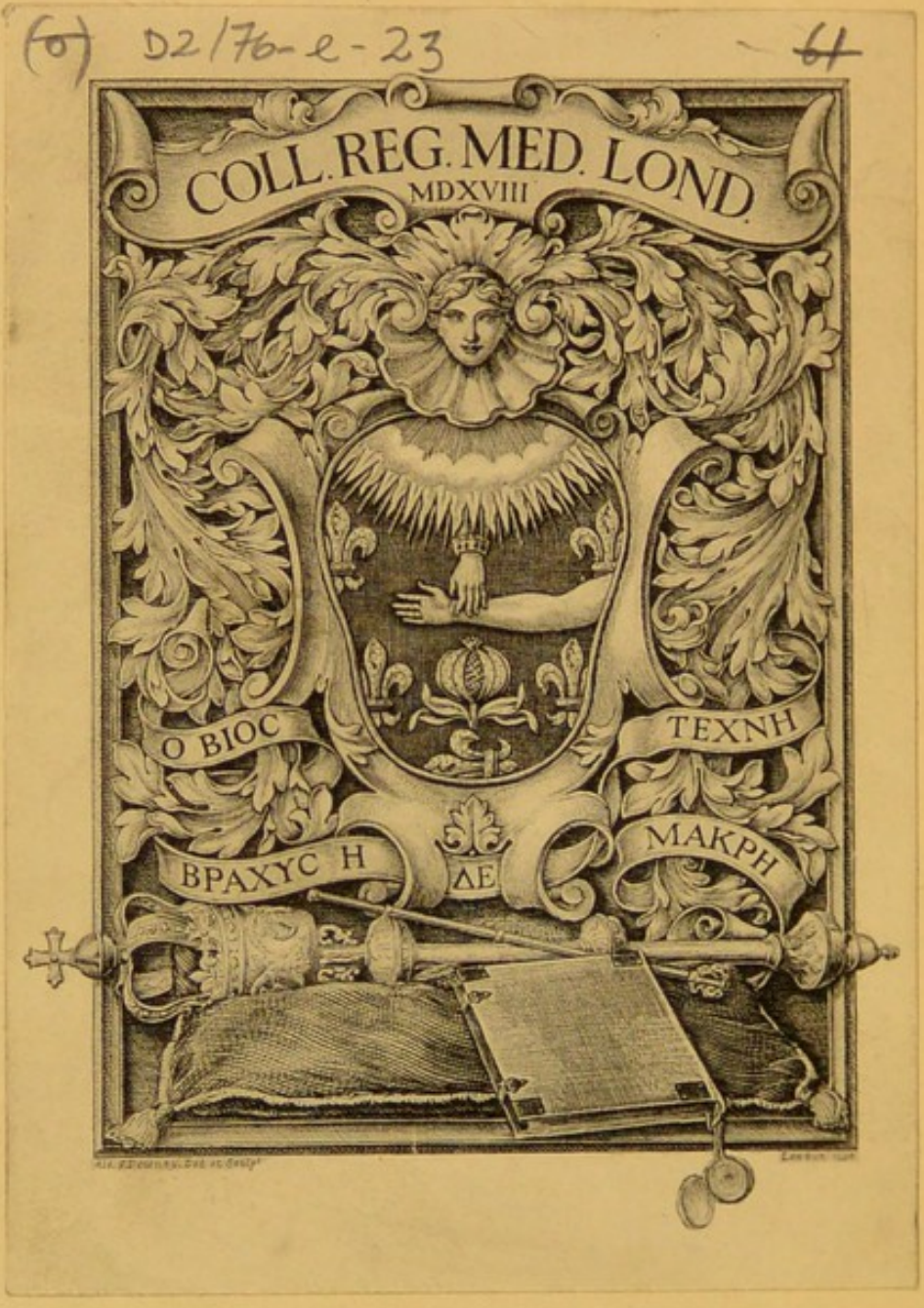
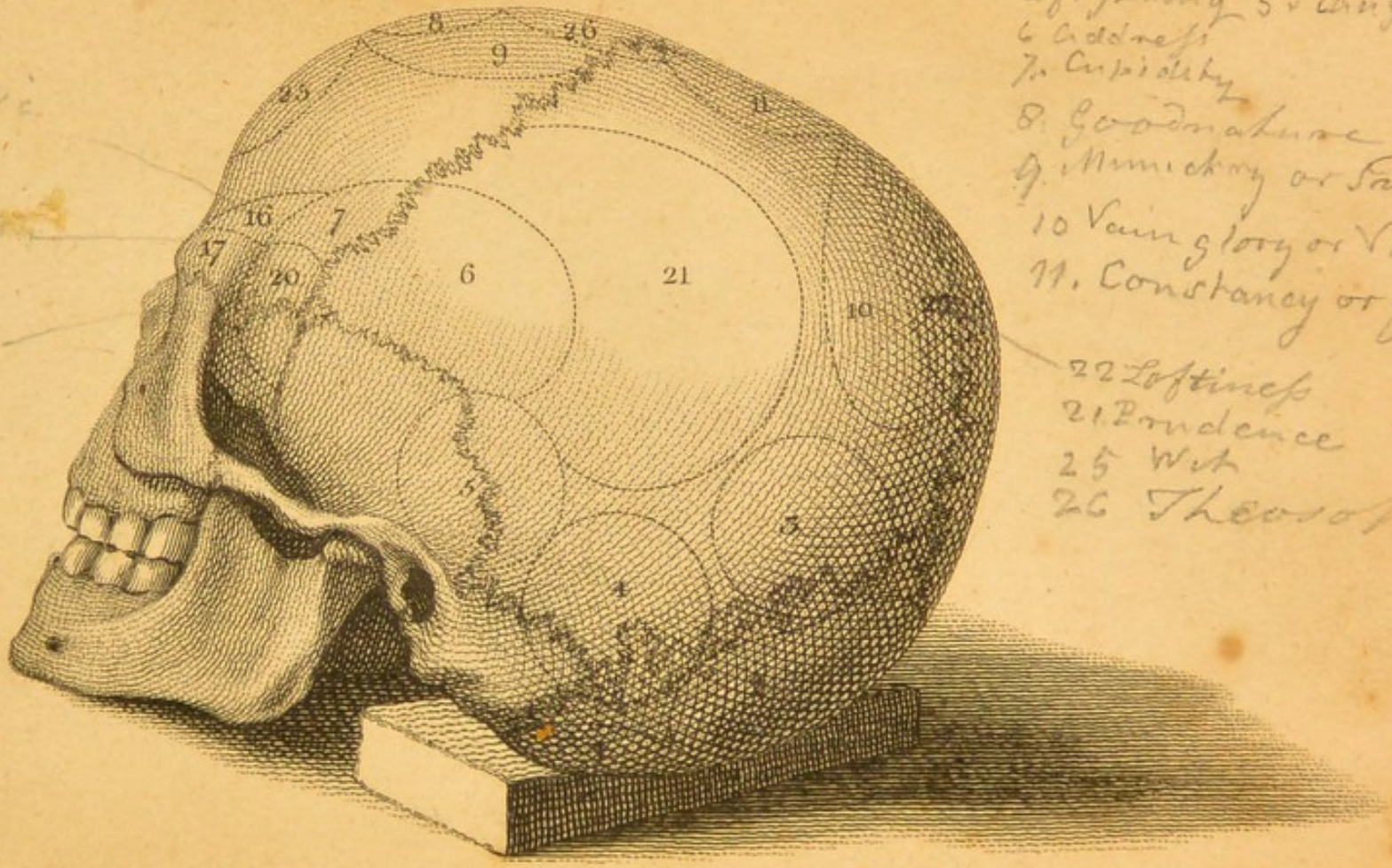
Some account of Dr. Gall's new theory of physiognomy founded upon the anatomy & physiology of the brain, with the critical strictures of C. W. Hufeland.





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6 Caddrefs
7. Cupidity
8. Goodnature
9. Mimickry or Sanctation
10 Vain glory or Vanity
11. Constancy or firmnefs

22 Loftineſs
21 Prudence
25 Wit
26 Theoſophy

Drawn by Chas. Cheyne

Engd. by J. Stewart

London Published by Mess.rs Longman & Co.s Feb.y 6.th 1807.

SOME ACCOUNT

OF

Dr. GALL's NEW THEORY

OF

PHYSIOGNOMY,

FOUNDED UPON THE

ANATOMY AND PHYSIOLOGY

OF

THE BRAIN,

AND THE FORM OF THE SKULL.

With the Critical Strictures of

C. W. HUFELAND, M. D.

AUTHOR OF THE ART OF PROLONGING LIFE, &c.

The finger of God hath left an inscription upon all his works, not graphical or composed of letters, but of their several forms, constitutions, parts, and operations, which aptly joined together, do make one word that doth express their natures.

SIR THOMAS BROWN.

LONDON:

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* The mark of Interrogation on the plate (?) denotes the seat of an organ, the function of which Dr. Gall has not yet ascertained.

PREFACE.

IT is a circumstance not very honourable to the state of science and literature in this country, that the recent discoveries, or pretended discoveries of a distinguished physician abroad, concerning the structure of the brain, as the receptacle of distinct organs of mind, and the form of the skull, as the basis of a new science of physiognomy; should have become an object of satire, before they have been fairly made a subject of examination. This new notion (for it does not pretend to be a system) of *Craniology* and *Cranioscopy* has become a theme of ridicule, and yet scarcely any thing has appeared in the English language on the subject, but some short essays in magazines, translated from German newspapers; which translated articles were written more in the stile of Mr. Bays's Comedy to "strike and astonish" than to convey a correct notion to

the anatomist or physician. That men of judgement should be inclined to smile at such accounts, is not to be wondered at; but we may regret, that they should be so ready to judge on such reports. It is true, the judge can decide only from the evidence before him, but he ought to know when the evidence is closed, and not preclude future enquiry by a premature decision.

I have seen a different conduct pursued on the continent, where the doctrine originated. I saw no want of laughers there, and certainly more opponents than favourers of the theory. I heard Gall deliver his lectures before an audience prejudiced against him, whom he offended rather than conciliated, by a coarse bluntness of manners, impatience of contradiction, and an unnecessary attack upon certain favorite metaphysical notions, which have but a very distant relation to purely physical doctrines: yet Gall was listened to patiently and respectfully. I found that men of the very highest distinction in general literature and science were curious to follow him in his discussions. I perceived that professional men of eminence were divided in opinion concerning the merit of his pretended discoveries in anatomy; and that some allowed of the worth of his anatomical

anatomical disquisitions, who would not admit of his theory of distinct organs. But I seldom heard the hard words and contemptuous epithets which have been so abundantly used in this country where so little is known. And amid the zealous opposition which he has had to encounter, his honesty and fairness as a reporter of facts within his practice and experience, have never been called in question: and from acquaintances (professional men) who have known in him Vienna, I hear that his practice is very large, and that he possesses the general esteem as a man and a physician.

Why then have the first reports of his doctrine been so unfavorably received here? This is doubtless owing, in a great measure, to the want of judgment in those reports themselves; but I fear also, much may be imputed to the spirit of nationality. Gall is a German, and we are Englishmen. Now I have observed that my worthy countrymen entertain a general presumption, that whatever is produced, either in the severe sciences, or elegant arts, on the continent, is unworthy our notice: I say *presumption;* I do not accuse my compatriots of being blind to established facts: where is the Englishman, for instance, who would deny that Italy has pro-

duced greater painters, and Germany greater musicians than ourselves? But I impute to them a somewhat too strong persuasion *a priori* of their own deserts, and of the demerits of their neighbours: hence a disinclination to attend to evidence, and a slowness in receiving foreign improvements. In some departments of knowledge, which respect rather the luxuries than the necessaries of intellectual life; speculative philosophy, for instance, this may not be very injurious; but there are other walks of science, in which this obstinate inattention may occasionally become a serious evil.

That this is likely to be the case in respect to our author, I am by no means disposed to affirm. I am neither the admirer nor the partisan, nor even the judge of Gall: and have been induced to make this REPORT concerning his doctrine; rather from a sense of the indirect advantages which may arise from it, than from an high esteem for the doctrine as Gall leaves it.

There is one point of view from which it is impossible to contemplate the new theory with indifference. It presents a new field for experiment and observation. It furnishes materials for discovery, which the anatomist and physician have always in their hands.

The

The results which our author lays down are eafily comprehended and learnt; the rules are simple and short; and tho' the application of them may not be easy to unprofessional men; nor any reliance be placed upon the vague observations of unpractised persons; still the man of scientific observation will not fail to avail himself of them. Our author states facts, not of individual observation and rare occurrence only, in which cases the utmost precision of statement, and the fullest evidence are essential to the worth of the communication: but he affirms certain universal laws of nature; every observer therefore will naturally renew the experiment stated. He will not try Gall's doctrines by the evidence G. himself brings forward; but by the proof which the nature of things brings with it, and which lies before him as well as Gall. The student of nature, when a new phænomenon is pointed out to him, does not require very exact information, in order to induce him to open his eyes and see: it is enough that the suggestion is not altogether frivolous and ridiculous. And he will be less disposed to apply these epithets, the more extensive and varied his knowledge of nature may be.

This is true in the sciences of mere curio-

sity; but how strongly does it apply when the discovery professes to suggest new remedies for the most dreadful disease which affects our frame, insanity: and to instruct us concerning the ultimate cause and direct impulse to the most horrid crimes and calamities of life, murder and suicide!

These remarks have no other object, than to dispose the general reader to a candid and liberal perusal of these sheets; and the professional man to a willingness, to try the observations within the sphere of his practice: for to professional men alone does the duty of judging belong, tho' the general reader will find much that is interesting to him.

Concerning Gall himself a few words more ought to be said. It is now many years since he has busied himself in those pursuits and speculations which are to be the subject of the following statement. As soon as the first vague notions were formed by him, he very laboriously employed himself in collecting skulls of every description, (which is much more easy in Germany than in England.) He caused models to be taken in Gypsum of living characters of eminence. He made great collections also of skulls of animals, and founded a cabinet of great extent and worth. As his ideas became more exact,

exact, he gradually made them known; and delivered lectures on the subject. At length his fame reached the court; and the Austrian government (under that fatal administration of bigotted and weak priests, which has at length brought down destruction upon it, and threatens to involve the ruin of all civilised Europe) thought it right to interfere: Gall was interdicted lecturing; because his doctrine was said to lead to materialism and atheism!!! However he had already a numerous party of adherents, who had interest at court; some foreign ambassadors, it is said, interested themselves in his favor, and he was allowed to read before *foreigners only*; that is, Austrian subjects were prohibited attending his lectures.

At length, various unauthorized publications having been spread about the northern states of protestant Germany, and the public curiosity being excited, Gall resolved to deliver his lectures at the principal universities and large cities in the north of Germany. In his tour he delivered lectures at Dresden, Berlin, Halle, Jena, Weimar, Göttingen, Hamburg, &c. He was every where receceived with the distinction men of letters enjoy in Germany; and was invited to table at the little courts where he remained;

(in Germany a sort of criterion determining the rank and respectability of an individual.) Thus he fulfilled the double purpose of enlarging the field of his own observation, and conferring with professional men concerning his doctrines. That these latter gentlemen were in general not forward to oppose or confirm his theory in his presence, may be readily conceived. The contest generally began when the professor was departed. Every where, a contest arose; but I believe in most places the majority were against our lecturer.

It was in the course of this tour that the *present reporter* of his doctrine, attended his lectures; of which he was furnished with copious minutes, collected and collated by several medical students.

These minutes, he has further compared with three little publications by other hearers. Gall has declared his resolution not to write till he shall have completed a series of expensive and laborious engravings which are preparing, when he purposes to give to the world a voluminous, splendid, and as he thinks, decisive work. Of these little books by far the best is that by *Professor Bischoff* of Berlin; to which *Dr. Hufeland,* already known here by his *Macrobiotic,* annexed his opinion in detail. This opinion I have thought

thought it right to translate entirely, tho' I could have wished it had been more compressed in its stile, and more confined to the medical and anatomical parts of the subject. The first of the following chapters, and the appropriation of the several organs to their seat on the skull, by the technical words used in osteology, I have also translated from Dr. Bischoff.

I have endeavoured to give as correct and copious a statement as my materials afford, without pretending to have any ultimate opinion on the doctrine; tho' I cannot avoid saying thus much of the teacher. He seems to possess the faculty of observation in a much higher degree than that of reasoning. He has acuteness in observing the individual appearances of nature, but is not always happy in the formation of general notions; and I fear too that he is obnoxious to the poet's couplet,

> " To observations which ourselves we make
> " We grow more partial for th' observer's sake."

He forms his premises readily, but he makes his deductions incorrectly. As to the doctrine itself,

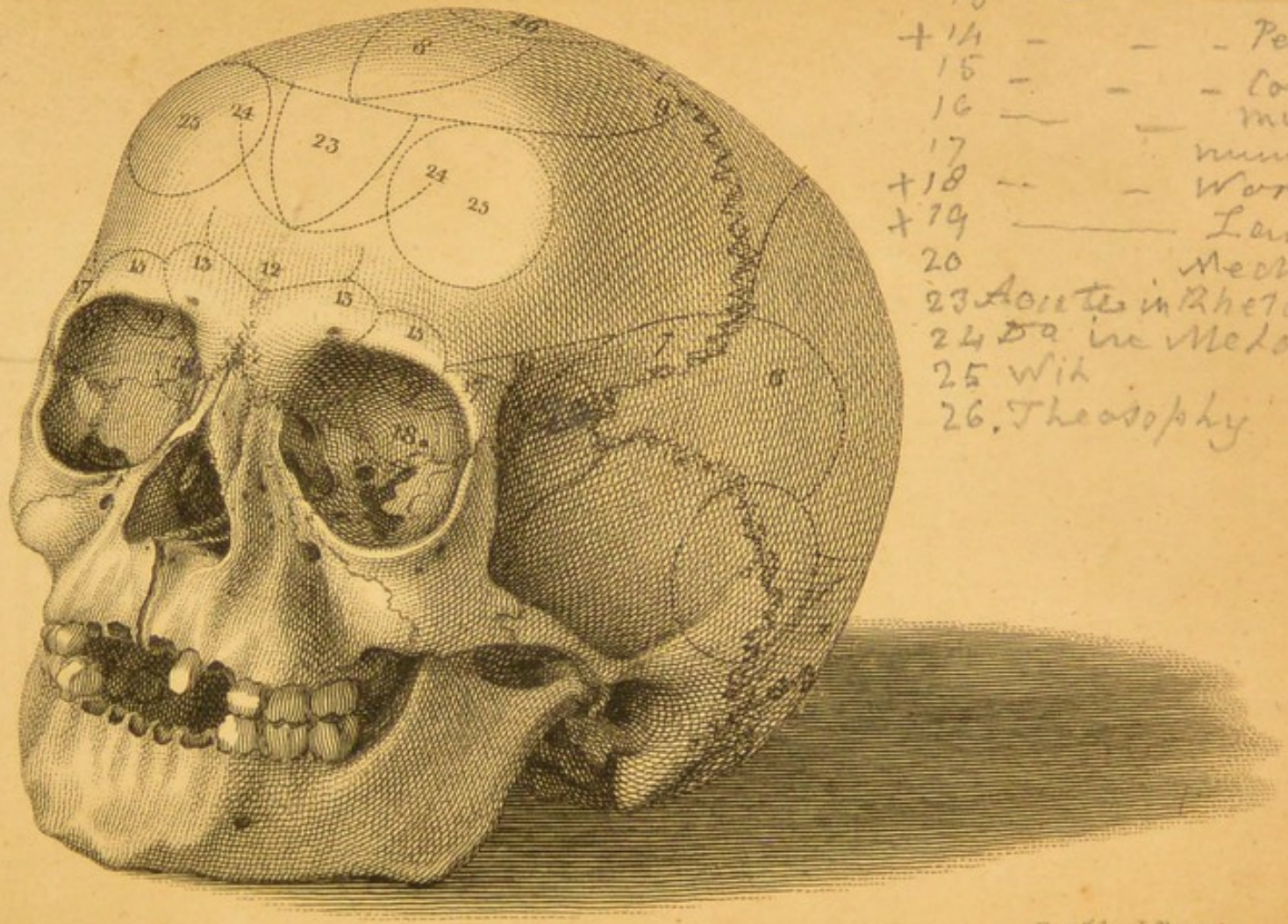
VALEAT QUANTUM VALERE POSSIT.

London, November, 1806.

4 Fighting
5 Slaughter
6 Cruelness
7 Craftiness
8 Goodnature
9 Mimickry

14

12 Aptness to learn things
13 — — Places
+14 — — — Persons
15 — — — Colours
16 — — Music
17 — Numbers
+18 — — Words
+19 —— Language
20 Mechanic Arts
23 Adepts in Rhetoric
24 Do in Metaphysics
25 Wit
26. Theosophy



Drawn by Chas. Cheyne

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CHAPTER I.

OF THE ANATOMY OF THE BRAIN.*

THE following is a brief summary of Gall's Observations on the Anatomy of the Brain.

The nerves of the body do not consist of any medullary substance, they are only fibres. These fibres spring from each half of the spinal marrow in various fascicles, which arise, by the side of each other, from the *cauda equina* to the *medulla oblongata*. These fascicles are separated by furrows and a pulp resembling the *substantia corticalis*. Each of these fascicles consists of fine fibres, which are not separated by any intermediate body.

* The unprofessional reader may pass over this chapter which is written more particularly for the experienced anatomist; while the doctrine of organs and general notions which follow afterwards, do not, in order to be understood, suppose in the reader any thing beyond the information which every man of education and general knowledge possesses.

In

In large full grown animals these fascicles may be easily separated.

Besides these nerves, which, issuing from the spinal marrow may be called the *diverging* nerves *(hinaustretende)* there is another sort of nerves, which bear to those the relation of veins to arteries, and are formed where those terminate; as for instance, the nerves which form the brain *(cerebrum)* in the cortical substance; these are the *converging* nerves *(zurücktretende)*. But these converging nerves do not actually reach the spinal marrow, but entering, on their way, into the two hemispheres of the brain and the parts hitherto considered as belonging to the brain; they meet together in four *commissures* or sutures.

These nerves, thus eccentrically and concentrically formed, may be thus distinguished:—

1. The characteristics of the diverging nerves are;

a.) That they are harder to the touch, and may thus be recognised by a greater cohesion than the converging nerves.

b.) That they become stronger in their direction outwards, that is, from the spinal marrow to the surface of the brain.

c.) That

c.) That they, to that end, pass through Ganglia which the others do not.

The diverging nerves form, in their eccentric progress, the most important and largest congeries of nerves, which have an hundred thousand fold greater volumen than those nerves themselves. This could not be done did they not, on their way, receive a considerable increase. This takes place also in certain points of the cerebrum and cerebellum as in the *corpus olivare*, &c. And these Gall calls knots of nerves or ganglia (extending, as the reader will remark, the import of this term.)

These ganglia, when an incision is made in them, have a serrated appearance, with a colour mixed of yellow, grey, and red; and when touched, seem to have a firmer texture than the mass of the other nervous fibres, which proceed out of these ganglia, strikingly encreased in strength. That these ganglia serve to strengthen the diverging nerves, may, on inspection, be seen, and is further evident from this circumstance; that those nerves which are to be further spread as viz. the olfactory nerve in the whole of the pituital membrane, form more ganglia than other nerves which are less widely spread. The *cinereus bulbus* of the olfactory nerve is nothing

nothing but the last ganglion which this nerve forms previous to its being spread over the pituital membrane.

Further, this law of the encrease of mass by means of a knotty swelling or tumour is confirmed by the structure of plants.

To return to the fascicles out of which the diverging nerves arise in the spinal marrow, and of which eight pair are already known; each of these fascicles has its certain function, and forms its own nerves and congeries of nerves, with which it therefore bears a fixed proportion, as for instance, that pair of fascicles, i. e. the *corpora pyramidalia*, which form the hemispheres or the cerebrum, bears always a proportion to the cerebrum. Where the hemispheres are large, the pyramids are large; and *vice versa*.

The order in which the most important of of these eight nervous fascicles diverge and form the parts that belong to them is as follows.

First, the *nervus oculomotorius*, and the nervous fibres which form the *nervus accessorius*, proceed on each side, from the pair of fascicles which lie most on the outside of the *medulla spinalis*, and in particular of the *medulla oblongata*. The *corpus olivare* is on each side the common ganglion for these

nerves

nerves, which they, being diverging nerves, require. When cut, the corpus olivare has the colour of a ganglion. The nervous oculomotorius can be traced into it.

More towards the middle of the medulla oblongata, is found that pair of fascicles which forms the cerebellum, and has hitherto been known by the name of the *corpora restiformia; seu, processus cerebelli ad medullam oblongatam.* Among *mammalia,* this pair of fascicles, as well as the cerebellum which is connected with it, is found largest in man. And among other animals it diminishes in proportion as the cerebellum and the sexual impulse connected with it diminishes; so that oviparous animals retain nothing but the *processus vermiformis.* That part of the cerebellum which lies on each side of the processus vermiformis is not formed by the corpora restiformia but by the *striæ* of nerves which issue from the middle of the fourth ventricle, and appear on the medulla oblongata. That these nervous striæ are not the origin of the auditory nerves, as *Sömmering* asserts, is proved by this, that they are not to be found in oxen, dogs, pigs, &c. who yet hear and have strong auditory nerves.

In this pair of fascicles also, which forms

the

the cerebellum; the characteristic of the diverging nerves, is also to be found: viz. that they pass through a ganglion. The ganglion of the cerebellum is the *corpus ciliare* which lies in the *arbor vitæ*. This is seen by tracing the corpora restiformia as they enter the lower surface of the cerebellum (the brain being reversed) or making a cut in the cerebellum, directly from behind towards the front, on the upper surface of the cerebellum about the third of an inch from the border where the hemispheres meet.

After the nerves which form the cerebellum, have passed through this ganglion, they spread themselves eccentrically over the *substantia cinerea s. corticalis*, which surrounds alike the cerebrum and cerebellum. They form with this a nervous membrane, which in the cerebellum is plaited in parallel folds, but which may be unfolded as well as the circumvolutions of the membrane which forms the hemispheres.

Next this pair of fascicles, follow those of the auditory, olfactory, and optic nerves. As diverging nerves, they all pass through ganglia: the back pair of the four eminencies are the first ganglion of the olfactory nerve, as the front pair forms the ganglion of the optic nerve. These two nerves can be traced into their ganglia.

The

The most important of these eight pair of fascicles is the middle one, which has hitherto been called the pyramids. This pair is the origin of the whole cerebrum or the two hemispheres: This is proved,

1. By the size of the pyramids being, in the various kinds of animals, always in proportion to the size of the hemispheres.

2. By the pyramids pursuing an uninterrupted course to the surface of the hemispheres. This takes place in the following way:

These fascicles first cross each other about an inch below the *pons Varolii*, so that each fascicle passes over to the opposite side; and thus in the sequel the left pyramid forms the right hemisphere, &c. For, after crossing each other, the fascicles separate below the pons Varolii, and do not cross again; and thus that which was originally the right fascicle continues on the left side.

From this crossing, which may be distinctly perceived if the medulla oblongata be properly cleansed from the *pia mater*, and the pyramids separated about the middle; the diseased phænomena may be accounted for, which appear on the right side of the body after an injury has been done to the left hemisphere; and on the contrary.

These broad fascicles or pyramids are, as diverging nerves, subject to the necessity of passing through ganglia; and they in fact pass through two of them.

The first of these is the *pons Varolii seu protuberantia annularis Willissii.* This is, in part, a commissure of the diverging nerves of the cerebellum (which may be here anticipated) and in part a ganglion of the fascicles forming the hemispheres.

Even on the outside of the pons Varolii, but still better if (the brain being reversed) a slight superficial incision be made in it in the direction of the pyramids towards the *crura cerebri,* and the edges of this incision be carefully drawn from each other; the diverging nerves of both hemispheres of the cerebellum may be seen running across and meeting in the *pons* (or bridge) as their commissure. If these transverse striæ be pursued with the handle of a scalpel, or with a concave scalpel, somewhat deeper in the substance of the bridge, there will be met about one or two lines below the surface a layer of nervous fibres, running in a line from the pyramids to the *crura cerebri.* Betwixt these nervous fibres running along through the bridge and those transverse striæ, is to be seen the cortical or cineritious sub-

stance

stance which covers the extreme surface of the nervous membrane, and forms, as it were, its last ganglion, as the organ of nourishment to the oblong fibres, which issue out of the bridge in a strikingly greater mass than they enter into it from the pyramids. If this layer of nervous fibres which runs from the pyramids along the pons Varolii be removed, a layer of transverse striæ is met with, which striæ returning from the two halves of the cerebellum, meet together in the bridge as their commissure. This layer of transverse striæ is succeeded again by an oblong layer of nervous fibres issuing from the pyramids.

Gall has at present discovered eleven layers of these nervous fibres, proceeding from the pyramids through the pons Varolii.

After the nervous fibres of the pyramids have in this way passed through the pons Varolii, as their first ganglion, and issued out of it much encreased, they form the crura cerebri, which, as observation teaches, are nothing but a continuation of the pyramids, or that pair of nervous fascicles which forms the hemispheres of the cerebrum.

The nervous fibres which form the crura cerebri, before they pass into the membrane, the folds of which constitute the hemispheres, pass through a second ganglion, that is, the

ganglion of the cerebrum, a part of the brain, the real form of which has been hitherto unknown, and still less its internal quality, but which is discovered at once when the middle lobe of the brain by the *Fossa Sylvii* is cut away. The whole congeries of the brain, and also the optic nerve around this, may be taken away. This optic nerve winds on each side of the front pair of the four eminences which are its first ganglion from behind, round that grey mass which forms the ganglion of the cerebrum, towards the front, in order to form the *decussatio nervorum opticorum*. Seen from above, or from the great ventricles or cavities of the brain, it is the *thalami nervorum opticorum* (which are nothing but a web of all the nervous fibres in the ganglion of the cerebrum, or are properly the ganglion itself) and the *corpora striata*, (which are properly the nervous fibres already diverging from this ganglion) which constitute the ganglion of the cerebrum.

That is, this ganglion consists of two pulpy masses crossed in the middle by the nervous fibres which spring from the pyramids, and have been strengthened by passing through the pons Varolii. If the brain be reversed, and the upper pulpy mass be carefully taken away, the nervous fibres can be traced from

the

the crura cerebri entirely through the ganglion of the cerebrum. Each of the nervous fibres which are then seen forms a particular involution of the brain, and is to be considered as the organ of some intellectual function. After these nervous fibres have passed through the ganglion of the cerebrum enlarged, they diverge on all sides through the distinct involutions of the cerebrum, and forming a nervous membrane over the pulpy cortical substance which surrounds the whole brain on which they are spread, terminate in this pulpy matter, which constitutes, as it were, their last ganglion*.

In the same manner as the diverging nervous fibres of the cerebrum and cerebellum terminate, terminate also the diverging fibres of the other nerves which spring from the spinal marrow, in a pulpy substance, which is, as it were, their last ganglion, and in different places of different qualities. In the labyrinth, the pulpy mass, in which the progressive fibres of the auditory nerve terminate, appears like a transparent gelatinous body; in the nose, the pulpy mass in which

* Here the German writer has inserted marks of interrogation (??). An expeditious style of commenting, not unusual in German works, where the editor differs in opinion from the author.

the diverging fibres of the olfactory nerve terminate, appears like a serous skin, the pituital membrane, &c. In some places this substance is woven into a hardish web of nerve, as, for instance, in the ganglion of the cerebrum (the *corpus ciliare)* and in the ganglion of the *nervi accessorii et oculo-motorii*, (the corpus olivare). In other places it lies like a grey pulpy substance, as, for instance, in the ganglion of the cerebrum and on the surface of the cerebrum and cerebellum.

Out of this pulpy mass in which, as before stated, the diverging nerves of the cerebrum, cerebellum, &c. terminate, the other kind of nerves arise; whether it be that the diverging nerves turn back again and converge, or altogether independently of them; that is, a second species of nerves is found, viz.

2. The converging nerves and congeries of nerves, which may be thus characterized:

a.) That they are softer than the diverging nerves.

b.) That they take their origin in that pulpy mass in which the diverging nerves terminate.

c.) That they unite and strengthen themselves in an inward direction, that is, from the surface of the brain, &c. to the spinal marrow; but they do not, like the diverging

nerves,

nerves, go through ganglia, but rather avoid the ganglia of the diverging nerves.

d.) That they meet together from the homogeneous congeries of nerve on both sides, and form commissures.

The commissures which *Gall* has hitherto been able to exhibit anatomically are :

1.) The commissure of the converging fibres of the auditory nerve.

It lies immediately behind and before the pons Varolii, and in men it is covered by it, but in other animals, as they have a smaller cerebellum, and consequently a smaller pons Varolii as its commissure, it is perfectly free and distinct.

2.) The commissure of the converging fibres of the olfactory nerve.

3.) The commissure of the converging nerves of the cerebellum.

This, as already observed, is formed in the pons Varolii. When the brain is reversed, the converging nerves of both hemispheres of the cerebellum are to be seen very distinctly running across and meeting on the pons Varolii. These, and the diverging nerves which run along from the pyramids, and are destined for the hemispheres, succeed each other in distinct layers, as already stated.

(4. The

4,) The commissures of the converging nerves of the cerebrum.

a.) The largest and most important of these is the *corpus callosum.* In this are united, not merely most of the converging nerves of the whole hemispheres, but also the remaining particular commissures of the converging nerves of the cerebrum.

b.) The *commissura anterior,* or the union of the converging nerves of the front and middle lobe of the brain above the optic nerve. The *Septum pellucidum* is a part or continuation of this commissure.

In animals whose middle lobes are smaller, the commissura anterior is weaker, and in these the olfactory nerve furnishes the same with converging nerves.

c.) In like manner, the converging nerves of the back lobes of the cerebrum form together a *commissura posterior.*

d.) Besides these commissures, the converging nerves of the cerebrum form both before and behind some other particular commissures on the *corpus callosum,* for constituting a sort of covering round it.

Besides the above mentioned nerves and congeries of nerve, there also proceeds a tender nervous mass from between the two halves of the spinal marrow, upwards through

all

all the double organs which are formed by the nervous fascicles of the spinal marrow. This nervous mass is, as it were, the instrument of connection between the double organs, and appears on the great commissure the corpus callosum, as the *Raphe Lancisii.*

It may be proper to observe, that Gall was first led to that contemplation and study of the brain which ended in the doctrine above stated, by observing the phænomena of the *Hydrochephali interni,* in whom the whole brain is often stretched out into a membrane scarcely a line thick; hence he inferred that the brain cannot be, as is commonly fancied, a pulpy substance, but must be a membrane. About the same time certain pathological appearances, for instance, that the extremities are lamed by the hemispheres of the brain being wounded, evinced to him that an uninterrupted connection must take place between those hemispheres and the spinal marrow. He accordingly directed his attention to an anatomical exhibition of that membranaceous quality of the brain which he suspected from physiological reasons: and he was enabled, in opposition to all the anatomists of antiquity, and before all modern anatomists, to make this anatomical discovery, by pursuing a mode of anatomical

research

research contrary to the practice hitherto generally observed; that is, he traced the connection of the nerves and brain, not from the summit downwards, but from the spinal marrow upwards. In doing this, he followed the course which nature itself takes; as in the higher and more elaborate organisation of animals, the commencement is, as it were, in the spinal marrow, and the brain is gradually and more subtly formed, according to the kind and rank of the animal in the order of creation In the simplest animals, viz. the polypus, we see only scattered nerves; in the next order of animals, we meet with a kind of stem, from which diverging nerves issue in more highly organised beings. In animals, still further advanced, the nerves springing out of both halves of the spinal marrow (for the spinal marrow, as well as the brain and all organs of animal life, is double) form, partly the brain, partly nerves; all of which in fact spring from the spinal marrow, though they seem to have their origin in the brain, as has been already stated.

CHAP. II.

OF PHYSIOLOGY IN GENERAL.

THE anatomist is contented, when he detects a distinction of parts which is constant and invariable. This he marks and proclaims to his scientific brethren, and they not unfrequently, in grateful memory of his service, immortalize his name, by affixing it to the thing he first saw and made known (pons *Varolii*, membrana *Schneideri*, &c.). But it so happens, that the name of the discoverer is applied to the object, not because of the importance and value of the discovery, but, on the contrary, because for the present it is the mere detection of a thing, without the least insight into its functions and uses. It is impossible to look upon merely a picture of the brain, whether we take a section of it vertically, or survey its different layers horizontally, without being struck with the nice complexity

complexity of its organisation, and with our entire ignorance of the design and purposes of that organisation. This is more strikingly the case in examining the brain than in contemplating the other parts of the human frame. The ear and the eye also are subtly formed, but the principles of acoustics and vision are become objects of science—demonstrable science—which furnish us with a clue in examining the organs of sight and hearing. The organs of digestion, nutrition, &c. are also more simple, and have a reference to less complicated processes. It is in the brain particularly that the physiologist follows the anatomist humbly at a distance, and for want of certain data and experience, is forced to indulge in general observation and vague analogy. At the same time, all who are really interested in the progress of science, and who make liberal allowance for the imperfection of knowledge, gratefully receive the facts which the anatomist makes known, even when there is no prospect of an immediately useful application of them. And they also indulgently listen to the speculations of the theoretical physiologist, in the conviction that it is only by the freest use of speculating and thinking powers, that the understanding can be disciplined to adjust and

appreciate

appreciate the facts brought before it. In the formation of science, the observation of individual fact, and the theory of general notions, setting out from opposite quarters, tend to the same point; and it is by their union that science itself is established.

Thus, for instance, in respect to the brain and its functions, which form the object of this work: it is in general universally understood to be the organ of thinking. But thinking is only a general term, including a vast variety of intellectual phænomena, and the brain is, as we have seen, a very complicated organ. Shall we then rest contented with the general assertion, that the brain is the organ of mind? or shall we not rather, looking more narrowly into the structure of the brain, consider, apart, in their relation to mind, those of its parts which are anatomically shewn to be distinct, in the same manner as the brain, considered as one simple substance, has formerly been contemplated? We shall perhaps find that this more minute research is but a reasonable pursuit of the enquiry suggested by the first general observation. It is this which constitutes the subject of the following pages. Dr. Gall professes to have made this enquiry, and to have found that we ought not to content ourselves with considering

sidering the brain as the organ of thought, but as a congeries of distinct organs, the existence of which alone renders that great variety and diversity of talents possible, which distinguish the various individuals of the same species hardly less strikingly from each other, than man himself is distinguished from every other species of beings we know.

But before we enter into this enquiry it may be proper to notice an opinion that has of late years become popular, concerning the causes of that infinite diversity of intellectual power and moral character, which prevail in the world, which would, if established, render an examination into the physical organisation of man frivolous and useless. *Helvetius* has given currency to the notion, that men are born not only without character, but also absolutely indifferent to all character, without any tendency or disposition of any kind whatever. We all come into the world formed and disposed alike, and are purely the creatures of the circumstances in which we are placed. All the powers of the mind which have adorned but a few of our species, might (in spight of any thing contained in the first frame and organisation of the individual) have been the lot of every one of the thousands who daily come into

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and go out of the world, without leaving any other traces behind them, than in their progeny. This notion has been adopted by certain speculative men, from its imagined connection with the dogmata of materialism* and philosophical necessity: and in this country in particular, from its harmonising with the Hartleyan theory of association. But this notion could never gain credit with men in general; and for a reason stronger than all reasoning: We feel within us so decided a capacity for certain pursuits, and so utter a disability to follow others, that when we are told it might have been otherwise had we been otherwise placed in the world, the argument makes little impression; and we think we have done enough by asking, How can you tell that? And in truth, the objection implied in the question is well founded. It is in vain that Helvetius tells stories upon

* It deserves remark, that the doctrine of Helvetius, though in fact it has been patronised by materialists, is much more easily reconcileable with the immaterial hypotheses. For we are more accustomed to think the soul, the immaterial substance, to be simple and undivisable, than matter, which we know only as a compound substance. And one would have imagined that materialists would have rather attributed to an original diversity of material organization, the actual varieties in the character of men. This observation was made to me by a German friend; I am not aware that it has occurred to any of our English writers.

stories (and they in fact alone have made his book popular) of a boy who used to be left alone in a room with a great clock, and afterwards became a great mechanic, &c. &c. The celebrated reply of *Themistocles* to his envious adversary, who ascribed his greatness alone to his being an Athenian, is a sufficient answer to all such tales. "I should not have been great if I had not been an Athenian, nor would you, were you an Athenian, have become Themistocles." The argument of Helvetius proves nothing, and avails nothing, against the consciousness of unequal powers, added to the daily observation of the early display of decided talents. *Mozart*, when he was in his fourth year, was already an excellent performer, as well as accurate judge of music. Besides, Helvetius qualifies his assertion by a *bien organisé* (well organised), and this qualification renders the whole doctrine frivolous and insignificant. For why should we suppose this organisation to be susceptible of no other modification than a *well*, why not a *very well*, *ill*, *very ill*, &c. This opinion has been adopted by persons very averse from speculating metaphysically concerning man. Johnson, for instance, (whom I quote here because he was *not* a man of science, though of great shrewdness in observation) considered Talents,

or Genius, as he chose to call them, as a thing that, when once existing, might be directed any way. Newton, he thought, might have been a Shakespear. For, said he, a man who can run fifty miles to the south, can run fifty miles to the north. The fallacy of the simile needs no detection.

But though the notion of Helvetius is offensive to our best feelings, it will be objected that the opposite doctrine which Gall lays down, and which is to be developed in these sheets, is not less repulsive. That conciousness of moral liberty which, in spight of the metaphysician's attacks, attends us perpetually, and which seems to be essential to our most important moral principles, (it will be said) is equally hostile to the theories of Gall and Helvetius. The one represents us as enslaved by the things which surround us, the other as determined by the fixed dispositions and tendencies of our frame.

The genuine student of nature will never be deterred from his pursuit by any objection drawn from either metaphysics or morals; he is sensible that the field of research which lies open before him merits his attention; and having faith in the ultimate harmony of the universe, he is not anxious to remove apparent doubts or difficulties. This

answer is sufficient for the better kind, but not for the greater number of enquirers. It is incumbent on him who is introducing a new object of attention, to remove all obstacles to its being impartially received and attended to. There is one plain answer to the objections taken from the notion of the freedom of the human will: That the *idea of* ORGAN *is that of an instrument by which a thing may be done, not that of an impulse which necessitates the action.* Organs of certain powers and capacities do not suppose the exercise of such power; hence there is still room left for the introduction of another principle if there be a necessity and a reason for it. It may be further said, that Dr. Gall's Organic Theory does not introduce a greater necessity than the popular opinion supposes: The undefined fact is already admitted, in the notion that the brain is the organ of thought. Gall does but go into the detail, and shews how that in fact exists which the other opinion only supposes. Equally unfounded would be the objection to Gall's Theory, as favouring materialism. G. very judiciously declines all metaphysical researches: it is indifferent to him, as it is to all whose object is the sensible world within the confined limits of external nature; what our opinion may be as

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to the *meta*-physical properties of man, the nature and relations of matter and spirit. These he holds to be irrelevent enquiries. It is enough for him, that the life of man is dependent on his sensible formation, and that there is a connection (tho' mystical and incomprehensible) between his intellectual and sensible qualities. He does not determine that the one is the cause of the other, but contents himself with observing as closely as he can, the concomitancy of the effect. He is employed in analysing the dust of the earth of which man is formed, not the breath of life which was breathed into his nostrils.

It is most obvious that if a particular doctrine concerning the physical nature of man is not to be invalidated by general theories drawn from metaphysics and morals, neither can any such doctrine arise from such theories. Hence Gall has been very anxious to shew how his opinions have always been grounded in particular observations; but whether the analogies by which he has generalised his particular observations have been drawn with sufficient caution, may be fairly doubted.

CHAP. III.

OF THE BRAIN AS THE ORGAN OF THE SOUL.

IN asserting that the brain is the organ of the soul, mind, or whatever we may please to call it, it is hardly necessary, now, to caution the reader against supposing that the brain is the postive principle of the mind or soul. It is but the instrument, or condition, without which the active principle, whatever it be, is inefficient. It is that part of the body on which the mind in a certain active state operates, and which must have a predisposed fitness to be acted upon.

That the proper function of the brain is not the mere support of the lowest degree of organic and sensitive life, is sufficiently proved by the existence of imperfect beings, children which have been born without head, (ανεφαλοι) and which have yet fulfilled for a short

short time the more essential functions of animal life; but such ανεφαλοι have never betrayed the least symptom of an higher intellectual life.

That however the brain is the organ of mere intellectual existence is not to be proved diffusely here, as this is the common notion, and not peculiar to the doctrine to be here stated. It is, however, evident, as well by the study of comparative anatomy, according to which it appears that the brain of animals increases in proportion to their advances towards mind or intellect. (And this assertion Dr. G. professes to confirm by a collection of wax preparations illustrating this progression:) as by the cases which so frequently occur in the practice of medicine, of wounds, blows, &c. by which the mind also is injured.

*Sömmering** first affirmed that the relation which is found between intellect and brain, lies in the quantity of brain compared with the size of the animal; but this is incorrect, for the canary bird has in proportion more brain than man. Then he qualified his position, and asserted, the dignity of the ani-

* An anatomist of high repute for many years at Mayence; within a few years he has been invited to Munich as member of the (now) royal German society, established there by the king of Bavaria.

mal to be found in proportion to the size of its brain in comparison with its collected nerves, and thus expressed, it will be found tolerably accurate; but even this rule is insufficient; we must have recourse to a consideration of the distinct parts of the brain, and then we shall find that the animal is advanced in intellect, in proportion to the size of the hemispheres of the cerebrum. This is confirmed by comparing the brain of man with that of other animals. On the contrary, those parts of the brain which seem to be devoted to the lower functions of organic and sensitive life, viz. those which are at the basis of the cerebrum and the cerebellum, are often found in a state of greater perfection in various animals than in man.

Against the assertion that the brain is the organ of the soul, several objections are advanced.

1. The case of *hydrochephali*, those whose heads have been filled with water, and who have yet retained their faculties. This objection supposes that the brain is macerated and dissolved in the water; and falls away if the supposition be refuted. The brain being, as has been shewn, nothing but a folded skin or membrane, is susceptible of being unfolded without being destroyed. This takes place

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in *Hydrochephali interni*, in whom water, being collected in the ventricles of the brain, by its expansive power unfolds the membrane of the brain, and presses against the internal surface of the skull. Dr. Gall attended several years a woman who had all the symptoms of water in her head, yet she retained her faculties; on her death he found four ounces of water in her skull, and it was on her that he first discovered, to his entire satisfaction, the expanded membrane of the brain. Gall considers the *hydrops externus* as comparatively rare, and advises physicians, in sawing the skull, to use the greatest precaution lest they cut the membrane at the same time; and it is to the want of this precaution, that he ascribes the mistake concerning this disease. He states as a symptom of the *hydrops internus*, the protrusion of the eyes out of the sockets, arising from the same expansion occasioned by the water. Life, therefore, may subsist for a certain time, though the brain is thus forced out of its place; for no substance is lost. Having, in a state of disease, discovered the membrane of the brain, G. then proceeded to seek it in the fresh brain of a subject free from any disease in the head; and he declares that on repeated trials he has found it. In the

only experiment which the writer of this account witnessed, a pipe was put into different parts of the circumvolutions or *gyri* of the brain, and by blowing, a sort of bladder was occasionally produced. The subject on which the experiment was tried had been taken from the body several days before, and was allowed to be unfit to give the experiment a decisive trial.

2.) A second objection is founded on the fact, that very considerable parts of the brain may be destroyed, either by an external wound, or from internal disease, and the powers of the mind yet remain unhurt.

This objection is satisfactorily removed by the *duplicity* of the organs in the brain; the sound organ on the one side being sufficient to fulfil its function, notwithstanding the destruction of that on the other side. It is found that the organs of sense and animal life are double, as eyes, ears, the muscles, &c.; while those which maintain what more resemble a vegetative or organic life (as stomach, liver, &c.) are single. It is true, the lungs, kidneys, &c. may seem to be an exception, yet they are not, from their inequality, to be considered as completely double, and these organs form a transition from the lower and organic, to the higher and animal life.

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Among the cases which G. stated to shew the possibility of life continuing after a partial destruction of the brain, was that of a clergyman who was under his care, and who complained that one half of his head was good for nothing, he could not think on that side, &c. He preached three days before his death, and on examining his brain, the side complained of was found actually mouldy; the other side was in an inflamed state. Analogous to this are the well known cases of Hemiplegy.

Against this notion of a duplicity of organs in the brain, the unity of perception and consciousness has been brought forwards. But the analogy of the external senses is a sufficient reply to this objection; the organ is not in the one case, any more than in the other, considered as the principle of sensation or perception, it is but the material condition of their exercise.

G. digressed here concerning the use of the double organs; it is enough briefly to observe that he is of opinion only one eye, one ear, &c. is employed at a time; and that these succeed each other in their operation. Probably, he said, the right side of the brain is the more active, as the right side of the body throughout, head, breast, eye, hand, arm, foot,

foot, &c. are generally the stronger. Eight tenths of those, he says, who have a hump, have it on the right shoulder, as the muscles on this side are the most active and strong. He carried these remarks (without laying any stress on them) so far as to observe that, when a boy, he used to ask himself how it came that men seldom walk quite straight; and that he imputed it to the successive use of each eye, by means of which the point of vision is changed.

3. The argument derived from the cases of petrifactions in the brain needs no particular answer.

CHAP IV.

OF THE BRAIN, AS A RECEPTACLE OF DISTINCT ORGANS.

IT has already been said, that each circumvolution of nerve in the cerebrum, is to be considered as the nerve or organ of some certain operation of mind: That hence, each internal operation, as well as each external sense, has its own peculiar nerve and organ; and that hence, the brain is not *one* organ of the soul, not a common organ for all the functions of the mind, but a receptacle for distinct organs.

Tho' this assertion is far from being new, for we find it in *Boerhave*, *Haller*, *Von Swieten*, *Schellhammer*, *Glaser*, *Jacobi*, *Sömmering*, *Tiedemann* and *Prochaska*; and the academy of *Dijon* has even made the seat of these organs the subject of a prize dissertation; still it is necessary to state the proof of this

this plurality of organs, which lies in the following observations and reasonings.

1.) *Gall* first urges, the sense of fatigue arising from the mind being long employed on one subject of contemplation; and the relief and delight we experience in variety. This is analogous to bodily fatigue, which arises, not so much from a general exhaustion of muscular strength, as from the partial use and pressure of the distinct muscles of the body. When we have been long sitting we are relieved by standing; and the bed-ridden find ease by a change of posture. That mental exercise is analogous to that of the body, as well in general, as in respect to the different kinds of employment, is very strikingly apparent. Every man, who is habituated to a life of study, knows, that after having spent hours in reflecting upon an abstract idea, or in labouring to analyse an intricately compounded problem of science; when he feels exhausted by the intenseness of his study, if he take up a work of fancy or taste, (nor do I mean here the idly taking up a book that neither requires nor allows of attention, but a work demanding, in the perusal, no less energy of mind, tho' of a different kind, than a scientific disquisition) he will find himself as fresh to the task,

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his comprehension as lively, his attention as ready, as if just arisen from the healthiest and most invigorating sleep. It has been said of some hard students, that they knew no rest but in the change of object; and we see that children never tire in their sports; partly (no doubt) because they are restrained by no laws of decorum from indulging in the utmost variety of posture and motion; they bring every muscle of their bodies into play; the vigour of their youthful frame soon exhausts each particular organ, but instinct leads them unconsciously to the easy relief; hence the restless impatience, and ever changing pursuits of childhood, equally apparent in the exercises of both body and mind. Let it not be said here, that this diversity of organs, which is supposed to exist in the brain, destroys the unity of the mind itself, for this argument is destroyed by the analogy here pointed out. It is *One* will which sets every muscle in motion, as well as *One* mind which acts in every operation of intellect: In both cases the mode of action is alike incomprehensible, and yet, where we have similar phænomena, it is but reasonable to suppose that the modes and principle of action are also similar. The complete analogy between the affections of body and those of the mind, compels us in

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all explaining theories or hypotheses, to suppose like impulses and adopt like language. The body longs for rest after much and varied labour, as the mind languishes for repose after active enjoyment. Hunger and thirst, repletion and satiety, are alike common to both. In most cases we know the seat of the bodily affections, as we know the parts devoted to the functions of life. And we know too that the mind, however immaterial we conceive it to be, has still a material seat, and that no simple homogeneous mass, but which exhibits a most delicate and complicated organization.

2.) Shall we persist therefore in considering this organ as one and indivisible, in spite of appearances, more particularly when we find that this organ, supposed to be one and simple, produces many and compound effects? Let us suppose the brain to be the one simple organ of mind and all its faculties; wherever we find any one faculty in a state of high energy, we suppose the organ also adapted to produce this energy. But how does it then happen that the same person is remarkably deficient in other faculties equally dependent on the same organ? If we think the brain to be in any way an instrument, it cannot be both weak and strong at once. But if it

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be the receptacle of many organs, they may be as infinitely diversified as the actions and powers of man. This argument receives greater force if applied to the brute creation, who evince also diversity of character, who have also a curiously framed brain, and to whom we do not ascribe a moral character, a freedom of the will, which so intrusively incumber our speculations concerning man. Whence are some of our domestic animals cunning and thievish, and resentful? Why are others generous and grateful? Why are some kinds of dogs particularly susceptible of instruction and of affectionate attachment? We are told it is their nature, their instinct; but surely their instinct is not a principle, but an effect of their organisation; and if this organisation lie any where, we may presume it lies in the brain. In like manner, the diversities of character in the same individual at different periods of his existence add force to the supposition of distinct organs, which grow to maturity and decline.

3. There is a third argument which is founded on medical experience as well as general observation; the brain is susceptible of being partially affected by disease, wounds, &c. the consequence of which has been the loss of certain faculties and powers of mind;

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and insanity very frequently assumes the shape of a partial disease. Instances will be given hereafter.

The notion thus supported explains many of the common phænomena of life, *viz.*

a.) *Watchfulness,* which is that state in which all the organs of animal life are at the command of our will.

b.) *Sleep,* (that is, healthy and sound sleep) which is that state when all the organs of animal life are at rest, (the organs of organic life are distinguished by never tiring.)

c.) *Dreaming,* which takes place when some one or more of the organs of animal life are in a state of activity, while the others are at rest. The activity of these organs awakens the consciousness of the others. Consciousness appertains to all organs, and has none of its own: Hence there is no dream without consciousness, however we may forget our dreams. During disease, there may be dreaming without sleep, owing to the disordered activity of certain organs, of this kind is *delirium.* In a state of *somnambulism* the whole vital energy is concentred in certain organs, while the others entirely rest. And in the same way are we to account for the high concentration of power, the heightened sensibility, and the sudden bursts of intellect,

intellect, and the extasies of a disordered frame.

d.) Lastly, confirmed madness, or that disorder which consists in certain false notions and conceptions of things, which lies in the power of volition being lost over certain organs of intellectual life; and this arises from those organs (it matters not how) being in an highly excited or irritated state.

Such are the arguments *a priori* in favor of distinct organs in the brain; they can be confirmed only by those distinct organs, or at least their site, being pointed out in fact.—And in this lies the science, which Dr. Gall professes to have first discovered and made known to the world. I have used the term *science* here, not in its proper sense, but vaguely as we use it to express any knowledge, or any probable opinion founded on observation. The physiologist knows very well on what evidence his theories rest, as to the more obvious and palpable functions of animal life, and will, in respect to Dr. Gall's speculation, be content with proof as strong as the nature of the case admits, even should it fall short of the evidence which some departments of his science afford. He will not expect that the organs should be laid before the eye, in like manner as the muscles of

the body may be laid open. He will be content if any uniform appearance justify our supposing an organ; and if the result of a long observation of this uniform appearance, be the detection of a certain relation which it bears to the phænomena of character, he will adopt, as a matter of opinion, what may never be scientifically demonstrated, being always guided by analogy, the sole basis of experimental deductions.

The physiologist has observed in the animal creation, that the nerves of those animals which are distinguished for smelling, seeing, hearing, &c. are marked by being numerous and large, evincing a more elaborate developement. And having been accustomed to see the olfactory, optic, and auditory nerves in animals *proportionally* large with the senses they severally furnish the individual with, he will draw the general inference that *wherever any organ is met with in a higher state of developement, there we may expect to find the power dependent on it, in corresponding energy.*

CHAP. V.

OF CRANIOLOGY AND CRANIOSCOPY.

BUT the living brain can never be exposed to observation; and from the nature of its substance, loses much of its form and texture soon after the death of the subject.

The inference therefore of the physiologist concerning the organs of the brain would avail him but little, unless some certain connection were ascertained between the brain and its permanent covering, the skull. This connection is asserted in the following fundamental position.

"*That the internal lamina or plate of the "brain-pan or skull is, during the life of man, "perpetually formed by the brain itself: And "that therefore where the internal and external "plates of the skull run parallel, we may infer "the form of the brain from the outward "shape of the skull.*"

On this fact, and on that before stated, that each of the circumvolutions of the cerebrum consists of an organ of some intellectual or sensible power, the greater size and developement of which would of course give the skull its peculiar shape, rest the sciences of *craniology* and *cranioscopy*. The one of which asserts that the shape of the skull gives the law, by which, not the actual character, but the tendencies and dispositions towards character in men, are determined; and the other asserts, that that law can be discerned and ascertained by contemplating the shape of the skull.

The merely observing the process of ossification, is sufficient to suggest, that the bone is essentially the passive result of the more active and finely organised matter to which it is attached; and this is further confirmed by its subsequent diminution, and the mode of its being affected by the diseases of the brain. When the brain, with its three coats or skins, the *pia mater*, *tunica arachnoides*, and *dura mater*, which attend it in its circumvolutions, is already perfectly formed, there forms itself on eight parts of the external skin, a point of ossification, at which a slimy matter exudes; this hardens, lines diverge from it in every direction, and at length the eight bones of the

the skull are formed; these lines of concretion firmly attach themselves to the dura mater, they harden, meet at the sutures or seams, and complete, after the birth, the covering of the skull.

The best commentary upon, and deductions from this statement, will consist in answering the objections made to the general theory.

1.) Can we infer the form of the internal plate of the skull, from that of the external plate? Answer. The *laminæ* run parallel till the individual is about forty years of age, later in life variations take place, as well through age as disease, which will be noticed; and the power of inferring the one from the other suffers restriction.

2.) As the brain is of so soft, almost fluid a substance; is it found that the organs retain the same place in the brain, so that they can be with certainty recognised? Answer. Observation shews that the folds and circumvolutions of the *cerebrum*, in the more simple animals, are quite symmetrical; and in man, nearly so. And tho' the extent and boundaries of the organs may not yet be always determined, their relative position and their relative perfection may be ascertained.

3.) Is it not more probable that the form of the skull being determined at the birth, fixes that of the brain?

On no account; for whatever violence may be done to the bones of the skull during the birth, those bones return into their natural state, partly from their elasticity, partly from the active power of the brain working outwards. It is only when the bone is broken, and the brain itself is injured, that the intellect is affected, and that the skull retains the form which violence had impressed on it.

Gall produced, in confirmation of this statement, the remarkable skull of a man full grown, which was at the birth broken by Levret's forceps on both sides, and never recovered its form. The mark of the forceps was distinctly observed on the outside; but the internal lamella had no impression upon it, because not being broken, the power of the brain had restored it to its original shape. Yet from the thinness of the internal lamella, and the violence with which the forceps forced in the outer lamella, it having, by touching the inner lamella, destroyed the dipploe between, it cannot be doubted that some violence must have been done also to the inner plate.

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The principal cause of this activity of the brain operating outwards, lies in the regular motion of the brain occasioned by the circulation of the blood: this is the reason why swellings and *aneurismata* in the membranes of the brain never work inwards but outwards; that in case of wounds upon the skull, the mass of the brain presses outwards; that the vessels of the brain and its coats press upon the internal lamina of the bone. And this is in like manner the reason why, when at the birth, the bones of the skull are pressed or pushed wrong, without being broken, the brain under the place suffering violence, instead of being paralysed and destroyed, recovers itself by its own energy, remedies the injury, and forces the parts into their proper place. How otherwise do the heads of animals recover their shape, which are often pressed in during the birth?

4.) But are not the most important organs of animal life and of the intellectual functions, formed *after* the birth, and long after the skull is completely formed? It is ascertained that certain organs are formed after the birth, and G. himself asserts that the brain alters its shape in conformity with such subsequent formation.

It is necessary, in order to explain this, that we anticipate in one or two points, the enumeration of the organs. G. observes, that a very prominent swelling of the forehead is characteristic of young children, and that as they advance in years this protuberance diminishes, and the forehead retreats. There is another observation which every one has made, that the faculty and the habit of attention is peculiar to children, that they have a facility and felicity in making observations which seem to surpass what we afterwards remark in them. Hence, says Gall, the aptness of most parents to imagine their children, in whom they remark this sagacity, are possessed of singular talents; when a few years are passed over, the wonder ceases, and the miracle of three or six years old is an ordinary boy at ten or twelve. G. connects these observations together by placing the organs of observation in this district of the *os frontis*, as will be afterwards more particularly pointed out.

This is also confirmed in the organ of the sexual impulse, which is seated in the *cerebellum*, as will be shewn hereafter. It is known that the cerebellum is, in proportion to the cerebrum, very small in children, compared with its size in adults. The gradual

dual developement of this organ may be perceived by comparing skulls at different periods of life. In children, for instance, that part of the skull which corresponds with the cerebellum, between the two mamillary processes of the *ossa temporum*, measured across, occupies one inch and an half; and at the same time another part of the skull corresponding with other organs, measures, between the same processes and the summit of the *ossa parietalia*, three inches. But with encreasing years, as the sexual impulse and its organ are more and more developed, this proportion is no longer to be found on the skull; and the space between the mamillary processes approaches (as is demonstrated by a comparison of skulls of all ages) the breadth of the skull between the mamillary processes and the summit of the ossa parietalia; till at length, when the individual has arrived at his full growth, it equals and even surpasses it.

If this active power of the brain in forming the skull, which passively yields to all influence from within, while it resists all pressure from without, be established; how are we to account for the facts stated by travellers concerning the artificial modelling of the head by savages. G. objects to these state-

statements, and considers them as not being entitled to much weight, from their not having proceeded from anatomists, and not being confirmed by any skulls brought into Europe for examination. He knows, he says, that nothing short of extreme violence could produce any permanent effect upon the shape of the skull; and he appeals to observation. There are many provinces of Germany in which persons, and particularly women, are accustomed from their infancy to carry heavy burthens upon their heads, but though this has subsisted for generations, it is not found that any flatness is prevalent on the skulls of such people. But where the bone has been broken, it would follow that if death do not ensue, yet the organs immediately under the injured part would be paralysed and injured; hence it is found, that the same travellers who give an account of the deformity thus violently caused in the skull, also relate that among the same people extreme stupidity and idiotcy are very frequent.

5.) But does not ossification proceed according to certain laws of crystallisation, according to which we assume that the *sinus* of the *os frontis* and the upper jaw bone arise? How then can the brain determine the form of the skull?

To this it may be answered, that we find in the whole œconomy of nature, that the law by which the inferior organisation proceeds is, in a manner, subdued and rendered of no effect by the action of higher laws. Thus, during the existence of animal life, we find the mechanical and chymical properties of matter, as it were, suspended. In like manner, here too, the laws of crystallisation are rendered invalid by the superior energy of the living brain. Besides this, we often observe that the brain has power to restore the inward lamina of the skull on which it immediately acts, while the outward plate retains its injury. As after trepanning and wounds, and where the sutures separate in an *hydrops cerebri,* only the inner, not the outer plate, is restored; yet if the process of ossification were independent of the brain, we might expect a like reproduction of both. On the other hand, where the brain likewise is injured, then the inner plate is not restored, and disease always remains. The cases of hydrops cerebri strikingly shew the power of the brain; the skull swells enormously, and the membranes, which before united the bones, themselves harden to bone. These statements were confirmed by the production

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of a skull on which this partial reproduction, &c. could be perceived.

6.) It has been suggested that the form and eminencies of the skull may be attributed to the action of the muscles affixed to it, as we see that the muscles elsewhere form such eminencies and protuberancies. But this objection is sufficiently refuted by the impossibility of the muscles acting on the inner plate of the skull, with which the outer plate runs parallel, even in advanced life, and when the laminæ are at a distance. Besides this, there are parts of the skull marked by protuberancies, which are not covered with muscle; as for instance, the swelling of the upper part of the *os occiputis* in women (the organ of parental affection) which is much stronger in them than in men, and on which no muscle acts.

7.) But if the growth and developement of the brain and its parts have influence upon the form of the skull, in like manner the decrease or diseased imperfection of the brain should also affect it.

And this is found in fact to be the case. When in old age the powers of the mind decay, the brain also, as it were, shrinks; the circumvolutions sink in, and interstices are formed.

formed. In this case, either both plates of the skull gradually retreat and sink in, after the brain (and this generally takes place on the forehead first) and thus the head becomes smaller in general, as our daily observations upon old people may convince us: Or the skull itself becomes thicker, either by a new mass of bone forming itself in the place of the shrunken brain; or the inner plate alone shrinking, a fresh mass of dipploë is collected between the two plates of the skull. Hence it happens that in old age the head always becomes smaller or heavier, and sometimes both.

It is not only in a state of health that the skull is modified by the brain: The disease of the brain will also produce a diseased form of skull, which thus serves as a diagnostic sign of the disease of the brain.

In an *hydrops internus*, the *ossa parietalia* are pushed outwards: But at first the water presses downwards, makes the *basis cranii* flatter, and the orbits narrower, so that the eyes are pressed out.

Gall produced the skull of a boy seven years of age, who died of a consumption of the brain; the skull was unusually small, and Gall stated this as an instance that frequently occurs, and shewing how the growth of the

skull

skull was impeded by the disease of the brain,

Another phænomenon attending the shrinking of the brain, was stated by Gall to be not unfrequent, and leading to the same conclusion: that is, the hollowness and deepness of the orbit of the eye, the lamina of which retreats backwards with the shrinking brain.

But the more important cases on which Dr. Gall relies are those of lunacy, confirmed madness, and a disposition to commit suicide. With respect to these, Gall professes to have been led by his theory of the brain and of its organs to adopt modes of cure which have been successful, and which promise to be of great value to the practising physician.

When lunacy has lasted long, one part of the brain shrinks away after the other, till confirmed incurable insanity is the consequence. The effect of this is, that the skull becomes always smaller and generally more heavy, thick, and dense; from the accession of bone and dipploe, as before stated. By lunatics too the same appearances take place.

Gall has also found in suicides, the same thickness and weight of the brain; and he ascribes self-murder to a general disease of the whole brain, and considers this fatal deed as

generally

generally within the sphere of the physician rather than of the moralist. He ascribes therefore no organ to the love of life.

Where the disease of the brain is topical, there too the skull is partially affected. Where the brain is generally diseased, the skull betrays the evil by its general appearance; it ceases to grow, and a remarkable smallness and thickness of skull is apparent, not only in idiots, but in whole races that have been brutalised by long subjection and slavery.

These observations were made by Dr. G. as the result of many years practice, and with a particular attention to the subject. Here too he related a number of cases, the enumeration of which would be here irrevelant. He accompanied these statements by the production of skulls of very unusual thickness and weight: one of them, which weighed twice as much as another skull of an adult which was produced for other purposes, he stated to be that of a poor man, who had all his life been known as an industrious, sober, and honest man, but of a melancholy temperament: on a sudden, tho' no motive, adequate to the action, could be discovered by those who were acquainted with him, he killed his wife, several children (all of whom he loved tenderly) and then himself. G. stated

expressly

expressly, that he had never known either a lunatic, madman, or self-murderer, on whose skull some unusual appearance either in the particular formation, or general texture was not discoverable. He considers the fundamental causes of these diseases to lie in the brain, which however he supposes to be strongly affected by the climate and weather. Among the external causes, he imputes much to a moist atmosphere, and has remarked fatal effects in Germany from a prevalence of the south wind.

CHAP. VI.

OF ORGANOLOGY AND ORGANOSCOPY.

HAVING shewn by arguments *a priori*, that we ought not to be content with a general reference of the mind as *one* faculty, to the brain as *one* organ; but that as we are conscious of diverse powers of mind, and observe that the brain is a various substance; we may assume in both equally, a distinction of parts, tho' those parts may be ultimately so united as to become one; we ought hence to seek at least to ascertain the relation of these several parts to each other: And having proved that the skull is modelled by the brain, and that therefore we may avail ourselves of the hardness and permanent form of the one, to discover what the softness and perishable nature of the other would not permit our finding directly; we might proceed now to the statement of those organs individually: but it will be necessary previously

to make a few remarks on the kind of qualities and powers for which organs may be expected, and the kind of evidence, and means of enquiry, which the nature of the science admits.

It is observed by *Helvetius*, that all new ideas come into the mind unexpectedly and by chance, that they cannot be sought or anticipated; a remark, unquestionably just, for otherwise the ideas would not be altogether new. The commencement of every science proves this fact, but the progress of the same sciences also proves that, however gratuitously the elements of knowledge are given us, there is in man a power and an impulse to take the work of chance under the direction of his own thinking and anticipating mind. However few the data may be with which he is furnished, he instantly generalises his observations, makes systems, plans experiments, fails in them, is helped in his progress by new accidents, amends his theory, reverses it, discovers new properties and powers, and goes on daily in adding to the mass of his individual observations and facts; but still he is unsuccessful in his attempt to bring these observations to unite and bear upon one great result. The lovers of science, in the course of its progress, naturally

rally arrange themselves under two great classes, one of which seem to regard the individual facts they learn, as of no value, except as they lead to the one great idea they are seeking; and these are the *metaphysicians and speculative philosophers*: And they would willingly dispense with all individual things, and single phænomena, could they get at their theory and system without them. The other party consists of those who are searching in all directions for something new; they hoard up every discovery with much indifference as to its tendency, regard the quantity more than the quality of their information, and absolutely despise all general views and notions of things. These are the *experimentalists*—the *matter-of-fact men*. But as their aim is still the acquisition of more knowledge, and as facts and things do not generally present themselves to those who do not seek them; they have no means of acquiring further knowledge, but by arranging and classing that which they have already, generalising, in some measure, their notions, and pursuing their researches by something like a theory and system, though it may not look far, or be very complete. Thus it happens, that in the progress of science we are reminded of the ancient fable of The Bli

Man, and The Lame Man, who were obliged to unite their powers in order to proceed on their journey. But the union, though necessary, is not cordial; hence we see speculative and practical philosophers, as they are called, much more intent to decry the powers of their rivals than to borrow their aid.

Gall is an instance of this. Professing to be a mere observer of the phænomena of nature, he is a despiser of all speculation and metaphysics. And no one has suffered more than himself from this narrowness of mind; for as in spite of himself he must have something like a theory and system, as he cannot state his observations but in general words, as he must draw something like a conclusion, he finds himself within the territory of metaphysics before he is aware of it. Here he shews himself disadvantageously, not having been in the habit of scientific reflection and abstraction. As he has not even a language adapted to the subject, no chart of mind previously drawn, he is utterly unable to generalise his observations with taste or propriety: Hence his doctrine has often an absurd and ridiculous appearance, which the possession of other than experimental habits and talents would have enabled him to remove. These remarks I thought necessary here,

here, that certain gross defects (in the doctrine of which an account is to be given,) may not prevent its merits of another kind being attended to, as both may be reconciled together.

In answering the enquiry concerning the *powers and dispositions of mind, for which we may expect to find especial organs in man,* Gall thinks it proper to ask, What is the world? and answers shortly; It is that which is revealed to our senses and understanding. The world is nothing to that thing which perceives nothing; and it is and becomes something, and is more or less to all sensible and thinking beings, according to the respective organs of sensation and thought with which they may be endowed. The animal is distinguished from the lower species of beings, by perceiving things without itself, *(extra se)* by consciousness of such perception, and the power of acting, as it were, out of itself upon the external world. The animal perceives more or less of the external world, according to its organs of perception, that world being revealed to it by its organs of external sense. The sensations from without generate, or rather are metamorphosed, into ideas or thought, from the internal sense or organ whatever it may be. In the higher

excellence, and more perfect construction of this internal sense, which we may call the power of thinking, lies the superiority of man over the brute creation. Many animals surpass man in the delicacy and force of the external sense, yet man has more knowledge of the external world than they; because he has a sense or organ to perceive more relations and modifications of that world than they perceive, in other words because he has *mind* pre-eminently, if not exclusively.

What then are the modifications of the external world which man perceives by means of organs; and which of these organs are to be considered as independent and self-subsisting?

In general we call the power man possesses *understanding*, that of the animal, *instinct*. But, considered in themselves, instinct and understanding are not different. Power and sense are the basis of both. In both is impulse, which we name differently, according to a circumstance which is merely accidental. We call the impulse, which is understood by the subject in whom it resides, *understanding*. When we wish to express that the impulse is not understood, we call it *instinct*.

In men and animals we are alike compelled to assume the existence of an organ corresponding

sponding with every individual exercise of power. How otherwise can we explain the various distinct impulses or instincts of animals? To answer that they arise from a necessity implanted in the very natural constitution of the animal, is re-stating the difficulty, not answering it. All enquiries into the nature of things take for granted the necessary existence of each individual thing, and seek to ascertain the relations and connections between the several laws of existence by which each thing exists apart; so that one law or necessity springs from the union. Hence we derive the idea of instrument or organ as a mediating causal substance. But it may be said, the instincts of animals arise from the feeling or consciousness of necessity; but this consciousness, did it really exist, would not imply the power of acting conformably with its dictates. Besides, among what are called the instinctive actions of animals, are many which suppose an impulse beyond the sense of necessity or the feeling of present pain: we witness foresight, the choice of means, &c. Neither are the manifold impulses of the animal world to be referred to one simple impulse, that of self-preservation.

There are also many phænomena in the history of man which oblige us to have re-

course to a natural impulse or tendency to certain actions. There are instances in which an inclination to steal is found, which neither natural nor social wants can have generated. Affluent persons, nobles, and princes, have felt this impulse. The most abandoned and profligate people have evinced a singular attachment and fidelity in their friendships. And in individuals are found the most astonishing inconsistencies of character; religious sentiment has been seen in a high degree united with gross immoralities, which imply contrary tendencies, in the same character.

With respect both to animals and man, we can expect to find organs only for those distinct, individual, decided capacities and inclinations, which are the basis of the affections and actions of both. For the following appearances, therefore, we ought not to expect any organ.

1. For those talents and capacities which are the result of a number of powers united; as those of the poet, astronomer, &c.

2. For those powers and qualities which are common to all capacities and organs, and which therefore imply only different degrees of those capacities, as for instance:

a.) Susceptibility of impression is common to all organs; for the organ can be operated upon only by means of its being susceptible of impressions.

b.) Memory

b.) *Memory* too is common to all organs, for it is founded upon, and subsits in the exercise of the organ: we do not seek therefore for a memory in the abstract, but for a memory appertaining to particular objects, as musical, local, arithmetical memory, &c. And it is in fact found that the excellence of the memory of individuals is confined to those objects. the organs of which are in them peculiarly developed.

c.) *Judgment* also, is nothing but a heightened sense produced by exercise, and referable to the individual objects and organs: hence in the distinct arts and sciences in which men may excel, we find they possess the soundest and surest judgment, though on all other matters their understanding may be weak.

d.) *Imagination* or inventive power, is a still higher excellence, and *Genius* the most perfect developement of that organ, or of those organs, in individuals, in whom one or more of them may be found in this exalted state. We find some men endued with specific talents, a sort of insulated ability, while others, from the variety of their powers, are denominated universal geniuses, however incorrect such an appellation may be.

3. For the different degrees of *sensibility*,

as

as inclination, desire, passion: these must be referred to the individual organs, whose developement produces respectively the various degrees of desire.

4. The *affections* likewise are but modifications of other organs. *Joy* results from the harmonious energy of our different powers: *sorrow* is the dissonance of those powers in their exercise.

5. *Conscience* has no distinct organ. As we observe that some persons can perform the most atrocious deeds, without evincing any remorse or uneasiness, we might infer, that conscience too had its peculiar organ, the want of which might occasion such observation. But conscience is too complicated to be referred to a simple organ; its pleasing or painful impressions are the result of the concord or discord of our conduct with our notions, in which the most artificial and accidental motives take part.

In answering the objections made to the doctrine, that each definite impulse has its peculiar organ, Gall takes needless pains to obviate that arising from the freedom of the will, of which he gives a definition that will hardly satisfy any party. Freedom he considers as founded on the greater or less susceptibility of motives; and man has more

freedom

freedom of the will than other animals, because, in addition to all the sensual impressions, he can receive and obey the suggestions of morals, &c. In asserting the propriety of perpetually comparing man with the animals, he asserts, in opposition to *Cuvier*, that no animal has any organ in its brain which man also does not possess. Man unites in himself all the organs which are variously scattered and dispersed among the brute creation, and is therefore the representative of the animal world. But he has also organs in his brain which no other animal besides possesses, and these are the seats of those powers which are the prerogative and glory of the human race, as, for instance, *Theosophy*. Gall allows that it is frequently difficult to carry on the comparison in the anatomy of the human and animal skull, and frequently confesses his doubts, as for instance, whether the organ by which an animal has a love of high places, be the same which we find in man pointing out in him moral loftiness or ambition.

However Dr. Gall may, in spight of himself, speculate as to causes, and indulge in abstract statements, in his endeavours to render his doctrine intelligible and plausible, still in his proofs and direct arguments he confines himself to observation; and instead of

boasting

boasting that he was generally fortunate in discovering at once the organ which he was seeking, he relates with satisfaction the many mistakes and false conjectures which he made before he succeeded in fixing upon the right explanation.

From his earliest infancy, natural history was his favourite study, and his great delight consisted in collecting plants and animals of every kind, and classing them, not according to the method pointed out in books of science, but according to their obvious and sensible differences. As he grew up, he fixed upon medicine to be his profession, and was led by an impulse, which he of course considers as the result of his peculiar organisation, to the habit of observation and comparison. He was very early induced to remark the various shapes of the heads of his companions and fellow-students, and to connect these peculiarities with their moral and intellectual character. Having remarked in some cases a striking conformity between the general form of the heads of those who also resembled each other in mind and temper, he inferred the general character from the general shape of the skull; but unfortunately he found, on further examination, as striking a disagreement as he before remarked a certain correspondence

pondence in these observations. This forced him to retract his former general inferences, and be more precise in his remarks. He then began to direct his attention to the individual parts of the skull, and here he found less inconsistency in his particular deductions; but he was frequently forced to shift his ground in assigning the local organ he assumed. At the same time, he called to his aid the observations of comparative anatomy and professional experience; and after many years long and constant observation, he thinks himself justified in giving the result to the public, as facts proved by experiment, not as principles or rules susceptible of demonstration.

It may be useful to state more precisely the rules of observation by which he challenges the public, and particularly professional men, to try his statements: having faith in the uniformity of nature, trusting that what he has long uniformly seen, others will also invariably remark.

1. By a close observation of living persons in a state of health, carefully feeling and correctly noting the eminencies on the skull, each of which he considers as an organ, using that term in expressing the *continens pro contento*; and considering that only as skull which immediately covers the brain.

This

This observation has taught Gall, that persons eminent for certain talents have certain eminences on the skull, the seats of which are capable of being ascertained and pointed out*: while those who are altogether destitute of such talents, have a sinking or depression of the skull on this part. In order to make this experiment with success, Gall recommends it to be tried, not on common, every-day persons, but on those who are marked by strong peculiarities of mind and character: for perhaps every man has every kind of talent and tendency, though in so slight a degree as to be unproductive of any effect, from the stronger influence of other powers: hence the difficulty of determining the peculiarities of those who manifest mediocrity in all things, eminence in none. He also prefers subjects uneducated and uncultivated, as the natural tendencies of their character have been left more to themselves, while the polish of social life tends to rub off the prominent peculiarities of individual formation. In feeling for the organ, he recom-

* But only to the experienced observer. Gall deprecates the hasty and presumptuous stile of *organ hunting*, by which many of his disciples expose themselves and the doctrine to ridicule. He would for the present confine to professional men exclusively the practice of the art.

mends

mends the use, not of the fingers, but of the middle of the palm of the hand; and declares that habit, as well as a certain natural delicacy of tact, is necessary to qualify a person to make these observations with certainty of success.

2.) But some of the organs lie at the basis of the skull and on its lower surface; these must be sought for after the death of the subject.

3.) The observation of persons during a state of disease.—This is particularly applicable to diseases of the intellect; it furnishes Gall's Theory with some of its best arguments and illustrations, and suggests some important and estimable practical benefits which may be drawn from it.

Insanity is, in the opinion of Dr. Gall, a disease of the brain; and as we observe a sort of partial insanity, so G. is of opinion that parts of the brain may suffer a peculiar affection, while the other parts are left comparatively in a healthy state: but that the whole brain would be in a very dangerous condition, is as obvious as the want of confidence in a person lunatic, or partially insane. Supposing there is in the brain generally a tendency to disease, Gall is of opinion that the prominent and eminently developed organ would be peculiarly liable to be affected.

Hence

Hence Gall asserts an ability at all times to determine, upon an examination of the skull of a lunatic, in what way his insanity betrays itself, even if such lunatic should have avoided every actual expression of it. In mad people who have fancied themselves to be God, or Jesus Christ, or at least inspired prophets, as well as in those who suffer the agonies of religious despair, he has uniformly found the organ of Theosophy. Thus it is, that the fixed ideas of the insane are determined by their organ: and wherever any organ is found in a very high degree, there is always danger lest a disease of the brain should produce a corresponding madness: at the same time it is possible, that where the profession and habits of men lead them to exercise a particular organ, and set it in a condition of great activity, though by nature there may be no peculiarly marked organ, yet that the disease may fix upon the organ so put into activity. And as the influence of life and habit upon the organ is as sure as that of the organ upon life, Gall advises, that in many cases persons should try to resist the tendency of their minds, by following pursuits altogether the reverse: for instance, if he knew a young man of a melancholy turn of mind, full of nervous sensibility, conscientious

tentious and scrupulous, in whom also the organ of theosophy should be found in a high degree; instead of allowing him to follow what would probably be the bent of his inclination, the profession of divinity, he would urge him on the contrary to pursue an active life*. This observation has led Gall to the application of cooling remedies on that part of the skull where the organ lies, from the diseased activity of which the disorder proceeds. It being the same thing whether we affect the habits of thought and ideas, by diminishing the activity of the physical organ producing them, and whether we diminish the activity of the organ, by forcing the mind to other pursuits; that is, by rousing other powers, and setting other organs in motion.

4.) By observing the influence which wounds and injuries of the brain have, upon the intellectual powers and inclinations of men.

* I cannot avoid noticing here, that many years since, the greatest poet of Germany, GÖTHE, in his admirable novel, *Wilhelm Meister*, taught this same important lesson, certainly on very different grounds. He introduces a pathetic case of insanity, arising from a father's determining the profession of his son by his ruling passion; and he indirectly suggests the wisdom of often counteracting rather than obeying the inclinations of early youth.

But this rule of observation is rendered very uncertain, from the impossibility of determining with accuracy the part of the brain which is affected when we know the part of the skull which is injured: and even if we discovered an injury in the brain itself, still we could not infer which organ had sustained most injury, as in cases of wounds it is often found that parts of the brain not immediately wounded, suffer more in the dissolution or destruction of their organisation, than the parts directly touched and wounded. After the brain has been so shaken as to occasion death, it has frequently happened, that nothing could be discovered but a diminution of mass. In such cases we cannot possibly say that the brain has not been disorganised, and yet the place of the disorganisation cannot be pointed out. This also applies to the observation of the effect arising from the application of topical remedies to the skull, in cases of insanity, where fixed ideas prevail, &c.; and yet Gall requires that this circumstance should not be neglected in determining the organs. There is another objection to the inference which might be drawn from wounds and injuries, in ascertaining the seats of the different organs; and this arises from the duplicity of those organs. For as the organs for

the operations of the mind, as well as those of animal life, are double, it may easily happen (particularly when they do not lie near each other) that one of them only may be injured; and thus the function may be continued, tho' one of its organs is destroyed, as the sight remains after the loss of one eye.

This is the reason why the experiments of *Arnemann*, and those instituted by the Academy at *Dijon*, in order to determine the seats of organs in the brain, by destroying certain parts of it, were so little satisfactory, and led to no important discovery.

Further, as we experience that a diseased state, and the diseased irritation, will cause an encrease as well as a diminution or annihilation of its activity; hence we must avail our selves of such phænomena after the wounding of the skull and brain, with great caution and restriction.

5.) The comparison of the skulls of animals with their powers and qualities; and also of both of these with the skulls and powers of men.

It is true this part of comparative anatomy has been much neglected, and it is difficult to determine the relative parts of each: still much may be learned by such a comparison; as for instance, we find the musical organ

very strikingly in singing birds, that of slaughter, in carniverous animals, &c.

6. We may avail ourselves of impressions in gypsum of heads and skulls.

This is a valuable substitute for the natural skull, and when a number of them are brought together, more particularly of public characters, men eminent in the arts and sciences, the comparison of so large a number cannot but lead to important results.

7. It is useful to observe the gradations of eminence and perfection in which the distinct organs are found in the various classes of animals. Dr. Gall states the following facts as results.

a.) That the more homogeneous the mass of any organic being is, or the more an animal approximates to a plant, the greater is its power of reproduction; while this power declines, and life concentrates itself, the higher the nerves and brain advance in this developement; so that in the more perfect animal, man, the power of reproduction is confined almost alone to the bones, hair, and nails. It follows from this that the brain has no share in supporting organic life.

b.) That the organs of animal life in the various kinds of animals proceed from the spinal marrow.

The

The connection of the organs of organic and animal life takes place on that spot of the *medulla oblongata* where the pyramids cross (in the neck.) Hence this spot is the most mortal in man and beasts. In most countries, huntsmen, butchers, and cooks are acquainted with this. Even the falcon is instinctively led to strike its prey on this very spot, either with its beak or claws. But still we are not to consider this point as the organ of vital power, or the vital principle, as that is merely a fiction, and no where really existing. Immediately above this spot are those organs which are of first necessity and importance in the support of existence: on the basis of the brain are the organs of the sexual passion, parental and filial affection, and the organs of sense. The more the animal advances in perfection, the more the organs ascend, as it were; so that those which are peculiar to man, lie upon the summit of the brain.

c.) That those organs whose functions are analogous, as for instance, those of the sexual passion, love of children, &c. adjoin each other.

After the preceding statement it is needless to add that Gall considers the enquiry concerning the *seat of the soul* to be idle

and absurd: but it may be right to remark that he objects to the hypothesis of *Sömmering*, that it lies in the liquid found in the fourth ventricle, for two reasons. First, that not all the nerves end in this ventricle, viz. the auditory nerve does not; and secondly, that the existence of this liquor in the living and healthy state of the subject has not yet been proved.

It may be proper to add that experiments were made at Mayence on persons guillotined. The brain was opened immediately, and no liquor found in the ventricle; it may therefore be an accumulation of vapour or gas taking place after the death of the subject.

CHAP. VII.

ENUMERATION OF ORGANS.

In proceeding now to the enumeration of those organs which Dr. Gall supposes he has already discovered, the English reporter of this new German Organology does not hesisate to declare that he is well aware of the first impression which the very pretension to such a science must make on the minds of his readers in general, and that he regrets his author should have possessed so little address in his attempt to remove the obvious *â priori* objections to his doctrine. Dr. Gall once declared in the writer's presence, when he was hunting for a name for one of his organs, that he was better qualified to detect an unobserved phænomenon of nature, than to find words to state his discovery: hence he has frequently changed the names by which he

distinguishes his organs; and doubtless, should the substance of his science be confirmed, and become current, his vocabulary will not long remain as it now stands. This vocabulary too will be more offensive to an Englishman than a German, on account of the different habits of the scientific men of the two countries, in the use of popular terms. The German philosophers are accustomed, in order to express a natural or moral principle, to borrow some familiar term, commonly applied to an ordinary fact or appearance in life or nature which is derived from such principle; and at the same time, in their scientific use of the term, they make no reference whatever to that ordinary fact or appearance; employing the name of the thing for the principle in which the thing originates. German students are therefore accustomed to construe such popular terms liberally and scientifically, but in England, general readers will always be liable to misconstrue such a language; they will give a gross interpretation to positions which was never intended by the authors of them. On the other hand, were writers to avoid such popular terms, and hunt for a vocabulary in the wilds of metaphysics, they would be, it is true, not misunderstood, but still they would not be understood,

derstood, for they would not be attended to at all. I should not wish to try the virtue of most authors, by placing them between the horns of this dilemma. Gall has made his choice: without hesitation he has put his finger upon the human skull, and said: Here is the organ of cupidity, there of murder; this protuberance points out one who has an excellent verbal memory, that, denotes a person who recollects places well; at that corner lies the sign of musical sense, here that of colours, &c. &c. Such being his unqualified assertions, or rather, such being the assertions which it is easy to learn by heart and repeat, while the qualifications which the author makes are disregarded, and not repeated; no wonder that sometimes indignation, and sometimes contempt, indispose judicious persons to enquiry: and while Gall himself neglects to point out the different degrees of proof by which his distinct positions are supported, the laughers and the revilers cannot be blamed for chusing as the themes of their merriment or declamation, those assertions which appear the most extravagant and fanciful.

In the mean while, the most unfavorable remark which forces itself on the minds of even the candid and liberal, is the inadequacy of the organs to explain the various

phænomena

phænomena of mind. Some are found for very insignificant and merely accidental circumstances of life and characters, while essential features have no corresponding instrument. Perhaps, however, this objection may be sufficiently invalidated by observing, that we cannot here apply the rule, "*De non apparentibus et non existentibus eadem est ratio.*" We may well conceive the existence of the organs, tho' we may not be able to point out where they appear. But I need not here anticipate the objections of the judicious readers; the less so, as at the end I have translated the impartial strictures of Huseland, a physician of distinction in Germany, and advantageously known here.

Gall arranges the organs under three distinct classes.

1. Those by which man is immediately enabled to enter into connection with the external world.

I.

The Organ of Sexual Love.

This organ constitutes the cerebellum. It comprises that part of the *os occipitis* which lies below the *linea semicircularis inferior*, towards the great occipital hole, and in living subjects

subjects therefore is to be judged of only by the thickness and breadth of the throat and neck; it appears double on the skull. Though the two organs and eminences of the cerebellum join, yet each produces a swelling apart on the skull, occasioned by the *crista occipitalis interna*, which lies between.

Proofs and Observations.

a.) It has been already observed, that as the sexual passion arises, this part of the brain (the cerebellum) grows in disproportion to the other parts (the cerebrum); and when, by castration, the purposes of nature in the formation of this organ are defeated, we find that this organ ceases to develope and perfect itself. It is observable in all who have suffered this operation when young, that the back part of the skull, as it were, ceases to grow; the neck is narrow, and the voice, whose seat is in the throat, loses its manly vigour.

b.) This remark is equally made in many species of animals. In the more simply framed animals, in certain insects which generate in the usual way, the whole mass of brain consists of mere knots, which are, as it were, the commencements of the cerebellum;

lum; while in those other animals which do not procreate in that way, these knots are wanting. The stallion and the bull have a more perfectly developed cerebellum, and consequently have a thicker neck and broader head behind, than the gelding and ox. This is known to the common people who are concerned in the breed of horses, who give the preference to those stallions whose ears stand the widest apart. The male mule, which has no power of procreation, generally speaking, has a very narrow neck, and the ears stand close together. It is further observed, that the horns of the ox are much larger than those of the bull, for the reason before stated, that the process of ossification encreases, as the brain diminishes; from the same principle are the phænomena attending the growth of the horns in the stag. If at the time of rutting, the horns are cut off, the animal loses its power of procreation, in the effort of nature to reproduce this substance. The channel in which its strength should run is turned aside, and it does not recover its generative faculty till the horns are grown again.

Throughout the whole class of quadrupeds, the neck of the male is thicker than that of the female. Gall attributes this to the

longer

longer duration of the sexual appetite in the male.

c.) There are many phænomena, in cases of disease, tending to the same conclusion.

In the nymphomania Gall has found the neck very hot, swollen, and painfully inflamed. He related the case of a woman of rank and character in Vienna, subject to the most violent attacks. She was frequently seized with convulsive affections in the neck; and in a sort of madness would violently knock the back of her head against her back and shoulders till she obtained relief by means of a seminal discharge.

Wounds in the neck and back of the head will produce inflamation of the parts of generation and even impotence.

In nervous fevers, *satyriasis* is not merely a local disease, but a general evil of the whole nervous system; and to be removed only by some general remedy applied to the nerves. This seems to intimate the participation of the brain in generation.

The cases of *hydrops cerebri* are also in favor of the same doctrine: It is found that of all general functions of the brain, that of generation is often the only one which remains undisturbed; and for a very natural cause,

that

that the cerebellum suffers least of all parts of the brain.

Cretins are notorious for their lasciviousness, while they are without the common intellectual powers, and their cerebellum is unusually large. The known effects of sleeping on the back, Gall also attributes to the pressure and warming of the cerebellum.

Among other cases of insanity, G. related one of a man, from whom the fixed idea could not be removed that he had six wives, &c. The cerebellum was found monstrously large after his death. Once, on entering an hospital, in which he never was before, he heard a mad woman uttering the grossest obscenities, he desired the attendants to go and examine her head, declaring that if they did not find the skull remarkably large behind, he would renounce all his opinions. He was not deceived.

The bust of Raphael which was made from an impression taken in Gypsum, exhibits a sort of bag behind, announcing that tendency of his constitution to which he unhappily fell an early victim.

II.

The Organ of parental and filial love and the animal storge.

According to the observation that kindred functions are seated in adjacent organs, this organ is found in that part of the os occipitis which is included between the two *margines lambdoideæ* ——— and the *protuberantia occipitalis externa.* It appears simple on the skull, because the two organs adjoin.

G. very early remarked on this part of the skull, not only in women but in the female of many animals, a very striking protuberance or swelling, which is never found in the same degree in male animals: In the female ape too, and in children, this conformation is also remarkable. Having then no correct notions concerning the nature of an organ, Gall conjectured this part of the brain to be the seat of some sort of sensibility which may be more peculiarly the attribute of the female; but afterwards, considering sensibility as a quality common to all organs, he was led to attribute to this conformation, a characteristic feature of the female sex, the love of their children, also that strong animal *storge* which

is

is found so frequently in the brute creation.

The following are the results which G. professes to have drawn from many years continued observation :—

a.) That in general the skulls of the female and male, in the human race as well as in many animals, may be distinguished from each other by the outline formed by the occiput, taking the profile of the face. The female head behind will form a curve, in which the projection is above, while the male head projects below; conformably, says G. with our observation, that that sense or impulse of which are now speaking, prevails in the female, while that which was the subject of the last article, is more strong in the male. The contrary opinion which is maintained by many, as far as respects mankind, G. attributes to our not enough considering the effects of early impurity in boys, in weakening their passions; and the more careful education of girls, which leaves women the full possession of those sensibilities which are and ought to be attendant on healthy maturity of years.

b.) Further, this observation is found to conform with the facts known of the life and habits of the different kinds of animals. The various

various form of the os occipitis is found particularly striking in those animals, the male of which do not care for their offspring, as the dog, the cock, &c. while, on the contrary, where the male shares in the solicitude for its young, it also has the organ. In like manner, this organ is wanting in those animals which desert their young; as the cuckoo, which leaves its eggs in the nests of other birds; the crocodile, which buries them in the sand.

c.) In children this organ is also found, and always in some proportion to the affection they early evince for their parents, nurses, &c. But as they advance in life, the form of the skull changes. In boys, that part of the skull retreats, which is the seat of this organ, while the parts below become more prominent; on the contrary, this same part of the skull swells and encreases regularly in girls.

c.) Further: Gall has been led to assert the influence of this organ, by various observations in the course of his practice. Among other facts, he related one, as an instance of a most unnatural impulse in the mind, which is better explained by supposing a physical necessity, resulting from the organisation, than by any moral explanation. Catharine Ziegler was tried at Vienna for the murder of

her bastard child: she confessed the act and said she could not possibly help it, she was forced to do it, she could not any how resist the desire she felt to commit the murder. The frankness of this her confession, connected with favourable circumstances, her good character, &c. induced the tribunal to pass a merciful sentence; and, under pretence of insanity, (which she did not herself plead,) she was acquitted, and at length let out of prison. But she told the court, that if they let her escape, they would be responsible for the next murder she committed, for that if she ever had a child again she should certainly kill it. And so she did in fact. About ten months after her delivery from prison, she was delivered of a child, which she soon murdered. Brought again to her trial, she repeated her old story, and added, that she became pregnant merely for the sake of having a child to kill. It does not appear whether she was brought before the same Judges as before, most likely not; she was executed for this second murder*.

* From the MSS. notes whence this account is partly taken, I do not find that this skull came under G.'s observation; but one of the printed statements of G.'s Theory, lying before me, states, that G. found the organ of maternal affection as it were cut off, but that book is too incorrect to be relied upon.

At Spandau G. examined the skull of a woman in confinement on suspicion of having seven times successively murdered her new born infant, but the fact could never be proved against her. In her he found the organ wanting. While, in a woman in labour who suffered under a delirium, and could not be persuaded that she was not pregnant with six children, he found this organ unusually large. The skull was produced, and it actually had the conformation pointed out. G. hence considers the want of this organ as the result of some disease in the brain, preventing its developement in this part.

Various objections have been made to the supposition of such an organ.

1. That it is too closely connected with the organ of sexual passion, to be distinguished from it: but G. replies, that these passions do not accompany each other, on the contrary, more frequently are found together, in an inverse ratio. It is one of the most interesting of Gall's observations (if in fact it be correct) that women, notorious for their licentious habits, are generally bad mothers, and indifferent to their offspring: and in like manner, that affectionate and tender parents are generally known to be at the same time among the chastest of wives. Those animals,

G. adds, are the most lascivious, which are most neglectful of their young.

2. That this love of the offspring does not show itself till the offspring exists, but the organ has subsisted long before: G. answers this objection by a remark of great importance in the general theory: that an organ may long remain in an inactive state, and that its presence shows the *possibility*, not the *reality* of any passion. Thus, in many animals, the sexual organs are periodically stimulated, as is the uterus of females, which produces thier periodical purification. In like manner, this organ may be first stimulated and called into action by pregnancy. That an organ may be stimulated to greater activity is instanced in mules, which may be rendered prolific in a warm climate by very nourishing food. The same answer may be applied to those who would bring forward the life of *actual* abstinence and celibacy led by so many of both sexes, in whom the same organs are to be found.

3. It has been said that cats, and other animals which manifest this storge, want the posterior lobes of the cerebrum, which is the seat of this organ; but this is a mistake, the lobes are actually in the brain though placed otherwise.

III.

The Organ of Friendship or Fidelity.

This organ lies on both sides of the skull, adjoining, and just above the preceding organ, towards the ear, immediately over the *sutura lambdoidea,* and above and about the middle of the *margo lambdoideus,* on the *parietalia;* and is the second organ which appears double on the skull, as the similar organs do not immediately adjoin.

The proof in support of this organ, and of the precise boundary of it, is not like that brought forward in respect to the preceding organs. G. speaks concerning it with unusual hesitation and diffidence. The evidence adduced is certainly not of a kind to justify our affirming its existence, though it may furnish a motive to anatomists, and persons who have a love of scientific observation, to direct their attention to the suggestion of the author*.

* To avoid the necessity of ever repeating the same remark, the compiler of these sheets wishes it to be understood, that what Gall confesses with respect to the present organ, he himself is disposed to extend to many of the organs hereafter to be enumerated, and most pointedly to those which concern the higher attributes and more delicate distinctions in mind; as wit, metaphysical acuteness, &c.

There are two distinct observations which have led to the supposition of this organ.

First, this organ is found in a great degree in certain species of dogs, whose fidelity and constancy are characteristic; in the terrier, the spaniel, the lap dog, &c. but not in the butcher's dog, the greyhound, and the mastiff.

G. has also observed this organ in a high degree in several persons, in other respects totally different, and agreeing only in this one quality. In the poet Alxinger; in a notorious highwayman at Vienna, distinguished equally as a robber and a friend, and who chose to die rather than betray his confederates, &c.

IV.

The Organ of Fighting.

This organ lies on both sides of the skull near the organ of friendship, but somewhat lower, or behind, and a little above the ear. It embraces therefore the *angulus mastoideus of the parietalia.*

Gall was long in the habit of collecting around him the boys playing in the streets of Vienna, and making them, by petty bribes,

confess

confess their own faults and betray those of their fellows. He then used to class his subjects together, the fighting, lazy, and roguish boys apart; and it was thus that he was led to assign an organ to an impulse whose reality will be readily acknowledged; tho' its description may not be easy. G. first called this the organ of courage; but it intimates, in fact, merely that sort of bodily courage, that disregard and inattention to bodily pain and danger, which distinguishes the boxer, and which disposes a man to be a soldier. Gall's profession allowing him to go on in his examination among the lower classes of society, he declares, that his speculation has been confirmed by several hundreds of instances, in which the character of the individual was as certain, as the organ was clearly ascertained. He then reversed the order of his enquiry, and examined the skulls of persons equally known for their want of courage, in whom he found the organ also to be wanting.

G. exhibited the skulls of the same poet *Alxinger* and of the Austrian General *Würmser*. The skull of the one was on this part quite flat, while a very marked swelling distinguished that of the General. It is needless

to add, that G. selected these specimens from the known character of the subjects.

Further, G. asserts that a comparison with various animals confirms his opinion. This organ makes, he says, the skull broad behind; it is a criterion of the spirit and courage of horses, dogs, &c. The bull-dog has a very broad head, the mastiff, on the contrary, not so much, also the little pug dog has this breadth behind. The hyæna is very broad between the ears, the hare very narrow. In birds also the organ is found; in the robin red breast and the Guinea hen. It is said that the Caribs try to flatten the head. G. suggests that if this habit be really existing, it may have arisen from their having observed that their bravest warriors have a peculiarly broad skull behind; and wishing that their children may be like them, they try this experiment.

V.

The Organ of Slaughter.

Dr. Gall was led to the detection of this organ by observing the different structure of the head in carnivorous and granivorous animals. Draw a perpendicular line behind the

meatus

meatus auditorius and you will find, that in granivorous animals, the whole of the brain, except that part of it which constitutes the organs of sexual love and the storge, falls before this line; and that on the contrary, in carnivorous animals, a great portion of the mass of the brain will be found behind this line. In men and in monkies the meatus auditorius falls in the middle of the mass.

After making this observation, it was agreeable to the maxims of Dr. Gall's theory to infer, that that portion of the brain which is possessed by that class of animals, is the seat of the organ which gives the impulse whence the class is formed and named. In animals, at least, that thirst of blood which leads to slaughter, must have a physical cause, an organ or instrument through which it acts; and if it be in the œconomy of nature to furnish man with the various propensities of the animal world, at the same time that he is endowed with higher impulses which enable him by the act of his will to modify and govern those propensities; there will not be any thing to the considerate student of nature, more offensive in the supposition of this organ, than in that of any other. Thus much is said by way of anticipating the probable

bable objection *â priori* to the notion of an organ of slaughter or blood.

This organ lies before and above the preceding organ of fighting, or above and somewhat behind the *meatus auditorius*, falling behind the line before mentioned; it appears double on the skull. It occupies that part of the parietal bone which lies immediately on and over the *margo temporalis*, and that district where this part of the parietal bone is united with the *pars squammosa* of the *os temporum*.

That man is an eater both of flesh and vegetables is known, and the position of his brain suits the rule laid down; the observation of a number of striking coincidences may justify the assuming a connection between the natural food taken by animals, and certain tendencies of character in men; and their being seated in one and the same organ.

It is notorious that individuals occasionally manifest a great delight in causing and in witnessing the violent death both of animals and men, which seems to suggest the existence of a *physical* impulse. Dr. Gall related a number of anecdotes (and every country has its own) of very strange propensities to

blood,

blood, which being unchecked by moral motives, may well lead to acts of cruelty and at length to murder. Connecting this fact with the observations just mentioned, and which the study of comparative anatomy had suggested to him, he proceeded to examine the skulls of persons who had betrayed those dispositions. From the Elector of Wirtemberg he obtained the skull of a murderer, in whom he found his expectation realised; and when at last the band of robbers and murderers who so long infested the left banks of the Rhine under *Schinderhanns*, were caught, and a number of them were executed; he found in the strikingly marked developement of this organ in these banditti, a confirmation of his conjecture which was satisfactory to him.

G. has further observed, that in those subjects, in whom this organ is prominent, the organ of good-nature is generally found very weak. Where the organ of slaughter is fully developed, and left as it were unbalanced by other organs, it may at length produce an impulse so strong as to be beyond the influence of voluntary power. Hence, that blind rage of murder and destruction, which general history, as well as the annals of criminal courts, have made known to us, and

which

which seems to be, in the wretched subjects of it, no less a diseased and insane impulse, than others less fatal to the peace of society.

VI.

The Organ of Address.

This organ lies before and above the organ of slaughter, about three fingers broad, just over the *meatus auditorius*, on the front lower angle *(angulus sphænoidalis)* of the parietalia, and appears also double on the skull.

It is found particularly in animals remarkable for their cunning and address in seizing their prey, in stealing, &c. particularly in the martin, tiger, panther, fox, cat, greyhound, and in some kinds of birds, &c. In men it is found in persons of very different characters, tho' each of them have that whence the organ is here named. Gall's German word *schlauheit* generally means cunning; and he asserts its frequency in persons of a low, mean, tricking turn of mind, in priests who ingratiate themselves with the wealthy, in upstarts who have risen by their *sçavoir faire*. But not only these persons are marked by this organ: it is common

mon to great politicians. Frederic the Second had it in an eminent degree. It is common to great actors, and seems to produce one of the great requisites for the stage. G. found it in the greatest actor and actress of Berlin, Iffland and Madame Unzelmann.—*Jam satis !*

VII.

The Organ of Cupidity.

Such is the name which G. has very recently given to an organ, which he formerly made known under the more offensive term *theft*. And this change of denomination is a specimen of that kind of improvement which must be made in the terminology of Gall's theory, should the general facts be ultimately acknowledged and wrought into a system.

This is the organ of address continued almost to the eyes, and is like that organ double. It occupies that part of the *os frontis* which is found by the *linea semicircularis* towards the coronal suture.

If the organs of address and cupidity be both at the same time strongly developed,

the

the head has a broad and at the top a flattened appearance.

The cupidity which is the result of the organ under observation, is, more particularly explained, the impulse privately and secretly to take away, and is occasionally found connected with no desire whatever to retain what has been so taken. Our books on psycology contain very curious cases of this propensity to steal, even in persons of rank and fortune, and the same thing is observed in animals. The jack-daw will not touch what you throw him, but he will steal the same thing and hide it carefully, and then bring it again; it is the same thing with the raven, cat, monkey, &c. Here this impulse seems to arise from the pleasure felt in the exercise of address or cunning. This same passion was felt by Victor, the first King of Sardinia. Gall stated a variety of singular cases which may perhaps be matched by tales every where. He spoke of ladies who *longed* to steal, and whose desire it was absolutely necessary to gratify; and of an impulse to steal arising after a person had been trepanned; cases which seem to imply that some organ has been excited by disease or accident. The Kalmucks, he says, are in general thieves. A young Kalmuck who

was

was brought to St. Petersburgh, and employed as attendant at the altar, and who had been impressed with religious fears, if not with religious principles; grew melancholy and languished with the *maladie du pays* (home-sickness.) He avowed to his confessor, that he longed to steal, and that his religion would not suffer him. The priest, finding that he could not cure him of his desire, and that the boy was actually pining away, at length gave him a permission to steal, upon condition, that within a given number of hours he should return the articles. In the evening the boy came back full of joy and gratitude, and brought the confessor his watch, which he had stolen from him while he was elevating the host.

Gall asserts, that during his long experience, and that minute examination which he has made in prisons, houses of correction, &c. he has always found this organ marking determined and incorrigible thieves. The organ, he observes, he has found more strikingly marked in the thieves of protestant countries, than in those among the Catholics, because there are among the one people fewer moral restraints from religion, &c. than the other; so that the prevalence of the vice requires a stronger natural impulse among Protestants than

than among Catholics. But it does not follow that the converse of the proposition is equally true, that wherever the organ is found in an eminent degree, there the habit and characters of stealing must also be found. It is only in extreme cases that the physical tendency is to be considered as too strong to be subdued by moral restraints. Only when it allies itself to cases of acknowledged partial insanity.

It has been objected, that the idea of property is purely artificial; and that therefore no act which respects it, can have a natural origin. But G. contends that a vague sense of property at least is natural, on which the more complicated notion is engrafted, and cites well known facts of natural history, to prove that it is common to the brute creation. Birds of passage, as well as those which have for a time been confined in a cage, return to their old nests; and the Shamois will fight for its post on the mountain, which it keeps during the whole summer.

VIII.

The Organ of Good-nature.

This organ lies in the centre of the upper part of the forehead, between and above the *tubera*

tubera frontalia. It lies in the middle of the forehead, and though composed of two distinct organs, yet they, meeting, appear but as one.

The existence of this organ receives its strong confirmation from its undoubted reality in many quadrupeds. This first led G. to seek, and at last find it in the human race. G. asserts, that there is a sure criterion of the temper of horses and cows, &c. in the form of their forehead. Wherever a broad protuberance is found in the middle, about the breadth of three fingers above the eyes, they will also be found gentle and good natured; when, on the contrary, the forehead is marked by a sinking in, or depression, they are assuredly malicious, and must not be trusted. Many jockies and horse-dealers, says G. and particularly the French, have long known this; and it forms one of the circumstances to which they are particularly attentive. Other animals of the stag kind, on comparison, afford the same observation. The Austrian horses in general have this organ, and have also the character assigned to it. In the doe and the shamois this organ is not to be found, and the shyness of this latter animal is well known. Birds of prey, the vulture, the eagle, &c. have a sort of furrow, as if hollowed out,

in this part. It is the same with beasts of prey, the hyena, crocodile, &c. This fact being established in the brute creation, the rule of analogy which G. so readily follows led him *â priori* to determine, it must be verified also in man. And he asserts his expectations have been realised. The better busts of Nero; the impressions taken in gypsum of Roberspiere's head; the general form of the forehead, and the character of the Caribs, (whether we attribute or not any thing to the boards with which they are said to flatten the forehead is here immaterial;) and a great number of particular observations, which of course are arguments only to the observer, and merely motives of examination to others; all concur to make Dr. G. assign to the brain in this district an important function.

IX.

The Organ of Mimickry or Imitation. *

This is one of those organs concerning which, the reporter of G.'s doctrine feels himself

* The German word is *darstellung*, a term of frequent use in the theory of the fine arts, and a constant torment to the English reader from the want of an adequate word in his own

self embarrassed from the paucity of materials; to say nothing of the want of proof, the seat of the imagined organ itself is but vaguely given. G. confessed he could persuade no one of the reality of it, of which however he was, from repeated observation, himself convinced.

This organ is to be inferred from a ball-like swelling of the uppermost part of the forehead, on each side of the centrally situated organs of *Good-nature* and *Theosophy* (to be hereafter described.) Where this organ and also those of good nature and theosophy are also developed, they would, together, form one beautiful swelling or vault of the fore part of the crown of the head.

The persons in whom G. says he has strikingly observed this organ, are not merely great actors professionally, but also mimicks in private and low life, people, in whom mimickry has been a passion. Whether or not it is to be ascribed to monkies he seems to doubt.

own language. It seems to correspond with μιμησις, though not with our *imitation*, which renders the Greek imperfectly. *Darstellung* is used for the vivid and exact *description* or *representation* which the poet makes of nature and life.

X.

The Organ of Vain-glory or Vanity,

Lies on the parietal bone backwards. It appears double on each side of the organ of *Loftiness*, (hereafter to be described) with which it is so nearly allied, that G. seems to have subjected himself imprudently to unnecessary objections and reproaches, by asserting a distinction so little capable of being made even plausible. He is able to assert in support of it, nothing but certain observations which he says have been made not only in common life, but also in mad-houses, where he has at once by this sign discovered those who evinced a vain madness, thinking themselves kings, queens, &c. It appears double, from the intervention of the organ of loftiness. Persons having this organ have often the habit, so characteristic of an haughty man, of carrying their head aloft, inclined rather backwards. The Germans say of a proud man, " He carries his nose high."

XI.

The Organ of Constancy or Firmness,

Lies also in the middle of the skull, behind the organ of theosophy, and before that of loftiness,

loftiness, in that part where the *anguli frontales ossium bregmatis* meet. The adjacency of this organ to that of theosophy, according to Gall's peculiar train of thought, serves to account, as well as moral causes, for that spirit of firmness and endurance which distinguishes the heroes of religion so much more than those of philosophy. That this organ, put into action beyond its due proportion, may produce the diseases of incurable obstinacy, &c. follows from all that has been said; hence pathological phænomena, as well as that firmness and constancy which G. asserts he has found in conjunction with this organ, which might therefore be stiled the organ of *character*.

II. We proceed to the organs (according to Gall's not very correct or significant classification,) by which we are enabled to acquire a more familiar acquaintance with objects which are known to us by means of the external senses.

Before Gall had arrived at the conclusion, that memory is a quality common to all powers, he considered the organs which are now to be enumerated, as so many various organs of memory, as it is by means of these organs that man is enabled to arrange and fix the

impressions of the external world in various relations. But now he prefers representing them as organs of a particular *sense*, which sense, when it rises to a certain degree of force and vividness, may become active and productive. The organs therefore that immediately follow are termed in German, Organ of the Sense of things, Sense of place, Sense of person, &c. a phraseology which deviates too much from our ordinary language to be adopted here.

XII.

Organ of Aptness to learn and retain Things.

This organ lies immediately over the root of the nose, betwixt the two eye-brows, upon and above the *glabella ossis frontis*, and appears simple on the skull, because the organs meet in the centre and coalesce into one. In the earlier classication which G. employed, he termed this organ that of the *memory of things*, as opposed to words; the import of which appellation will be at once intelligible to those who recollect in what sense the philologists distinguish between a *Lexicon verbale* and a *Lexicon reale*.

Gall has collected various observations concerning

cerning the formation of the forehead on the part pointed out, both in quadrupeds and men. First, he has found that those animals which are, to a certain degree, susceptible of education by man, are marked by a protuberance of the lower part of the forehead, nearly in the proportion of their capacity of being taught; and he illustrated this by the production of various skulls exhibiting this gradation; in the water otter, the fox, the greyhound, the spaniel, &c. In the elephant, the forehead is much raised; still more in the ourang outang, but most of all in man. Further, G. has minutely compared the skulls of wild and tame animals of the same kind; and uniformly found that the tame, or tameable species, are marked with this organ, above the wild species. This he has particularly noticed in the wild and tame duck and goose, the tame hog, the wild boar, &c. &c. This observation induced G. for a time to call this organ—the *abrichtung* organ; a word which is not in our language, used to express the training of animals, an art which G. thinks will never make any great or material progress, nature having fixed its limits. In men, Gall has observed this organ, particularly among that class of persons who are commonly called *matter-of-fact* people, men

of information and business. It denotes the facility of receiving and retaining the impressions of outward things.

XIII.

Organ of Aptness to learn and retain Places.

This organ lies on each side of the organ last mentioned, and hence appears double on the skull. It fills that half of each of the eye-brows which is next the nose *(arcus superciliaris.)*

The function which this organ is destined to fill in the inferior animals, is, that it gives the power of seeking out distant places, and of finding them again, when long deserted and left, at a great distance. Birds of passage, such as swallows, storks, &c. &c. are all marked by this organ; and it is known of such birds that they have a perfect recollection of their ancient places of residence. Swallows will return, year after year, to the same nest. Pigeons, which are used as letter-carriers, have also this organ. The capacity which animals, dogs for instance, have, of following their masters, as well as of returning to their home, has generally been attributed, and often truly, to the acuteness of their scent; but many

many facts are known which do not allow of this explanation. Gall related a tale of a dog taken to England from Vienna, which soon escaped from its new owner, went alone to the port, contrived to get on board a ship, and accompanied a gentleman to Mayence, whom he there deserted, and then took his course alone to Vienna. Another well authenticated anecdote was related by G. of a dog which, in like manner, escaped from Petersburgh to Vienna. Whence can this uniform and otherwise inexplicable instinct arise, in certain species of animals? and why should not this instinct be attached to a peculiar structure of the nerves and brain?

In men, this organ seems to operate variously, but in every case it is connected with a disposition to observe the relations of space, and produces a delight and a peculiar ability in those occupations which depend upon such relations. For instance, both Marshal *Laudon* and General *Mack*, are distinguished by this organ; and these Generals are both said to possess, in an eminent degree, that important part of the duty of a Commander in Chief, which lies in a skilful disposition of troops in the field; what may be called the geometry of war.

It generates the love of travelling. After G. had

had formed his opinion concerning this organ, he was struck by meeting a woman of low rank in the streets of Vienna, on whose forehead the organ was so strikingly marked, that he took an impression of her head for his cabinet. On enquiring of her concerning her life, he found she was possessed by a very mania for wandering. At sixteen she ran away from Munich to Vienna, where she lived, not as a servant at one place, for she could not possibly stay long in any family, but went from inn to inn, where her restless love of change was best gratified. She, as well as all persons thus organised, had a surprising skill in finding her way in strange places. We all know how very different this ability is, in different persons, and that it stands in no general relation to the intellect in general. The portraits and busts of most eminent travellers and navigators, are marked by this organ. If I mistake not, the biographer of Captain Cook mentions his countenance being distinguished by over hanging eye-brows.

After an illness, the aptness, or sense which this organ is supposed to create, has been lost. G. knew a bookseller's man, who had a nervous fever, and, on his recovery, found that he had lost all recollection, and could not again learn to remember how and where

the books in the shop were placed, with which he had been before so well acquainted.

XIV.

Organ of Aptness to recollect Persons.

Of this organ, one of the most insignificant in its function, as well as in the observations by which its reality is supported, Gall himself spoke only with hesitation. It is observed, that many persons possess, in a very striking degree, the power of recognising individuals after a long separation, and with little previous knowledge. This power, or sense, as Gall terms it, is certainly essential to social life, and may, therefore, he contends, be with propriety supposed to be the object of a peculiar provision by nature. The organ lies in the brain near the *ethnoides*, and causes a protuberance of the skull in the orbits of the eyes, under the *foramen supra orbitalis* towards the nose, and above the *os unguis (or lachrymale.)* Where this organ is strongly developed, the eyes are in consequence pressed downwards, and have somewhat of an oblique direction towards the nose; but where the adjacent organs are also strongly developed, this direction may not take place. All that G. is

able

able to advance in support of his supposition, is the relation of some singular phænomena of very young children, and of aged people, famous for a strong personal memory, with this peculiar direction of the orbit of the eye. But when unsupported by corroborating arguments, such facts cannot be supposed to influence the opinions of those who have not themselves witnessed them.

XV.

Organ of the Sense of Colour.

This is the first of the enumerated organs which seems to be wanting to the brute creation. The fear which horses and turkey-cocks have of a burning red colour, is an extreme case, in which even the coarse nerves of these animals are affected. In like manner it is sometimes found that individuals, and even whole families (G. knows two such) who have no such sense. The organ lies on the outside of the organ of place, and appears therefore double. When it is found in an eminent degree, it raises the eye-brow into a pleasing arch, and gives a very agreeable, free, and open expression to the forehead; and this, says G. is the characteristic physiognomy

ognomy of painters. G. asserts, he has remarked this organ in all who have a fine sense and who possess a skill and delicate management of colour, as artists. It is found also in those who are fond of gay and gaudy colours, and oftener in men than women, and is characteristic of the Chinese countenance. It is in general found more among Asiatics than Europeans, and is seen but little in Englishmen

XVI.

Organ of Aptness to learn and retain Music.

This is the organ concerning which the disciples of G. venture most frequently to speak, and occasionally play the prophet. It is one about which G. speaks with great confidence, and for which he seems to have gained most credit. It lies above the exterior angle of the eye, and occupies that part of the forehead which is circumscribed within the front half of the *linea semicircularis ossis frontis*, the back half of which corresponds with the organ of cupidity. When this organ is strongly developed, that part of the skull is necessarily enlarged. It is extended either in breadth, (G. cited the Italian *Viotti* as an instance) or the forehead becomes high, as

was

was the case in the Emperor Joseph. In Mozart (whom the Germans please to call the Shakespear of his art) the organ had extended itself in the breadth of the forehead. In other eminent musicians it appears like a large round swelling. But in every man of musical skill or natural uncultivated talents, G. and his experienced followers declare they can discover the organ, and do not hesitate to determine *à priori* the want or the possession of the musical sense even of entire strangers. The existence of this organ receives strong confirmation from the structure of the skulls of birds. Singing birds may all be distinguished by the form of the forehead. Every one of them has the conformation pointed out, which is as certainly not to be found in those species which do not sing, as the parrot, raven, jackdaw, peacock, &c. In singing birds, the existence of this organ has the effect of flattening, within, the orbits of the eyes; while the monkey, which has no sense of musick, has an oval-shaped orbit. In those animals, which like the monkey are absolutely without this organ, both the outward *lamina* of the orbit of the eye (inasmuch as it is formed by the *os frontis*) and the upper lamina, are not touched by the brain; and in man that part of the *os frontis* which forms

the

the forehead, lies closely upon that part of the same frontal bone which forms the orbit of the eye; while on the contrary in those men and animals which have this organ, it is only the outward lamina of the orbits (inasmuch as they are formed by the os frontis) which is not touched by the brain, and the *pars frontalis ossis frontis* does not lie upon the *pars orbitalis*. That the sense of musick does not depend upon the construction of the ear, may be fairly inferred from its total independence of the sense of hearing. It not unfrequently happens, that persons whose power of hearing is faint still possess a very delicate sense of musick. In the *acta naturæ curiosum* is related the history of a boy who in a frenzy, during violent epileptic convulsions, sung several popular songs with great precision. How far this sense stands in connection with that of tact and rhythmus, is a point concerning which Gall has not yet been able to form a decided opinion.

XVII.

Organ of aptness to learn and retain Numbers.

This organ occupies the extreme corners of the front lobe of the cerebrum, and is marked

marked on the skull beneath the organ of music, at the extreme end of the arch of the eye brow, and at the exterior upper angle of the orbit of the eye; or on that part of the skull which evelopes, above and behind, the *apophysis jugalis seu malaris ossis frontis*, and in the *fossa glandulæ lacrymalis ossis frontis*.

Gall was first led to conjecture the existence of this organ, from his observing a boy of thirteen years remarkable for his talent in calculation, who would, on hearing three distinct series of eleven figures once mentioned, retain them immediately, and perform with them all the operations of arithmetic. This observation was confirmed by others, and so often repeated till it produced that conviction, which perhaps no one will feel who does not himself make similar remarks. Among insane persons, G. met with one man strongly marked with this organ, whose sole occupation consisted in enumerating from 1 to 99, and then beginning again. On a bust of *Newton* which G. produced, he professes to find this organ, and he says it is also to be perceived in those of *Kästner*, *Euler*, *Boden*, &c. He related two cases of persons who when their business call for a long and continued calculation, complained of pain on the spot where the organ lies.

lies. Animals are deficient in this organ, and negroes have it very seldom.

XVIII.

Organ of Aptness to learn and retain Words.

This organ lies at the back of the lower part of the two front lobes of the brain, and presses upon the basis of the orbit of the eye at the back part of the upper lamella, which is formed by the frontal bone. In living subjects it can be detected, but only when the organ is very much developed, by what is commonly called a goggle eye, the eye being projected forwards.

By what G. terms the *sense of words*, he denotes the faculty of recollecting single words independently of their connection and sense, which is totally distinct from the sense of language.

G. cited as persons possessing this organ in a high degree, several celebrated dramatic performers, but I find no general observation supporting his conjecture.

XIX.

Organ of Aptness to learn and retain Languages.

This organ lies in front of the lower part of the two front lobes of the brain, and presses the skull in the orbit of the eye upon the os frontis on the upper and front lamella of the orbit, between the organs of number and person; it presses the eye downwards, when developed to a high degree, so that the eye seems to be rather hanging than prominent.

This organ might be said to denote the philological talent, as it does not give the mere ability of learning words as a mere nomenclature, but the higher talent of seizing the spirit and genius of general and of particular languages. Animals (even the monkey) are without this organ.

In a digression concerning difficulties of speaking which are so often experienced by children, Gall expressed the opinion that the source of the evil lies not in a defect of the organs of speech, as is commonly conceived, but in an imperfect developement in the organ in the brain, now under consideration. G. stated a number of professional cases, shewing that

that persons might speak without a palate, and even without a tongue, and cited *Lobstein's* dissertation entitled *Feminæ elinguis Historia.* He took occasion to examine the skulls of maniacs and others who had lost the faculty of speech, and found in a section, that the laminæ of the orbits were higher arched at the ordinary seat of this organ, which is to be explained agreeably to the law before stated, that the laminæ of the skull are formed by the activity of the brain, and follow it when it retreats. The total want of this organ produces idiotcy.

XX.

Organ of Mechanic Art.

This organ is found on the skull upon the temples, behind the organ of number, and below the point where the organs of music and cupidity meet; or on the *os frontis* immediately behind the *apophysis jugalis* of the same, and above the place where it joins with the *ala magna ossis sphenoidei.*

By mechanic art G. here understands the genius of invention, as applied to external form. In unison with other organs, it forms

the artist, in the most honourable sense of that term, as applied to the fine arts. This organ is found on the beaver, the marmot, and field mouse, animals which possess a great portion of that instinctive skill which has so often been confounded with reason, and which certain metaphysicians still consider as such. The bust of Raphael was shewn to G.; he judged it to be that of a great mechanic. Persons ingenious in the little contrivances of life are found possessed of this organ. It often happens that the forehead of persons marked with this organ has a certain square appear ance, which Gall first considered as the characteristic of this class of persons.

XXI.

Organ of Prudence or Circumspection.

This organ is found about the middle of the parietalia, yet somewhat nearer the temples, behind and above the organs of cunning and words, hence near the *Linea semicircularis ossis bregmatis*, and above the same; it of course appears double.

Gall speaks of this organ with great confidence; his observations, he says, are too numerous

numerous and uniform not to have their source in nature. This organ is found in all those animals in whom caution is a characteristic. The doe has it very strongly marked, still more, the shamois. It is also common to those animals which seek their prey by night, in a greater degree than to those animals which seek their prey by day. The owl has this organ more strongly marked than the eagle. We ought not, says G., to ascribe the nocturnal excursions of this animal to the structure of its eyes, for by the power of enlarging or diminishing the pupil at pleasure, it can accommodate itself to every degree of light. The water otter has this organ to a greater degree than the fox, with which it in other respects agrees. It is also found in the mole, the marten, &c. In men it denotes often a very scrupulous and timid character, when found in a greater degree; while in persons of a thoughtless and dissipated turn of mind, the want of this organ may be observed. Gall has examined, for this purpose, many beggars, and found this organ only in two subjects, while he has uniformly met with it in prudent and cautious persons. He has also met with it in madmen, who suffer from absurd and groundless fears and apprehensions. G. (in spight of its apparent inconsistency) observes

that this organ is found more strongly in children than in grown persons, and imputes to it their frequent hair breadth escape from imminent dangers.

XXII.

Organ of Loftiness.

This organ lies immediately behind the crown of the head, between the two organs of vanity or vain glory before enumerated; on the skull, therefore, it occupies the centre of the *sutura sagittalis*, and the adjoining part of the parietalia. It appears simple upon the skull, since it lies on the centre, where it forms a kind of swelling.

The English term loftiness has been chosen as expressing in part the double function which this organ seems to fulfil; though those functions have at most only a kind of figurative resemblance. Gall first called it the organ of haughtiness, and then adopted that of "sense of height" on account of a secondary quality he supposes he has detected in the subjects on whom this organ is found; that is, he has found this organ to be peculiarly developed in those animals which are fond of high

high places; in eagles and other birds which seek eminences.

In men, this organ seems rather to denote the tendency to haughtiness, though it is probable that both these sensations may in fact be connected. One of the most striking coincidences of the supposed organ with the character, G. found in a beggar, in whom he remarked it in a very great degree. On enquiry concerning the history of this man, he was informed that this man was a beggar through pride; this feeling had taken possession of his mind so powerfully as to produce a conduct that fell little short of madness. When young he refused to learn any trade, because he thought work degrading to him; and when sunk to the wretched state of a common beggar, he could not avoid occasionally manifesting the strong tendency of his mind, often ridiculously.

In mad houses G. has met with frequent confirmations of the reality of this organ. He has remarked its prevalence on those who in their insanity deemed themselves kings and queens; he has observed it in children, accompanied by the disposition to play the king and the general, and take the lead over their play-fellows.

III. We now proceed to the last class of organs, those which constitute the peculiar prerogatives and glory of the human race, and which more eminently raise him above the brute creation. But here the great argument in favour of Dr. Gall's theory, derived from analogy and comparative anatomy, altogether fails. When we consider, besides, that the organs still remaining are crowded into a narrow compass, comprising only that portion of brain on the crown of the head which the inferior animals have not, and that therefore the difficulty of ascertaining the seat of the organs is here greatly increased. Considering further, that the powers and dispositions of mind here distinguished, are not only the most important, but also the most recondite, concerning the identity or diversity of which metaphysicians and psychologists are in great doubt. The reporter of G.'s doctrine cannot help expressing his regret here that he should be able to find so little argument and evidence in support of the fanciful suggestions of his author. But the subsequent organs may therefore be dismissed with greater brevity.

These organs all lie on the crown of the head, or on the forehead, that august feature

which

which the poet considers as the glorious characteristic of humanity.

> Pronaque cum spectent animalia cætera terram;
> Os homini sublime dedit: cælumque tueri
> Jussit, et erectos ad sidera tollere vultus*.

The forehead rises in animals as they are advanced in the scale of intellect, but it is in man alone that the front assumes that graceful swell which is no less beautiful to the eye of taste than significant to the physiognomist.

XXIII.

The Organ of Rhetorical Acuteness.

This organ lies on the middle of the forehead, above the organ of things, or of education, and beneath that of good nature. These three organs follow, therefore, in a strait line drawn from the *glabella* to the sagittal suture. It appears, therefore, simple on the forehead.

The function or talent which G. supposes to be connected with this organ, which G. himself terms the organ of comparing acuteness, is principally that of popular speakers.

* Ovid Metamorph. l. 1. v. 84.

G. has

G. has found this organ, generally, in priests famous for their pulpit eloquence, and in men gifted with the talent of quickly combining their ideas, and of supporting them by illustrations, allusions, parables, similies, &c.; in short the talent of ready recollection and lively combination.

XXIV.

The Organ of Metaphysical Subtlety.

This organ lies on each side of that of rhetorical acuteness; it appears, therefore, double, and when strongly marked with the last organ, forms a prominent round swelling. It is to be observed on the forehead of *Socrates, Kant, Moses Mendelsohn,* and *Fichte.* The ancients, says G. had an obscure sentiment of the high qualities connected with this structure of the forehead. They always gave their *Jupiter* a front endowed with these attributes.

Under metaphysical subtlety G. understands the power of abstract thinking, as opposed to desultory observation.

XXV.

XXV.

The Organ of Wit.

This organ lies at each of the outward sides of the organ last mentioned, and when strongly developed, without the two other organs last enumerated, it forms two balls on each side of the forehead, by the *tubera frontalia* of the *os frontis*. But when all are found together they form one great prominence, and these considered as constituting one complex organ, G. terms that of the *spirit* or *power of induction*, including the faculty of seizing and comparing all the various relations of things.

G. began one of his lectures by saying,—"What wit is I do not know;" a confession that might have been well extended to the other talents which he has thus partially united, while he yet considers them as distinct. It should be observed, that it is this part of the forehead, the beautiful swelling of which is considered as so significant of intellect, which G. observes to be often marked in children, and to retreat in advancing years; hence he formerly termed it the organ of *observation*.

XXVI.

XXVI.

Organ of Theosophy.

This organ lies behind the organ of good nature, in the centre of the uppermost part of the *os frontis*. The forehead rises in the middle, and forms (when this organ is strongly developed) a kind of ridge which is frequently left bald.

G. was, early in life, made attentive to the great proportion of bald headed persons whom he found at their devotional exercises before the altar, and at the same time he observed that structure of the crown of the head which has just been noticed. He afterwards made this remark on priests in general, particularly monks, and those who took the tonsure from inclination. He opened *Lavater*, and found that most of his pious characters were strikingly marked by this peculiarity. He recollected the national character and physiognomy of the Egyptians. He found that painters, who may well be disposed to be often, perhaps generally, led unconsciously by obscure feelings in their creation of original forms, had commonly chosen the same figure for the portraits of

of their saints and martyrs. The head of Jesus is generally of this cast. This vague sentiment became afterwards conviction, from a minute and long continued examination of characters which were familiar to him.

With this organ, which respects the noblest and sublimest sentiment that man can conceive, and when in happy coincidence with other excellent tendencies of the human frame, produces the highest human excellence, Gall closes his specification of individual discoveries with the acknowledgment, that this specification has not the merit of being systematic. He offers it merely as a temporary and provisional statement *(sous condition)*, subject to all the additions, modifications, and corrections, which every science of observation peculiarly needs.

CHAP. VIII.

MISCELLANEOUS AND CONCLUDING OBSERVATIONS.

GALL, in the course of his lectures, frequently referred to a variety of observations, which he professed to have made on certain involuntary motions made by persons under the influence of a strong feeling; or, as he would say, occasioned by the peculiar activity of a particular organ, by which he thinks the locality of those organs receives a strong confirmation. The topic under which he brings these observations he calls *mimickry*. The editor feels himself not authorised to pass it over in total silence, at the same time that he is unwilling to dwell upon the subject.

Gall's general notion is this: when the organs, being excited, are put in a state of activity, a physical sensation is excited in us, of which, indeed, we are not conscious, but

which

which directs and determines the motions of our body. Hence G. explains many common appearances, which every one has observed, though till now no one ever dreamt of pressing them into the service of a psychological or physiological theory.

A man cannot recollect the name of a person or thing; what does he do in his distress? He rubs his forehead backwards and forwards, either over the eyes, or higher on the forehead, just where the appropriate organs lie.

In like manner a man frequently covers his forehead with the palm of his hands, while busied in contemplation or study.

Proud men raise themselves frequently on their toes; they hold their heads backwards, that the organ of loftiness may itself become more elevated.

A sense of danger, the necessity of *circumspection*, leads all animals (man not excepted), to stretch their necks forwards, horizontally, presenting the broad extent of that organ as it were in the front.

The timid man scratches his head on the organ of courage behind his ear, as if he tried to stimulate his feeble organ to activity.

Devotion raises the forehead gently; an instinct has always led mankind to associate

pious

pious sentiments with height. The heaven of all religions is above.

These are the few particulars which the editor was less repugnant to quote.

Physiognomy, which seems to be so closely allied to Dr. Gall's own doctrine, does not, however, meet with a favourable treatment from him. There may be, he says, a relation between the structure of the brain and that of the countenance, but the connection between these is not immediate, nor can it be scientifically ascertained. The physiologist may suspect, but he cannot prove it. *Lavater* would have been more fortunate in his guesses, had he possessed anatomical skill, and proceeded in any way according to scientific rules; but he was a mere sentimental idler. He never made above two judicious general observations. Physiognomy, which pretends to explain the qualities of the mind from the *native* features, is not possible; but *pathognomy*, which professes to recognise only the accidental features which have been formed by the influence of the brain upon the countenance is very possible, and receives a strong confirmation from the doctrine of organs. The *mimickry* last mentioned is a branch of this pathognomy.

The

The observations which naturalists have made concerning national countenances, have been fruitful in the science of physiognomy, but not as to the structure of the skull. No general results could be drawn, without a previous collection, not of a few only, but of a very large number of skulls, from the juxtaposition of which some general result might follow. It is also necessary that we should make further and more precise remarks concerning the character of nations, before this branch of physiology can be successfully cultivated.

There is a concluding remark which may indispose those towards Gall's theory, who cannot hinder the intrusion of *moral feeling* into the field *of natural observation*. This doctrine repels the notion of the PERFECTIBILITY OF MAN, by which I mean his *indefinite improveability:* for the bounds seem to be fixed in his physical organisation. The *eternal peace* is precluded by the innate irascible disposition. The prevalence of all the bad passions in man cannot be impeded, while the physical tendencies in man remain the same.

Happily, however, this objection is but apparent: not any of the generous wishes or fond hopes of amiable minds, are *opposed to* the doctrines of the philosopher of nature;

 they

they are all *above* and *beside* them. He who is lead to indulge in beautiful and sublime speculations concerning the grand œconomy of nature and providence, by the evidence of *moral fitness* which he finds *within him*, or the *natural and historic testimony* with which he is acquainted *from without*, will not be oppressed either by the imperfections or fixed organisation of the physical world, as burthening the intellectual and moral universe. He will perceive that it is not absurd to suppose a corresponding change in both. Man may be bound for the present to certain organic limitations and restrictions of his faculties, which can never be infinite in any state of melioration. With his moral and intellectual nature, his organic nature may also be improved. Why should it not?

REMARKS

ON

DR. GALL's THEORY

CONCERNING THE

ORGANS OF THE BRAIN.

By Dr. C. W HUFELAND.

It is with great pleasure and interest that I have listened to Dr. Gall's own statement of his new doctrine. And I am fully persuaded that *he* belongs to the most remarkable persons of our age, and his doctrine to the boldest and most important advances that have been made in the study of nature.

It is necessary to see and hear him himself, in order to perceive how far removed he is from every kind of quackery, metaphysical

enthusiasm *, and the spirit of party. Endued with a rare spirit of observation, acuteness, and the talent of deduction; brought up in the bosom of nature, and by constant intercourse with her, become her favourite; he has detected a number of phænomena in the whole circle of organic beings, which have hitherto been not at all, or but superficially observed. He has ingeniously combined these observations, discovered their analogical relations and import, deduced inferences from them, and established certain truths, which are particularly worthy our notice, because they are the pure result of observation alone. It is thus that he has contemplated the properties, connections, and functions of the nervous system. He himself ascribes his discoveries alone to his having devoted himself to the study of nature with his senses awake, and his undertanding unprejudiced; and to his having regularly pursued the operations of nature through all their gradations, from the simplest to the most complete exhibition of plastic power. It is hence

* In the original the author says, *transcendental* enthusiasm, a term which cannot briefly be explained. Gall and Hufeland are alike hostile to the modern metaphysicians; and the compliment here paid to Gall is in fact merely a sneer upon the disciples of Kant, and the other metaphysical leaders.

hence unjust to call this doctrine *a System*, or to judge of it as such. The genuine observers of nature are bad System-makers. They could not see so correctly did they set out in their enquiries with a system ready formed in their minds. They would misunderstand the real objects they contemplated if they troubled themselves too much about unity of idea. Hence Dr. Gall's doctrine is nothing but a collection of instructive, and, in part too, unconnected observations of the phænomena of nature, with their immediate deductions. Nor does Gall himself wish that his assertions should be seen from any other point of view.

It would be yet too soon to attempt criticising and judging the theory decisively. All that can be done is to subject the particular assertions to a long and experimental examination.

My object here is merely to state a few remarks and doubts. For examination should begin with doubt and incredulity, and so it began with me. There cannot be found a more decided adversary of Gall's doctrine than I was: nor was it till I remarked with what profundity of research, and genuine love of truth, the author of these discoveries proceeded, and what pregnant truths his

doctrine contained, that I began to be a believer: Still I am far from being entirely convinced of its truth. There are chasms, vague positions, and inadequate proofs to be found in it. And I consider it to be my duty towards Dr. Gall, and towards that truth which is the object of his search, freely to point out these to his attention.

It is necessary, in judging of Gall's opinions, carefully to distinguish what is *anatomical*, which respects the form and structure of the brain, from that which is *physiological*, and concerns its functions. The first treats of objects of sensible perception, and can therefore be ascertained to be true only by being sensibly perceived. The second contains the results of perception, derived from various phænomena, by induction, and inference. Assertions of this kind must always be considered as hypothetical, and the truth of them can only be determined by an examination into the inferences and their premises.

First, as to the matters of fact. What has Gall shewn us in the structure of the brain which we did not know before?

This has been so correctly stated by Professor *Bischoff*, in the first of the preceding chapters, that I have nothing to add but that I have

I have, without the aid of Gall's preparations, and by means of dissections which I myself made, convinced myself in a great degree of the truth of his statements; more especially as far as respects what he calls the *diverging nerves*. I have seen the separation of the *medulla oblongata* in fascicles; the crossing of the inner pair of the pyramids; the passage of layers of longitudinal fibres, mixed with fibres running across, through the *pons varolii*; the transition of this substance into the *crura cerebri*; the oval form and quality of the *corpora striata*; the radius-like spreading of the substance of the nerves, in all directions on the surface; the unfolding of the brain into a skin, or rather its being spread into a broad surface; and the origin of the optic nerves in the four eminences. All these are objects with which we were either altogether unacquainted, or which we at least did not know exactly and in connection. And even if we admitted that Gall had discovered nothing new in the external form of the different parts of the brain, yet it is undeniable that he has cast a new light on the internal structure and connection of those parts; and this alone would be enough to immortalize his name. Every one who has eyes to see may convince

himself of this; but it is, indeed, necessary to practice the method of anatomical enquiry which Gall has used, and without which he would never have made his discoveries: that is, first, by beginning the examination from below at the medulla oblongata, and pursuing it as it spreads above: and secondly, in using, not a knife which destroys the parts, but blunt instruments, in order to separate and unfold the pulpy parts. I leave minuter examinations of these anatomical discoveries to greater anatomists than I profess to be; but I would have them *honest* examiners, persons who do not confound the doctrine with him who teaches it.

Here I shall confine myself to what is *hypothetical;* and as every thing which cannot be sensibly demonstrated, may be brought under this head, we shall meet here with much that is called anatomical, as, for instance, the course taken by the various congeries of brain.

This too has been completely stated by Professor Bischoff, so that I have nothing to add to it, and can build upon it as forming the essence of Dr. Gall's doctrine.

I entirely coincide with Dr. Gall in this, that what is spiritual or intellectual in us, ope-

rates

rates by means of organs*, (which, indeed, every voluntary motion of the arm proves;) that this material condition of the exercise of our intellectual powers applies not merely to the grosser faculties, but to the more internal and subtle energies, sensations, ideas, &c. that the brain is the organ of these more essential and elevated powers of the mind; and that we may assume with great probability, that as the external senses have their particular

* Few will probably be found in the present age, who venture to dispute this position, in spight of the very vague and indistinct notion we form of organs. The reader will be amused by comparing with this opinion that of the eloquent *Sir Thomas Brown*. In his *Religio Medici* he says, with that peculiar felicity of style which renders him one of the finest writers in our language, as he is, one of the most original thinkers of our country. "In our study of anatomy, there is a mass of mysterious philosophy, and such as reduced the very Heathens to divinity; yet, amongst all those rare discourses, and curious pieces I find in the fabric of man, I do not so much content myself, as in that I find not, there is no [any] organ or instrument for the rational soul; for in the brain, which we term the seat of reason, there is not any thing of moment more than I can discover in the crany [*cranium*] of a beast; and this is a sensible and no inconsiderable argument of the inorganity of the soul, at least in that sense we usually so conceive it. Thus we are men, and we know not how. There is something in us that can be without us, and will be after us, though it is strange that that it hath no history, what it was before us, nor cannot tell how it entered in us."—EDITOR.

particular organs, in like manner the internal sense may have its various organs in the brain, as is indeed intimated by the variously formed and different substances in the brain. But this opinion is not new or peculiar to Dr. Gall, but has been long and frequently asserted by medical men. Dr. Gall himself admits this, and cites particularly the late Dr. *Mayer* *.

But I am of opinion that we ought to distinguish between the spiritual substance in us, in as much as it has a reference to the world without

* As a proof how long I have been of Dr. Gall's opinion, even without knowing him, I cite the following passage, which I wrote fifteen years ago:—

"I hope my readers will not here misunderstand my meaning, and imagine that I reckon the soul to be a part, or production, or property of the body. This is by no means the case. The soul is, in my opinion, something totally distinct from the body, a being of a totally different, more exalted, intellectual world; but in this sublunary combination, and in order to be a *human soul*, it must have organs to fit it, not only for action, but also for sensations, and even for the higher functions of thinking and combining ideas. The first *cause of thought* is, therefore, spiritual; but the *business of thinking* itself, as carried on in this mortal machine, is organic. In this manner alone can be explained that mechanism, in many of the laws of thought, and the influence of physical causes in improving or disordering the function of thinking; and one may consider the function as material, and cure it (a circumstance which often occurs to

without us; and is to be put in connection with it; and this same spiritual substance, in as

to us physicians) without being a materialist; that is, considering the soul the first cause of it, as matter, which, to me, at least, appears to be absurd."

Art of Prolonging Life, v. 1, p. 203.

There are still more striking resemblances to Gall's ideas to be found in "Mayer's Treatise on the Brain," the spine, and the origin of the nerves. Berlin, 1779, I will quote only a few passages:—

P. 36. "The *pons varolii*, the *medulla oblongata*, and the "*medulla spinalis*, are the parts of the brain which the "creator has most closely connected with life."

P. 38. "It may be asked, Do the operations of the dif- "ferent powers of the soul take place in different parts of "the brain, especially organised for that purpose? This is "rendered probable by the partial loss of particular powers "of the soul, by disease and by wounds."

P. 41. "I see no contradiction in assuming, that each of "the operations of the soul takes place in particular de- "partments of the brain. As the particular parts at such "a spot become, by the more frequent repetition of their "operation, more developed, the impulse of the juices "there will be encreased," (consequently their size en- "larged.)

P. 43. "It is a much more probable opinion, that the "functions of the soul are performed in the parts of the "brain itself, rather than in its cavities; &c. but it would "be an extremely rash undertaking to attempt fixing with "certainty, the seat and disposition of the various facul- "ties of the soul."

There is good plain sense in this note of the learned professor's work; but it cannot pass for a moment as a specimen of metaphysic correctness. We may *assume* an organ as

as much as it is conscious of its own energies, reflects on them rationally and freely, determines itself, wills, orders, and brings unity into the variety of its perceptions. These higher, peculiar operations of mind, are most assuredly not attached to or modified by organs; and this is also admitted by Gall completely, when he asserts, " I know no organ for reason, will, consciousness, memory; for these faculties belong to all organs, are bound to none in specie, but are the common characters and qualities of the whole."

Besides, he himself calls these organs only conditions and pre-dispositions of certain energies, which, of course, supposes a something else as necessary to call forth those energies into action; that is, he supposes a certain spiritual substance, but the nature of which is foreign from the subject of his enquiry.

But

as a connecting instrument, to bind an immaterial cause with a material function, (though this is incorrectly said, for *function* is merely *ens rationis*, a thing of thought.) But this *explains* nothing, for the organ itself must be either material or immaterial; if material, what unites it with that which is immaterial? and *vice versa*. The *quis custodiat ipsos custodes* of the poet, comprises the great practical difficulty in all political institutions; something like it is the case in metaphysical speculation; who shall explain the explanation?—EDITOR.

But Gall goes further and says, these organs lie on the surface of the brain; that continuation or extension of the nerves of the brain which we call the *hemispheres* is their seat, and I am able to point out the place of the greater part of them: further, they are denoted by elevations on the surface of the brain, which effect corresponding protuberances of the skull; and we are therefore enabled to infer the internal tendencies of the mind from the external form of of the skull. The proofs have been stated above.

Upon this I will take the liberty of stating some remarks and doubts, which at least prevent my considering the point as absolutely decided.

I. The whole is and remains but an hypothesis, to whatever high degree of probability it may be brought, for the proofs advanced do not exhaust the subject, nor remove all objections.

The principal proof brought forward in physiology to ascertain the function of an organ, consists in shewing that the actual exercise of the function always accompanies the existence of the organ, and that on the contrary, the destruction of the organ entirely or partially destroys or impedes the exercise of the function. This proof is more or less

convincing

convincing, according to the number of individuals, and still more according to the various kinds of organic beings, in which this coincidence has been found. As for instance, the function of the nerves, as organs of motion and feeling, is proved by feeling and motion being destroyed by the cutting or pressing the nerve. It may be asked, has Gall been able to bring forward this proof concerning the organs of the brain?

It seems to me that he has not. For however striking it is to perceive, that through the various classes of animals up to man, certain tendencies and predispositions of the soul are, for the greatest part, found united to certain protuberances of the skull; yet the proof, to be decisive, ought to be without a single exception, for Gall himself admits, that the law must be false, if a single exception can be found; and I have found such exceptions repeatedly since I have begun my examination. I will mention only two. Prominent eyes (goggle eyes) denote, according to Gall, a strong verbal memory, yet I have seen such eyes repeatedly, in persons whose memory of this kind is very weak; and I lately met with the organ of theosophy very strongly marked, like a ball, in a person who did not manifest the least disposition of the kind.

As

As to the second proof arising from the want of the function where the organ is wanting: here it ought to be shewn that the destruction of the organ is attended by the loss of the function, but a wound on the brain is so easily mortal, that this kind of proof seems impossible. In cases of wounds, we have instances of large masses of the surface of the brain (and of course organs, according to Gall,) being taken away, and the individual has survived. But I am not aware that any one of these persons has been observed to lose any of the predispositions, or tendencies, or talents, affixed to the part of the brain so lost.

II. Size and energy do not always stand in proportion to each other in an organ. The internal quality, and the more or less of power lying in the mass, determines also as certainly the energy of the power; and quality is able to supply what may be wanting in extent or quantity. This is the difference between intensive and extensive perfection, and it is therefore an error to infer perfection from size alone. This is also taught us by experience. Little men are in general more energetic than large men, and small eyes see with more strength, and last longer, than great eyes. That which is true of other organs

must

must * also be the case with the organs of the brain. The greater or less power in an organ cannot therefore depend on its size alone, yet Dr. Gall's doctrine is supported entirely by this proposition.

III. It is well known that organic parts are often enlarged by disease, but which, far from being a proof of heightened energy, shew only that the nourishing juices of that part have been encreased by disease; and the energy of the functions of such organ is diminished, not improved. They are called hyperorganisations, enormities of the substance. Thus the liver, stomach, heart, any one of the viscera, an arm, an eye, a foot, may be unusually enlarged, but we infer a diminution, not an increase of power. A similar state of things may take place among the single organs of the brain, and should we not err then, in inferring an encrease of power from an encrease of size? Nor would it be a refutation of such an argument to object that only one of such organs would be in that case

* Our commentator is surely guilty here of a mistake (from which Dr. G. himself will not be thought free), in confounding *must* with *may*. His argument in fact is sufficiently strong, when he concludes there *may be* an intensive vigour independently of size.—EDITOR.

enlarged;

enlarged; for it often happens, that corresponding organs and limbs are alike affected; as both eyes and both feet may swell together: besides, there are organs in the centre of the brain which are but single to the feeling.

IV. A change may take place in the interior of an organ, occasioned by disease, by which its energy may be destroyed; or in other words, the organ may be lamed. But the size of the organ is not changed, or at least the protuberance of the skull is not flattened; and even where the organ disappears within, the skull does not always sink, but the space is filled with bone. Here again, therefore, we can draw no inference from the existing protuberance to the existing power; and even the substance of the nerves, when lamed, can long retain its size and extent, as we experience in the external nerves.

V. We will admit that the skull, not only at its first formation, but even during the whole of life, assumes the shape of the brain within; this is proved partly by the law of the never-ceasing regeneration even of the firmest parts, partly by the remarkable instances of excavations and change of form in the hardest bones, by means of tumors, aneurysma, &c. The internal surface of the skull clearly shews the impressions of the vessels which lye below.

Still, this does not seem sufficient to justify

our considering all the protuberances of the external surface of the skull to be products of the internal expansive power of the brain. My reasons are these :

a. The two laminæ of the skull, do not, it is obvious, always run parallel. This is shewn even by an horizontal, and still more by a vertical section. This may be exhibited most sensibly by the following experiment. If the external elevations of the skull are the mere result of the form of the brain, then the internal surface of the skull must have corresponding depressions wherever the external surface has any elevation. Hence a model of the skull, taken in gypsum or wax from the internal surface, would have precisely the same formation as the skull, except that it would be somewhat smaller. I have repeatedly made this experiment, and have *in some* remarked a sensible diversity between the skull and such impression.

b. Various causes may occasion the bony substance of the Diploe to accumulate, and consequently remove the external from the internal lamina, and form an elevation where there is no corresponding depression *.

c. It

* This is asserted by Gall himself; and it ought to be observed that this and the preceding objections are directed more against the certainty of our knowledge than the reality of the fact.—Editor.

c. It is certain that the muscles have the effect of producing a protuberance on the bones. This is seen on the whole body where the muscles are attached, and this must also take place on the skull; and thus the protuberance on the spot where the temporal muscle is attached, and that where the muscles of the *os occipitis* are attached, (the organs of parental affection and the sexual passion) are on no account to be considered as product and proof of the quantity of brain. The protuberance on the temple often proves only that a person chews strongly, and the organ of parental affection, that a woman has borne heavy burthens on her head and shoulders*.

d. The protuberances on the lower parts of the *os frontis,* over the eyes, are clearly derived more from the internal extension of the bone which we call the frontal sinuses, than from the brain; and thus our judgement concerning the organs which lie here is very fallacious. I have seen skulls in which these sinuses are extended half over the *os frontis.*

e. It is undeniable that external and internal accidental causes may produce protuberances on the head. Of external causes I will enumerate only blows and falls; of the internal,

* This objection has been anticipated and answered.—Editor.

the gout and venereal disease, which it is known can produce protuberances that last for life. Gall says, that such protuberances may be sufficiently distinguished from those natural organic protuberances, by being on one side only of the skull, and not alike on both sides. But this will not prevent deception in those cases where the organs on both sides meet, and unite and form but one elevation, as for instance, the organ of loftiness, theosophy, and parental affection.

I wish, besides, that exact enquiries were instituted in those countries where it is the custom, from the earliest infancy, to carry heavy burthens on the head, as for instance, on the banks of the Rhine. A permanent pressure from without must necessarily, according to the same laws, press the skull inwards, (and thus hinder the formation of the organs in this part) as the permanent pressure of the brain from within presses the skull outwards. The latter is a fundamental position of Gall's doctrine, and if that be true the other must be true likewise. Hence in those countries the organs of loftiness, theosophy, and firmness must be oppressed, and those tendencies of mind and character must also be wanting, for the organs are mechanically hindered in their formation: If therefore the

organs

organs were found there in spight of that pressure, or if those organs were not found, and those qualities of mind were still there, in either case it would furnish an argument against Dr. Gall; for, in the first supposition, it would appear that a permanent pressure does not alter the formation of the skull, and thus the formation of the skull by the pressure of the brain would be unproved. In the second supposition, it would be evident that the qualities of the mind could exist without the external visible organs, and then the whole doctrine of organs would be false *.

VI. Dr. Gall confesses, that he is not acquainted with every organ and its seat, and there are unquestionably many qualities of the mind and temper remaining, for which no organ has yet been found, and which yet must have one; as these qualities are not artificial productions, but manifest themselves in earliest infancy, very strikingly, as predispositions or tendencies of character; as for instance, Self-love †. It is a quality we often remark

* Here the author has either grossly misunderstood Gall, or he is guilty of a great error in reasoning. G. asserts that the inert bony substance is formed altogether by the brain; not that it reacts upon it with like power.—EDITOR.

† That *Self-love* is no simple principle of our nature, as has been long incautiously admitted and taken for granted; upon

very young children, that they refer every thing to themselves, keep every thing for themselves, part with nothing, and are envious towards others; while on the contrary, we perceive in other children, from the very first, an impulse to forget themselves, to share every thing with others, be kind and social. Vanity, rapacity, avarice, love of fame, are but products and various forms of selfishness. Self-love ought, therefore, to have its organ, as well as the love of others, and the impulse to murder would then be explicable as a disease. Taste and smell ought, besides, to have their organs in the brain, as well as the sense of tones and colours, for our taste and our judgement concerning it are evidently different things; nor does it seem to me that opposite qualities can be well explained, as G. explains them, by the mere want of organs. The want of good humour is mere indifference,

upon which assumption modern systems of morals have been established; has been recently proved with all the strictness of metaphysic demonstration by a train of acute and original arguments in a small work, entitled, "*An Essay on the Principles of Human Action*," published by Johnson. This little tract has supplied one of the greatest *desiderata* in moral philosophy. The author has succeeded in proving, to the logical understanding, a doctrine which the better feelings of noble minds had embraced in opposition to the fashionable opinions; that *Man is capable of purely and absolutely disinterested actions*.—EDITOR.

ence, not actually bad temper; the want of love is not hatred; nor the want of avarice liberality. Must we not assume that these opposite inclinations have each their peculiar organ? And what, if we perceive that an inclination suddenly changes itself into the very contrary, of which we have instances? If we see a liberal man, on suddenly acquiring riches, become avaricious? Has a new organ sprung up within him? This is not conceivable.

Whether these still unknown organs be found or not, we must assume that they really do exist, and in both cases a troublesome difficulty arises.

If they are not found, this renders it very uncertain what functions we shall ascribe to the organs already found, for it may then, aye, it must then follow, that the departments of the skull already ascertained to cover certain organs, must also cover at the same time other organs; and who will then be able to distinguish what belongs to the known and what to the unknown organs?

Should, however, these organs be found, we shall then at length find the surface of the brain so covered with organs, that the districts assigned to each will perpetually become

smaller, so that it will become impossible to distinguish them by feeling.

To this we have to add, that Dr. Gall assumes that each circumvolution of the brain *(gyrus cerebri)* is a distinct organ; in that case there would be 30 organs on each side; and the *gyri cerebri* do not, as is well known, press upon the exterior surface of the skull.

VII. Dr. Gall divides the whole congeries of nerves into the diverging and converging, and asserts, that wherever the one is found, the other also is. Each nerve, and also the brain, unites both.

Ingenious as this idea is, and though it harmonises with the fundamental functions of the nervous system, yet it has not been experimentally demonstrated. I certainly perceive that the one portion form Ganglia, and the other Commissures; that the one is somewhat stouter than the other: But I do not, and cannot see that the one diverges * and the other converges.

The characteristic sign that the diverging mass is accompanied by arteries, the diverging mass by veins, is, for this reason, untenable,

* Yet our critic declares at the beginning, his conviction of the truth of Gall's notions concerning the *diverging nerves*.—EDITOR.

nable, because in every part of the human body, veins are found wherever arteries are.

VIII. Where then is the central point of the congeries of diverging and converging nerves? There must be such a point, for otherwise the idea of diverging and converging would have no meaning, and the whole nervous system would have no unity. But, according to Gall, I see every where nothing but diverging and converging substance. Even the *medulla oblongata*, which, according to him is the point of union, or kernel of the whole system, consists of single fascicles of nerves which have individually their particular function.

IX. I must add a remark as to the seeing with *one* eye. This assertion may be very easily refuted by the following simple experiment. Let any one hold a broad sheet of paper perpendicularly before him, with the back against his forehead and nose, dividing as it were the face, and of course the circle of vision. By this means the rays of light on the one side cannot enter into the eye on the other side, through the opaque body which divides the face; and if we actually see with one eye only, we should in this case behold only one half of the circle of vision: but we

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do in fact see the whole, and thus the assertion of Gall is refuted. We must, therefore, thus modify the position, that every man sees in general better with one eye than with two, either because his eyes by nature have unequal strength, or because he has accustomed himself to use the one more than the other.

X. I cannot approve of what has been said concerning conscience, for this is not an object of experiment, and does not therefore come within the sphere of Dr. Gall's doctrine. It has no organ, and our concern is with organs only; nor can I applaud the kind of explanation here given. Conscience is said to arise from the relation of our actions to our inclinations, but it may be further asked, why does the agreement of our actions and inclinations delight us, and their disagreement give us pain? This shews us that our internal self-satisfaction or dissatisfaction has its origin in a higher principle of our mind, that is, the *principle* or *sense of truth*, of which our sense of right and wrong, good and bad, beauteous and deformed (in a higher sense of these terms), are so many different modifications, and of which we have the clearest marks, even in the child. This alone is conscience, and it is the opposition of true and false, right and wrong, good and bad, which constitutes

constitutes its sphere; and not the dissatisfaction which a man feels when his inclinations are not gratified; for otherwise the regret which an epicure feels when he sees a spoiled dish, would be an affair of conscience: yet this follows from Gall's explanation *. On the contrary, according to the derivation given above, conscience is the august pledge of a more noble and divine descent; it distinguishes us essentially from the brute creation, and connects us with a loftier world of spirits, between which and the animal world man stands, and of which we have but an imperfect pre-sentiment, resembling, perhaps, what the brute creation have of us. I should be disposed to assert that conscience is moral instinct, and as the animal seems sometimes to approach to human nature, but merely instinctively, which man alone understands, and which ceases to be instinct in him; in like manner it seems as if man has an instinct of the world of spirits, which he is in some other mode of existence to learn to understand.

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* Dr. Hufeland must have misunderstood his author, or Dr. G. must have expressed himself worse than the Editor is acquainted with, if this comment were necessary.

The result of my examination I would thus express. I adopt Gall's docrine in as much as it assigns the energy of the mind to the brain as its organ, and in this organ assigns to particular and distinct energies a particular and appropriate organisation of the brain. But I deny that these individual organs are always intimated by elevations of the surface of the skull. Still more confidently do I deny that the elevations upon the skull arise solely from this cause, and that therefore a sure inference may be drawn from them to the dispositions and tendencies of the mind. The doctrine, therefore, is true in theory, but there are no means of applying it in particular cases. In other words, the *organology* is on the whole true, but the *organoscopy* cannot be relied upon.

ON THE EFFECT AND APPLICATION OF GALL'S DOCTRINE.

Useful and pernicious Consequences.

I COME now to a point which does not, indeed, concern the science itself, but which interests a great number of persons still more; that is, what is the use of this doctrine? Are its consequences salutary or pernicious?

I am well aware how unjust it is to put such questions too soon to the discoverers of new doctrines, and to judge of them by the answer. Every truth is good and useful; every discovery, if it be really one, is an extension of the sphere of truth, and hence also of human perfection and felicity, which is the same thing. Its consequences *must* be good and salutary, however unable we may be to perceive it, and if it injure, it can be only from its abuse; and what is there in the world, even in the most excellent things, which may not in this way become injurious?

For

For the present I will make but a few remarks, necessary to prevent such abuse, to correct unfair judgements that may be formed, and suggest hints concerning the future application of the doctrine.

We may consider this application as it is general, and as it is particular.

As to the general application of it, I must reply first to two objections, which were they well founded would certainly have the greatest weight, viz. *That this doctrine teaches materialism;* and, *that it deprives the human mind of its freedom, and consequently of its morality.*

The first point charges this doctrine with representing the spiritual principle in us as a somewhat corporeal, dependent on organisation, and being one with it; thus giving aid to the fatally prevailing doctrine of materialism, according to which mind is but a mere attribute of body, and perishable with it.

This is obviously not the case. Gall carefully distinguishes the spirit, the soul, from the organisation; the organs are the material conditions of its activity, not the active being itself; without the presence and influence of the spiritual being they are nothing. Still further, he excepts the higher powers of mind

from

from the state of dependance on single organs, and considers reason, consciousness, and volition, as hovering alike over all. He who finds materialism in this, may find it as well in the assertion, that the body has influence on the mind, and the mind on the body, and yet no one doubts of this. It is the same whether we say the soul moves the arm by means of the nerves, or, the soul is affected by light through the optic nerves; or whether we say the soul requires the co-operation of certain organic functions for the calling forth of her higher energies; for nothing more is in fact asserted than that the soul needs in this sublunary existence the aid of a co-operating material conformation (viz. of organs) in order to act in this sphere, and at the same time be limited and determined in this its action. It is here assumed that the soul is an essence altogether distinct from matter, and yet in this life indissolubly bound to the world of matter, by a bond of union utterly inconceivable by us. The Materialist and the Immaterialist differ in this; the one considers matter as the *sole cause*, while the other considers it as the condition *(conditio sine quâ non)* of the active powers of the soul. The latter is Gall's mode of thinking, and he who finds materialism in it, does not understand

stand what materialism or what Gall's doctrine is, or cannot and will not understand it, because he is already a materialist, and glad to draw any doctrine into union with his favourite system.

Though superfluous, I will add another, and that a decisive observation. Were the organs the sole cause of the activity of the mind, it remains to be explained what that power is which prevents their being all alike active, which gives them their direction, and allows at one time an inclination to prevail, and at another time restrains it. What is this determining power? It cannot be the organ itself, but something out of it or beyond it; hence it must be the will, a something spiritual, independant of organisation. Further, in what does the difference lye between sleep and wakefulness; between the activity of the mind when awake and when dreaming? It lies in this only, that in the one the organs of the brain act without spontaneity and free will, and in the other freely and spontaneously. And does not this shew that the activity of the organs and that of volition are different things?

The second reproach which concerns the freedom, and of course the morality of actions, is equally ill founded, for the organs determine

determine merely the disposition or tendency, not the actions themselves. These are left to be directed by our free will, and it depends upon us to exercise as we please these organs of the soul, as it does to use the external organs of the body. The only difference is this, that he who has a very strong organ will have a stronger inclination to exercise the activity united with it, and more difficulty in abstaining from that exercise, than he will have, whose organ is feeble. Besides, this notion is in no respect new; we do but change words, and call new organs, what before were termed the good and bad dispositions and tempers of men. Every one has been long convinced that men are born with different inclinations, some of which manifest themselves very early in life, so that in children of the same parents, and educated together and alike, very different dispositions and inclinations may be observed. Hence there have been long a class of vices and virtues of temperament, in reference more to organisation than liberty; and what but such violent inclinations and desires opposing the better knowledge and will of individuals, have the theologians had in view when they have treated of original sin, temptations of the devil, &c. &c. Gall adds to this merely

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certain organs as the seat of such inclinations, &c. the will remains still free. And it is with these organs of the mind, as with those of the body, that by not being exercised not only is the act hindred, but even the organs themselves lose their fitness for action ; and in like manner, by such exercise, they are developed and encreased. Thus, by means of moral culture, the disposition and inclination may be modified and diminished. Hence the great importance of early education, while these organs are in growth. At this period, by violence or punishment, the developement of organs may be hindered, and their influence, during life, diminished, as is known to be the case of the bodily organs when not exercised in early youth.

I proceed now to the special application of this doctrine, and this may be made as it respects physiognomy, ethics, education, the administration of justice, and the practice of medicine ; and this application may also be considered as it respects a general or an individual judgement.

And here I must begin by observing, that though in my opinion the general application is not injurious, I yet consider each particular individual application to be, for the present, premature, hazardous, and even unjust and dangerous

dangerous to the individual. I have shewn above, how much is wanting to complete certainty, in inferring the form of the brain and its organs, from the external shape of the skull; how many exceptions must be allowed for from external circumstances, diseases, wounds, the motion of the muscles, &c.; and that hence, however well established the general positions may be, we cannot still be confident in our particular application. The rules of nature may, as Gall very justly observes, be in themselves fixed and invariable, and not even suffer an exception; still these rules may be variously modified and changed in their appearances in nature, as we see in plants and trees, of which every species has a distinct principle of formation and growth; and yet, through external circumstances, the various individuals of the same species may display the greatest varieties and diversities of growth and form. In respect to the shape of the skull, the deviation from the rules laid down by Gall may be but the hundredth case, but not knowing that hundredth case, our judgment of the ninety-nine cases must necessarily be uncertain. To this we must add the very important circumstance, that the organ betrays only the tendency, the disposition towards any quality or energy, not the quality

itself. He for instance who has the organ of cupidity, may have a stronger inclination to steal, but still be no thief; his power of free action may so keep down the power of the organ, that not only the act to which it tends may be repressed, but even the organ itself be lamed and lose its power, as we see in the external organs of our body. How unjust, therefore, would it be, to cast suspicion on a person having such an organ, when he, perhaps, on the contrary, deserves our esteem in a higher degree, than he who has by nature, no impulse to correct and subdue.

Besides, what renders the individual application still more uncertain, is the difficulty of discovering the organ by feeling. Gall himself confesses, that among his many scholars, there are very few, indeed, who possess that address, that delicacy of tact, which is requisite to render their observations worthy to be relied upon. To acquire this skill demands habit and attention, as it were a peculiar *education of the hand.*

Application to Physiognomy.

It is certain, that should the physiognomy of the skull be in general confirmed, it would offer more reality and certainty than the physiognomy of the countenance which *Lavater* taught, as it respects solid and firm parts, while the face consists, for the greater part, of soft and changeable features. Indeed, the skull alone furnishes us, properly speaking, with a physiognomy; that is, a doctrine or science of natural qualities or properties: while the common physiognomy is (more correctly) rather pathognomy, or the science of the affections and passions of man, as far as they can be expressed on the countenance, and gradually give it a certain form and character.

But still, for the reasons above stated, craniology affords us no certain physiognomy as applied to individuals.

Application to Education.

It would be a great abuse of this doctrine to determine at once the moral and scientific

propensities of children from the fancied organs of their skull, and fix their education accordingly. It might make many a one wretched.

But still it may in general serve to direct our attention to the early developement of propensities and tendencies of character, and to the necessity of early repressing bad and encouraging good qualities; as by these means the several organs would be either impeded or promoted in their growth, and even in infancy determined and fixed for life. It may also help to destroy the generally prevalent and fatal mistake, that children are to be trained to good conduct merely by instructing and convincing their understandings, and never by inspiring them with implicit faith and blind obedience, though many things in this age can only be believed, not comprehended, and many virtues must be made a matter not of insight but of mechanical habit. The evil of the contrary practice is this, that by waiting till the duties of life can be comprehended, the time is lost when they can be rendered habitual, and, as it were, natural, so that they in future remain mere notions and opinions, not deeply rooted and seemingly natural feelings. Gall's doctrine shews, that by mechanically hinder-

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ing a bad tendency from coming into action, (whether by external motives or not) the organ is prevented from developing itself, and the root of the evil is destroyed; and in like manner by cultivating and strengthening good habits and thoughts (though by mechanical means) in childhood, the organs by which they act may be so developed and improved, that the tendency to good may be increased. In this way we may cultivate in men, physically as well as morally, a moral and pious nature, undoubtedly far more valuable than the artificial talents so elaborately produced by our modern systems of learned education.

Application to Morals.

This doctrine, generally accepted and applied, is certainly advantageous rather than pernicious to true morality. It leaves the mind free, as has been already shewn, though it points out how far it is limited by certain pre-determined tendencies to evil; and in this it also impresses upon us the necessity of moral culture, in order to subdue those tendencies, and thus raises the worth of morality as well in general as in particular instances, by making the difficulty of the struggle more

apparent, where nature has given strongly developed organs. It is true, it teaches also that at last, in extreme cases, the tendencies may be so decidedly preponderant, as to be no longer governable by the will; yet here also it leads us to feel indulgence and compassion towards those morally unimproveable men whom (viewing them in this light), we cannot possibly hate, but must pity, as those who are incurably diseased. It shews us also, and this is of peculiar importance, that it is by education that morality is fixed and secured to us, as our own inmost property, and that it is only by the influence of motives raised above this life, that is, by religion, that a defective organisation can be remedied, the natural organic impulses subdued, and man determined to what is good and holy, even against his inclination and his will.

But it would be otherwise were we desirous to determine by this doctrine individually the moral worth and character of men. This is not to be known by any art which lies in the fingers, by any swellings or protuberances of the skull: indeed, if we seriously reflect, we shall be convinced that the judging of the moral worth *of others* is, generally speaking, not the office of men who are so little able to judge properly even of their own worth. But

mixing

mixing with moral judgement a physical observation like that of Gall's doctrine, what errors would not be committed, how often might the bad man be fancied good, and, what is far worse, the good man be deemed bad! He who had conquered decided propensities to evil (the highest triumph of virtue), and raised his mind to purity and goodness, might still appear to be a dangerous, and be a suspected man; while he who had no organ of vice, and whose freedom from it would therefore suppose little virtue, would be esteemed, compared with him, an angel of light.

Application to Jurisprudence.

The influence of this doctrine upon criminal justice is important. If we assume a predisposition to certain crimes in the physical organisation of the subject, his criminality may be deemed less, but he himself becomes more dangerous; criminals enter into the class of sick men, and punishments are remedies. Where a cure is possible, occupation, instruction, punishment, are to be considered alike as means of cure; but where all these are of no avail, when it seems that the power of the ill-

ill-disposing organ is so predominant that it can no longer be regulated by the will, then the individual is to be treated like one insane, removed from the great body of society, that he may not injure, or possibly infect it. This separation cannot always be effected by entire seclusion; he is dangerous to every one, and the life of one so useless and wretched may be of no worth at all. It may be necessary (to use a Mosaic phrase) to cut such a soul off from his people, not as a punishment, but for the reason that makes the surgeon amputate a useless and incurable limb. This doctrine, therefore, instead of leading courts of justice to be unwisely mild and gentle, should rather make them severe in their judgements, not indeed with a view to punish a fault that could have been avoided, but in order to prevent crimes in future, and form a conviction that there are no other means of individual reform, or general security.

But of course the general application only of the doctrine is meant, and on no account a particular application to individuals. The magistrate has never any thing to do with the moral worth of the subject, his concern is only with his actions. He has no right to infer the probability of future violations of the law but from previous offences; and though he

he should infer, from long continued and repeated acts, a strong physical impulse, he has no right to form such inference from an examination of the organs of his head; the less so, as there still prevails so much uncertainty in the forming of individual judgements.

This applies also to *judicial medicine* *. The organology is not yet advanced far enough to furnish grounds for determining the greater or iess culpability of the individual; and if it were, it would not materially affect the administration of justice, for it has been shewn that that strong natural impulse to commit a crime which might lessen his moral guilt, would at the same time render him still more an object of punishment, politically, in reference to the greater danger to the public from the influence of that natural impulse.

Application

* *Medicina forensis.* This is a topick in the administration of justice in Germany, unknown, at least as a distinct branch of study, to our English practitioners and lawyers. But it is considered of so much importance, that lectures are read upon it regularly in all the great universities. It comprehends all those subjects upon which medical men are in the habit of giving their testimony in courts of justice, of course all the symptoms by which poisoning, wilful murder, the birth of a bastard child, dead or alive, &c. are to be judged of. A great variety of matters are included in it.—E.

Application to the practice of Medicine.

Though I estimate the new discoveries of Dr. Gall highly, as enlarging our medical knowledge, I cannot yet convince myself of their utility in practice.

The only cases in which they might be useful, are those of the diagnostic and prognostic symptoms in diseases of the mind. We might be often able to determine, with greater probability, the seat of the suffering mental power, and to judge of the probability of cure from the more strong or weak developement of the organ.

But in the cure of diseases, there seems to me to be no new and essential remedy afforded, for the knowledge we already have concerning the functions of the brain and nerves, has taught us the use of topical bleeding, the pouring of cold water, &c. in cases of fever and madness, and also where the external nerves, viz. of the genitals, are debilitated, to apply stimulants to the spine, &c. The only thing in which Gall's theory might be of use, would be the more exactly ascertaining the place where local remedies are

to

to be applied, when single organs may be particularly affected; yet even this advantage does not seem to me to be attainable, so as to render it of essential worth, for neither the operation of the remedy, nor the seat of the organ, can be ascertained so exactly as to justify our presuming that this topical application may be eminently useful. It is certain that bleeding, or applying cold water, does not affect the spot alone where the application is made, but the whole head, and we may be assured, that if the temperature of the whole brain be made more low by such means, or if it be raised by the application of stimulants, the individual organ will also be affected in like manner. Were it otherwise, did much depend on the exact application upon the morbid organ, it would be a fatal circumstance; for, as the extent and bounds of the several organs cannot be exactly defined, and a morbid organ lies very near others in a healthful state, that application which might be useful to the morbid organ, might at the same time injure the others. The places, therefore, for the drawing off blood, are more properly chosen where the blood vessels within, meet in large branches, or particularly unite with the external vessels.

FINIS.

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