for not a membrane, so long as it is connected with the system, can be touched without sensation. If the general weal suffer any violence or convulsion, or if any part fall into incompetency or decay, the soul feels the evil at once with deep grief and pain, and lends all the succour that it possibly can, to save the for-

tunes of the endangered and falling republic in whose councils it sways. In a word, so great and binding is their friendship, that so long as the soul and the body live, there is no possession belonging to the parts but belongs to the whole. That soul then that thou carriest with thee whithersoever thou goest, is enclosed in space and in its own world; yet still abides in the highest place, in its own senatorial hall. The corollary is, that the body lives in dependence on its soul, and the soul in dependence on its body; also that the soul is no purely simple substance; no imaginary being, of which neither place, nor connexion in any sense, nor extension can be predicated; and it also follows that the existence of the world and the body are *not* indifferent to the soul.*

That the soul is within the circle of nature, and is in the world, and in the human body, and therefore in place or space,† is rendered additionally evident from the consideration, that the soul cannot be released from the ties of its body, by anything short of the utter death of the latter, which alone is sufficient to break the chain and detach the strong connexion. As soon as the day arrives which is fatal to the body, the soul eludes the chains and flies out of the prison of its habitation; and then straightway the nerves and the tendons and ligaments drop down flaccid; the membranes and the cords which gave tone to the system lie loose and purposeless; the powers of the muscles evaporate; all warmth and continuity of tension disappear out of the blood; then too all sensations, which are common to the soul with the body, perish, and the very organs of the senses are yielded a prey to death. Only at this moment it is, when

* Contrary to the doctrine of Leibnitz, and in later times to that of Berkeley, that sensation, perception, and in general, the mental faculties, might be enjoyed, without the presence of an external world, or a material body.—(Tr.)

† In asserting that the soul is in nature and in place, Swedenborg implies that it is a part of *creation*—of the finite sphere: he does not mean to deny that it is a part of the spiritual world, but that world, at this period of his life, he regarded as within the circle of nature; *i.e.*, *finite creation*. Nor is he peculiar in this; for before the spiritual world was revealed experimentally, it may be doubted whether the conception existed of a universe altogether beyond nature, yet finitely substantial, and totally external, as that world is, to the human mind and soul. But his argument for the non-simplicity and the intelligible reality of the soul, is not impaired by this necessary shortcoming in his experience.—(Tr.)

these ties are annulled, that the soul is freed from the prison-house, and retires out of her kingdom. This is a sign, that the soul is inherently tied to its body, and enclosed in the membranous cells and compartments of the latter;* which could not be were it a simple substance, for in this case its incarceration would seem to be impossible; and less still could it keep its place in the brain so long as ever it was not stripped of the membranous ties of its body. Therefore the soul awaits the fate of the series that are placed under it to serve it, and when these lose their natural harmony, the body then undergoes the last struggle, it gasps, fails, and gives up the breath of life.

So when the body has performed its part upon the scene, and the soul has lost the use of the sensations common to itself with the body and its organs, then the soul takes its flight and emigrates from its palace. By no means, however, is it therefore exiled beyond all worlds, or consigned to any place or position either above or below nature; but only entering upon a freer field of existence, it expatiates in the fulfilment of its own nature over the immensity of heaven, and rises higher into the celestial aura, the more purely and holily it has lived in its microcosm, and the more finely it has there been moulded into correspondence with the genuine state of the causes of heaven and the principles of its own particular essence. And still impressed most purely upon its simplest modifiable substances as causes, there remains in it the effigy of the body with its motions and effects, just as the figure of a tree with all its details is involved in the seed. Also at this time whatever actions

* It must not be supposed that Swedenborg ever modified *this* doctrine in his theological works. On the contrary, he there states it with additional particulars, and gives it an experimental basis. See especially the *Arcana Cœlestia*, vol. i., n. 179, where in describing (from personal experience) the resuscitation of man from the dead, he dwells at some length upon this *enclosure of the soul*, as being so real and complete, that without a special divine attraction, resurrection would be impossible. If that materialism is frightful which gives us nothing but body for a soul, at least equally frightful is that immaterialism, which asserts a soul with no predicates that can bring it under the conditions of human knowledge and experience: which refunds all things into phenomena or states of an occult entity termed *mind*. But the time has come when the fearless acceptance of experience and common sense as the only basis of induction, must uproot from philosophy its *idola theatri*, its materialism and immaterialism, with other poor but pretentious sectarian creations.—(Tr.)

through the instrumentality of the body have by long usage become habitual or instinctive, are still represented to the life in the separated soul. If therefore the soul be formed in the body, under the gracious providence of God, by the practice of virtue, into a correspondence with the principles of morality in conjunction with religious faith; that is to say, into a correspondence with the supremely constant causes and the original and only truths of heaven, of which the soul in its higher integrity is the adequate recipient; and if the process have been maintained until it has become a habit and almost an instinct, to will and desire nothing but what is in accordance with those genuine and purest causes; then is the soul a true and most fitting subject, organ and instrument of the almost instantaneous and highly harmonic modes of heaven. And thus heaven, which is perpetually receiving life from similar souls, creates by its thorough accordance with them ineffable joys and delights; joys with which those of this gross world admit of no comparison; so slow, impure, mixed, and often so discordant, is the music of our lower sphere. But of this more in another place.

It follows from what we have laid down, that the soul is in the world, and by the intervention of nature, is in connexion with the body, and in harmony with its own purest world, namely, heaven; in fact that it is finite, and within the limits of nature,* attached on the one hand to the bodily microcosm, contiguous, on the other, with heaven, and dependent upon the aura of heaven: consequently it is a substance belonging to both the purer and the grosser world; and meant to be conformed by means of the grosser world, while it lives in society with its body, to the state of the purer world. Thus the soul has a place, a time, an origin; also a power and a force of passion and of action.

We are deceived and mocked by our senses and the imperfect sphere in which they live, and our senses by their peculiar atmospheres, which are so remote from the purest atmospheres, that scarcely any comparison can be instituted between the two save by very high proportions and analogies. What is the unit or minimum in the external senses, may be the aggregate, pro-

* If by nature the reader here understands *creation*, he will fall into no error.
—(Tr.)

duct or maximum in the purer senses and auras. The series of the grosser senses may commence where the series of the purer senses terminate; and the sensation of sight may begin where the soul's sensation ceases. The smallest degrees and moments proper to the organism of sight or hearing, may serve for the greatest in the soul. That is to say, within the minutest moment* of sight or hearing, thousands or myriads of corresponding moments may be formed in the purest organ, of which moments we do not become conscious unless the modifications have products adequate to the modes of the grosser senses, whose moments and times can be observed; all the rest escape our view, as being devoid of time, moments and degrees. We are conscious only of effects composed of an infinity of least effects, and of series existing from manifold causes, or from causes subordinated one to another through many series. And when we are not made conscious of the causes, then we think that they have in them no degrees, or moments, or laws, succession, or series. For this reason it is that we fly to substances defined of nothing,† which substances cannot be anything, because nothing and something are mutually contradictory; or in the words of Christian Wolff, the most illustrious philosopher of our age: "If you set down nothing as a position, you may do so as often as you please, and still it will be nothing, not something." He also says: "The knowledge of empty terms is no knowledge at all; and where nothing cheats us under the guise of a cause, there is no understanding of the reason of anything." And again: "If nothing is assumed, we are not therefore to admit that it is something. If something be assumed to exist, something must also be assumed to enable us to understand why the first something should rather be than not be. Nothing has no sufficient reason why it should be rather than not be." (*Ontologia*, § 61, 64, 70.)

* A *moment* is literally a movement, or any distinct part of a measured series of things; thus in an hour the sixty proximate divisions are termed moments; and any particular detail of a given thing, is a moment of that thing.—(*Tr.*)

† It is remarkable that in our own time more than one system has arisen that has professedly taken *the nothing* for its starting point. There is some candour in this, which of right ought to have been done long ago by many philosophies. Hegel, however, asserts that *nothing* and *being* are identical. Well does Christian Wolff say: "*Nihilum mentitur causam.*"—(*Tr.*)

Meanwhile we can have no better proofs than those supplied by anatomy, to shew that the soul is given and annexed to its body, and is conterminous to the bodily series.* If we elevate the sensation of sight by the microscope, and enlighten the perceptions of the soul with the sciences, we shall plainly see that there is nothing in the body but has a continuous and contiguous connexion; a continuous connexion by membranes of different kinds; a contiguous connexion by the manifold liquids and fluids of the system: and that the one plays the part of agent, efficient and modifier, that is, of principle and cause; the other, the part of patient, effect, principiate or causate. To shew that *nearly all things in the animal body are membranaceous and in this way continuous*, let us begin from the primordial ovum. Now in the female the first ova are enveloped in most pure tunics and matres† of their own; and the testicles as well as the ovaries are constructed by the orderly juxtaposition of membranes. And when the ova are quickened, and the imprisoned embryo is expanded with all the power and form of its father, then the enlarging and thickening tunics become obvious to sight and touch. In this event the embryo is surrounded with the amnion and chorion, and its head with the placenta, whether one or several, and in the case of brute animals, with the farciminal or allantoid membrane also; to say nothing of the twisted umbilical cord. Now these are all mere tunics originating from the ovum, and which are exquisitely tender at first, but gradually thicken and indeed harden as they advance; and they run through these stages in order that the quick elements and atmospheres may form them nicely on the model of their own series, according to the laws of their several pressures, actions and modifications. We need

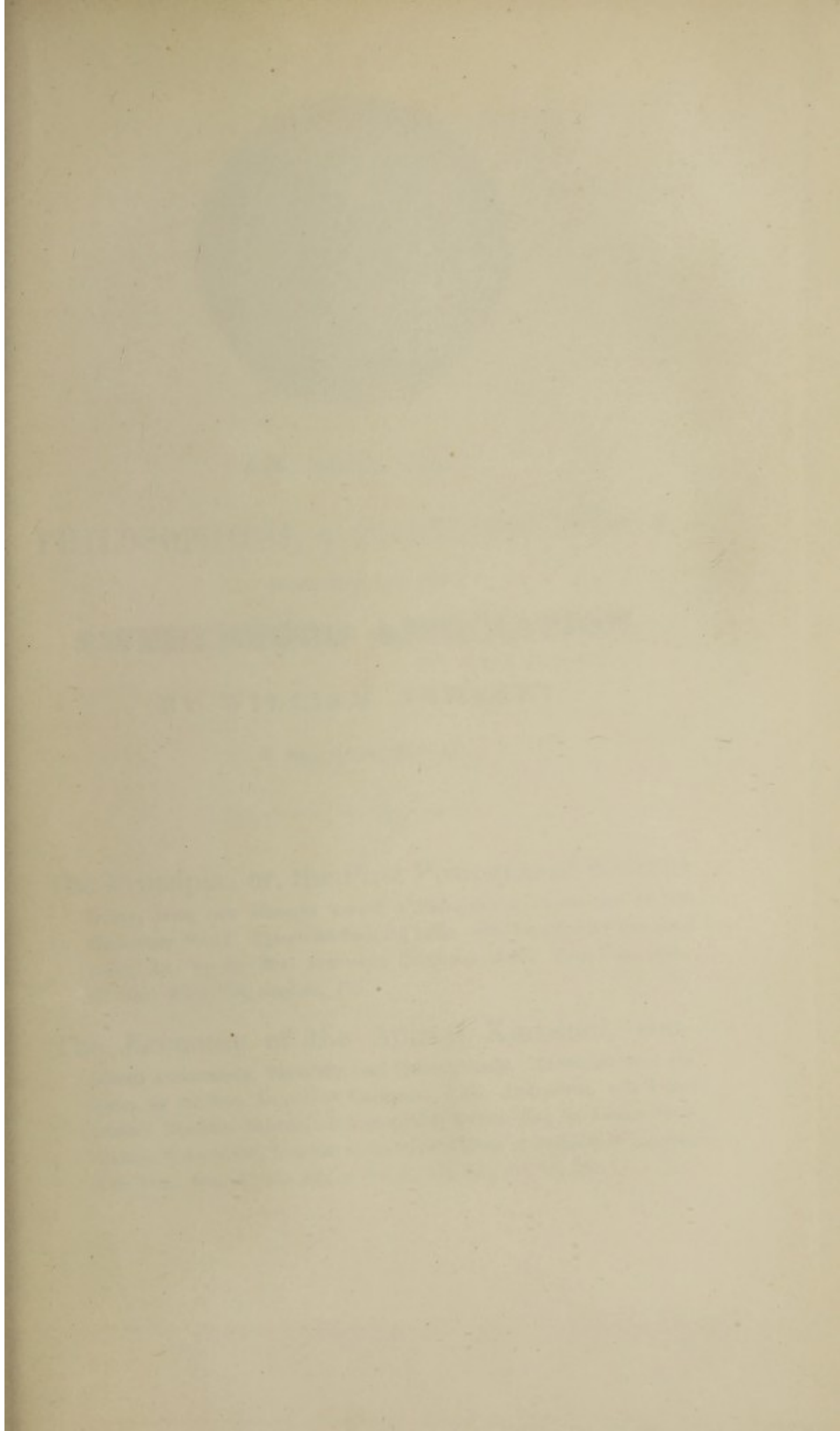
* The reader will find the argument on this subject finely handled by Swedenborg in his *Outlines of a Philosophical Argument on the Infinite, and the Final Cause of Creation, &c.*, where nearly the whole of the second Chapter is devoted to the question.—(Tr.)

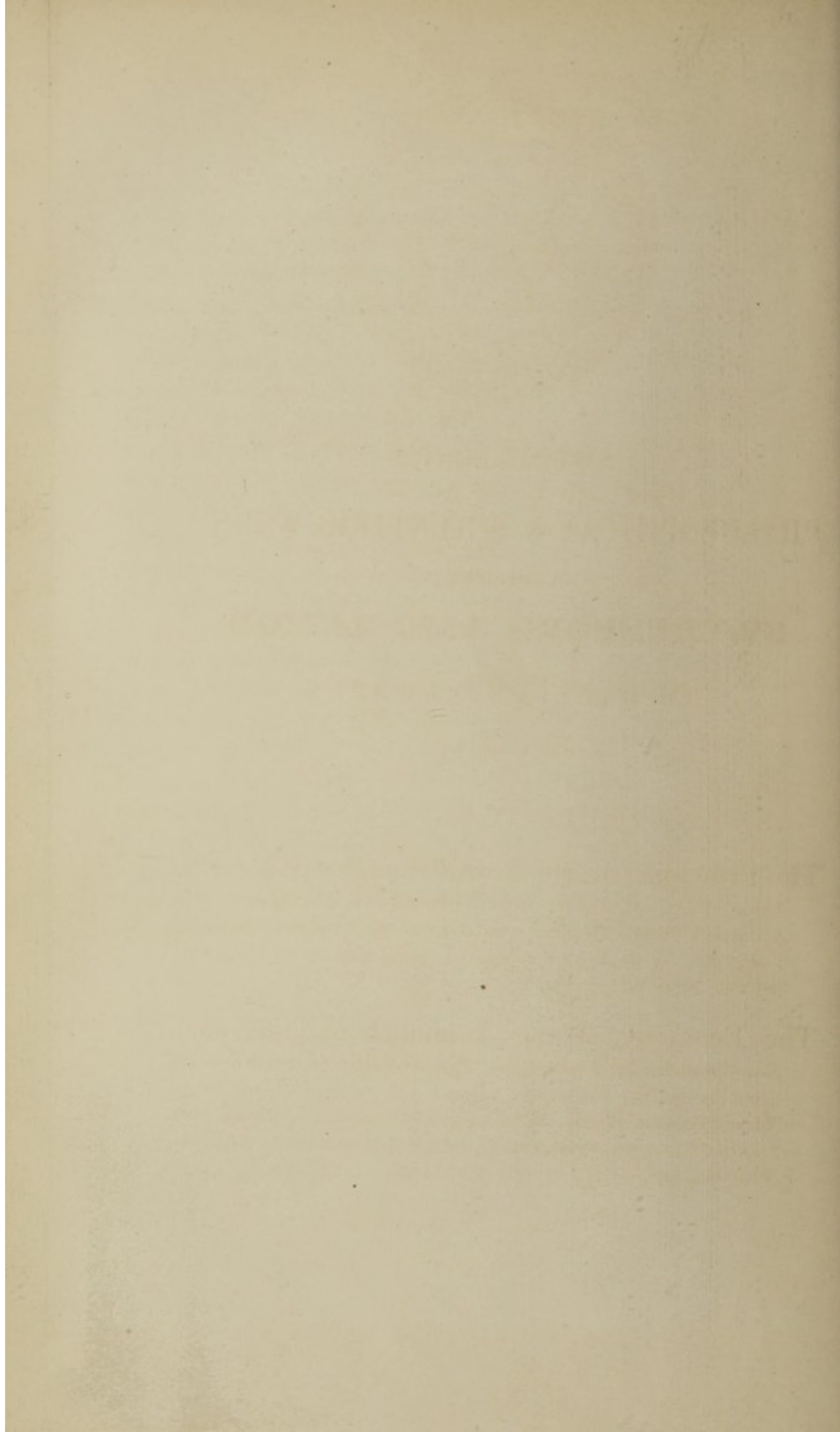
† The word *matres* is here used for membranes. In the organic views of Swedenborg, the membranes, and preëminently the skin, which is the *general* and the fulcrum of all the membranes, by their involution constitute the solids of the system; the animal spirit, the *universal* corresponding to the general, constitutes the fluids of the same. Thus the word *matres* suggests the *matter-giving* function of the skin and the membranes.—(Tr.)

hardly allude to hydatids, which again are skins and bullæ containing serum. In every direction in the series of the body there are scattered glands, which excrete and pour forth liquids, and sharpen and rectify the same, to fit them for adoption into their proper places, and for supplying defects, when the parts in the series, wherever situated, require renewal. The glands are spheroidal forms, enclosed in particular membranes; each being a conglomerate of other smaller and simpler glands, all surrounded by a web and network of membranes, and forming clusters or groups of which the larger gland appears to be made up. Such, for instance, is the case with the pituitary gland in the sella equina, which is enveloped and suspended by the dura mater, attenuated however until it almost looks like the pia mater. But not to specify the several glands, we need only remark, that the purpose of them all is, to secrete menstria suitable for renovating the several parts of the body, or to filter juices, that will readily and naturally enter into and distend the membranes; and that therefore there are various orders of glands, mucilaginous, lymphatic, salivary, ceruminous, sebaceous, lacrymal, &c., &c., differing in color, shape and use, on account of the very different duties they perform. But respecting the glands we refer the reader to special anatomical treatises on the subject. The substance of the fat secreted from the blood and other liquids, consists entirely of conglobate portions, and each of these, of membranous cells and loculi. So also the marrow of the bones, and its individual parts, which are more minute than those of the common fat. To say nothing of the vessels, vesicles, and different follicles. The muscles consist of fleshy fibres * * * * *

[The rest of the MS. is lost].

END OF THE POSTHUMOUS TRACTS.







SWEDENBORG'S
PHILOSOPHICAL & SCIENTIFIC WORKS,
PUBLISHED FOR THE
SWEDENBORG ASSOCIATION,

BY WILLIAM NEWBERRY,

6, King Street, Holborn.

The Principia; or, the First Principles of Natural
Things; being new attempts toward a Philosophical Explanation of the
Elementary World. Translated from the Latin, with Introductory Remarks,
Index, &c., by the Rev. AUGUSTUS CLISSOLD, A.M. Two Vols., 8vo.,
£1 10s.: either Vol. separate, 15s.

The Economy of the Animal Kingdom, con-
sidered Anatomically, Physically, and Philosophically. Translated from the
Latin, by the Rev. AUGUSTUS CLISSOLD, A.M. And edited, with Intro-
ductory Remarks, Indexes, Bibliographical Notices, &c., by JAMES JOHN
GARTH WILKINSON, Member of the Royal College of Surgeons of London.
Two Vols., 8vo., £1 11s. 6d; or Vol. I., 16s. 6d., Vol. II., 15s.

The Animal Kingdom, considered Anatomically,
Physically, and Philosophically. Translated from the Latin, with Introductory Remarks, Indexes, Bibliographical Notices, &c., by JAMES JOHN GARTH WILKINSON. Two Vols., 8vo.

(This Work is not published by the Association, but Mr. Newbery has a few copies on sale.)

Outlines of a Philosophical Argument on the
Infinite, and the Final Cause of Creation; and on the Intercourse between the Soul and the Body. Translated from the Latin, with Introductory Remarks and Index, by J. J. G. WILKINSON. One Vol., 8vo., 6s.

Some Specimens of a Work on the Principles of
Chemistry, with other Treatises. Translated from the Latin, with Introductory Remarks, Bibliographical Notices, Index, &c., by CHARLES EDWARD STRUTT, Member of the Royal College of Surgeons of Edinburgh. And Dedicated, by permission, to the Baron Berzelius, perpetual Secretary to the Royal Academy of Sciences of Stockholm. One Vol., 8vo., 21 Plates, comprising 159 Figures, 12s.

This Work contains also New Observations and Discoveries respecting Iron and Fire, and particularly respecting the Elemental Nature of Fire: together with a new construction of Stoves. And a New Method of Finding the Longitude of Places, on Land or at Sea, by Lunar Observations.

Miscellaneous Observations connected with the
Physical Sciences. With an Appendix, containing Swedenborg's Papers from the *Acta Literaria Sveciæ*. Translated from the Latin, with Introductory Remarks, Biographical Notices, and Index of Subjects, by CHARLES E. STRUTT. One Vol., 8vo., 9 Plates, comprising 86 Figures, 7s. 6d.

Posthumous Tracts. Translated from the Latin
by JAMES JOHN GARTH WILKINSON. In Three Numbers, each 1s. 6d. sewed, or One Vol., cloth boards, 8vo., 5s.

This Work is a Translation of the Opuscula mentioned below.

A Hieroglyphic Key to Natural and Spiritual
Mysteries by way of Representations and Correspondences. Translated from the Latin, by JAMES JOHN GARTH WILKINSON. Sewed, 2s.

Œconomia Regni Animalis in Transactiones

Divisa, Quarum hæc Tertia de Fibra, de Tunica Arachnoidea, et de Morbis Fibrarum agit: anatomice, physice et philosophice perlustrata. E chirographo in Bibliotheca Regiæ Academiæ Holmiensis asservato, nunc primum edidit JAC. JO. GARTH WILKINSON, Reg. Coll. Chirurg. Lond. Memb. One Vol., 8vo., 10s.

Opuscula Quædam Argumenti Philosophici. Ex

Autographo in Bibliotheca Regiæ Academiæ Holmiensis asservato, nunc primum edidit JAC. JO. GARTH WILKINSON, Reg. Coll. Chirurg. Lond. Memb. One Vol., 8vo., 5s.

Regnum Animale Anatomice, Physice, et Philo-

sophice perlustratum cujus PARS QUARTA DE CAROTIDIBUS, DE SENSU OLFRACTUS, AUDITUS ET VISUS, DE SENSATIONE ET AFFECTIONE IN GENERE, AC DE INTELLECTU ET EJUS OPERATIONE AGIT. E Chirographo in Bibliotheca Regiæ Academiæ Holmiensis asservato, nunc primum edidit Dr. J. F. E. TAFEL, Philosophiæ Professor et Regiæ Bibliothecæ Universitatis Tubingensis Profectus. One Vol., 8vo., 10s.

Regnum Animale Anatomice, Physice, et Philo-

sophice perlustratum cujus supplementum sive PARTIS SEPTIMÆ SECTIO PRIMA de PERIOSTEO et de MAMMIS, et SECTIO SECUNDA DE GENERATIONE, &c., agit. E Chirographo in Bibliotheca Regiæ Academiæ Holmiensis asservato, nunc primum edidit Dr. J. F. E. TAFEL. Philosophiæ Professor et Regiæ Bibliothecæ Universitatis Tubingensis Profectus. One Vol., 8vo., 10s.

Regnum Animale Anatomice, Physice, et Philo-

sophice perlustratum, cujus PARS SEPTIMA DE ANIMA agit. E Chirographo in Bibliotheca Regiæ Academiæ Holmiensis asservato, nunc primum edidit Dr. J. F. E. TAFEL. Philosophiæ Professor et Regiæ Bibliothecæ Universitatis Tubingensis Profectus. One Vol., 8vo., 10s.

Clavis Hieroglyphica Arcanorum Naturalium et

Spiritualium, per viam Repræsentationum et Correspondentiarum. Opus posthumum EMAN. SWEDENBORGII. 4to., cloth boards, 4s. 6d.

Ludus Heliconius, Sive Carmina Miscellanea,

quæ variis in locis cecinit EMAN. SWEDBERG [SWEDENBORG]. Recensuit Dr. J. F. E. TAFEL. Cloth boards, 2s. 6d.

Itinerarium, Ex operibus EMAN. SWEDENBORGII

posthumis. Partes I., II. Nunc primum edidit Dr. J. F. E. TAFEL. Cloth boards, 4s. 6d.

Camena Borea, Cum heroum et heroidum factis

ludens, sive FABELLÆ Ovidianis similes, &c. Ab EMAN. SWEDBERG [SWEDENBORG]. Edidit Dr. J. F. E. TAFEL. Cloth boards, 4s. 6d.

L. Annæi Senecæ et Pub. Syri Mimi, Forsan et

aliorum selectæ Sententiæ. Quas notis illustratas edidit EMANUEL SWEDBERG [SWEDENBORG]. Ad fidem rarissimæ editionis principis anni 1709 denuo publici juris fecit et Fragmenta nuper reperta adjecit Dr. J. F. E. TAFEL. Cloth boards, 2s. 6d.

Other Works from Manuscripts of the Author are in course of Publication.

Copies of the *Prospectus* and *Laws* of the SWEDENBORG ASSOCIATION may be had of W. NEWBERY, No. 6, King Street, Holborn, London, on the receipt of four Postage Stamps.

SWEDENBORG'S THEOLOGICAL WORKS.

*Books published by the Society for Printing and Publishing the Writings of the Hon.
Emanuel Swedenborg, Instituted in London in 1810.*

AND SOLD AT THEIR DEPOSITORY BY

WILLIAM NEWBERY,

No. 6, KING STREET, HOLBORN.

ENGLISH EDITIONS.

THE FOUR LEADING DOCTRINES OF THE NEW CHURCH.

Signified in Revelation xxi. by the New Jerusalem; being those respecting the LORD, His Divine and Human Natures, and the Divine Trinity; the SACRED SCRIPTURE; FAITH; and LIFE. With an Introductory Preface, and an Account of the Author.

Royal 8vo., 6s. 6d.; demy, 4s. 6d.; foolscap, 3s.

*Each of the above Doctrines may be had
separate, namely,*

THE DOCTRINE of THE NEW JERUSALEM RESPECTING THE LORD.

To which is added, Nine Questions on the Trinity, with their Answers.

Royal 8vo., 2s.; demy, 1s. 6d.

THE DOCTRINE of THE NEW JERUSALEM RESPECTING THE SACRED SCRIPTURE.

Royal 8vo., 2s.; demy, 1s.

THE DOCTRINE of THE NEW JERUSALEM RESPECTING FAITH.

Demy 8vo., 6d.

THE DOCTRINE OF LIFE FOR THE NEW JERUSALEM,

FROM THE COMMANDMENTS OF THE DECALOGUE.

Royal 8vo., 1s. 6d.; demy, 1s.

THE DOCTRINE of THE NEW JERUSALEM CONCERNING CHARITY.

Demy 8vo., 1s.

A BRIEF EXPOSITION OF THE DOC- TRINE OF THE NEW CHURCH,

Which is meant by the New Jerusalem in the Apocalypse.

Royal 8vo., 1s. 6d.; demy, 1s.

ON THE NEW JERUSALEM AND ITS HEAVENLY DOCTRINE,

As revealed from Heaven; to which are prefixed some Observations concerning the New Heaven and the New Earth.

Demy 8vo., 1s. 8d.

THE SAME WORK, without the Extracts from the Arcana Cœlestia.

Royal 8vo., 1s.

THE TRUE CHRISTIAN RELIGION; OR,

THE UNIVERSAL THEOLOGY of THE NEW CHURCH.

Foretold by the Lord in Daniel vii. 13, 14; and in the Apocalypse xxi. 1, 2. With INDEXES of Words, Names, Subjects, Passages of Scripture, and an INDEX to the Memorable Relations.

Demy 8vo., 10s. 6d.

*The Indexes COMPLETE, with Title, &c.
separate, 1s.*

THE CORONIS OR APPENDIX TO THE TRUE CHRISTIAN RELIGION.

Treating of the Four Churches on this Earth since the Creation of the World; with a brief Continuation. Demy 8vo., 1s.

ARCANA CŒLESTIA:

THE HEAVENLY ARCANA which are contained in the Holy Scriptures, or Word of the Lord, unfolded; beginning with the Book of Genesis: together with Wonderful Things seen in the World of Spirits and in the Heaven of Angels. With INDEX of Words, Names, Subjects, and Passages of Scripture.

Thirteen vols., demy 8vo., £3 18s.

The Index, or any other volume, separate, 6s.

THE APOCALYPSE REVEALED;

In which are disclosed the Arcana therein foretold; and which have hitherto remained concealed. With INDEX.

Two vols., royal 8vo., £1 1s; demy, 12s.

THE APOCALYPSE EXPLAINED

ACCORDING TO THE SPIRITUAL SENSE,

In which are revealed (more fully than in the preceding Work) the Arcana which are there predicted, and which have been hitherto deeply concealed. With INDEX.

Six vols., demy 8vo., £1 16s.

Any volume separate, 6s. The INDEX separate, 3s.

A SUMMARY EXPOSITION OF THE
INTERNAL SENSE

OF THE PROPHETIC BOOKS OF THE OLD TESTAMENT and of the PSALMS of DAVID. With a Twofold INDEX.

Demy 8vo., 1s. 6d.

ON THE WHITE HORSE.

Mentioned in the Apocalypse, chap. xix., with References to the Arcana Cœlestia on the subject of the Word, and its spiritual or Internal Sense. With an APPENDIX.

Demy 8vo., 6d.

ON THE DIVINE LOVE AND THE
DIVINE WISDOM.

(Extracted from the Apocalypse Explained.)

Demy 8vo., 1s.

ANGELIC WISDOM CONCERNING
THE DIVINE LOVE AND THE
DIVINE WISDOM.

Royal 8vo., 4s. 6d.; demy, 2s. 6d.; sewed, 2s.

ANGELIC WISDOM CONCERNING
THE DIVINE PROVIDENCE.

Royal 8vo. 6s.; demy, 4s.

THE DELIGHTS OF WISDOM CONCERNING
CONJUGIAL LOVE:

AFTER WHICH FOLLOW,

THE PLEASURES OF INSANITY CONCERNING
SCORTATORY LOVE.

Demy 8vo., 5s.

THE INTERCOURSE BETWEEN THE
SOUL AND THE BODY.

Which is supposed to take place either by Physical Influx, or by Spiritual Influx, or by Pre-established Harmony.

Demy 8vo., 6d.; foolscap, 4d.

CONCERNING HEAVEN AND ITS
WONDERS, and CONCERNING HELL,

Being a Relation of things heard and seen.

Demy 8vo., 4s., with HARTLEY'S PREFACE, 5s.

ON THE EARTHS IN OUR SOLAR
SYSTEM,

Which are called Planets; and on the EARTHS in the STARRY HEAVENS: with an account of their Inhabitants, and also of the Spirits and Angels there; from what has been heard and seen.

Demy 8vo., 1s.

AN ACCOUNT of the LAST JUDGMENT

AND THE

DESTRUCTION OF BABYLON;

Shewing that all the Predictions in the Apocalypse are at this day fulfilled; being a Relation of Things heard and seen. To which is added,

A CONTINUATION CONCERNING the LAST
JUDGMENT and the SPIRITUAL WORLD.

Demy 8vo., 1s.

FRENCH EDITIONS,

Of M. le Boys des Guays.

ARCANES CELESTES

De l'Ecriture Sainte ou Parole du Seigneur dévoilés,
ainsi que les merveilles qui ont été vues dans le
monde des esprits et dans le ciel des anges.

Tomes I., II., III., and IV., 8s. each.

L'APOCALYPSE

Dans son Sens Spirituel, d'après l'Apocalypse Ré-
vélée et l'Apocalypse Expliquée. 8s.

EXPOSITION SOMMAIRE

De la Doctrine de la Nouvelle Eglise qui est en-
tendue dans l'Apocalypse par la Nouvelle
Jérusalem. 3s.

EXPOSITION SOMMAIRE

Du Sens Interne des Livres Prophetiques de l'Ancien
Testament, et des Psaumes de David.

Avec un double Index des Matières. 3s.

DE LA PAROLE ET DE SA SAINTETE.

1s.

DU CHEVAL BLANC.

Dont il est parlé dans l'Apocalpse, chap. xix. 8d.

DOCTRINE DE LA NOUVELLE

Jérusalem sur le Seigneur. 2s.

DOCTRINE DE LA NOUVELLE

Jérusalem sur l'Ecriture Sainte. 3s.

DOCTRINE DE LA NOUVELLE

Jérusalem sur la Foi. 1s. 6d.

DOCTRINE DE VIE

Pour la Nouvelle Jérusalem, d'après les Préceptes
du Décalogue. 2s.

DOCTRINE DE LA CHARITE.

Œuvre Posthume. 1s. 6d.

DOCTRINE DE LA CHARITE,

Extraite des Arcanes Célestes. 2s.

DES BIENS DE LA CHARITE

Ou Bonnes Œuvres, et Explication du Decalogue.
2s.

DU DIVIN AMOUR

Et de la Divine Sagesse. 3s.

WELCH EDITION.

TRAETHAWD YNGHYLCH CAERSALEM NEWYDD, A'I HATHRAWIAETH NEFAWL,

Fel y datguddiwyd hi o'r Nef: ynghyd a rhai sylwiadau ynghylch y Nef Newydd ar Ddaear Newydd
Demy 8vo., 1s.

LATIN EDITIONS, in 4to.

APOCALYPISIS EXPLICATA SECUNDUM SENSUM SPIRITUALEM;

Ubi revelantur Arcana, quæ ibi prædicta, et hactenus ignota fuerunt. Vols. 3 and 4, 10s. each.

INDEX RERUM IN APOCALYPSI REVELATA.

3s.

INDEX VERBORUM, NOMINUM, ET RERUM IN ARCANIS CŒLESTIBUS.

8s.

DE NOVA HIEROSOLYMA

Et ejus Doctrina Cœlesti: ex auditis e Cœlo. Quibus præmittitur aliquid de novo Cœlo et novâ Terrâ. 4s.

DE ULTIMO JUDICIO, ET DE BABYLONIA DESTRUCTA:

Ita quod omnia, quæ in Apocalypsi prædicta sunt, hodie impleta sint. Ex auditis et Visis.

Item CONTINUATIO de ULTIMO JUDICIO et de MUNDO SPIRITUALI.

Cloth boards, 5s.

QUÆSTIONES NOVE DE TRINITATE, &c.

Ad Emanuelem Swedenborg propositæ a Thomas Hartley; tum illius Responsa. 6d.

LATIN EDITIONS, in 8vo.

DOCTRINA NOVÆ HIEROSOLYMÆ
DE DOMINO.

2s.

DOCTRINA NOVÆ HIEROSOLYMÆ
DE SCRIPTURA SACRA.

2s.

DOCTRINA VITÆ PRO NOVA HIE-
ROSOLYMAEx Præceptis Decalogi: et DOCTRINA NOVÆ
HIEROSOLYMÆ DE FIDE. 2s.CONTINUATIO de ULTIMO JUDICIO
ET DE MUNDO SPIRITUALI.

Cloth boards, 2s. 6d.

DE DOMINO ET DE ATHANASII
SYMBOLO.

1s.

DOCTRINA NOVÆ HIEROSOLYMÆ
DE CHARITATE.

1s.

CANONES, SEU INTEGRA THEOLO-
GIA, NOVÆ ECCLESIE.De Deo Uno et Infinito. De Domino Redemptore:
et de Redemptione. De Spiritu Sancto. De Divinâ
Trinitate. 1s.*Dr. Tafel's Editions.*

ARCANA CŒLESTIA

Quæ in Scriptura Sacra seu Verbo Domini sunt de-
tecta, unacum Mirabilibus quæ visa sunt in mundo
spirituum et in coelo angelorum.

13 vols., 10s. each.

THE SAME WORK, on inferior paper,

13 vols., 8s. each.

SAPIENTIA ANGELICA DE DIVINO
AMORE ET DE DIVINA SAPIENTIA.

4s.

DE COMMERCIO ANIMÆ ET COR-
PORIS,Quod creditur fieri vel per influxum physicum, vel
per influxum spirituale, vel per harmoniam præ-
stabilitam. 1s.

DICTA PROBANTIA

Veteris et Novi Testamenti collecta et breviter ex-
plicata. Opus posthumum. 4s.ADVERSARIA IN LIBROS VETERIS
TESTAMENTI.E Chirographo in Bibliothecâ Regiæ Academiæ
Holmiensis asservato. Continens Explicationem
Geneseos. Vols. 1 and 2, 10s. 6d. eachADVERSARIA IN LIBROS VETERIS
TESTAMENTI.Continens Leviticum, Numeros, Deuteronomium,
Josuam, Judices, Ruth, Samuelem, Reges, Cronica,
Jesajam et Jeremiam. Fasc. 1, 2, 3, 4, 2s. 6d. each;
or in 1 vol. cloth boards, 11s.

DIARIUM SPIRITUALE.

E Chirographo in Bibliothecâ Regiæ Academiæ
Holmiensis asservato.

Pars I. Vol. I. 12s. Vol. II. 18s.

— II. 11s.

— III. Vols. I. and II. £1.

— IV. 4s.

— V. Vols. I. and II. 12s. each.

— VI. Continens Indicem Partium II.—IV., 4s.

— VII. 10s. 6d.

The two volumes constituting Part V. are a common
Index to the Memorabilia of both the Diarium and
Adversaria, and one of the most valuable of Swe-
denborg's posthumous works.*Catalogues and Reports of the Society's proceedings may be had gratis of the Publisher,
W. Newbery, 6, King Street, Holborn.*

