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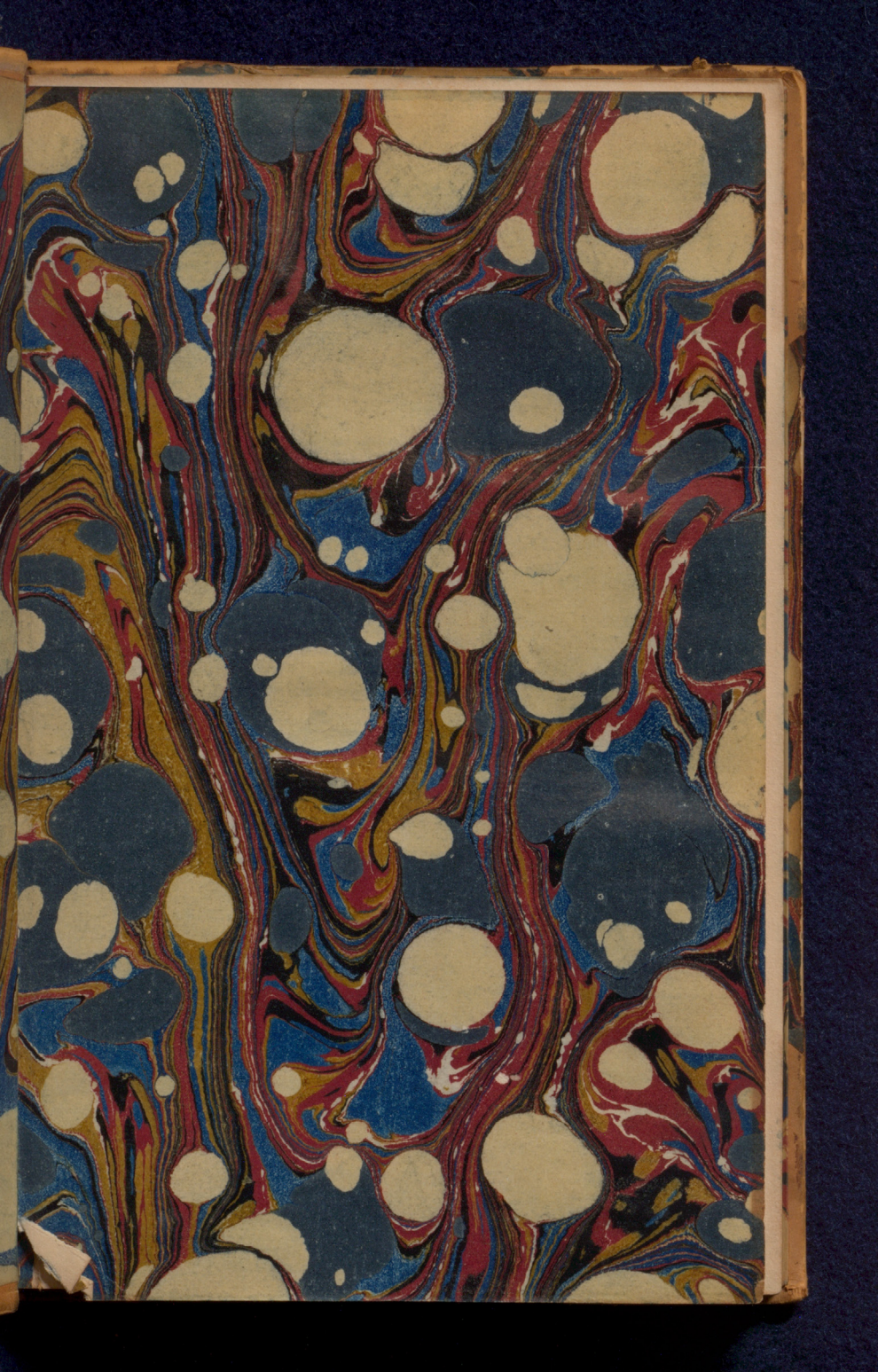

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ON

THE FUNCTIONS OF THE BRAIN

AND

OF EACH OF ITS PARTS:

WITH

OBSERVATIONS ON THE POSSIBILITY OF DETERMINING THE INSTINCTS, PROPENSITIES, AND TALENTS, OR THE MORAL AND INTELLECTUAL DISPOSITIONS OF MEN AND ANIMALS, BY THE CONFIGURATION OF THE BRAIN AND HEAD.

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ORGANOLOGY;

OR,

AN EXPOSITION

OF THE

INSTINCTS, PROPENSITIES, SENTIMENTS, AND TALENTS,

OR OF THE

MORAL QUALITIES, AND THE FUNDAMENTAL INTELLECTUAL FACULTIES

IN MAN AND ANIMALS,

AND THE SEAT OF THEIR ORGANS.

By FRANÇOIS JOSEPH GALL, M.D.

TRANSLATED FROM THE FRENCH

By WINSLOW LEWIS, Jr., M.D., M.M.S.S.

IN SIX VOLUMES.

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FUNCTIONS OF THE BRAIN.

XIII. *The Faculty of Distinguishing and Recollecting Persons.* (*Personen-sinn.*)

I HAVE been struck with the fact, that certain persons and animals recognise, with the greatest facility, individuals whom they have seen years before, though only in passing. This is a faculty which is very feeble in me, and the want of which has caused me, through my whole life, a thousand annoyances. I have seen in all classes, among the people at large as well as among well educated persons, those who possess this faculty and those who are destitute of it. There are persons, and I am of the number, who, when they rise from table, cannot distinguish in the party the person they sat next to during the meal. As this singularity often causes them embarrassment, exposes them to make a thousand ludicrous mistakes, and to pass, with the most indifferent manner, before those who approach them with an air of recognition, they make every effort to avoid such mistakes, but they cannot succeed. It costs them an incredible effort of mind to learn certain faces by heart, and it is only those countenances, that are marked by some peculiarity, which leave on them a durable impression.

On what does this depend? Those, who give only a superficial attention to this phenomenon, always have reasonings, or rather sophisms, ready to explain every thing, say that this belongs to the eye; that such

persons see in an indeterminate manner, or are near-sighted. My own example proves that it is not so. There are few men whose vision operates in a manner more determinate than mine. I have always been able to distinguish from each other, at considerable distances, birds and other animals, and plants, by their general appearance alone. I have never been near-sighted; and with a single look I distinguish, with the greatest clearness, all that surrounds me.

Does it depend on the faculty of comprehending the qualities of objects? Neither is it this which decides; there are hardly any persons who have exercised themselves more in this respect than I have; for both as a physician and a naturalist, I have made it my great business to know how to distinguish, both the various maladies which afflict the human race, and the infinitely varied objects which nature presents us. Though I neither know how to paint nor draw, I have always distinguished with great facility the numerous forms of the head; and were it an object to direct a painter, I certainly could indicate to him the most characteristic traits of the person, of whom he wished to make a portrait.

To be convinced that all these explanations are false, it is enough to cast an attentive look on what is passing in nature. Frequently, children from three to five years of age already possess the memory of persons to a very great degree. There are dogs who recognise, after years, a person whom they have seen but once; while other dogs, after a few days of absence only, no longer recognise persons whom they have frequently seen. Monkeys, dogs, horses, elephants, goats, and even birds, recognise, with more or less facility among a thousand others, their master, or one who has shown them kindness, or, one who has offended them.

All the animals which live in flocks, know each other,—who would believe it? All the bees of the same hive know one another, and their number

amounts to from twenty to eighty thousand. It is even remarked, that the bees of the same apiary, consisting perhaps of fifty to one hundred hives, well know how to distinguish a bee which does not belong there. The lamb, the chicken, &c., know their mother in the midst of a great number of sheep and fowls, &c.

No one can doubt, that the faculty of discerning individuals is, for the animal, one of the most essentially necessary of the fundamental faculties. It cannot, therefore, be supposed, that nature has made such a faculty to depend on accessory circumstances. Whoever knows the maternal solicitude of nature for all animals, will admit, that it depends on a particular interior organization — on a proper organ.

I think I have arrived by observation to the discovery of this organ; but before entering into any details concerning it, I must say a word on the different forms of the eye, and on the causes, which determine the diversity of these forms.

On the Forms of the Eye, and the Causes which determine their Diversity.

The eyes are placed in the orbits. According as the form of these osseous cavities varies, the balls have also a different form and position. The form of these cavities is determined in a great measure by the brain; this makes it clear how the position of the eye may be an external indication of the greater or less development of certain cerebral parts.

This cavity presents four walls. 1. The roof, which is formed by a part of the frontal and the sphenoid bones. 2. The internal wall, formed by a part of the os planum, and by the os unguis. 3. The external wall, formed by a part of the sphenoid and of the malar bone. 4. The inferior wall, formed by a part of the palatine, of the malar bone, and the su-

perior maxillary. Of these four walls, the roof and the posterior part of the external wall are alone in immediate contact with the brain. This part of the external walls corresponds to the anterior extremity of the middle lobes of the brain, while the inferior surface of the anterior lobes lies on the roof, XV. XVI. XVII. XVIII. XIX. Pl. V. VIII. XV. XVI. XI. XII.

The form of the orbit is found totally or partially changed, according as all the cerebral parts placed on the roof, or only some among them, are more or less developed. When they are very feebly developed, the whole orbit is found placed high, and the eyes are raised and brought near the superior orbitar arcade; in this case, the orbits are deep and formed like a hollow cylinder. But, when all these encephalic parts have acquired a high degree of development, the eyeballs are pushed forward, whence result large prominent eyes.

In this case the low roof depresses the ball, which, in its turn, depresses the inferior arch of the orbit toward the cheek, and produces below the inferior lid a kind of protrusion. When the external part, XIX, is alone developed, the corresponding part of the arch is alone depressed, which determines the depression of the external part of the eyeball, and of the external commissure of the lids, as well as the size of the external orbitar angle. When the internal part, XVI. is alone much developed, the internal part of the roof is alone depressed; this directs the internal commissure of the lids, downward.

Seat of the Organ of the Recollection of Persons.

Those eyes, whose internal part and the corresponding palpebral commissure are depressed, indicate, as I have discovered, after twenty years of observation, the great development of the memory of persons. But having met this faculty in a high degree

in persons who had not the eyes placed in the manner indicated, I thought I had judged hastily, and said no more in my account of the cause of this organization; but since then I have found my first opinion confirmed so often, that I have been forced to return to it.

Every time that I find the eyes so placed in an individual, whose organization is not otherwise too repulsive, I can engage that he has great facility in recognising persons. But one cannot always deny this faculty to those, who have not their eyes placed in this manner. It may happen, that the neighbouring organs being advantageously developed, there results a depression of the whole ball and a horizontal position of the two eyes. In such case one might incorrectly believe, that there is an inconsiderable development of XVI. and XIX. This difficulty may occur the more easily, as XVI. and XIX. are both very small organs.

Idiots have often been shown us, who by their faculty of recognising persons, caused the astonishment of physicians. We have constantly found, in these individuals, the above indicated position of the eyes.

It is probably this faculty, carried to a very high degree, which principally constitutes, in a painter, the talent of successfully seizing a resemblance. This resemblance is not limited to the features; it is composed of whatever is characteristic in the whole person, the habitual gestures, the gait, the dress, &c. Hoffman, the famous portrait painter at Friburg in Brisgau, has in an eminent degree the eyes which we have described. I find the same conformation in Titian and Tintoret, who both excelled in the painting of portraits.

In the print of Montaigne, who constantly paints the whole person, the eyes are manifestly depressed at the internal angle.

I have always been struck with the direction of the eyes of Sterne. Pl. LXXXIII. fig. 6, it will be difficult to find any which present to a higher degree the sign

of this faculty. Convinced, many years since, that, in the greatest number of cases, the conduct of man is but the counterpart of his organization, I have lately read Sterne a second time. Both in Tristram Shandy and in the Sentimental Journey, we meet with portraits drawn with great detail, and minute to excess, although such portraits are not essential to the design of the author. We read, for example, in the *Sentimental Journey;*—

"I have his figure this moment before my eyes, and think there was that in it, which deserved better. The monk, as I judged from the break in his tonsure, a few scattered white hairs upon his temples, being all that remained of it, might be about seventy; but from his eyes, and that sort of fire which was in them, which seemed more tempered by courtesy than years, could be no more than sixty — Truth might lie between — He was certainly sixty-five; and the general air of his countenance, notwithstanding something seemed to have been planting wrinkles in it before their time, agreed to the account.

"It was one of those heads which Guido has often painted, mild, pale, penetrating, free from all commonplace ideas of fat, contented ignorance looking downwards upon the earth; it looked forwards; but looked as if it looked at something beyond this world. How any of his order came by it, heaven above, who let it fall upon a monk's shoulders, best knows; but it would have suited a Bramin, and had I met it upon the plains of Indostan, I had reverenced it.

"The rest of his outline may be given in a few strokes; one might put it into the hands of any one to design, for t'was neither elegant nor otherwise, but as character and expression made it so: it was a thin, spare form, something above the common size, if it lost not the distinction by a bend forward in the figure, but it was the attitude of entreaty; and, as it now stands presented to my imagination, it gained more than it lost by it.

"When he had entered the room three paces, he stood still; and laying his left hand upon his breast, (a slender white staff with which he journeyed being in his right,) when I had got close up to him, he introduced himself with the little story of the wants of his convent, and the poverty of his order, and did it with so simple a grace, and such an air of deprecation was there in the whole cast of his look and figure, I was bewitched not to have been struck with it."

In another place; "She was dressed in white, and much as my friend described her, except that her hair hung loose, which before was twisted within a silk net; she had superadded likewise to her jacket, a pale green riband, which fell across her shoulder to the waist; at the end of which hung her pipe.—Her goat had been as faithless as her lover; and she had got a little dog in lieu of him, which she had kept tied by a string to her girdle; as I looked at her dog, she drew him towards her."

In another place he says, "And in translating according to my custom, French figures and attitudes into English."

Such a correspondence between the organization of a writer, and the kind of spirit that pervades his works, is a strong presumption, that the sense of persons or individuals must be recognised as a fundamental faculty, which has its proper organ in the brain.

XVI. *Faculty of attending to and distinguishing Words; Recollection of Words, or Verbal Memory, (Wort-gedächtniss); History of the Discovery.*

In my ninth year, my parents sent me to one of my uncles, who was a curate in the Black Forest. The latter, to inspire me with emulation, associated with me in my studies another boy of my age. They often reproached me, because I did not learn my les-

son, as well as my fellow pupil, although more was expected from me than from him. From my uncle's house my companion and myself went to Baden, near Rastadt. Among thirty scholars that were there, when the object was to recite by heart, I had always to fear those, who in composition obtained only the seventh or even the tenth place. Two of my new fellow pupils surpassed even my former companion by their facility of learning by heart. As both had large, flaring eyes, we gave them the nickname of *saucer-eyes*. After three years, we went to Bruchsal; there again, some scholars with saucer-eyes caused me mortification when the point was to learn by heart. Two years afterwards I went to Strasburg, and I continued to remark that the pupils, who learned by heart with the greatest facility, were those who had large, flaring eyes, and that some among them, in other respects were only indifferent scholars.

Even if I had had no preliminary knowledge, I could not have avoided the inference, that eyes thus formed are the mark of an excellent memory. It was not till afterwards, that I said to myself, as I have already mentioned in the introduction to my first volume, if memory manifests itself by an external character, why should not the other faculties have their characters outwardly visible? It was this which gave the first impulse to my researches, and which was the occasion of all my discoveries.

It will, no doubt, be thought singular, that it is precisely on the subject of this faculty and its organ, that my works are least complete. I shall confine myself wholly to facts. The facts will remain immoveable, even in case my manner of viewing them should undergo some modifications.

Natural History of Verbal Memory.

Men long since began to distinguish this species of memory, by the aid of which we learn by heart with great facility, even things which we do not understand, and have termed it *memory of words, verbal memory* (*memoria verbalis*). It was also known that those, who have an excellent memory for words, have not always the other faculties to a very eminent degree; and this idea was even too much generalized. The conclusion should have been, that this faculty supposes a particular organ; but though proofs without number, were presented in support of this opinion, received prejudices were opposed to admitting it. Almost every where, in the schools, in the various institutions of education, in the lives of philosophers, we see examples of prodigious memory, without the subject endowed with it having given evidence of other faculties to an eminent degree. If, in treating of this faculty and the following ones, I burden the reader unusually with names and words, let him throw the blame on the faculty of which I treat.

The memory of words is sometimes manifested in a surprising manner from the tenderest infancy. At Landau, a boy of five years of age knew by heart all the Catechism, all the Fables of Lafontaine, and a great number of other poetical pieces; he also learned by heart, without at all understanding it, an entire volume of the mathematics of Bezout; he knows in the same manner much of history and geography. Dr. Spurzheim saw, at Linden, a young boy, who is likewise a prodigy of memory. In treating of the succeeding organ I shall cite several other examples of the same kind.

Persons, endowed to a high degree with verbal memory, recite by heart a very long passage, a great number of verses, an entire play, after having read it once or twice. They know how to quote on every occasion the finest passages of the classic authors.

A man was one day presented to Frederic II., endowed with such a memory, that he recited by heart a considerable piece, which he had never heard read but once. The same day, Voltaire had to read some verses to the king. Frederic concealed the stranger behind a screen, and when Voltaire had finished reading, he told him that the piece was neither new nor of his composition; and then made his accomplice appear, who recited it, and maintained that he had himself composed it twenty years before. Let the reader judge of the fury of the irascible Voltaire, and of the shouts of laughter of the philosopher of Sans-Souci.

I had already remarked at Vienna, and I found this observation confirmed in the whole course of my travels, that persons endowed with verbal memory apply themselves in preference to a kind of study, in which many words are needed; for example, to mineralogy, entomology, ichthyology, ornithology, natural history in general, or to numismatics, heraldry, &c.

The memory of words is highly important to comedians, though far from constituting by itself a great actor.

I have already cited, in several places, examples of the entire loss of this kind of memory, without the other faculties being in the least disturbed in consequence.

Seat and external Appearance of the Organ of this Faculty.

In treating of the organ of the memory of persons, I have said, that the anterior convolutions of the middle lobe touch the posterior external parts of the orbit. When these convolutions are very much developed, this part of the sphenoid, which forms the posterior third of the external wall of the orbit, is pushed forward; this diminishes the depth of the orbit, and renders the eyeball prominent.

It is, however, by no means probable, that the middle lobe is peculiar to the faculties. The frugivorous animals have only the internal convolutions, and they learn words and names, as well as the carnivorous animals. Besides, memory has too little analogy with the carnivorous instinct to permit us to suppose, that the convolutions of the middle lobe, placed above the ear, constitute the organ of the carnivorous instinct, and the anterior convolutions of the same lobe, the organ of the memory of words.

Now, if it happen in fact, that the ball is pushed in front of the orbit by a considerable development and a great prolongation of this lobe, the form of eyes which results from it, would no longer be the mark of a great memory. This is perhaps the reason why certain persons possessing large eyes projecting even with the head, in the prime of life and health, have not always a more than ordinary memory. It is at least certain, that some persons learn by heart in general with facility, but have a treacherous memory for names; while others easily fix names in their minds, but have much trouble to recollect pieces, however inconsiderable, whether prose or verse. I have not yet succeeded in discerning well all these varieties; but in ten cases that might be referred to me, I should not be deceived in more than one. I should be still less likely to deceive myself, if the organ of this faculty were not placed in such a region, that it can easily extend itself in all directions, from above downward, forward, laterally, and from below upward.

I regard, as the organ of verbal memory, that cerebral part which rests on the posterior half of the roof of the orbit, (Pl. IV. between XV and 59.) In the prints we have not given ciphers peculiar to the part in question, because we had considered the memory of words only, as forming a part of the faculty of speech.

Yet it is certain, that frequently it is only the posterior half of the orbitar plate, which is found depressed by the great development of the cerebral part indicated;

and, in this case, the posterior part of the orbit must equally lose its depth, and the ball be pushed forward. This form of eyes is often met with, without the circumstances, which I shall indicate in speaking of the faculty of language, taking place at the same time. It is for this reason, that I treat of this organ separately.

Let us observe persons who make collections; we shall find ninety-nine in a hundred have large, flaring eyes. It appears, that the necessity of furnishing their head with a great number of names inspires them with this love of collections. They experience great pleasure in retaining with great facility, the names of the thousand objects which they collect. My respectable master, M. Jacquin, sen. Professor of Chemistry and Botany; the Abbé Mazola, and M. Kreuzer, both of them Entomologists; the Baron Vanderluhe, the Count of Herberstein, Botanistr at Vienna: the Counsellor Bloch, Botanist and Entomologist at Dresden, who each form with ardor collections in their respective departments; M. Œtzel of Potsdam, who makes collections of all the objects met with in commerce; Rœding, at Hamburg, M. Martens, at Bremen, who has made a precious collection of algæ; Beuth, at Hamburg, who amasses all that can be considered objects of natural history; Gering, at Frankfort, who makes a collection of insects and butterflies; Professor Sukow, at Heidelburg; Goll, who makes a collection of prints; Winter, at Amsterdam, who collects birds, monkeys, and shells; Messrs. Camper, father and son, at Franaker, Bruggmans, at Leyden, &c., have all, without exception, large, flaring eyes. Temmink, at Amsterdam, who is making a collection of monkeys and birds, has this organization to a less degree than the others; but yet, as he says himself, makes this collection, only in the idea of establishing one day, according to certain characters, a division of the different varieties of these animals. I should never finish, if I wished to cite all the examples within my knowledge, which confirm this observation.

Hufeland speaks of an individual having large eyes singularly projecting, and who has yet no memory: he says very large, eyes singularly projecting.

It is precisely this manner in which he expresses himself, which makes the observation suspicious to me; for such eyes are frequently the sign of disease, either rickets or hydrocephalus, which the patient has experienced in his early years. Although such persons in maturer life appear to enjoy good health, the practised physician can discover in them the traces of their former disease; they are very sensitive and extremely irritable; their head is not symmetrical, it is more elevated sometimes before, sometimes behind, sometimes on the sides, and they are greatly disposed to mania. Certainly such projecting eyes cannot coincide with an excellent memory.

In the second place, such persons may have already lost the faculty with which they were originally endowed. Excesses of every kind, too long sustained mental effort, severe diseases of long duration, misfortunes, frequent lying-in, singularly enfeeble the memory. In subjects who have incurred these accidents, we can only determine what existed formerly, and by no means what exists now.

When a person unacquainted with organology asks of a stranger whether he has a good memory, he may receive such an answer as to mislead him. I one day asked a young person in whom I observed very large projecting eyes; "Have you a good memory?" "No," said she, "I cannot remember any thing at all." "Yet you have been to school?" "Certainly." "And how did you manage to learn your catechism?" "In almost no time, I knew it from one end to the other; no one of my companions could equal me in this respect: I could recite it still to you entire and even backwards." "But you have just told me that you could remember nothing." "Ah! my God, that is but too true: I forget all the commissions which my mistress gives

me." This explained the enigma. The case, which Hufeland cites, was perhaps of the same nature.

It remains for me also to examine, how far the masses of fat, placed behind the ball, may become sources of error. A man of my acquaintance once experienced violent headaches for a long time. The cephalalgy affecting at first the right side exclusively, the right eye sunk in the orbit; the pains having afterward reached the left side also, the left eye underwent the same change. I would not venture to decide whether this sinking of the eyes was occasioned by the mere absorption of the fat placed behind the ball, or, whether there was a diminution of the cerebral mass placed behind the eyes. It is known, that, by emaciation of the whole body, the eyes sink equally, and that by strong congestions of the blood to the head, they appear more projecting; but these are circumstances which could not lead a physician into error.

It would be possible, that the dimensions, more or less considerable, of the ball itself might here enter into the account; but we must not forget, that the dimensions of the ball are in proportion to those of the orbit, and that the form and size of the orbit, are determined in a great measure by the brain.

I have said, that the cerebral mass, belonging to the memory of words, might act in all directions. I should wish to know more precise cases, to be able to determine, in what circumstances, the considerable development of these parts has acted in one direction or in another. The greater or less diameter of the head, from one temple to the other, might serve as an important guide. A great diameter in this direction is always a favorable augury for the memory of words. The eyes are also sometimes more, sometimes less distant, so that the root of the nose is sometimes broader and narrower; which equally indicates, that there exists in this region a cerebral mass more or less considerable. I have seen persons, who, with an ordinary conformation of the eyes, yet learned by heart with great

facility. But, in these cases, the diameter from one temple to the other is ordinarily very considerable, and sometimes even the inferior part of the temples is projecting, which attests a great development of the adjacent cerebral parts.

I often hear others speak of hollow eyes, where I see large prominent ones. This happens when the inferior part of the forehead projects considerably; such a prominence makes the eyes appear sunken, though placed in orbits which have no great depth in the skull. A forehead, which projects in its inferior part, indicates a great prolongation of the cerebral part placed on the orbitar plate. The eyes of which I mean to speak are well cut, well opened, and the ball advances in a half sphere beyond the inferior part of the orbit. Deep eyes, on the contrary, are rather small, and do not pass the edge of the inferior arch of the orbit. Compare the eyes of Racine, Pl. LXXXIV. fig. 1, of Milton, fig. 2, with those of Rousseau, fig. 3.

Milton wearies me by the crowd of names of which he is every where lavish. In the first canto of Paradise Lost, there is an enumeration of names which takes several pages. In all his poems he gives names to all the objects of which he speaks, of whatever nature they may be. Here again is the impress of the organization of the writer.

Racine, it is said, never forgot any thing. J. J. Rousseau, on the contrary, complains without ceasing of his bad memory.

"Every morning about ten o'clock," says he, "I went to walk in the Luxembourg, a Virgil or a Rousseau in my pocket; and there, till the hour of dinner, I recalled to memory sometimes a sacred ode, sometimes a bucolic, without being discouraged; because in conning over that of the day, I never failed to forget that of the previous evening."

Two women of my house had small sunken eyes. After more than eight years, they had not succeeded

in retaining the names of persons to whom I was in the habit of rendering professional attention.

Of the Memory of Names and of Words, in the state of Disease.

An officer was wounded by a thrust immediately above the eye. He tells me, that since this moment he has had much trouble in remembering the names of his best friends; he had absolutely no knowledge of my doctrine. He does not perceive any debility of his other faculties.

At Marseilles, another young man received, above the eyebrow, a stroke of a foil, which destroyed entirely his memory of names; he could not recall those of his most intimate friends, not even that of his father. I have cited other similar facts in several places of this work.

Baron Larrey had the kindness to bring me one of his patients, whose history is as follows:

Edward de Rampan, aged twenty-six years, received from a foil, the point of which had been broken on the cushion, a blow on the middle part of the left canine region, near the nostril, in a direction oblique from below upward, and a little so from without inwards. The instrument penetrated to the depth of about three and a half inches, across the left nasal fossa, crossed the cribriform plate of the ethmoid near the insertion of the falx cerebri, and appears to have penetrated, in a vertical direction and a little oblique from before backward, to the depth of five or six lines in the internal posterior part of the anterior left lobe of the brain, in such a manner as to approach the anterior part of the mesolobe.

The patient experienced a very considerable hemorrhage at the very instant of the wound, and a very large quantity of splinters escaped by the nose and mouth.

All the organs of sense were paralyzed at the instant; but they have by degrees recovered their functions, and there remain at present only the following alterations:

The sight of the left eye has been totally lost for a month; it is now restored, but the patient sees all objects double.

The smell was totally extinguished; it is restored at present, and the patient can distinguish the odorous alcoholic liquors from the inodorous liquids.

The taste was equally destroyed. It returned by degrees on the right side of the tongue, so that the right half of this organ perceives savors very well, while the left side is deprived of this faculty; the whole of this organ is drawn to the right in opposition to the hemiplegia, which exists on the right side; the mouth being thrown to the left.

The hearing, first lost in the ear of the wounded side, was subsequently restored, and nothing now remains but a buzzing.

The voice, which was likewise lost, has been also restored, and there remains only a slight stuttering.

The force of the generative organs has been perfectly preserved. There supervened a hemiplegia of the whole right side; there remains now only a paralysis of the upper and lower extremity of this side for locomotion only, the sensibility remaining untouched.

The memory of names has been wholly extinguished, and is reproduced now with great difficulty; while the memory of images, and of all which is susceptible of demonstration, is perfectly sound.

The mental aberration, which existed in the first periods in the organs of intellect, has now ceased; but whatever has relation to his self-love, to his military success, &c., throws him into a state of profound alienation and melancholy; while the conversations, which have relation to his family, neighbours, friends, restore his faculties again.

The patient recalled to himself very well the person, the figure, and the face of Baron Larrey; he would have recognised him without difficulty; he saw him always before his eyes, (the patient's own expression,) yet he could not recall his name, and always designated him as Mr. Such-a-one.

I have seen this patient, and have convinced myself that his state is such as it has been just described to me.

If the memory of words is often destroyed in the state of disease, it happens sometimes also, that this faculty acquires a greater degree of activity. The following is an example.

A madman, says Pinel, cured by Dr. Willis, has thus given the history of the paroxysms. "I always," says he, "awaited with impatience the access of agitation, which continued six or twelve hours, more or less, because, while it lasted, I enjoyed a sort of beatitude. Every thing seemed to become easy to me; no obstacle arrested me in theory, or even in reality; my memory suddenly acquired a singular perfection; I recalled to myself long passages from the Latin authors."

I think the difficulties we have encountered in this treatise on the organ of words, will disappear, in proportion as we advance in the treatise on the organ of spoken language, which is to follow.

XV. *Faculty of Spoken Language; Talent of Philology, &c., (Sprach-Forschungs-sinn.)*

The treatise on this faculty will offer important remarks of more than one kind. I shall occupy myself, first, with the material and experimental part, and shall conclude with philosophical considerations. When the greatest part of the middle portion of the inferior anterior convolutions, placed on the superior plate of the orbit, or on the roof, is greatly developed, this wall is not only flattened, but even depressed.

Hence results a peculiar position of the eyes. In this case, the eyes are at once prominent and depressed towards the cheeks, so that a certain space is found between the ball and the superior arch. The ball, thus depressed, acts on the inferior arch and augments its cavity. This large cavity produces in the living subject, when he has the lids open, the appearance of a little pouch filled with water, and hence the name of *eyes with pouches*. (See Pl. LXXXII. fig. 3, 6; Pl. LXXXIII. fig. 4; Pl. LXXXIV. fig. 1, 2, 5, 6; Pl. LXXXV. fig. 1.

Persons who have the eyes thus formed, possess not only an excellent verbal memory, but they feel a peculiar disposition for the study of languages, for criticism; in general, for whatever has relation to literature. They compile dictionaries, write histories; they are well fitted for the offices of librarian and keeper; they collect the scattered treasures of all ages; they compile learned volumes; they search into antiquities; and, however little other faculty they may possess, they excite the admiration of every body by their profound erudition.

Sometimes this faculty is already very active in childhood. At the age of six years, Baratier (Pl. LXXXIV. fig. 6,) already knew more than six languages; at so tender an age he translated the Greek authors, and corrected the translations of his predecessors. We see, that this youthful philosopher had a very happy conformation of the scull, and large *pouched eyes*. Louis Dufour de Longuerue was, from the age of four years, a prodigy of memory. The living and dead languages, history, theology, ancient and modern philosophy, antiquities, belles lettres, chronology, geography, were familiar to him. He dictated an historical description of France absolutely from memory, without consulting any book. We have seen the son of Dr. Perking, aged only eleven years; he was occupied with languages the whole day; he understands Latin, Greek, Arabic, and several living languages. His eyes are formed like those of Baratier.

I need not say, that such an organization acts very differently, according as it coincides with the greater or less development of other organs. When it is joined to eminent superior faculties, it produces universal geniuses, who embrace the whole sphere of activity of human intelligence. (Pl. LXXXII. Galileo, fig. 3, Bacon, fig. 6; Pl. LXXXIII. Rabelais, fig. 4; Pl. LXXXIV. Voltaire, fig. 4.

I am going to give the list of a certain number of remarkable men, endowed with this organization, without taking account of their other faculties, and without confining myself to chronological order.

The work of Dominicus Custos, printed at Augsburg in 1612, contains engravings of the persons, whose biography he gives. We have been not a little astonished to see, that the organization, of which I have spoken, is found in all the learned men, of whom mention is there made as philologists. Such, for examples, are Just. V. Mathiolus, who had also a collection of plants; Occo, a physician who possessed a collection of medals; Aldovrandus, a naturalist; Jerome Wolf, David Hoischel, Gryph, Nicholas Glanardus, William Canter, Francis Pogge, all philologists.

Pic de la Mirandole had so great a memory, that it was sufficient for him to hear a book read three times, and he would recite two or three pages in succession, or even repeat the words of these two or three pages in a retrograde order. It is related, that at the age of eighteen years, he knew twenty-two languages. Milton (Pl. LXXXIV. fig. 2,) was possessed of the most vigorous memory, so that all the studies of his youth were constantly present in his mind. His history of England supposes the knowledge and comparison of all the cotemporary writers, even of those who have put in operation the first materials. Coming from the hand of a blind man, it was as astonishing a prodigy as Paradise Lost. He was author of principles of grammar, of dictionaries, and knew Latin, Greek, Hebrew, Syriac, &c. The position and conformation of

his eyes announce this prodigious memory in the most distinct manner.

Rabelais (Pl. LXXXIII. fig. 4,) was acquainted with the languages, ancient and modern, grammar, poetry, philosophy, astronomy, jurisprudence, medicine. He had furnished his memory with all the riches of his time. But let us attend also to the considerable development of the frontal parts, both superior and inferior. Let us consider also the admirable organization of Leibnitz, Haller, &c. Let us direct our eyes to the portrait of Edmund Castell, (Pl. LXXXV. fig. 1,) which is found at the head of his Lexicon Heptaglosson, a work which will continue for ages the resource of all philologists. What a resemblance appears in the organization of all these distinguished men!

Pelloutier, philologist; Perrault, architect and writer; Perron, who studied by himself Greek, Hebrew, philosophy, and the poets, a writer of prodigious memory; Rollin; Renaudot, who knew seventeen languages, and history; all had large pouched eyes; as well as Crebillon, (Pl. LXXXIV. fig. 5,) who never wrote his pieces till it was necessary to give them to the theatre. When he presented to the players his tragedy of Catiline, he recited the whole of it to them from memory; he never forgot any thing that he had learned.

Let us consider the eyes of Strabo, of Arétin (Leonard), polygraphist, historian, and translator; of Sarpi, author of the history of the Council of Trent; of Gibbon; of John Müller, author of the history of Switzerland; all have eyes very prominent and depressed toward the cheek.

Let us consider the portrait of Adelung at Brunswick, and that of his daughter, who inherited her father's genius for languages; those of Messrs. Bottiger, of Dresden; Heyne, of Gottingen; Schlosser; Birkenstock, of Vienna; Saxe, of Utrecht; Murr, of Nuremburg; Harles and Meusel, both of Erlangen; Krans, of Kœnigsburg; Rasdorfer, of Schweinfurt; Wolf, of

Berlin; Wolke, of Leipsick; Binger, of Manheim; the last became blind from excessive reading. Finally, let us admire the external sign of this beautiful faculty in our two celebrated professors of the university of Paris, MM. Desgenettes and Percy.

I should fatigue the reader by multiplying quotations. Whenever I look at the portrait of a man who has gained a name, in a department which supposes this kind of memory, I find large depressed eyes. How, after this, could I doubt, that this is a proper fundamental faculty, and that the organ has its seat above the orbitar plate?

The facts prove to demonstration, that this organization always produces the same turn of mind. To what fundamental force can we refer the functions of this organ? Is it by means of this that the human race has created for itself a spoken language? Has this organ traced to nations the immutable laws of general grammar? These are questions, which can be answered only after very numerous observations. The following might lead to the supposition, that they ought to be answered affirmatively.

Faculty of Language in the State of Disease.

A certain woman had intellectual faculties sufficient to arrange her household and take care of her children. But although her hearing was good, she could never learn to speak. In her cranium, the superior orbitar plates are hollowed into a spherical shape, a certain proof, that the cerebral parts, placed above, were very feebly developed. In the cranium of an individual completely idiotic, the superior orbitar plates likewise take a spherical form in the cranial cavity.

Pinel reports a fact, which I shall give in this place.

A notary, in consequence of an attack of apoplexy, had forgotten his own name, that of his wife, his

children, and his friends, although, otherwise, his tongue retained all its mobility. He no longer knew how to read or write, and yet he appeared to remember objects, which had formerly made an impression on his senses, and which related to his profession of notary. He has been seen to point out with his fingers the files of papers, which enclosed acts which could not be found, and indicate by other signs, that he preserved the former chain of his ideas.

A soldier, whom Baron Larrey had the kindness to send me, is in a state almost similar.

It is likewise in consequence of an attack of apoplexy, that this man finds himself unable to express his sentiments and ideas by spoken language. His face carries no trace of deranged intellect. His mind finds the answer to the questions addressed to him and he does all in his power to express it. I showed him an arm-chair, and asked him if he knew what it was; he answered me by sitting down in the chair. He is incapable of articulating, immediately, a word, which is pronounced in order to make him repeat it; but, some instants afterward, this word escapes him involuntarily.

In his embarrassment, he points with his finger to the lower part of his forhead; he manifests impatience, and indicates by his gestures, that it is from that point, that his inability to speak comes. It is not his tongue which is embarrassed; for, he moves it with great activity, and pronounces very well a large number of insulated words. Neither is his memory in fault; for, he manifested to me very strongly, that he was sorry not to be able to express himself on many things, which he would have wished to tell me. Nothing is lost in him but the faculty of speaking. This soldier, like Pinel's patient, is no longer capable of reading or writing.

Perhaps similar facts throw light on those mental diseases, in which the patients absolutely refuse to speak. I have the scull of a madman of this species;

in this scull also the superior plate of the orbit forms a vault elevated to the segment of a sphere.

It might be said, that in these cases in which the nervous system is attacked with weakness, it is the part previously the most feeble, which suffers most, and that the patient finds himself incapable of speaking, and has even lost the recollection of ever having spoken, though the exercise of his other intellectual faculties continues to take place to a certain extent. This would also explain how, after a fall, or any lesion, a man, from disease, may find himself incapable of speaking, without this incapacity being imputable to a palsy of the vocal organs. In such cases we have tried, in the insane hospital at Vienna, to excite the action of the brain, not only by internal treatment, but also by friction, for example, with the ointment of tartarized antimony, and we have thus succeeded in restoring the faculty of speaking.

There are children from two to twelve years of age, and even of fourteen, who know not how to speak, although they are not idiots, and understand nearly as well as other children, who speak. In these cases, the fault does not lie in the vocal organs, as the ignorant sometimes persuade themselves, and still less in a state of apathy of the subject. Such children, on the contrary, often have great physical vivacity ; they do nothing but jump, pass from one idea to another with astonishing rapidity, and fix their attention on nothing. When you hold them, and pronounce in their ear a name or any other word, they repeat it distinctly. It is very difficult to make this experiment twice in succession, and impossible to go to three times, which proves a general weakess of the organs of the intellectual faculties. Sometimes, however, such subjects are capable of expressing their ideas and sentiments in writing with sufficient order, which well proves, that their intellectual weakness is peculiarly relative to the faculty of speaking. Though these cases are not absolutely rare, I have not hitherto

been able to procure the cranium of such a subject. When we treat these children by a tonic curative method, when we do not compel them to undergo too strong an exertion, and too long continued exercise of their feeble intellectual faculties; when, by the progress of age, their cerebral parts gain more consistence, their intellectual faculties often develope themselves by degrees, and they at length acquire the faculty of speaking, and take rank among reasonable people. It is only in the case, in which there exists hydrocephalus, or any other organic disease, that we need despair of a favorable event.

Spurzheim saw, at Inverness, in Scotland, a man who, being struck with apoplexy, knew the qualities of objects, who recalled vocal signs, but who could not pronounce them. If a color was shown him, as green for instance, and the question was asked whether it was brown, yellow, or any other color than green, he said no; when the true color was named, he replied in the affirmative. Spurzheim observed a similar case at Paris. The man understood all that was said to him, but could not find the pronunciation of the words which he wanted. He asked for different objects; and if the article was brought him which he mentioned, he always said it is, or it is not, that.

Sometimes this species of memory is found exalted in the state of disease. The patients recall events of which they had no recollection in the state of health. They quote whole passages which were long since forgotten; they speak languages which they had learned in infancy, but of which they had completely lost the exercise.

The organ of the faculty of language is perhaps particularly excited in those cases of alienation, in which the patients think they hear some one addressing them. I have had charge of two women affected with this kind of mania, both had large, flaring eyes depressed toward the cheeks.

The same irritation appears to exist in those mad-

men who think they speak all languages. In a madman of this sort, whom we saw at Berlin in the great hospital, called la Charité, the cerebral part peculiar to this function was unusually developed.

There exists, then, a partial mania limited to the faculty of speaking; now this phenomenon would be impossible, if the faculty of verbal language were not founded on a particular cerebral part.

In order the better to show what the language of words is, and what the faculty is which gives birth to it, it will be useful to examine its mode of existence and its different degrees of perfection in animals.

On the Language of Animals.

All language is the expression or the manifestation of the ideas or the sentiments, which men or animals experience. There are consequently as many different languages, as there are means of expressing or communicating one's ideas or sentiments. These means are either verbal sounds, or gestures, signs imperceptible to the ear. Sounds and gestures are either natural or arbitrary; man makes use of two languages; where natural signs are not sufficient for him, he invents arbitrary ones. Animals have the lauguage of signs. No one doubts it. In another place I shall develope the origin of the language of signs. But have animals verbal language also? It is this which we are now going to determine.

The following is the manner in which C. G. Leroy expresses himself on this subject.

"We remark, in animals, only cries which appear to us inarticulate; we hear only the constant repetition of the same sound. Besides, we have some trouble to figure to ourselves a connected conversation between beings which have a long snout or a beak. From these prejudices, it is generally concluded that animals have no language, properly so called; that

words are an advantage peculiar to us, the privileged expressions of human reason. We are too superior to the beast, to seek to disguise to ourselves or to misapprehend what they enjoin, and the apparent uniformity of the sounds, which strike us, should not mislead. When a language, which is strange to us, is spoken in our presence, we think we hear only the repetition of the same sounds. Habit, and even the understanding of the language, alone teach us to judge of the difference. That difference, which the organs of the beasts make between them and us, ought to render us much more strange to them, and even make it impossible for us to recognise and distinguish the accents, expressions, and inflections of their language. It is however certain, that the beasts of each species distinguish very well among themselves, those sounds which to us appear confused. It does not happen to them to mistake in this matter, nor to confound the cry of fear with the sighing of love. It is not only necessary, that they express these marked differences, but also to characterize the slightest shades. The language of a mother who announces to her family, that they must hide, conceal themselves from the view of the enemy, cannot be the same as that which indicates that they must accelerate their flight. This is a question which must be resolved by the solution of two others. Have they the mechanism necessary for speaking? Can they without speaking execute what they do execute? Language supposes only a succession of ideas and the faculty of articulating. We have recognised, without being able to doubt the fact, that the beasts feel, compare, judge, reflect, conclude, &c. They have then, in regard to connected ideas, all which is necessary for speaking. With regard to the faculty of articulating, most of them have nothing in their organization which, as appears, should deprive them of it. We even see birds, otherwise so different from us, succeed in forming articulate sounds entirely similar to ours. Beasts have, then, all the conditions

which are necessary to language. But, if we closely follow the details of their actions, we see farther that it is impossible they should not communicate a part of their ideas, and should not do this by the aid of words. Their various agitations have different intonations which characterize them. If a mother, terrified for her family, had but a single cry to warn them of the danger which threatened them, we should see the family at this cry always make the same movements. But, on the contrary, those movements vary according to circumstances. Sometimes it is to take to flight, sometimes to hide themselves, another time it will be to present themselves in the attitude of combat. Since, in consequence of the order given by the mother, the actions are different, it is impossible but that the language should have been so likewise. Can it be said, that the expressions are not much varied between a male and a female during the period of their commerce, when we remark between them a thousand movements of a different nature? Eagerness more or less marked on the part of the male; reserve, mingled with enticement, on the part of the female, pretended refusals, vehemence, jealousies, reconciliation. Could it be believed, that the sounds, which accompany all these movements, are not as varied as the situations themselves, which they express? It is true, that the language of action is of great use among brutes, and that it is sufficient for their communicating the greater part of their emotions. This language, familiar to those who feel more than they think, makes a very prompt impression, and produces almost at the instant, the communications of the sentiments which it expresses; but it cannot suffice in all the combined actions of brutes, which suppose concert, convention, designation of place, &c. Two wolves who, in order to hunt more easily together, have divided their parts, one of whom has gone to attack the prey, while the other has charged himself with waiting at a given place to rein-

force his comrade with new strength, could not have acted together with so much concert, without communicating their project; and it is impossible, that they could have done this without the aid of articulate language.

"The education of brutes is accomplished mostly by the language of action. It is imitation, which accustoms them to most of the movements, which are necessary to the preservation of the natural life of the animal. But, when the cares and the objects of foresight and fear have greatly multiplied with the danger, this is no longer sufficient; the instruction becomes more complicated, words become necessary to convey it; without an articulate language, the education of a fox could not be completed. It is certain from observation, that before having been able to instruct themselves by personal experience, the young foxes on leaving the burrow, for the first time, are more distrustful, and more cautious in the places where war is often made on them, than the old ones where the snares have never been spread. This observation, which is incontestable, proves absolutely the need they have of language; for, without it, how could they acquire the knowledge of proper precautions, which knowledge supposes a succession of facts known, of comparisons made, of judgments rendered? It appears then, that it is absurd to doubt, that brutes have among them a language, by means of which they transmit ideas, the communication of which is necessary to them. But the invention of words being limited by the need one has of them, we see that language must be very limited among beings, who are always in a state of action, of fear, or of sleep." *

When one has frequent occasions of observing animals, he learns to understand their language, and knows the different inflexions assumed by the cry of

* Lettres philosophiques sur l'intelligence et la perfectibilité des animaux, par C. G. Leroy à Paris, 1802, p. 82, 87.

the cock, the chicken, and other birds, according to the sentiment or the idea which they wish to express. I saw a flock of ducks utter confused sounds with all the marks of inquietude; their singular movements fixed my attention; I could not doubt, that they were occupied with something which greatly interested them; their inquietude became every moment more visible; at length a duck, that had run from a distance at full speed, threw herself into the court. All her companions received her with marks of the most lively joy; all approached her, extended their heads towards her, stooping down, wagging their tails, and making a sort of reverence. The quacking became more and more animated, and all finished by retiring, much pleased, into their cover. Now, will any one tell me, that these ducks did not speak to each other? I am informed of all the wants of my dogs by the different sounds which they utter. My monkey manifests by sounds, always modified, the most varied wants, sentiments, affections, and ideas. There are none, even to my domestics, who do not understand his language.

This language is natural to animals; it is inherent in their natures; it is the same in all the individuals of the same species; every individual learns it, all speak it well, and all understand it perfectly. The attentive observer will easily convince himself, that this language is much more extended, especially in the more intelligent species, than is commonly supposed.

But what proves still more in favor of a faculty in animals for language, is their aptitude to understand the arbitrarily formed languages of mankind. All our domestic animals furnish evidence in favor of this last assertion. They learn to comprehend, not only insulated words or articulate sounds, but entire periods expressing several ideas. I have made, on this subject, many observations. I have often designedly spoken of objects which might interest my dog, avoiding to name him, and without allowing to escape any

intimation or any gesture, which could have awakened his attention. Nevertheless he expressed pleasure or chagrin according to the occasion; finally, he manifested by his conduct, that he had well understood that the conversation concerned him. I had brought a female dog from Vienna to Paris; at the end of very little time she understood French as well as German. I have assured myself of this, by uttering before her whole sentences in both languages.

It remains for me to examine to what extent comparative anatomy confirms these observations, by the examination of the cranium and of the head of animals.

On the Organ of the Faculty of Language in Animals.

In man, the brain, or rather the inferior anterior convolutions, which at present interest us, extend themselves, ordinarily, about two inches from the median line toward the right and left; in such a manner, that the whole width of the anterior inferior surface of the human brain is ordinarily about four inches. In the horse and the ox, it is nearly two and a half inches; and, in fact, the forehead of animals is much less broad than that of man. The whole of this cerebral mass, situated on the orbitar plate and against the forehead, is composed of several organs, such as those of educability, of the faculty of localities, memory of persons, of words and of language, of the faculties of tones, of numbers, and perhaps those of order and time. Now, according as a species is found endowed with more or fewer of these organs, its cerebral mass will extend more or less on the sides, and the inferior anterior surface of the cranium will be more or less large. In man, the ball of the eye, or the orbit, except its external edge, is covered by the inferior convolutions of the anterior lobes of the brain, and the superior plate

of the orbit is very large, more or less extended toward the side, and more or less flattened or prominent, according as the convolutions are more or less large or developed. In the monkey, nature has remained faithful to the same type; but the anterior parts of the brain shrink much more than in our species; a much larger part of the eyeball is placed without the encephalon. The superior orbitar plate is not only less in size, but also more spherical in the interior of the cranial cavity; the effect of which is, that, making allowance for proportion, the brain of the monkey terminates forward more in a cone or an oval, than that of man. Pl. LXXXIX. fig. 1. the interior of the base of a human cranium; fig. 2, open base of the cranium of the monkey, shows that the inferior middle convolutions of the anterior lobes are much more excavated, that is, much less developed toward the orbitar plate, than in man. The orbits of the ape (*guenon*) and of the ourang outang are almost as deep as those of man; which proves, how much smaller the inferior surface of the anterior lobes is in these animals, than in man. In the papions, the mandrils, and the pongoes, more than half the eyeball is found outside of the brain. Compare the crania of man with the crania of all the species of monkeys; Pl. LXXV. LXXXVIII. with Pl. LXVII. fig. 1, the cranium of the pongo, fig. 2, cranium of the papio, and Pl. LXXIX. fig. 1, the cranium of the sagouin, fig. 2, the cranium of the capuchin monkey, fig. 3, the cranium of the troglodyte monkey, fig. 4, the cranium of the ourang outang. Compare the brains of the patas monkey and of the ourang outang, Pl. XXXIV. and Pl. LXXVII. the brain of an ape (*guenon*), fig. 1, with all the plates of the human brain.

In the dog, it is only the posterior internal part of the ball, which touches the brain; more than two thirds of the eye are found placed outside of the encephalon. In several other animals, the whole ball is found outside of the brain, and more forward. This

takes place in the badger, the beaver, the pig, for the part of the cranium which, in these species, seems, at first view, to constitute the superior orbit, forms, in fact only the frontal sinuses. See Pl. LXVI. LXX. LXXII. the two heads of dogs, LXXXI. fig. 1, and fig 2; in general all the heads, and, Pl. XXXIII. the brains of the kangarou, fig. 3, of the tiger and lion, fig. 4, and 5, Pl. III. the brain of the calf; Pl. XIV. the brain of the sheep; Pl. LXXVII. fig. 2, the brain of the cat.

In birds there is always as much more of cerebral mass placed above the internal part of the ball, as the species has more aptitude for language. Compare Pl. LXXXI. fig. 3, the pie; fig. 4, the starling; fig. 5, the great raven; fig. 6, the parrot, with the gallinacea, Pl. LVII. and the brain of the chicken, Pl. I. fig. 2.

This small number of examples will enable the reader to conceive, not only, that animals may have among them a determinate language, but also how they are capable of comprehending those arbitrary sounds, which compose our languages, how they are competent to seize a series of ideas expressed by a period.

It even appears, that the aptitude for language, possessed by animals is destined, not only to subserve their proper wants, but also to render them capable of understanding the signification of sounds, and the language of other animals and of man.

Philosophical Reflections on Spoken Language.

Since Condillac, philosophers have exhausted themselves in reasonings on the influence, which signs in general, and spoken language in particular, exercise on our ideas and our knowledge. They maintain, that, without signs we should hardly think; that it is only articulate words which can lead us to abstract ideas; that signs and language develope our faculties, give birth to our inclinations, our sentiments, affections,

passions; that, without signs, we could not compare our simple ideas, nor analyze our compound ones; that in this way, languages are as necessary to thought as to speech, to the possession of ideas as to their expression: that without language we should have only very few ideas, and these very confused and incomplete.

It happens, by a fatality common to philosophers, and which happens to physicians and all others, to take the symptoms for the disease, the shell for the fruit. Destutt Tracy has aready said, that Condillac should have announced his discovery differently, and have said, that every sign is the expression of the result of a calculation executed, or, if you will, of an analysis made, and that it fixes and establishes this result, in such manner, that a language is really a collection of discovered formulæ, which afterward facilitate, and marvellously simplify the calculations and analyses which we wish to make ulteriorly. In fact, all possible signs, the language of gesture as well as verbal language, are the product of the activity of the faculties, inclinations, affections, and passions of men and animals. It is in the nature of man and animals to produce certain sounds as soon as they are affected; as soon as the experience they necessity of communicating with their fellows. It is an effect so necessary to their organization, that it even takes place in spite of us; and these seem almost always to depict our various affections so well, that they become the most certain and the most distinct natural signs. Before all language, the organs of our qualities and faculties are active, and however little this action may be felt, it manifests itself either by gestures, or by sounds, or words, or by both in combination. It follows, that these external signs, for the most part, are proportioned to the action of the internal faculties; it is by means of language, that man and the animal communicate their feelings and their ideas; and consequently the language of each species of animal, of each people, of

each individual, must be more or less rich and just, according as the sentiments and the thoughts are more or less numerous, clear, lively, and determinate. Any language whatever can never have more signs, than those who form it have ideas or sentiments. Languages and knowledge always are in concert; and in their progress, the equilibrium always establishes itself between the interior faculties and the signs. In order to transmit to my hearers or my readers, in a clear manner my ideas and my feelings, I try to impress myself with them, to personify them, if I may be permitted to use the expression, and the proper language spontaneously presents itself. This is the reason why the most perfect language is always employed by the most profound and enlightened men; and whenever language is poor, vague, imperfect, vacillating, the sentiments and the course of the ideas are open to the same charge. The language of brutes is, for the same reason, very limited; and thus it may be conceived, why that of certain savages is composed only of three hundred words. The words are created only in proportion to the need we have of them.

The doctrine so pompously announced, therefore, is false; namely, that language, that signs in general, have called forth, directed, and fixed the progress of the human mind in its combinations and researches. I admit, that the history of signs is, at the same time, the history of the successive advancement of human knowledge. But it is knowledge, inclinations, sentiments, talents, which have produced the signs; never could any sign give rise to any inclination, sentiment, or talent. It is necessary first to have experienced these, and then to have found the acceptation of the word or sign invented by others. Speak of metaphysics in the most distinct terms to an animal, an idiot, a man of very limited powers, and it is talking of colors to a blind man. Boast to a miser the pleasures of beneficence, to a cruel man, the charms of compassion; you will never, with all your signs, awaken

benevolence in the miser, or humanity in the cruel man.

Verbal language, it is true, is, of all languages and of all possible artificial signs, the most convenient to employ; it needs neither instruments nor preparations as for traced figures; it requires neither space not freedom of limbs as for gestures; in whatever position one is, maimed, sick, acting, he can produce this language. It is heard as well by night as by day, at a distance as well as near, without disturbing one's self, without turning toward the speaker, without being earnestly attentive, without even wishing it. These properties, which sounds possess, of being the most natural and the most convenient of all signs, cause them to become by custom the most habitual of all, and within us they are the most intimately connected with the ideas which they represent.

It is also true, that sounds have the very precious property of being able to become permanent signs by means of writing; that they remain fixed under our eyes, like hieroglyphics, drawings, and all other durable signs; and can, like them, awake in us, constantly, the ideas with which we have been transiently affected, and recall to us those which we may have forgotten, and which serve as necessary connections with others.

Notwithstanding all these advantages, so well detailed by Destutt Tracy, it must be confessed, that the language of gestures, though destitute of some of these properties, is more natural, more intelligible, more universal than spoken language, and that the language of actions or of gestures, is anterior to spoken language, &c. The immense utility of the language of gestures I shall make evident, when I have occasion to speak on *pathognomony* and *mimickry*.

The cases of disease, which I have quoted above, in which the patients had full knowledge of things, without being able to find or pronounce their names, prove, that the action of the internal forces precedes signs; that it is, in some measure, independent of

these; and, finally, that arbitrary signs, like spoken language, can give rise to ideas and sentiments, only so far as they have become by use means of association.

If it were true, that without signs, we should hardly think, and that nothing but articulate words can lead us to abstract ideas, then children would scarcely think before knowing how to speak. Now, experience shows that, before speaking, children acquire an infinity of notions, which without thinking, would be impossible. Children even commence the operations of their intelligence by making abstract ideas for themselves. Without stopping at the shades of color, all these shades are referred to the abstract idea: they are all green, red, blue, &c. The young of animals, the calf, the foal, &c. are the offspring of the cow, horse, &c. Thus, abstraction is the first want of the understanding, and is effected without the aid of any language.

It is likewise proved by experience, that, when an individual has been deprived of hearing, he employs other signs, natural or artificial, to express his sentiments and his thoughts. Men have at length seen the fallacy of the opinion, refuted many centuries since, that persons, deaf from birth, are not susceptible of the same sentiments, ideas, acquirements, as those persons who hear. The attainments of the deaf, unless their intelligence is imperfect, are often more just and more precise than the vague and indeterminate knowledge of other persons. The instruction of these is too often given in ill understood, ambiguous terms; the instruction of the deaf, on the contrary, always commences with the objects themselves; the deaf man will never persuade himself, that he has a positive idea of spiritual things; he knows very well, that whatever he learns of them is founded on negations, because he has been made to conceive, for example, that spirit is not an extended body, that it is not matter without action, &c. For the rest, every body knows the precision of their ideas on the affections, the sen-

sations, the sentiments, and the passions, and with what rapidity they communicate together before having received the least instruction.

Spurzheim saw a young Scotchman, born *deaf* and *blind*, who, though deprived of these two principal means of communication, and without having received any education whatever, manifests moral or affective qualities and intellectual faculties, to a higher degree than many other individuals endowed with all the external senses.

This fact is too important to be omitted. I shall relate it, as Spurzheim has reported it in his Phrenology.

"The history of James Mitchell, a young Scotchman, born deaf and blind, furnishes us an evident proof, that the five senses do not procure us our affective and intellectual faculties, and that they are only intermediate instruments. On account of the importance of the fact, and because I have myself seen this young man, I will speak of him with some detail.

"He was born the 11th Nov. 1795, deaf and blind, of intelligent parents. It may be conjectured, that he perceives sounds internally, for he appears to experience pleasure in moving hard bodies against his teeth; he has been seen to do this for whole hours. He has always seen the light so far as to distinguish day from night, and dazzling colors; and amused himself in his youth with looking at the sun through the clefts of the door, and with kindling fire. At the age of twelve years, the drums of both ears were perforated, one by Sir Astley Cooper, the other by Mr. Saunders, but without any improvement of the hearing. At fourteen years, Mr. Wardrop performed for him the operation of cataract on the right eye; after this he recognised more easily the presence of external objects, but never made use of sight to distinguish the qualities of bodies. Before and after this period, the colors of red, white, and yellow particularly fixed his attention. His senses of relation were always smell and touch. At present, he recurs to smell less than

formerly; he turns bodies with quickness in all directions, and turns the head sideways in the same manner as other blind men. His desire to know external objects, their qualities and uses, has always been great; he examines all that he meets, men, animals, and things. All his actions indicate reflection. One day, the shoemaker brought him a pair of shoes too small; his mother shuts them in a neighbouring closet and takes out the key. Some moments afterwards Mitchell asks his mother for the key, turning his hand, as if in opening a door, and pointed to the closet. His mother gives it to him; he opens the door, brings the shoes, and puts them on the feet of the young boy, who accompanied him in his excursions, and whom they fitted very well.

"In his childhood, he always smelled out the persons whom he approached, carrying their hands to his nose and drawing in the air. Their odor determined his affection or aversion, in the same manner, as persons, endowed with the sense of sight, are attracted or repelled by a handsome or ugly person. He always knew his clothes by the smell, and refused to put on those of another. Bodily exercise always amused him, such as rolling himself from the top to the bottom of a hill, turning a somerset, making wood or other objects float down a brook, which ran past the house of his father, picking up round and smooth stones, which he found on the bank, arranging them in a circle, and placing himself in the midst, or building houses with pieces of turf, in which he left openings, probably to imitate windows. Since he is able, by the aid of his right eye, to distinguish objects better, he is bolder in his excursions. He goes alone the distance of twelve Scotch miles, from Nairn to Fort Georges. He passes the greatest part of the day in the fields and on the road; but returns at the hours of meals.

"The traits of his countenance are very expressive. In general his natural language is not that of an idiot,

but of an intelligent being. When he is hungry, he carries his hand to his mouth, and points to the closet where the eatables are shut up. When he wishes to lie down, he inclines his head on one side on his hand, as if he would place it on his pillow; he imitates the motions of artisans in referring to them, as the movements of a shoemaker, who draws his thread by extending his arms, or of a tailor in sewing. He loves to mount on horseback; he designates this exercise by joining his hands and placing them under the sole of his foot, no doubt to imitate the stirrup. He makes, like every body else, the natural signs, for yes and no, with his head. He does not like any one to kiss him on the face, and if his sister does this in sport, he wipes and rubs himself with a discontented air. It is remarkable that almost all the signs, which he invents, are calculated for the sight of others. He appears to know his own inferiority in regard to this sense. Formerly he was accompanied by a little boy in his excursions; he went where he wished, but if he met any object, which seemed to him an obstacle, he waited for his companion to come up.

"He easily recalls the signification of the signs made to him. To make him comprehend the number of the days, they incline the head to him, to intimate that he must lie down so many times before the thing takes place. Approbation is manifested to him by caressing his shoulder or arm, and disapprobation by striking a slight blow. He is sensible to the caresses and the satisfaction of his relations. He loves young children, and takes them in his arms. He is naturally good and offends no one, yet his temper is not equal. Sometimes he loves to have others play with him, and breaks into bursts of laughter. One of his favorite amusements is to shut up somebody in a chamber or in the stable; but if others thwart him much, or too long, he becomes angry, and utters very disagreeable cries; in general, he appears contented with his situation.

"He has natural courage, but has always acted with prudence. When young, he wished every day to go farther than he had done the day previous. One day he found in his way a narrow bridge of wood, which was over the stream near his father's house; he places himself on his hands and knees to pass it. His father, to intimidate him, sends a man to make him fall into the water, at a place where there is no danger, and immediately to draw him out again. This lesson produced the desired effect, and he passed there no more. Some years after he still remembered this punishment. One day, being vexed with his little companion, while they were playing in a boat tied to the bank, he took him, plunged him in the water and drew him out again.

"He fears the perils of fire, water, and cutting instruments. Animals killed, such as fowls, never made a disagreeable impression on him; but when he touched the body of a dead man, (it was his father,) he retired terrified and with precipitation. Since then he has touched other bodies, without experiencing the same emotion; he knows that they are interred, and his sign to express it, is to carry his hand towards the ground.

"He is afraid of dying, and knowing that people die in bed, he never remains lying when sick; and having remarked, that the dead are covered with white cloths, he is uneasy in sickness, if dressed with white linen. The death of his father has given occasion to observe his attachment to his parents. When the coffin, which enclosed the body of his father, was exposed before the door, previous to interment, James went out of the house with precipitation snuffing the air about him, probably to guide himself; he approached the coffin, threw himself on it, and pressed it in his arms, while his whole countenance indicated the greatest sorrow. At the moment when they wished to remove the coffin, he threw himself on it anew, held it, and they were obliged to tear him from

it by force. Some time after, his mother being indisposed, he shed tears. Every time that any one of the family is absent, he manifests uneasiness. During some time he had a disease in one foot, which was placed on a stool. A year after, observing, that the boy, who usually accompanied him, did not leave his chair, he touched his legs, and finding a bandage, he went to the barn, and looked for the stool to put his friend's foot upon it. In 1814 he was attacked with acute rheumatism. He loves particularly his eldest sister, and prefers her to every other person. An aunt, to whom he was also attached, came to see them. At this time his sister fell sick and was obliged to keep her bed; Mitchell manifested uneasiness, and wished to know what had become of his sister; he made a sign, that they should lead him up stairs, for his sufferings would not allow him to walk alone. Having found his sister in bed, he experienced pleasure in pressing her hand; but after descending into the parlour on the ground floor, he no longer wished to have his aunt remain near him; he always made signs, that she must go up stairs, desiring, without doubt, to express, that she ought to go and take care of his sister. In my work on *Madness*, page 132, I have related this fact; but by mistake I stated, that it was the aunt who fell sick. It is true, that this circumstance is not essential; yet, through love for truth, I think it my duty to state the fact as it occurred.

"It is difficult to say whether he experiences religious sentiments; he accompanies his parents to church, and is accustomed to place himself on his knees during the prayers of the family. He conducts himself decently; but is this from custom, or through devotion? He knew that while they were on their knees, his father had a book (the Bible) before him. Three months after the death of his father, one Sunday, when a clergyman, who had assisted at the prayers of the family while his father lived, was at the house,

Mitchell brings him his father's Bible, and makes a sign to all the family to put themselves on their knees. It is certain, that he experiences the sentiment of justice and injustice. He is troubled every time he has offended his sister or his mother; and caresses them to regain their affection. His sentiment of self-love, or personal dignity, is evident; for, he would not take his regular meals in the kitchen where the servant is, but in the chamber, in presence of the family; yet, if he returns before the dinner hour, he will go and ask a potatoe of the cook. His love of approbation is very decided. He likes to be caressed. He gives the preference to well dressed persons; and, if he has new clothes, will not change them for the old ones. Several times he has thrown into the river his old clothes, or shoes, to prevent his parents from making him wear them. Sometimes, in great anger, he has also torn his clothes. They wished to teach him to make baskets, but the sedentary life displeased him, and, as the employment wearied him, he threw the materials into the fire. Destruction therefore serves him as a means to rid himself of disagreeable things. A neighbour taught him to smoke, and this taste became very strong with him. Every time he emptied his earthern pipe, he broke it. They gave him a more durable pipe, but he refused it the second time. They allow him at present daily, four supplies of tobacco, and two new pipes; so that each pipe serves twice; after that, it is broken. This enjoyment sometimes calls forth his cunning. One day his sister makes him a sign to go and buy two pipes. In returning he brings one in his hand, and gives it to his sister; she gives him to understand, that he ought to have two. At first he makes believe, that he does not understand her; but when his sister urges him to go and find the other pipe, he draws it out of his pocket with shouts of laughter. Several persons of the city of Nairn, who know his taste for tobacco, furnish it to him. On returning to the house, he never shows it till after having received from the family his daily ration.

"I shall finish what I have to say of this singular being, by speaking of his sense of property. One day he meets on the road a man mounted on the horse, which had been bought of his mother some weeks previous. Mitchell according to his custom touches the horse, appears to recognise him instantly, and makes a sign to the rider to dismount. The latter, in order to observe his intention, obeys, and sees with surprise, that Mitchell leads the horse to his mother's stable, takes off his saddle and bridle, gives him oats to eat, retires, shuts the door, and puts the key in his pocket."

It is impossible to have a more certain proof of innate dispositions, and of the insufficiency of external instruments. This young man is deprived of the two principal senses of relation; he has received no education, does not understand the artificial signs calculated for the hearing and sight, and yet manifests the affective and intellectual faculties in a high degree; while many other persons, who enjoy all the external senses in perfection, are very limited in their mental manifestations, or are even idiots.

From all which I have said in regard to the sense of languages, I think myself authorized to infer, that verbal language, considered as a cause, is by no means in so close connexion with our faculties as philosophers pretend; that it is rather an effect, a creation of our internal faculties; and finally, that a particular organ of the brain presides over this admirable function.

"One might easily conceive," says Demangeon, "the different species of memory already admitted by the ancients, without so great a number of organs. Memory would be almost limited to words, with faculties very few in number, or little developed, as in children, parrots, and other animals; with faculties more numerous or more developed, it would extend itself to things, places, numbers, &c. Thus, without denying, that the angular form of the exterior of the orbit sometimes is the indication of aptitude for calculation, that

the prominence of the eyes in man is a sign of verbal memory, or that the swelling of the internal and superior part of the arch of the eyebrows, indicates the sense of locality, which constitutes already three sorts of memory, I think our authors have multiplied organs too much, and have often endowed them with a speciality of function, which they do not possess. Such, among others, is the organ of aptitude for philology or languages, which can only be learned by means of several faculties.

"Of what species was the memory of the Italian Magliabecchi, who, having read a manuscript, which, in order to try him, they pretended to have lost, dictated it from memory without missing any thing? It is also related that Frederick II., king of Prussia, one day confounded Voltaire, who came to read him a piece of verse of his own composition, without having yet communicated it to any body, by telling him, that this piece was not his, that he knew it already, and could even call some one who had learned it by heart, at the same time introducing a man of his court, who repeated it without forgetting any thing, after having heard it once only, while concealed behind a curtain. Is this the simple memory of words; or is there a memory of phrases, of verses, of rhymes, construction, style, &c.? By the force of what organ do the mocking birds reproduce, not only the words of different languages, but even the notes of other birds and the cries of several animals? If it is by means of the two organs of verbal memory and of imitation, why cannot man, who has these two organs, equal them in the reproduction of the same phenomena?"

Demangeon always holds to his idea on the results of the enlargement of the brain in general, without having regard to the favorable development of certain cerebral parts; and while ever complacently giving himself to reasoning, he has the appearanae of forgetting facts, of which, however, the reading of my book might have furnished him a very large number.

I have instanced bees, which, with an extremely small cerebral mass, have an astonishing local memory. I have cited pigeons, dogs, horses, &c., which, having hardly the tenth, or even the hundredth part of the human brain, have local memory, or the faculty of guiding themselves, to a degree infinitely higher than men. I have even instanced imbecile persons, and idiots, who excel in the memory of persons, places, music. I have cited great mathematicians, geographers, mechanics, musicians, philologists, whose other faculties were very limited. On the supposition of Demangeon, every great compiler of dictionaries, of grammars, every great musician, mathematician, &c. ought to be at the same time a great poet, metaphysician, warrior, actor, &c. In general, every considerable volume of the brain ought to have, as its result, moral qualities and intellectual faculties very energetic. Is not Demangeon in contradiction with himself, when he maintains that mocking birds reproduce, not only the words of different languages, but also the notes of other birds, and the cries of several animals, and that man cannot equal them in the reproduction of the same phenomena?

Demangeon asks, of what species was the memory of the Italian Magliabecchi, &c. I answer, let him again read my own passage in my large work, T. IV. p. 70, where I have myself related the mystification of Voltaire by the king of Prussia, and he will find, that I attribute the faculty of retaining phrases, with so great a facility, to the memory of words or verbal memory.

XVI. *Faculty of distinguishing the Relation of Colors; Talent for Painting,* (*Farben-sinn.*)

By the expression, faculty of distinguishing the relation of colors, I do not mean to designate the simple faculty of seeing or perceiving colors. Animals also see

different colors; they are susceptible of illusions produced by the employment of colors, of light and shade. I have seen dogs bark at the portraits of persons, who were unknown to them, which they perceived by chance in an apartment, and give marks of affection to the portrait of their master; but it will be difficult to find examples of animals who have shown, that they had a perception of the harmony or want of harmony of colors.

There are persons who are incapable of perceiving a very marked difference between one color and another. Dr. Unzer, of Altona, never was able to distinguish the difference between green and blue. A boy, who wished to learn the trade of a tailor, was obliged to renounce that design, in consequence of his incapacity to distinguish certain colors. Spurzheim cites the case of a man whom he saw at Dublin, who loved the mechanic arts and drawing, especially that of landscapes, but who was obliged to abandon painting, because he could not distinguish red from green. At Edinburgh, in Scotland, he also saw three brothers and a cousin german of theirs, who cannot discern green from brown. Such persons certainly are not made for painters. There are other persons, on the contrary, who discern the most delicate shades, and who have a peculiar tact, by the aid of which they are capable of arranging colors to please the eye. But these advantages, though necessary to the painter, have nothing in common with the true talent for painting. By the expression, faculty of distinguishing the relations of colors, I mean the faculty of judging the harmony and contrast of colors, of perceiving and judging of their laws, and conforming to them in their employment.

It is this faculty of distinguishing the relations of colors, which constitutes the talent of the painter. I do not here speak of the painter as an artist, nor under the relation of composition, nor under the relation of drawing, nor that of expression; I speak of the painter only so far as he is a colorist.

In speaking of the functions of the senses, I have already proved, that the talent of the colorist does not at all depend on the eye. The most perfect eye is sometimes found the property of the most indifferent painter, and there are examples of excellent colorists who had weak sight. Before the cerebral organs were thought of, men were doubtless compelled to deduce all our qualities and all our faculties, from the five senses. In this system, painting also could only be a product of the eye, I might quote, in favor of this error, several authors who have written on painting; but I content myself with relating what Sobry says on this subject, who has explained, better than any one else, the opinion of his contemporaries.

"It is not enough," says he "that the sense of sight should be useful to man; it is not enough, that it should be indispensable to him; nature has wished, that it should also be a source of pleasure; she has wished, that it should be the source of his most constant, sweetest, purest enjoyments. In distinguishing man from all other animated beings, in this respect, she has ordained this sense to be the principle of one of her most moral enjoyments.

"In fact we do not see, that animals extend the use of the sense of sight much beyond its utility to them; a fine situation, agreeable places, objects well arranged, appear to affect them but little; the bird seeks, without choice, the foliage in which he conceals himself: the fallow deer, the cave which shelters him; the domestic animal, the asylum which receives him; no one appears to take either more or less interest in the sight of the things which surround him, and it may be said, that, for all animals, the sense of sight is bounded absolutely by its physical character.

"It is to man alone, that it has been given to have moral enjoyments through the sense of sight, independently of the physical means of this sense, with which he is so liberally provided for his advantage. So that it may be said, that, if the sight of man is limited to a

certain number of objects, as regards utility, it embraces an infinite extent of them, as a source of delight.

"From the pleasure of seeing, springs the desire of representing to one's self what has been seen; hence reiterated attempts to trace objects; hence the gradual success of the enterprises of drawing and painting; arriving, from rude beginnings, to satisfactory productions, and finally to a perfection approaching to illusion."

But it is precisely from the circumstance, that animals, notwithstanding the perfectibility of their eye, remain insensible to the fields enamelled with flowers, and to all the beauties of nature, that we ought to infer, that neither the pleasure caused by the sight of these objects, nor the judgment which the mind passes on them, enters into the sphere of the activity of the eye. It ought to be felt, that, though the eye transmits to the soul the impression of these objects, there are nobler objects, which set this impression at work for more elevated ends. Indeed, the talent of the colorist is founded on a faculty much superior to that of seeing. It is founded on the agreement of an internal sentiment and an act of the intellect, with the laws of the proportions of colors, such as they exist in the external world. Let me explain myself.

The internal man and animal are formed for the external world; their interior organization ought, therefore, to be found in unison with external objects, inasmuch as the animal and the man must have points of contact with objects from without. Their organs of taste and smell are in unison with the substances which are appropriate to their nourishment. In the same manner all the cerebral or internal organs are adapted to external objects. The animal has the instinct of propagation, and their exist males and females; the instinct of the love of offspring, and it finds its object in children and young ones; the faculty

of distinguishing localities, and it finds its application in the relations of space.

There must exist likewise, in the external world, objects on which the faculty of colors can be exercised. The laws of the proportions of colors have not been invented by man; they exist in creation; man, and probably he alone of all animals, is endowed with an organ, by the aid of which he recognises these laws; that is, this organ and these laws are in direct relation: the action of the organ becomes a revelation of these laws; the organ bears the impress of the laws to which the proportions of colors in the external world, are submitted.

View of the Laws of the Proportions of Colors.

I pass over in silence all that Newton, Buffon, Goethe, and the modern natural philosophers, have said on the proportions of colors and on their mixture. I likewise abstain from examining the question, whether there exist seven primitive colors, or three only. I have no other end but to convince the reader, that there really exist, out of ourselves, determinate laws for the proportions of colors. Thus, for example, the three fundamental colors, supposing them to be only three, when placed side by side are always inharmonious. Blue, yellow, and red are inharmonious. If two of these colors are mixed, a mean color ensues. Blue and yellow compose green; blue and red, violet; red and yellow, orange. To obtain harmony, we must place by the side of a primitive color, a mixed color, in which the primitive color enters as part of the mixture; the mixed color will always be in harmony with the two primitive colors from which it results. Place a riband of silk, of one of the three primitive colors which I have named, and nearly an inch wide, on a leaf of white paper, and look at it attentively; at the end of some

instants, there will be seen the three primitive colors, and by their side the mixed color, resulting from the two last primitive colors. If, for example, we place on the paper a blue riband, there will be seen beside, the yellow and the red, and by their side the orange, resulting from their mixture.

Klotz, at Munich, is entirely satisfied of the internal laws of colors. It is on these laws, that the possibility of the scale of colors rests; and if we ever are enabled to represent these laws of the proportions of colors by signs, as we do those of the proportions of sounds, we may hope to preserve pictures from the scythe of time. We might then note a picture of Titian or Rubens, as we do a piece of Mozart or Grétry, and reproduce masterpieces of the pencil, as well as those of musical composition, after the lapse of many ages.

The most recent experiments of naturalists on colors, made by the aid of a certain number of superimposed transparent laminæ, give still more precise ideas on the laws of their proportions.

He, who, by virtue of his organization, is capable of seizing these laws, is from this circumstance susceptible of feeling the harmony, or want of harmony, existing between colors. He, in whom this organization is developed in a high degree, has a natural and lively impression of this harmony; without having learned these laws he divines them; wherever he meets with colors, he passes judgment, without knowing how or why, on the harmony or the want of it existing between the colors. This is the talent of the painter, so far as he is a colorist. This is what determines the vocation for painting. This talent, it is true, may be perfected by the study of rules and models, and thus become an object of intelligence; but it would not exist without that revelation, which comes from the activity of the organ, and constitutes its natural foundation.

Talent for Painting in Mental Alienation.

In Pinel's establishment, a sculptor gave himself up to all the extravagance of rage in his cell; he tore every thing to pieces, and continued several months in a most violent state of mania. Calmness at length succeeded, and his freedom was given him in the interior of the hospital; his understanding was still feeble, and he supported with difficulty all the weight of an inactive life. The art which he had cultivated seemed to smile in his imagination, and he desired to try himself first in the class of portrait painting. They readily seconded him in his design, and he made the sketch of the portraits of the Superintendant and his wife. The resemblance was well caught; the patient soon had a relapse, which terminated his miserable existence.

My readers will no longer doubt, I suppose, that the faculty of colors is a fundamental faculty founded on a distinct cerebral organ.

Of the Organ of the Faculty of Colors, and of the external Appearance of this Organ.

At Vienna, I never lost sight of the difference of the talents which constitute the art of painting, and I observed with very particular attention the painters who distinguished themselves for coloring; for example, Lamby. In all of them I remarked, that the frontal part, situated immediately above the middle of the eye, advanced into an arched prominence; the whole arch, and especially its external half, was directed upwards in such a manner, that the external half of the superciliary ridge was more raised than the internal.

I have only been able to discover the seat and form of this organ, by observing attentively very distin-

guished colorists, and I made the discovery at a period, when I had not the least idea either of the form or of the direction of the individual cerebral convolutions. Afterwards, however, an attentive examination enabled me to discover, in the region indicated, a little convolution projecting outward, having from half an inch to an inch of transverse diameter. It is the convolution XVIII. Pl. IV. V. XIII. the favorable development of which determines the faculty of distinguishing the harmony and disagreement of colors.

I have found this discovery confirmed in all my travels. We have seen, in a passionate amateur of coloring, a collection of portraits of all the famous painters of both sexes, who have distinguished themselves in this department of the art. In all these portraits, we found the region immediately above the middle of the eyebrows, extremely prominent.

We were especially struck by a bookseller at Augsburg, blind from birth, who maintained, that it is not the eye but the intellect, which recognises, judges, and creates the proportion of colors. This man even assures us, that, by means of an internal sense, he has precise notions of colors, and it is a fact that he determines their harmony with exactness. He has a great number of pearls of colored glass; he forms with them different figures, and the arrangement of the colors is always harmonious. He tells us among others, that, whenever he takes much pains to arrange the colors of a ground, he feels a pain immediately above the eyes, especially above the right eye. The region which I have above indicated is considerably developed in this man.

"Devoyer, born nearly blind, who has never seen paintings, except with the aid of a glass, passes for a connoisseur."

Now compare the greatest painters, who have excelled in coloring, with other painters equally distinguished, but who, in regard to this point, have not equalled the first. Compare Titian, Pl. LXXXV. fig. 2;

Correggio, Rubens, fig. 3, Claude Lorraine, Van-Dyke, Paul Veronese, Giorgion, Rembrandt, fig. 4, Teniers, le Tintoret, with le Poussin, Lesueur, Raphael, fig. 5, Michael Angelo, fig. 6, Lebrun, Jouvenet. In the portrait of the first you will always see the superciliary ridge strongly raised in the middle; in the last, on the contrary, this ridge has almost a horizontal direction; from the root of the nose to near the middle of the superior arch of the orbit, it is flattened or depressed; while in the first, this region becomes more and more prominent as it approaches the middle of the superciliary ridge.

The organ of the sense of colors is usually more developed in women than in men. Hence it happens, that the eyebrows form, generally, an arc of a circle in women; this explains why they are more susceptible than men of receiving an agreeable impression from a happy choice of colors; why they are so much pleased with a dress of various colors, and why they are more frequently than ourselves, lovers of flowers. A woman will always prefer, whether for herself or her friend, a colored portrait to a bust. This shows why female artists, who in every other respect rarely equal men of genius, raise themselves sometimes to the level of the most distinguished painters in the art of coloring. Angelica Kauffman, daughter of the celebrated Ruisch, is an example of this.

The faculty of colors explains several phenomena, which would remain for ever inexplicable without organology. I confess, that to speak pertinently of all the objects which enter into the domain of the physiology of the brain, I should have to make treatises much more complete than my work permits; I should need almost universal knowledge, an impossible thing, but which must one day engage the connoisseurs to make application of organology to every individual part. I will furnish, meanwhile, a little extract from observations which Dr. Gambs, of Frankfort, has had the politeness to communicate to us.

"If," says he, "we direct our attention to painters in general, we shall observe two clases of them, essentially distinguished from each other. The first is formed by the historical painters; the second by the landscape painters, to whom we must add the painters of animals, flowers, and fruit; all those, in fact, who copy from nature. It is to be remarked that the first, who make a study especially of anatomy, history, antiquities, the works of the ancient and modern masters, who consequently are obliged to study nature and art at the same time, need, to a greater degree than the second, a taste for the arts, and consequently the organ of the arts, of which I shall speak hereafter, ought to be more developed in them.

"This organ of the arts, being placed at some distance from the organ of the faculty of colors, is a circumstance, perhaps, which explains, why the painters of history have rarely been good colorists; why some among them, as Michael Angelo and Poussin, have even neglected coloring, which they professed to consider the least essential part of painting, while their merit in regard to drawing, invention, expression, and composition, places them in the rank of the first historical painters.

"If, on the contrary, we observe attentively the landscape painters and the painters of portraits, who in the exercise of their art especially need the faculty of localites and that of persons; if we observe attentively, that the organs of these two faculties are very near that of colors, we shall perceive why, in the number of landscape and portrait painters, there has always been a great number of excellent colorists, who in this department, have surpassed almost all the painters of history. Compare the excellent landscapes of Claude Lorraine, of Schwanenfeld, of Ruisdael, Both, and others, with the works of the first painters of history, and you will easily be convinced of this truth.

"2. Climate appears to exercise great influence on

the organ of the faculty of colors, as well as on other organs. Almost all the Italian painters, though surrounded by the most beautiful nature, are so indifferent in regard to coloring, that, if we except Annibal Caracci and Titian, both colorists of the first rank. Italy does not possess a single landscape painter equal to Claude Lorraine, to Schwanenfeld, or to Ruisdael, and to other Flemish painters. Holland, Germany, and even the North, on the contrary, have produced a great number of excellent landscape painters, but a very small number of good historical painters. Spain and Portugal have excellent painters of history; for example, Velasquez and others, but not a single landscape painter. In the Italian school, the Venetians, placed more toward the north, are almost always the best colorists. The French school is reproached with being a mongrel, which takes the middle stand between the Italian and the Flemish; it is even predicted, that it will never produce a Raphael, a Titian, a Paul Veronese, a Correggio; it is generally maintained, that the French are endowed with the faculty of arts and of that of colors, to a less degree than the Italians and the Flemish; that the greater part of their historical paintings are also hard, and want natural character as much as their music; and that we cannot acquit the greater part of their paintings of the fault of bad coloring."

I imagine, that custom and natural feeling have much to do with these criticisms. I am neither an artist nor a good connoisseur, but it seems to me, that the new French school has some masterpieces to oppose to its detractors, and that the names of the Gerards, Guerins, Robert-Lefevres, Girodets, Vernets, Forbins, Davids, Regnaults, of the excellent colorist Gros, &c., ought to place them in the first rank among the modern schools. But I repeat it, I consider myself incompetent to decide this controversy.

Neither will I undertake to decide, as some have done, how far the narrow forehead, more prominent in front

of the Dutch and Flemish, explains the greater activity of their organ of the faculty of colors. To determine the question with a knowledge of the cause, I ought to have compared, not only the foreheads of different nations in general, but also to have studied particularly in them, the organ of the sense of the relation of colors.

The different degree of talent for painting, in different nations, reveals itself even in their drawings and engravings. The drawings of the Flemish, even those by the pen, are always, in regard to shades, more finished than others, and exhibit masses of crossed lines by which the artist has intended to give them the appearance of coloring. Many are retouched with india ink, or offer white lights on dark ground. The Dutch landscape painters, properly so called, have been in the habit of coloring their landscapes *in gross* after nature, on the spot, or at least, of taking a colored sketch of them.

In the first engravings of the Dutch and German artists, we cannot mistake the intention of the engravers to imitate colors. The Italian engravers, on the contrary, from the origin of the art to our day, have never been able to imitate them by giving to their works the perfection of retracing the colors, as Reubens and his pupils did, and as the superb dog of Golzius shows.

The organ of the faculty of coloring is pretty generally much developed among the Chinese, whatever may be the variations which the form of their head undergoes. It is for this reason, that their superciliary ridges are strongly drawn upward, especially in the external half. Every body knows to what degree they are prodigal of colors. Every part of their houses is covered with them; the columns, the entablatures, the friezes, all is painted in green, blue, red, yellow; they paint even their statues; they surpass all the nations of Europe in the art of dyeing.

According to the different degree of activity of the organs of the faculties of localities, of the arts, colors, the taste of those who make collections of objects of art, or who consider themselves critics, must modify itself variously. John Fuseli has written a journal of the arts, in which, in criticising works, he gives proof of an exquisite faculty of the arts, but of a very defective one of colors. There are other critics whom nothing escapes which has relation to coloring, but who pay no attention to bad composition, to a drawing so incorrect as to revolt the eye, to a mistaken expression, or one absolutely false.

Men have always been struck by the difference which exists between the faculty of the arts and the faculty of colors. How then happens it, that it has not been concluded from this difference, that each of these faculties ought to be founded on a particular and proper organ? It is either because few go back from an effect to its cause, or because, for want of exact knowledge, men are contented with an insufficient explanation, provided it be generally adopted.

"According to Messrs. Gall and Spurzheim," says M. Demangeon, "the organ of painting directs itself to landscapes, when united to that of localities, but to portraits when seconded by that of persons. But to what organ was united the extraordinary talent of Vernet for painting views of the sea and harbours; that of James Van Es, for painting, with so much perfection, fishes, birds, flowers, fruits, and especially shells; that of Peter Breughel, the younger, or the infernal, for painting sorceries, devils, and hells; that of his father and his uncle, who preferred landscapes, fruits, and pleasing subjects; that of those who undertake to paint only caricatures, portraits of women, and other partial and exclusive subjects?"

We have already said, that man is not the result of a single organ, but of the combined action of all; that only the most energetic leads him to act in preference

in the direction of his faculty. Again, this organ is modified by the more or less powerful action of others; thus, when we say, that the talent for painting directs itself rather to landscapes or portraits according as the organ of localities, or that of persons is conjointly developed, we do not exclude the idea, that the painter, who ought essentially to make use also of the talent of imitation, may make use of this faculty on all suitable objects. All the objections of Demangeon do not destroy the principle, that it is necessary to have a sense of colors, in order to seize well their relations and represent them in painting. Besides, these sea views, these sorceries, devils and hells, caricatures and portraits of women, are they not either places or persons? Does not the organ of a caustic spirit contribute to the composition of some of these paintings? Finally, where have we said also, that the painter cannot imitate things? No where.

XVII. *Faculty of perceiving the Relation of Tones, Talent for Music.* (*Ton-sinn.*)

Why seek in the brain an organ for music? To be apt for music, nothing is requisite but an ear: all the talent of the musician lies in the ear. Thus says the multitude; thus say the physiologists.

In the treatise on the functions of the five senses, I have endeavoured to refute this prejudice, and have assigned its sphere of activity to the ear as well as to the eye. As I cannot suppose, that all persons have read the first volume of my large work, I am here going to repeat, what I have there said against the opinion of those who maintain, that to be a musician, nothing is needed but ear; by this means, we shall here find collected all the proofs in favor of the existence of an organ for music.

There are a great number of animals endowed with a finer ear than man, which, however, do not evince

the slightest aptitude for music. We know birds who do not sing, endowed with as fine an ear as the singing birds. In the species of singing birds, the female, deprived of the faculty of singing, is endowed with the same auditory organs, and as fine an ear as the male.

Certain naturalists do not wish to hear the singing of birds spoken of at all. The notes of birds, say they, have no more analogy to music, than the neighing of horses. It is man alone, endowed with an acoustic ear, who is capable of distinguishing chords and discords. This faculty, they continue, belongs to a peculiar instrument called the cochlea, with which man is furnished, and of which all other animals are destitute.

It is indisputable, that many animals have a finer ear than man, and that the auditory organs in them are more perfect than in our species; this is what I have proved in speaking of the sense of hearing. There I have also shown, that the other mammifera are furnished with a more perfect cochlea than that of man. In my lectures I am accustomed to show my hearers the cochlea of the ox, the dog, the cat, &c.

What shows this error in all its nakedness, is the circumstance, that birds in general, and singing birds in particular, are destitute of the cochlea. It is replaced in them by an osseous canal slightly curved.

If the ear were the material cause of singing in birds, and of music in man, birds and man could not, in regard to singing and music, do more than repeat what they have heard. Now, how has each of the singing birds acquired his note? Where is he who gave lessons to the first thrush, or to the first nightingale? How happens it that birds, hatched and raised by those of a different species, and who have never heard their parents sing, yet utter the note peculiar to their species? M. Darvin says, on the authority of Kircher, "that the young nightingales, hatched by other birds, never sing except in those

cases where they have been instructed by associating with other nightingales." But this is not the fact. If the comparison be permitted, it is with the singing of birds, as with the language of men of the same country. In essential particulars it is the same, but it undergoes modifications within a circuit of some leagues only, in each inconsiderable district, even in a little island. Young birds, raised in the house, do not sing so well the first years, but they improve themselves from year to year, without ever having heard other birds of their own species sing.

How can we conceive the invention of music in man, if the musician must have heard before, all the music which he makes? Who does not perceive, that the composer of music derives these compositions from the interior of his soul? That whatever he expresses on paper by notes, he had previously perceived and conceived within himself? Why then are not persons, endowed with the finest ear, likewise endowed with the most distinguished talent for music?

I am aware that Buffon, Cabanis, and others, charge the musical faults of certain composers to the inequality which exists between the two ears; but daily experience refutes this assertion. It is difficult to find an individual, who has both ears equally good. Holzbauer, the celebrated chapel master at Manheim, was deaf of one ear, and heard very imperfectly with the other; that did not prevent him from composing very harmonious music. Astley Cooper speaks of a man who was very hard of hearing from his childhood, and who, notwithstanding, was very sensible to harmony; this person played very well on the flute, and performed with great success in concerts. "I have known a child," says Darwin, "who loved music extremely, who easily retained an air after hearing it sung distinctly, and whose organ of hearing was yet so imperfect, that it was necessary to speak very loud in adddressing him." I have read in the work of a French physician, the case of a boy who had lost his

hearing in consequence of the small pox, and who, notwiihstanding, composed songs himself, and sung them very correctly. All these facts prove, that the ear is, at most, but one of the conditions for executing musical compositions; but that it cannot be considered as the cause of the perception of music and of musical invention.

Those who attribute to the throat, the note, whether of birds or of man, also pass a judgment equally superficial. The throat is for the note only a means of execution, as the hand is for the painter and the sculptor. A counter-tenor or bass voice, the flexibility of the voice, &c. depend, it is true, on the structure of the windpipe. But must not such a faculty, whether in the bird or man, have conceived the whole succession of tones before impressing on the windpipe such or such movements? For the rest, I know perfectly, that the windpipe or the glottis is in connexion with the instinct of propagation and with that of song. The glottis in singing birds is differently formed in the male from its formation in the female. Gelded birds do not sing. The voices of women and of eunuchs differ from that of men. A great number of the species of birds sing only in pairing time. The red-breast, the wren, the canary bird, and the goldfinch, on the contrary, sing through the whole winter. All physiologists know the relation, which exists between the windpipe and the sexual parts, as well in animals as in man.

Willis deduced aptitude for music from the softness of the brain; but he could not sustain this opinion, either by facts or by reasoning. There remains, therefore, no other course to take, but to admit, that there exists in the brain, a peculiar organ for music.

History of the Discovery of this Organ.

There was shown me a young girl, named Bianchi, aged about five years, and I was asked to decide what was the most remarkable talent of this child. I discovered nothing in her, which indicated extraordinary memory; and the idea had not yet presented itself to my mind, that the talent for music could be recognised by the form of the head; I did not even know, at this period, the different species of memory. My friends, however, maintained, that the young Bianchi had an extraordinary memory for music, and they inferred from this, that the ideas, which I professed in relation to the external signs of memory, were false. This child repeated all that she had heard sung or executed on the piano; she retained by heart whole concertos, which she had heard at most twice. I inquired whether this young girl learned every thing, without distinction, with the same facility. Her parents assured me, that she was endowed with this astonishing facility, for music only. What could I conclude from this declaration? That there exists a well marked difference between memory for music, and the other species of memory which I knew at that period; and that each species of memory must have its distinct organ.

From that moment I devoted myself to more connected researches into the different species of memory. In very little time I became acquainted with a considerable number of persons, who had an excellent memory for certain objects, and a very feeble memory for others. These observations led me to augment the number of my denominations for memory, and I admitted a peculiar memory of tones.

While occupying myself with these researches, I did not fail to perceive, that the individuals, endowed with an excellent memory of tones, were ordinarily good musicians, and sometimes composers in this art.

This observation led me to conclude, that the denomination, *memory of tones*, was too limited; that it does not express all that constitutes the talent of the musician; that the sphere of this talent extends much beyond the memory; that it comprehends all which regards the relations of tones. I therefore adopted the expression, *faculty of the relations of tones*, an expression which refers the manner, in which the intellect of the musician brings into operation the relations of tones, to the mode of action of the senses in general.

I was fully assured, that the talent for music was not dependent on the aggregate force of the intellectual faculties in general; but that it belongs to an individual, fundamental faculty, and has consequently a particular organ. I had then to reflect on the means of discerning this organ; for, it is only when the seat of an organ is discovered, so as to leave no doubt upon the subject, that I can consider myself secure from all the specious reasonings by which others would combat its existence.

I applied myself to observing the heads of musicians. Chance so ordered, that I met with several, in whom the superior lateral part of the forehead was very narrow, and the temporal part, on the contrary, very broad; whence it resulted, that their foreheads formed a segment of a truncated cone. At this period, I was not far enough advanced in my observations, to seek the external mark of each particular faculty in a determinate region of the head. I therefore thought, for some time, that a forehead, in the form of a segment of a truncated cone, was the external sign of musical talent.

But soon I had an apportunity to see great musicians, Beethoven, Mozart, the son, Kreibig, &c., who had the superior part of the forehead large and prominent; which made me renounce my idea, that a forehead formed like the segment of a truncated cone, was the characteristic sign of a talent for music. It was not difficult for me, at Vienna, to observe a great number

of musicians, among whom were some of the highest merit. I moulded the heads of several of them, in order to be able to make these comparisons more easily. I finally succeeded in discovering a region, in which all musicians, endowed with inventive genius, have a prominent projection, produced by the subjacent cerebral mass.

The better to establish my discovery, I endeavoured to ascertain the counter proof. I observed children and adults who manifested no taste for music, some of whom, in fact, gave evidence of antipathy to it. In all these individuals, I found the same region of the brain absolutely flat. Finally, I procured for myself the skulls of some great musicians, and their examination at length convinced me, that my discovery, relative to the faculty of the relation of tones, was absolutely exact. After this, nothing prevented my professing this truth publicly. I am going to lay open to my readers the natural history of the faculty of the relation of tones, both in animals and in man; after which I shall explain in detail, the proofs of the existence of this fundamental faculty and its organ.

Natural History of the Faculty of the Relation of Tones in Man.

The innate forces of man have manifested themselves at all times. Song has also been in all ages, one of the favorite amusements of the human race. Music and song are not the inventions of man; the Creator has revealed them to him by the aid of a peculiar organization. By means of his organization, man is placed in relation with the laws of the vibrations of bodies, as the painter is with the laws of colors. There exist without us certain laws, according to which sonorous vibrations are produced and propagated. The experiments of Chladni have rendered sensible to the eyes some of the laws of these vibrations,

If we cover with fine sand a plate of glass or metal, hold it by one of its points, and make it tremble by means of a blow from a fiddle-bow applied to one or another of these points, we can decide beforehand, that the sand, arranging itself in a manner foreseen, will form this or that determinate figure. The vibration of the molecules of the disk gives rise to this or that regular figure, according as the point to which the bow is applied, and that which is sustained, vary. The reader will be able to see the farther experiments, by aid of which this philosopher demonstrates the laws of the vibrations of bodies, by referring to the treatise on acoustics which he has published. It is on these laws of vibration, that tones are founded, which are subordinate and coördinate among themselves, according to fixed laws. On the supposition that man must necessarily be sensible to music, it would follow, that he must be endowed with an organization, that places him in relation with all the laws of music, that he should possess an organ on which these laws are impressed, and which should, to a certain extent, represent their type. Wherever the organ is wanting, there exists no relation between the animal and the tones. Where the organ exists, the animal or the man is agreeably affected by harmony, and disagreeably, by the discordance of tones. When this organ has acquired a certain perfection, the animal or the man not only perceives and judges well the relations of the tones, but also creates within himself relations and successions of tones, which please the more, as they are more conformable to the external laws of vibrations, and to the organization of other individuals.

The following observations will convince the reader, that the faculty of tones is a proper and independent faculty, and, consequently, supposes a particular organ.

There are frequent examples of this faculty having existed, in a high degree of activity and perfection, from the tenderest age. Handel had hardly begun

to speak, when he attempted to compose music. His father banished all the instruments from the house, yet he soon found means to exercise himself. At the age of ten years he commenced a series of sonatas in three parts. Piccini, from his tenderest infancy, showed such a decided taste for music, that he could not see a harpsichord without starting. Mozart, sen. travelled through Europe at the age of six years, playing on the piano, not only with great power of execution, but with soul and taste. Mozart, jr. studied composition at the age of twelve years, under the famous Streicher. Another prodigy is the famous Desales, a child of twelve or thirteen, who played a concerto on the violin, beset with difficulties, with a vigor and address altogether extraordinary. This child felt strongly what he executed; his style was grand and full of energy. Mademoiselle Bills, of Bruchsal, then seven years old, began taking lessons in music from her father, towards the end of Dec. 1799, and, from the month of April, 1800, began to give concerts at Paris. Crotch, from the age of two years, discovered an extraordinary talent for music. Crouchby played on the harpsichord at the age of three years, and gave evidence of disapprobation at each false touch; at the age of six years he was a virtuoso. Every body knows the brothers Pixis, of Manheim, and many other similar precocious geniuses.

Mademoiselle Leontine Fay, and the child who plays Richard III. at London, have found a rival in the young Hungarian, Baron de Praun. This young man is hardly ten years old, and he has already astonished the Romans, among whom he passed some months, not only as a virtuoso by his success on the violin, but also by his astonishing erudition. In a brilliant *soirée*, where was found united all that Rome contains of distinguished *savans* and artists, the young de Praun, after having executed the most difficult concertos of Rhode, with a taste and precision which astonished Paganini himself, sustained a scientific

examination, and resolved more than a hundred questions, which were addressed to him by the professors of the archi-gymnasium. His Holiness, wishing to honor the precocious talent of this new Pic de la Mirandola, has just named him knight of the golden spur, and count of the sacred apostolic palace. The archi-gymnasium has likewise decreed to him a gold medal.

Such prodigies are, ordinarily, in every other relation except in that of their peculiar talent, children like others; which proves, that the faculty by which they distinguish themselves, as well as its organ, are independent of all the other faculties and all the other organs, and that we must recognise it as a peculiar power.

Individuals, endowed with a great development of the organ of the faculty of the relation of tones, born, consequently, for music or for song, often excel, without any previous instruction, in any kind of music which they are able to execute. Such a peasant is a virtuoso by his manner of whistling; a leaf from the linden tree, a straw, are the instruments on which he surpasses his comrades; a milkmaid leads the singing at church; a beggar charms beneficent souls by his ballad.

Activity of the Organ of Music in Idiocy and in Mental Alienation.

In certain cases both of mania and of idiocy, where all the other qualities and faculties of the soul are deranged, this manifests itself almost in a state of integrity. A girl of fourteen years sang with precision forty songs, all which she knew by heart; she was, however, in such a state of idiocy, that she ate plaster and charcoal, gnawed bones like a dog, and made efforts to devour whatever fell into her hands. A lady, who usually never sang, became insane in consequence of lying-in; during her insanity, she sang

without interruption for several weeks, and sometimes her singing was singularly melodious. Spurzheim relates a similar fact, observed in England. Would it be right to conclude, that there exists a relation between the womb and the organ of music? I have already spoken elsewhere of a young boy, who remained two months deprived of the consciousness of his own existence, and who, during this period, sang all the ballads which he had before learned. Pinel speaks of a mad musician, in whom, from the time of his convalescence, a confused recollection recalled his favorite instrument the violin. It was given him, and he regained in a few days his previous superiority. It is to be remarked, that this musician still held at the same time the most rambling discourses, often spoke only by monosyllables, which he mixed with leaps, dances, and gestures the most senseless and the most absurd. I have seen a madman who gave lessons on the violin. It is too well known, in the insane hospitals, that certain maniacs trouble the repose of all the neighbourhood by their perpetual singing. Cabanis remarks, that he has known certain persons, who, always singing false in a state of health, sang justly by accident in the paroxysms of fever or in certain extatic desires.

External Appearance of the Organ of Music in Man.

In order to make observations on this organ, it is necessary to avoid confounding with real musicians those persons, who from habit have a great facility for playing on an instrument. Frequently they pretend to tell me, that I ought to find in certain persons, especially certain ladies, an organ of music greatly developed; and I find nothing but the habit of execution. Such performers betray themselves by the character of their playing, which is rather the work of the fingers than of their minds. Their countenance

expresses nothing of that abandonment, of that sweet delight, which penetrates the whole soul of the true musician.

Thus far I have seen the organ of the faculty of the relations of tones greatly developed in all the musicians, who are composers in their art; it assumes two particular forms. Either the external angle of the forehead, placed immediately above the external angle of the eye, enlarges itself considerably toward the temples, in such manner, that in this case the lateral parts of the forehead overlap the external angle of the eye, in which case all the frontal region above the external angle of the eye, as far as the half of the height of the forehead, is considerably prominent; or there rises immediately above the external angle of the eye, a prominence in the form of a pyramid, the base of which is supported above the eye, and the point extends to the external anterior edge of the forehead, as far as the half of its height. Hence it happens, that musicians have the lower part of the forehead either very broad, or square. The celebrated drawer of animals, Tischbein, at Hamburg, without thinking of the existence of an organ of music, had made the same remark on the heads of great musicians. They have ox fronts, he tells us. Frequently the foreheads of musicians appear much swollen above the external angle of the eye.

Mozart, father and son, Michael Haydn, Paër, MM. the brothers Naderman, Dussek, Pl. LXXXVI. fig. 1; Marchesi, fig. 2; Viotti, fig. 3; Blasius, Daleyrac, Delavigne, Zumsteeg, Crescentini, are examples of the first conformation. Beethoven, Lafont, Neukom, Joseph Haydn, J. J. Rosseau, Benucci, fig. 4; Grétry, fig. 5; and Gluck, fig. 6, of the second.

I have, as yet, no idea of the difference of talent which results from this difference of conformation. It is, however, to be presumed, that a musician, who should be at the same time instructed in organology, would discover a difference in the talent of music; it

is certain, that one or the other of these two conformations is constantly met with, in all persons endowed with great musical genius.

I know personally a great number of musicians celebrated either for song or for composition. I have carefully examined the ladies Mara, Sessi, Canabich, Schmalz, Gail, Bigot, Catalani, Barilli, Bertinotti, Voitus, Bills, Albert, Pasta, Fodor, &c., &c., MM. Krebs, Himmel, Reichard, Glœgle, Gara, Dulong, Boyeldieu, Galli, Rossini, Lays, &c. In all of them, the development of the cerebral part indicated, is so full, that, if we could arrange all their busts in one line, the most indifferent observers could not fail to convince themselves, that this is the constant and characteristic mark of musical genius.

Neither have I ever met an exception in the portraits or busts of great composers of music, of whom there remains to us nothing but the works. Examine the busts of Haydn, Gluck, Mozart, Grétry, Lulli, Sacchini, Rameau, Philidor, &c.

At Vienna, an ecclesiastic came to see me, and without being willing to give his name, begged me to instruct him in organology. After I had explained to him its general principles, he ased to see some organs. I showed him several, as well in sculls as in casts. On coming to the organ of locality, I told him, that he was endowed with it to a high degree, and that he must be very fond of travelling: he told me, with joy, that he actually was so. When I affirmed, that he had also the organ of the faculty of numbers and of mathematics greatly developed, he threw himself from his chair, and told me that he was professor of mathematics. "Yet," I continued, "you would have distinguished yourself still more in music, especially in the theory." He then sprang on my neck, and told me that he was the abbé Vogler. He has himself related this anecdote in all societies, which has made him a zealous proselyte to organology.

A lady had become insane in consequence of a blow

received on the occiput; her relatives requested me to observe two large prominences which had grown out, they said, since her disease, on the lateral parts of the forehead. These prominences were only the organs of the faculty of music, become more apparent because she had lost her flesh. I learned afterward, that they deplored the misfortune which had happened to this lady, especially on account of her great talent for music. In treating of the faculty of localities, I have related a similar example.

The organ of the faculty of music is formed by the convolutions xx. Pl. viii. x. plaited in zigzag, the folds of which regularly diminish; they form a pyramid or cone, the base of which is placed immediately above the external angle of the orbitar plate, and rises to an inch or an inch and a half. When these convolutions are much developed, especially in their inferior part, it follows, that the brain and the cranium become larger in the region which they occupy; the external part of the superior orbitar wall is completely filled by the cerebral mass: there is then, in the cranium, only a small part of the external orbitar wall which is found placed without the brain, a circumstance which enables us very easily to distinguish the organ of the faculty of tones on the cranium. Pl. lxxv. represents the cranium of Kreibig, a celebrated violinist, who played habitually with the Emperor Joseph II., in whom likewise the organ of music was very well developed. What a difference between this head and that of Pl. lxxvi!

This explains why the negroes, the inhabitants of Otaheite, the Spaniards, the French, and the English, furnish a much smaller number of great musicians, than the Italians, Bohemians, and Germans. The heads of these last are generally broader in the region referred to than those of other nations. See the narrow head of a negro of the Cape of Good Hope, Pl. xc. Must we again attribute these differences to the influence of climate?

I know, however, some negroes, who from their infancy have had a passionate fondness for music, and who evince a great musical talent. All these negroes have the inferior exterior part of the forehead, placed above the eyes, very large. Pl. xci. represents the head of a Congo negro, who learned music of himself, and executed it on almost all the known instruments. No one will deny that the Russians, Spaniards, French, and English have great musicians; and, on the other hand, there are among the Germans and Italians individuals, in whom the organ of music is developed to so feeble a degree, that, far from finding pleasure in music, they have even an antipathy to this art. Lessing and Tischdein are remarkable examples of this.

The organ of music, as happens likewise with all the other organs, is modified in a different manner in each individual, though essentially it is the same organ in all. The different individuals of the same species of birds have each a note differing a little from that of the other. Thus the music of Mozart, of Leo, of Jomelli, of Pergolesi, of Durante, Martini, Cimarosa, has a different character from that of Gluck, Haydn, Cherubini, Boyeldieu, Spontini, Mehul, Nicolai; and all vary among themselves. Baillot, Boucher, Rode, and Lafont, though all four excellent violinists, offer, however, great modifications.

The character of the composition of each musician is determined by the greater or less development of other organs, which accompany that of music. When the considerable development of the organ of music coexists with a great development of the organ of murder, it produces a predilection for warlike music; when coexisting with a development of the organ of theosophy, it produces a predilection for church music, &c. Musicians by applying these principles, will be able to account to themselves for their individual taste, and for the proper character of their compositions.

It appears to me, that men who are capable of de-

ducing the laws of composition from the laws of sonorous vibrations, and from the relations of tones, and of thus establishing the most general principles of music, ought at the same time to be endowed with an organ of numbers very much developed; for, the exercise of this degree of musical talent requires, without question, much calculation; moreover, the inferior convolution of the musical organ, the largest of all, is immediately continuous with the organ of numbers. This explains why one may be an excellent musician, and not have the talent of composition, or be a great composer, without being at the same a great musician.

We have seen, that this organ does not always follow the usual course in its development. It acquires, commonly, a precocious development in subjects endowed with very great musical talents; and I saw it so developed in a little girl aged two years, that it was not difficult to me to predict the astonishing progress which this child has since made in music; but I also know a case, where it began to develope itself only at the age of seventeen.

I here quote a passage extracted from Memoirs, or Essays on Music, by Grétry, published in the year V. In this passage, Grétry speaks of his innate taste of the instinct which drew him towards music. Perhaps it might be inferred, that a wound contributed to the development of his musical organ.

"If during these miserable years I did not wholly waste my time, if I made any progress in music, if I gained any trifling knowledge, I did not obtain this advantage from the lessons of the instructer, but in spite of them; for, if any thing had been capable of destroying in me that innate taste, that instinct which carried me towards music, I dare affirm it was the manner adopted to teach it me.

"*I must here speak of an accident which I think has influenced my organs in regard to music.* I may be in an error, but it is certain, that no man would dare affirm the contrary.

"In my country it is the custom to say to children, that God never refuses them what they ask the day of their first communion. I had long since resolved to ask him, that he would cause me to die on the day of this august ceremony, if I was not destined to be an honorable man and distinguished in my profession. That very day I was threatened with death.

"Having gone after dinner, on the towers to see the wooden clocks strike, of which I had no idea, there fell on my head a rafter, weighing three or four hundred pounds, and I fell down insensible.

"The church warden ran to the church to seek the *extreme unction.* I came to myself during this time, and with difficulty recognised the place where I was; they showed me the weight I had received on my head. Come, said I, putting my hand on it, since I am not dead, I shall be an honest man and a good musician. They supposed these words to be the effect of my confusion. I appeared not to have any dangerous wound; but on reviving, I found my mouth full of blood. The next day I observed, that the skull was beaten in and the cavity still exists.

"I had perhaps arrived at the period when the character changes; but it is certain, that I became all at once an habitual dreamer; my gaiety degenerated into melancholy; music became a balm which consoled my sadness; my ideas were more clear; and my vivacity returned only at intervals."

Several times, persons who had applied themselves to music with unusual ardor, and long in succession, complained to me, that they experienced pains and spasms in the external inferior part of the forehead. The reader will easily explain to himself, why a long continued application to music provokes pains and spasms rather in the region referred to, than in any other. A lady spoke to her singing master of the organ of music. She could not designate the place to him, when the master said to her; "If there is an organ of music it is there, placing his fingers; it is

there when I compose, that I experience a painful sensation; when an idea does not come to me, it is there that I carry my hand."

I asked Mr. Berton what he felt, after having composed a long time with great application? He answered me, that he felt a great void in his head, and while saying this with a certain air of embarrassment, he carried both his hands to the two organs of music.

All, I have hitherto said on the faculty of music and its organ, leaves no doubt, that the faculty of music is a fundamental quality, and that this faculty is founded on a particular organ.

Natural History of the Faculty of Music, and of its Organ, in Animals.

There is not a single mammiferous animal endowed with the sense of music, to the extent of being able to sing itself, or even of repeating the notes which it hears. Thus the skulls of this class of animals are smaller than that of man, in the region where the organ of music has its seat. Their orbits are placed either half or wholly outside the brain. Either there exists no orbitar plate, or there is only the internal part situated toward the cribriform bone or the nose. It follows, that the mammifera are destitute of a great portion of cerebral matter, which in man is found in this region, and which consequently must be destined to functions peculiar to the human race.

I will not, however, maintain, that certain mammifera are not endowed at least with the sentiment of the harmony of tones; the elephant, and sometimes dogs appear to hear music with interest. Camels, asses, mules, and even oxen, better support the fatigue of their accustomed work, when they are allowed to hear the sound of music or of singing; every body has seen dogs, bears, and Franconi's horses dance in time; but what is mentioned, in this respect,

of spiders and serpents, seems to me to belong rather to an agreeable impression which the vibrations of the air excited in them, than to a sentiment of harmony or of melody.

The greater part of birds have nothing which can be called singing. Some of them are endowed with the faculty of imitating a song, or a melody: of this number are the bullfinch and the tufted lark. In a few species, singing is common to both sexes; but the note of the female is always weaker, and less perfect. Almost always it is the male only that sings. Some have only their proper, well characterized note, as the *pinçon*, the goldfinch, the greenfinch, the nightingale, &c. Others, beside their proper note, have the faculty of imitating the note or the cry of the birds in their neighbourhood; as the different magpies, the *écorcheur*, the mocking bird, the mocking thrush (turdus polyglottus); others finally imitate the voice of man and other animals, and can be taught by various wind instruments.

How can we account for these differences? Whenever any animal has a quality or a faculty in common with man, he must also have the corresponding organ in the brain. Compare the brain and the cranium of singing birds, with that of birds which do not sing. In these last, the brain is less broad near the eyes; the cranium is contracted immediately above the eyes, or, the anterior superior part of the orbits; the orbits themselves are very large and oval; and in many species the brain does not advance to the eyes. Pl. LVII. fig. 1, 2, 3, 4, 5. LXXI. fig. 1, 2, 3, 4, 5, 6, 9, 10.

In the singing birds, on the contrary, the brain, and consequently the cranium, are broader toward the exterior anterior edge; hence it happens, that the orbits are rounder: for, the lateral depression, which exists in those who want the organ of music, is diminished by the development of this organ. Pl. LXXI. fig. 7, 8, 11.

To form a clear idea of this difference, let any one

place before him the crania of the grossbeak, by the side of that of the yellow canary, or of the goldfinch; that of the cuckoo, the rollier, by the side of that of the blackbird, the common thrush, or the starling.

After this, compare together the singing birds, either species with species, or individual with individual, always having regard to the greater or less perfection of their note. The cranium of the *pinçon* of the goldfinch, and of the redbreast, is not as broad in the region alluded to, as that of the nightingale and the mocking bird; that of the blackbird is less so than that of the thrush properly so called, (turdus musicus.)

To convince myself of the truth of what I have just advanced in relation to individuals of the same species, I have reared, for example, dozens of mocking birds; and, while they were still blind, I have placed near them thirty chosen singing birds, of different species. Some of my mocking birds learned to imitate the note of one only of their numerous masters; others imitated several; and some imitated them all with astonishing perfection. Both during their life, and after their death, a practised eye could distinguish by the inspection of their heads, the greater or less development of this cerebral part. The greater part of my auditors, after having a little practice, had acquired a facility for discovering these differences.

In those species in which the male alone sings, the male ordinarily distinguishes himself from the female in a manner equally striking. Place the cranium of a male nightingale by the side of that of a female, and you will always find the orbits of the female more hollowed, those of the male on the contrary more rounded; and consequently his head larger in the superior part, in the diameter from one exterior edge of the orbit to the other. Among the singing birds, the bird catchers recognise the male by this sign, that is, by this great breadth of the head above the eyes,

and thus distinguish him from the female which has the head narrower above the eyes. Still more, even among the males, those, which have the head broadest in the region referred to, have the most perfect note. In the choice of birds, I have always had reference to this sign, and it has never deceived me. This difference is sensible even in the yellow canaries; though the females learn by imitation, to repeat little pieces which they sing, yet always less perfectly than the males, and they usually forget them during the moulting season. I well know, that such observations require much experience, and great patience, and great perseverance. The adversaries of organology find it much easier to cut short the question, than to constrain themselves to make numerous observations, the result of which would expose them to the danger of being convinced of the truth of my doctrine, by the force of facts.

Certain persons, with the best intentions, can discover none of these delicate differences. Let such persons remember, that, in researches of every kind, it is necessary, in the first place, to learn by long practice to place a sure reliance on the senses. It is necessary to understand music, and to look at paintings. There are individuals who never learn to exercise their fingers in touching, or their eyes in seeing. Since Doctor Garden, in an article of the Journal on the *physiognomical system* of Spurzheim, has advanced, that even in the human cranium, there does not exist one of all those prominences, which we attribute to a considerable development of the brain, I should be wrong to complain of those, who cannot distinguish differences so minute in the heads of birds!

I can warrant to those who are willing to observe, and who are capable of making observations, that they will find all those which I relate, confirmed, and that the examination of the heads of birds, will equally convince them of the existence of an organ of music.

"The comparison," says Demangeon, "of lovers of music, and of musicians without tact or rhythm, as well as the difference of talents for symphony, harmony, and melody, also lead us to believe, that music cannot belong to a single faculty. Can it be believed, according to Mr. Gall, that the organs of music and of the generative energy are so distant from each other, and without any cord of communication between them, when we consider, that several animals sing only during their pairing; that the changing of the voice follows the progress of puberty," &c.

Has Demangeon already forgotten, that the generative energy has also its organ in the brain, and, consequently, the organ of music and that of the propagative instinct are not so distant from each other? Moreover, it is also in my work, that he has gained the knowledge of the relation, which exists between the development of the instinct of singing, of the genital parts, of the glottis, &c.

XVIII. *Faculty of the Relation of Numbers.**

There is no faculty which men think themselves better entitled to deduce from the intellectual forces taken collectively, than the disposition for arithmetic and for the mathematics generally. It is supposed,

* I know perfectly well, that the vulgar arithmetic, which itself is only a small part of the science of calculation, does not constitute all the mathematics, and that the synthetic method, which the ancient geometers employed exclusively, has nothing in common with calculation. I am not ignorant, that distinguished mathematicians have sometimes very little of the habit of numerical calculation. But, as I find the same cerebral part very much developed, as well in all persons who have a great natural facilty for calculation, as in those men who have enriched mathematical science with the most sublime discoveries, I think myself authorized to admit, that it is the same organ which gives to the young Colburn the facility of calculation in his head, to Pythagoras that of proving, that the square of the hypothenuse equals that of the two other sides of the rectangular triangle, and which enabled Laplace to write his mécanique celeste.

that the study most capable of exercising the judgment is that of mathematics. Nothing in this science, it is said, comes from without, every thing here is the work of the human understanding, every thing here is a real creation of attention and of the faculty of deriving consequences. There cannot therefore exist any peculiar organ for the faculty, by virtue of which a man has a great facility for arithmetic and for mathematics in general.

What I am going to say will show how far these pretensions are true or false.

History of the Discovery.

At Vienna, they mentioned to me a scholar of St. Pœlten, who was known throughout all the country, by his talent for calculation. He was the son of a blacksmith, and had received no more instruction at school than his companions; for every other purpose, he possessed about the same talent with them. I induced him to come to Vienna, snd presented him to my audience: at this period he was nine years of age. When they gave him three numbers, each expressed by ten or twelve figures, asking him to add them, then to subtract them two by two, to multiply and then divide them by numbers containing three figures; he gave one look at the numbers, then raised his nose and eyes in the air, and announced the result of his mental calculation, before my auditors had time to make the same calculation with their pens in their hands. He had created his method himself.

This boy astonished the inhabitants of Venice. An advocate came to testify to me his vexation, that his son, aged five years, was occupied exclusively with numbers and calculations, and that it was impossible to fix his attention on any thing else, even the sports appropriate to his age. I compared this child with the first; I could find no other resemblance be-

tween their heads, than a remarkable prominence at the external angles of the eyes, and immediately at the side. In one as well as the other, the eye was in a degree covered by the superior lid at its external angle.

These two examples of distinguished talents for arithmetic, and the coincidence of a similar conformation of the same region of the head, suggested to me the idea, that the talent for calculation might well be a fundamental faculty, depending on a particular organ; for, at this period, I had already made great advances in my theory of the plurality of organs.

I then sought out men distinguished by their talent for calculation. I first remembered counsellor Mantelli, whose favorite occupation was to invent and resolve problems of mathematics, and of arithmetic in particular. I found the same conformation of the head, in the region of the external angle of the eye. I went to see the Baron de Vega, author of the Tables of Logarithms, and then professor of mathematics, who in every thing, not immediately concerning this science, was a very ordinary man. I found again the same form of head in both. I examined families and schools, and had shown to me those children who distinguished themselves from their fellows by the talent for calculation. As I found the same external character in all, what could then prevent me from considering the faculty of numbers, as a peculiar faculty, and admitting a peculiar organ for this faculty.

Natural History of the Faculty of Numbers.

Man creates nothing. His intelligence is limited to the recognition of what exists. If one plus one necessarily equals two, and twice two equals four, it is not the talent of man which creates this necessity, but his talent acknowledges this necessity

as the result of eternal and immutable laws. The opposite angles of a parallelogram are eternally equal, whether this truth be discovered by a philosopher or not; and it is the same with all mathematical truths. If mathematicians justly take possession of optics, astronomy, music, &c., inasmuch as these sciences require the application of numbers, I ask, if the laws of the refraction of luminous rays, the laws of the vibrations of air and of sonorous bodies, the laws of motion in general, if these materials, which the mathematician puts in operation, have in the external world a real existence, independent of the mind, which conceives and combines them, or, if it is the genius of the mathematician, that creates them? If they have an existence, independent of the genius which submits them to calculation, which my readers will admit without difficulty, it follows, that there exists an external world for the talent of the mathematician, as for all other talents, and that his merit is limited to conceiving this external world.

Now, man must have received an organ for these objects, an organ by the aid of which he finds himself placed in relation with them; by the aid of which a particular series of laws is revealed to him. Without such an organ, it is impossible, that he should be instructed in the existence of these laws. When this organ has acquired a high degree of development and activity, these secrets are found in some manner unveiled before it. Man divines the external world, and the operations of this organ are in harmony with the true proportions of quantities, with the laws of refraction, of vibration, and of motion in general.

If it were otherwise, how could this talent be sometimes found to such astonishing perfection, in children and in men, absolutely of gross intellect? Independently of the two cases which I have related, the journals have spoken in a tone of admiration of a boy of seven years, named Devaux. He had a passion for going to all the fairs, and waiting for the traders,

at the moment when they had closed their accounts; and when they had been mistaken in their calculations, it was his greatest pleasure to discover the error.

The young Bidden, of Devonshire, aged only twelve years, had the honor of exercising in presence of His Royal Highness, the Duke of York, his astonishing faculty for the combinations of numbers. His Royal Highness and the persons present at this exercise expressed the greatest surprise, when they saw this child, without the aid of any figure, resolve all the problems proposed to him. He surpassed all that had been seen extraordinary in this department; and all kinds of calculation were equally familiar to him. He was the son of a poor laborer of Exeter, the father of nine children.

I saw in Paris the young American, Colburn, of whom mention has been made in the papers of the United States, and subsequently in the English and French Journals. I have moulded the head of this child, and had his portrait drawn. (Pl. LXXXVII. fig. 1.) I give a short notice in regard to him, which follows:

"This child was born in April, 1804, at Cabot, county of Caledonia, state of Vermont. He was not yet seven years old, when he was seen by Mr. Mc. Neven, who gives an account of this visit in the *Medical and Philosophical Journal and Review*, printed at New-York, 1811. In the ordinary course of life, Zerah appears in every thing like other children, by his frivolity and the puerile character of his amusements; but when his attention is entirely fixed on any subject, he then displays faculties very superior to his age, and when numbers are in question, superior, I think, to what could be expected from any age whatever. It was in August last, (1810,) that his father, hearing him repeat between his teeth some numbers, which he multiplied for his amusement, perceived his prodigious faculty for calculation. The attention which it excited, and the exercise given to

it in consequence of this attention, have, in a few months, singularly increased it. The promptitude of his answers on the questions of arithmetic proposed to him, is such, that he seems to answer from memory.

It cannot be doubted, however, that this promptitude is due to the rapidity of his combinations, for in calculations at all complicated, he is often heard to multiply, add, or subtract, aloud, and with incredible rapidity. He catches himself sometimes when he commits any error, and appears excessively mortified in consequence; but this scarcely ever happens to him. Mr. McNeven has heard him answer without the slightest appearance of hesitation, and without the least error, to the following questions: *Question.* What is the sum of 1347, 1953, and 2091. *Answer.* 5391. *Question.* What are the numbers, which, multiplied together, give 1242? The following solutions were given as rapidly as the words could be uttered; 54 by 23, 9 by 138, 27 by 46, 3 by 414, 6 by 207, 2 by 621. *Q.* What is the number, which, multiplied by itself, produces 1369? *A.* 37. *Q.* What is the number, which, multiplied by itself, produces 2401? *A.* 49; and 7 multiplied by 343 produces the same number. When the numbers were expressed by thousands and hundreds, he exclaimed with impatience, "Put them in hundreds;" that is, for 2401, he wished them to say twenty-four hundred and one. *Q.* What will 6 give, multiplied by itself 6 times? He calculated aloud in the following manner, as rapidly as he could speak; 6 times 6 make 36, 6 times 36 make 216, 6 times 216 make 1296, 6 times 1296 make 7776, 6 times 7776 make 46656, 6 times 46656 make 279936.

Q. how many hours in 26 years 11 months and 3 days? *A.* 226992. The person, who had addressed this question, was mistaken in the calculation he had made on his side; so that when Zerah answered, he thought it was he who had deceived himself. Zerah after a moment's reflection assured him, that it was

his own calculation which was right. The operation was repeated and the justice of his claim was allowed. Those, who questioned the child, had forgotten to bring into the account the difference of the leap years, and reckoned the last eleven months at thirty days. This forgetfulness reminds me of an anecdote of the same kind. They brought to D'Alembert a little shepherd, who had also an astonishing facility for calculation. "My child," said D'Alembert to him, "there is my age; how many minutes have I lived?" The child retired into a corner of the room, hid his face in his hands, and came a moment afterward to announce the reuslt to D'Alembert, who had not yet finished his own calculation. Having completed this, he finds that the two results do not agree. The child returns into his corner, repeats his calculation, and returns, assuring him, that he was not mistaken. D'Alembert verified his own. "But, Sir," suddenly answers the child, "have you thought of the bissextile years?" D'Alembert had forgotten them, and the little shepherd was right.

"As they proposed to him to multiply 123 by 237 his father objected that two triple numbers were too difficult. The child answered that he could multiply them, and kept his word; he even multiplied very promptly 1234 by 1234. Still it was seen, that difficult questions fatigued him, and he often begged, that they would not give him such complicated ones. While he answers, it is seen, by his appearance, the state of his eyes, and the contraction of his features, how much his mind labors.

"His physiognomy is very expressive; his forehead is small, but angular; the orbitar arcs (the eyebrows) considerably advanced; his eyes are grey, lively, and always in motion; his scull is arched and considerably broad; he has a small occiput, and red hair; he is singularly strong and large for his age; his motions are rapid, and he is slways in action.

"He has never been at school, and neither knows

how to read nor write. He was asked how he made his calculations. He answered, that he saw them clearly before him. He has yet no idea of fractions, and can reckon only in round numbers. He is the fifth of seven children, of whom no one is distinguished by remarkable faculties. His father, Abiah Colburn, was born with six fingers on each hand, and Zerah is the only one of the children, who inherits this singularity.

"Mr. McNeven, in speaking of Zerah Colburn, recalled another personage, Jedediah Buxton, known in the last century by an extraordinary talent for calculation, but unaccompanied with any sort of mind. Jedediah even seemed destitute of some of the most common feelings. Music offered to him only a confusion of sounds; and when carried to a play of Shakspeare, played by Garrick, he occupied himself merely in counting the number of words uttered by this great actor. Zerah Colburn, on the contrary, manifests much intellect; he is prompt at repartee, and sometimes sarcastic. Some days before the visit of Mr. McNeven, a woman had amused herself by asking him how much are three zeros multiplied by three zeros? 'Precisely what you are,' he answered; 'nothing at all.'

"It seems to us greatly to be feared," says Mr. McNeven, "that the efforts of attention, to which Zerah Colburn gives himself, may fatigue or disorganize this young head, and intercept whatever might be hoped from it, if left to the natural course of his ideas and developments." It is also possible, that these developments may be arrested by a new freak of nature which has produced them, or even that these extraordinary faculties may exhaust and destroy themselves.* McNeven quotes the example of Mr. Van R.

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* See A Memoir of Zerah Colburn; written by himself: containing an account of the first discovery of his remarkable powers; his travels in America and residence in Europe; a history of the various plans devised for his patronage; his return to this country, and the causes which led him to his present profession (theology;) with his

of the village of Utica, also living in the United States, who, at the age of six years, distinguished himself by a singular facility for calculating in his head; at eight years, he entirely lost this faculty without knowing how. At this moment Mr. Van R. calculates like other people, with his pen in his hand, neither better nor faster than any other person, and does not retain the slightest idea of the manner in which he performed his calculations in childhood."

The young boy of St. Polten also told me, that he saw the numbers on which he operated, as if they were written on a slate. This is the place to speak of the talent of the daughter of Lord Mansfield, whom Spurzheim saw at London, when she was thirteen years old. This young lady almost equals Zerah Colburn; she extracts, with great facility, the square and cube root of numbers of nine places.

Who is there, that will seek in these children their great facility for calculation in the faculties taken collectively, in a general faculty of drawing conclusions? All these difficulties disappear the moment we admit a peculiar organ for the talent, by which these individuals are distinguished. In this hypothesis, we conceive, that the organ of numbers may, in certain cases, receive a premature development and extraordinary activity, just as those of the instinct of propagation, of music, &c.

Besides, it is by no means rare, to find the talent for calculation in persons, whose minds have not been developed. A shepherd of the Tyrol, Peter Annich, had made himself famous by his astronomical calcula-

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peculiar method of calculation." Published, 1833. Colburn gives the following account of his introduction to Dr. Gall, (Mem. p. 76.) "Dr. Gall, well known as the author of the system of craniology, was then in Paris, and by means of his tutor, Zerah was introduced to him, without the doctor's having any previous intimation of the character of his visitor. Being requested by Mr. C. he proceeded to examine the cranium of his subject, and readily discovered on the sides of the eyebrows certain protuberances and peculiarities, which indicated the presence of a faculty of computation." [Ed.]

tions. His reputation induced father Hell to go to seek him; when this philosopher questioned the shepherd on his preliminary acquisitions, he learned, with astonishment, that the latter did not even know the name of mathematics or of astronomy. It is twelve or fourteen years since a negro caused a great sensation in London by the astonishing calculations which he made.

Schubler, counsellor of regency at Stuttgard, introduced us to Martini Hæfele, vinedresser of Alfaltrach, three leagues from Heilbrun. This man, who, of his own accord, applied himself to mathematics, and especially to the higher departments of algebra, made astonishing progress in several branches of the practical mathematics. Afterward, there were given him the works of Kaestner and Karsten, which he devoured; for ten years he had been making researches tending to improve the differential and integral calculus. So much for the evidence, that the talent for mathematics is innate, and has no necessary connexion with the other intellectual faculties.

It may even be maintained, that this faculty can, like other dispositions, be transmitted from father to son during several generations. The family of Bernouilli furnishes an example.

Mathematicians, so born, like all men endowed with very distinguished talents, manifest this faculty very early, and are led on by an irresistible inclination to cultivate it.

Mathematics had always a peculiar charm for Pascal. Thwarted in his passion for geometry, he became only more ardent to devote himself to it. On the simple definition of this science, he succeeded in discovering, by his penetrating genius, as far as the thirty-second proposition of Euclid. At the age of sixteen years he published a treatise on conic sections. From geometry he passed, with the same facility, to the other parts of mathematics. He was hardly nineteen when he invented the *Roulette*, a singular arith-

metical machine, by which may be made all sorts of arithmetical computations, without pen, and without counters, and even without knowing arithmetic.

Galileo had, from his infancy, so strong a passion for mathematics, that he may be said to have been born a mathematician. Joseph Sauveur and Ozanam learned geometry without masters. Lalande, when hardly nineteen, was appointed commissioner of the academy to go to Berlin, to determine the moon's parallax, in concert with La Caille, who went to perform the same operation at the Cape of Good Hope. Tycho Brahe had, from his infancy, an extraordinary inclination for the mathematics. Euler, likewise, at an early period, was led by an irresistible inclination, to mathematics.

When this talent is predominant in an individual, all the other operations of the mind take their character from it. I know a physician, gifted with a great development of the organ of calculation, who endeavours to bring home the study of medicine, and even the virtue of medical articles, to mathematical principles. One of my friends, a mathematician and philologist, has long sought a universal language, likewise founded on mathematical principles.

Faculty of Numbers in the State of Disease.

Two persons of my acquaintance, every time they had been engaged several days in succession in difficult calculations, felt a pain in that region of the head where the organ of numbers is found.

M. de Lagny, all whose works manifest a great geometrician, being on the point of expiring, Maupertius asked him what was the square of twelve; the dying man answered without hesitation, an hundred and forty-four. I saw in the asylum at Vienna a madman, whose insanity had degenerated into idiotism. His only occupation was to count, but he always

stopped at ninety-nine; I tried in vain; I never could induce him to say an hundred; he always began again to count one. Mr. L. A. Gœlis, in his excellent treatise on acute and chronic hydrocephalus, thus expresses himself: "The physiologist, will never explain how, by the side of a complete destruction of all the faculties of the soul, a single faculty may manifest itself in all its force. The son of a farrier, although stupid in every other respect, still, at his twelfth year, manifested an astonishing memory of numbers and a peculiar benevolence. These two qualities disappeared in proportion as his disease, the hydrocephalus, increased."

These are certainly unanswerable proofs, that the functions of the organ of numbers are independent of those of the other organs.

Seat and external Appearance of the Organ of Numbers.

The organ of the faculty of numbers is formed by the convolution XIX. Pl. IV. V. VIII. XIII. This convolution is a continuation of the lowest convolution of the organ of music, and it is placed on the most external lateral part of the orbitar plate, in a furrow or depression, which is the direction from before backwards. When this convolution has acquired a very favorable development, the external part of the plate is found depressed by it, in such a manner, that the superior orbitar arch is no longer regular, except in its internal part, and its external half represents a straight line, which decends obliquely. Pl. LXXXVII. fig. 3, portrait of Monge. Hence it follows, that the external part of the eyelid is depressed, and conceals the corresponding part of the eye. This character is still more infallible, when the external part of the orbit is found at the same time removed outwards, so that the salient angle of the superciliary arch extends

beyond the anterior parts of the temple, as is seen in the cranium of the celebrated mechanician, Voigtlænder, Pl. LXXXVIII. But this projection does not exist, when the lateral parts are rendered very prominent by a great development, either of the organ of music, or of that of construction.

After having acquired an exact knowledge of the form and place of this organ, let any one observe those men, who have distinguished themselves in the mathematics, by their creative genius. I know, personally, a great number of living mathematicians, and I have studied the busts, portraits, and engravings of many others. I find in all, without exception, the organ I have just described. Examine the portrait of young Colburn, Pl. LXXXVII. fig. 1. In him, the external part of the orbitar plate is so much depressed and pushed outward, that this conformation has not escaped the author of the first notices on this young man, inserted in the American journals. Let any one observe the busts and portraits of Euclid, Archimedes, Galileo, Pl. LXXXII. fig. 3; of Kepler, Newton, Leibnitz, Peter Gassendi, Huyghens, Sully, Descartes, fig. 5; of Euler, Roberval, Lagny, Bernouilli, Lagrange, Laplace, Tralles, Lalande, fig. 4; of Herschel, Olbers, Bessel, Boetzenberg, Egmeyer, Monge, Carnot, Jedediah Buxton, Pl. LXXXVII. fig. 2; of Bürgss, Body, of Messrs. Prony, Arago, &c.

When we know the physical conditions, under which the talent for mathematics has thus far constantly manifested itself, it may be concluded, without fear of mistake, that it will always manifest itself cereafter under the same conditions.

Some physicians of Paris, in order to try me, brought me three boys, one of whom was distinguished by an extraordinary facility for calculation; hardly had these children entered the room, when I pointed out the calculator.

It is not necessary to say, that the faculty of numbers and of magnitude, will find a different applica-

tion, according as it is accompanied by some organs greatly developed, or by others. It is according to these variations, that he who is endowed with them will be a geometrician, geographer, optician, astronomer, mechanician, maker of mathematical instruments, or composer of music. There is not, perhaps, any great composer, who is not endowed at the same time with the organ of the faculty of the relation of tones and that of calculation.

Usually, this organ is less developed in women than in men. Yet there exist examples of women who had great facility for calculation, and who have distinguished themselves in mathematics. Negroes have rarely strong dispositions for calculation and mathematics; accordingly their heads are almost always narrow, compressed in the region of the organ of calculation. Dr. Spurzheim believes, that the organ of numbers is generally developed in the English. Is this development the consequence of habitual exercise, or does the taste for commercial speculations belong to the development of this organ?

There exists, at Paris, a man whose intelligence, it is true, is in general limited enough, but who is so destitute of the talent of combining numbers, that it has always been impossible to make him comprehend that two and two make four, or that two and one make three. I have taken a cast of the head of this man, which is remarkable for the almost total want of development of the organ of the faculty of numbers.

Are Animals endowed with the Faculty of Numbers?

I will not decide whether animals count; whether they have a determinate idea of numbers.

"Beasts count, that is certain," says Leroy, "and although till now their arithmetic appears limited enough, perhaps one might give to it greater extent. In countries where they preserve game with care,

they make war on the magpies, because they carry off the eggs and destroy the hopes of the progeny. They therefore carefully mark the nests of these destructive birds; and in order to annihilate the ravenous family, they endeavour to kill the mother while she sits. Among these dams there are some restless ones, who desert their nests as soon as any one approaches. Then they are obliged to make an ambush well covered, at the foot of the tree on which the nest is, and a man places himself in the ambush to await the return of the sitting bird; but he waits in vain. If they have failed to kill the magpie in the first attempt, she knows, that the thunder must come from the cave where she has seen the man enter. While maternal tenderness keeps her sight fixed on the nest, fear deters her from it, until night can secure her from the fowler. To deceive this unquiet bird, the plan has been adopted of sending to the ambush two men, of whom one placed himself there and the other appeared; but the magpie counts, and keeps herself still away. The next day three go, and she sees that only two retire. Finally it is necessary, that five or six men going to the ambush put her calculation at fault. The magpie who believes, that this collection of men has only passed by, returns without delay. This phenomenon, renewed every time it is tried, must be placed in the rank of the most ordinary phenomena of the sagacity of animals."

Dupont de Nemours even maintains, that the magpie counts up to nine.

It is thought, that the hen counts her eggs, and the bitch her pups. It is certain that the bitch perceives when one of her young ones has been taken from her. But I do not suppose, that for this purpose she has any need of counting them. When we find ourselves in a company of few persons, and some one has retired, we perceive his absence without having counted the number of persons; the bitch might likewise have perceived the absence of one of her young, for the sole reason, that she knows each of them individually.

On the Faculty of Time. (*Zeit-sinn.*)

There are persons who have a great facility for retaining dates and epochs. They know the day of births, marriages, deaths, the epoch of all events, even the least remarkable. They commence all their stories by mentioning the year and the day. What they best know of history, is the periods. The jesuit Denis Peteau applied himself especially to chronology, and gained a name in this department, which eclipsed that of almost all the sages of Europe. In his portrait, the organ of numbers is very apparent. The senior Degmayer, at Augsburg, is generally known by his facility for retaining the dates of all events, the days of births, marriages, deaths, &c. From his infancy he had a decided inclination for mathematics; he has also the external mark of it very decided. I ask if this faculty belongs to that of numbers, of calculation, or whether it is necessary to seek for it a particular organ?

There are persons who in lying down are able to fix exactly the time they wish to sleep, and awake precisely at the moment they had fixed. Certain musicians, though they have a great talent for music, can never keep time: others, on the contrary, without having a talent for music, never miss it; so that this difference seems to constitute an essential difference between musicians. There are also individuals who have no perception of the rhythm of verses without rhyme. We see persons who find amusement in a collection of watches and clocks, and must have them all go with the greatest exactness. It appears, that there is no idea of time with those insane persons, who remain days and weeks fixed at the same place. A madman at Vienna had but one fixed idea, namely, that it was always the 17th of October. It often happens in mental alienation, as in other grievous diseases, that the idea of time is completely destroyed.

When these patients recover, they begin to count the time from the moment, when they regained the distinct perception of their existence. After twenty-seven years of seclusion and of mania, a lady experienced a revolution favorable to her moral state. Her delirium and madness continued during this space of time, to the extent of tearing her clothes, of remaining naked, &c. At the moment of the cessation of her delirium, she appeared to come out as from a profound dream, and asked after two young children which she had previous to her alienation, and could not conceive, that they had been married several years previous.

Can animals measure time ?

" Animals," says Buffon, " can have no idea of time, no knowledge of the past, no notion of the future."

C. G. Leroy has already well refuted this assertion of Buffon.

What constitutes in us the measure of time, is the succession of the ideas or sensations with which we have been struck, and which leave some trace in our memory. It is certain, that animals having fewer ideas than we have, there must be fewer degrees marked on the scale with which they measure time; but they must necessarily have some idea of it, since they foresee and mark its periodical returns.

All animals which rise at certain hours to eat, and there are many, are faithful to them, not however as a clock which strikes the hours, but with the modifications, which the circumstances of the season or even of the day may occasion in their will.

When the ground uncovered by the harvest now completed, has forced the pheasants to collect in the covers in which they are kept, that is about the first of September, they live collected in flocks, and then they leave the wood twice a day to seek their food, which is called going to pasture. Nearly all start together at sunrise. When the sun begins to appear above the horizon, they soon finish their repast, there being an abundance of food, the heat which is felt, invites

them to return to the woods. They leave them again between five and six o'clock, and their supper continues until sunset. If the heat is less intense, and provision less abundant, they take their departure so much the earlier. When food becomes scarce, and the days are shorter, the pheasants go out only once a day, between nine and ten o'clock, and their meal continues until sunset. How should these birds execute these regular processes, if they did not measure the intervals of time?

The red partridges, though less intimately united, have the same habits as the pheasants: and the experienced fowlers know whether to look for them in the woods or the plains, according to the hour. Rabbits have this peculiarity, that the experience of the past gives them in some respects, in a more marked manner, a knowledge sufficiently correct for the future. During the summer they usually go out of their burrows some time before sunset, remain out a part of the night, and rise again generally about eight or nine in the morning, when it is not warm. But if you find almost all of them gone out, at two or three in the afternoon, if they eat very eagerly, if the attention they give to this, makes them more bold and less cautious than usual, you may be certain, that it will rain in the evening or in the night. The marked avidity of the rabbits is therefore an act of prudence; that is to say, in consequence of a sensation, which they have experienced and which they still experience, they judge of the future by the past.

Domestic animals have likewise a measure of time. The knowledge of the past enables them to judge of the future. The hour for their supply of grain is marked by the impatient neighing of the horses. Those who are either feeble or of vicious disposition, do not fail to make the greatest efforts to pass out of the places, where they have been accustomed to repose. They have therefore the consciousness of their past existence. Dogs, especially those ac-

customed to be led to the chase at an early hour, announce the moment by cries of impatience whenever any delay occurs. That of the departure is hailed by the liveliest cries of joy. The hunter is often annoyed by them, and has much trouble to control their impatience, especially when armed with his gun, he intimates to them the return of the sport of which they have so lively a recollection. Who does not know, that dogs and all domestic animals mark with impatience the moment, at which they are accustomed to receive their food? It is certain therefore, that they measure time.

But is there a peculiar organ for this measure, and where is its seat? Spurzheim is inclined to think, that its organ is placed above that of order, and near melody, to which it furnishes especial aid. When we shall have collected numerous observations of persons, who devote themselves with ardor to the pursuit of chronology, to time and dates, and carefully compound them with those made on the arithmeticians, we shall be better able to form a judgment in this matter.

XIX. *Faculty of Constructiveness.* (*Kunst-sinn, Bau-sinn.*)

History of the Discovery.

The same thing has happened to me respecting the faculty of constructiveness and its organ, as in regard to the faculty and organ of music. When I was first engaged in this subject, I was not fully persuaded, that each quality and each faculty depended on a particular part of the brain. It was this which induced me to give my attention to the whole form of the head of great mechanics. I was often struck by the circumstance, that the heads of these artists were as large in the temporal region as in that of the cheek-bone. This was not indeed a positive sign, but I often found it, and I was at last more and more convinced,

that the faculty of mechanism is also a particular fundamental faculty.

I applied myself principally to discover a certain external development. I every where sought to make the acquaintance of distinguished mechanicians: I studied the form of their heads and moulded it. I soon met with some, in whom the diameter from one temporal to the other was much more considerable, than that from one zygomatic arch to the other. I finally met two very remarkable mechanics, in whom the temples were swollen into a large round cushion. These heads convinced me, that it is not the equality of the temporal and zygomatic diameters, which determines the genius for mechanics, but rather a large rounded protuberance placed in the temporal region, sometimes immediately behind the eye, sometimes a little above it. When I had assured myself of the seat of the organ and of its external appearance, I multiplied my observations; wherever I cast my eyes I found, both in our species and in animals, the most undeniable proofs, that the faculty of mechanics is a fundamental power. I will proceed to indicate the proofs.

Natural History of the Faculty of Constructiveness in Animals.

The tissue of the snail, the web of the spider, the hexagonal cells of the bee, the subterraneous galleries of the ant, of the mole, of the rabbit, the nests of birds and of the squirrel, the cabin of the beaver, &c., are so many masterpieces. What is the power which has created them?

The dog and the horse, so superior in many respects to the animals I have just named, have never, even in the moments of the greatest distress, manifested the least trace of instinct for building, or of any mechanical aptitude whatever. What, then, is the power which suggests to beings, so limited, the most inge-

nious means for their own preservation and that of their family?

Instinct? yes; without doubt an instinct; that is, an internal impulse; but it is not that instinct, which is the usual resource of closet philosophers and naturalists, in love with their own speculative ideas. It is a particular instinct, absolutely independent of every other species of internal impulse, and calculated expressly according to the peculiar relations, in which the animal is placed with the external world. The tissue of the snail is to secure it from the rain and the cold; the spider's web is to secure him his victim; the subterranean galleries of the mole are to serve for refuge and abode to her and her young. It was therefore necessary, that the organization of these beings should be in accordance with their wants, and reveal the primordial type of the works, which they were to execute abroad. Here again, therefore, there exists the same harmony between the laws of the external world and the internal organization of the animal, as in all the other fundamental qualities and faculties; here, again, we see in a small living organization, the type or the impress of a part of the external world.

Such is the only reasonable idea of the innate mechanical aptitudes. What would it avail the swallow and the thrush, to knead with water the clay which must give solidity to their nests, if the clay in drying was reduced to dust? It were in vain for the magpie to surround her nest with thorns, if the thorns did not prevent her enemies from approaching. It is the harmony, between the mechanical aptitudes of the animal and the objects without, which alone enables them to secure their existence against the dangers, which threaten them.

The action of this faculty, even in animals, is not subjected to the laws of a blind necessity. They vary, according to circumstances, the structure of their nests, of their galleries. The squirrels greatly modify their nests, and especially their habitations, in winter:

they vary in the choice of different materials, which they know each time how to bring into use in conformity with their purpose. In certain species, the mechanical aptitudes are reduced to inaction by captivity, and even by circumstances of little importance.

In others, they continue to manifest themselves, in a manner irresistibly, even under the most unfavorable circumstances. I have seen a weaving bird confined in a cage, who, at all seasons, interlaced the bars of his prison with hemp. The beavers, fed at Heilbrun near Salsbourg, and at Nymphenburg near Munich, chew branches of willow, amass them together, and cover them with mud.

What confirms the idea, that the aptitude to build is a particular faculty, is, that not only certain mammifera construct buildings for themselves and their young, and others do not, but that the same thing takes place among birds; the greater part of these last, it is true, build nests; but several, such as the horn owl (strixotus L.), the [effraie] (strix flammea L.), the screech-owl (strix ulula), the oyster-bird (hœmatopus ostralegus L.), the little sea lark of Buffon, do not build.

It is probable, that the climate exercises a peculiar influence on the organ of the instinct of building, as on several other qualities or faculties. It is maintained, that the beaver, which inhabited Gaul, did not build. The Lapland and Rusian beavers are content, as it is said, to dig two burrows, one above the other, below the level of the water, and to make a gallery between them. They assert, that in certain countries the cuckoo builds a nest, and hatches its young itself. But it is reasonably asked, if, in these cases, there is a certainty as to the indentity of the species, or if it is really the result of the influence of climate? Is it true that the bees, which were transported to Barbadoes and into the other islands of the Levant, ceased to make honey after the first year, because they found, that it was not necessary to them?

Natural History of the Faculty of Constructiveness in Man.

Man knows less of himself than of any thing else; first, because he attributes all the qualities and faculties of animals to that pretended instinct, by which it is attempted to explain every thing; and secondly, because he insulates himself absolutely from all the rest of the animal kingdom, and thus deprives himself of all points of comparison. Man makes clothing to cover himself; by what impulse? By that of necessity, to secure himself from the inclemency of the air and the stings of insects. He raises a cabin, a house, palaces, temples, because he finds it more convenient to be sheltered than to live in the open air, and because he wishes to satisfy his pride, or render homage to a being whom he considers above him; he constructs machines, because his hands are insufficient to execute what he undertakes. All the productions of our industry are due to our intelligence and our wants. "Man appears to have nothing which resembles instinct; no existing industry is produced by innate images; all his acquirements are the result of his sensations, or those of his predecessors, transmitted by words, fertilized by meditation, applied to his wants and his enjoyments; they have given him all the arts."

Such is the language which all authors, if I except some philosophic observers, have held till now, in relation to all human action. If I were ambitious of the approbation of my contemporaries only, I ought to remain faithful to this routine.

In the first sections of the first volume, I have already proved, in general, the absurdity of this manner of regarding man; and each of the fundamental qualities or faculties, of which I have treated, have furnished me new proofs of it. The following reflections will convince the reader, that the spirit of the

arts and of mechanical inventions, has also been given to man by a peculiar organization.

If the impressions previously received, our wants, reflection, reason, were the sources of our arts, their progress ought to be in direct proportion to the number of impressions received, to the urgency of our wants, and to the activity of our intellectual faculties. But if we consider the arts, either in individuals or in whole nations, we shall find that these circumstances may well determine the nature, the direction of our arts and of our inventions, and favor their progress; but by no means, give rise to the talent for them.

If we observe children, even those of the same family, assembled in the same school, surrounded by the same objects, and seeing the same examples; while some are devoted to their several pursuits, others are busy in drawing with charcoal, chalk, or pencil, different objects on the walls, the floor, on tables or paper, in cutting or fashioning different objects in wax, or in repairing the utensils of the house. Boys, from four to six years of age, have been seen to make an admirably exact model of a ship of the line. Hardly has the young Vaucanson seen the motion of a clock through an opening in its case, when he makes a wooden clock, without any other tool than a bad knife. The son of Reichenbacher, engineer for mathematical instruments, at Munich, from the age of five years, had his lathe to himself, disdained all the sports of his age, and would absolutely employ himself in what relates to mechanics only: his father had likewise the same exclusive inclination from his earliest infancy. At Mulhausen, in Switzerland, the manufacturers will receive into their shops only those children, who from their tenderest age discover a great talent for the arts in drawing and cutting; because they know by experience, that such subjects alone become intelligent workmen.

Examine the history of great mechanicians, draughtsmen, painters, architects; you will not find one, who

has not manifested the traces of his innate talent, from his earliest age. Lebrun, at the age of three years, employed himself in drawing with charcoal; at twelve years, he made the portrait of his grandfather. Christopher Wren, at the age of thirteen years, had made an ingenious machine to represent the course of the stars. Truchet, the father, was yet a child when he executed small machines, which announced what he would one day become. Michael Angelo was born a painter; at the age of sixteen, he executed works which were compared to those of antiquity. In his tenderest childhood, they used to find Peter du Laar, surnamed Bamboche, continually employed in drawing every thing he saw. His memory recalled to him with fidelity, even after a long time, the objects which he had seen but once. John Laurent Bernin, at the age of ten years, was able to make a head in marble, which gained him the approbation of all the connoisseurs. André Montaigne was destined to become a shepherd; his genius led him to higher objects; he passed all his time in tracing figures on stone or paper.

M. Berré (John Baptist,) born at Anvers, son of a tailor, being left to himself, learned drawing without a master, and against the will of all who had authority over him in his early childhood. He first made flowers, then tried himself in the class of animals of the chase, dead animals. He came to Paris to improve himself, painted lions and other carnivorous animals, and finally attached himself to the school of Paul Potter. He excels in the painting of domestic animals, cows, horses, &c., which he places either in rustic situations, or in the midst of rural buildings. He himself prepares his means of study, by sculpturing models, and forming reliefs of cows and stags on a small scale, without having prepared himself for it by preliminary studies.

A young artist, who, at this moment gives evidence of a great talent for sculpture, while a child and with-

out any idea of the existence of this art, engaged in carving crucifixes for the use of the laborers, and thus gained a little income, to procure himself the means of improvement. Every body is acquainted with similar examples.

The greater part of the great artists have not received an appropriate education, but, on the contrary, have had to struggle against want and obstacles of every kind; while thousands of painters, sculptors, architects, and mechanicians, who have never raised themselves above mediocrity, have had as much, and often more aid than the Claude Perraults, the Poussins, the Raphaels, Pl. LXXXV fig. 5; the Truchets, the Michael Angelos, Pl. LXXXV. fig. 6; the Anthemiuses, Wrens, Mansards, Nanteuils, &c.

How often have men, whom external circumstances prevented from devoting themselves professionally to the occupations, to which their natural dispositions called them, made them an amusement even in the whirl of affairs of a very different kind? Leopold I., Peter the Great, and Louis XVI., made clocks; the monk Platt employed the dust of the wings of butterflies to paint birds; and his paintings deceive so completely, that you think you see a real bird. Peasants have been seen to make orreries, that is, machines indicating the course of the stars.

Father Vincent, a peasant who inhabits a cottage at a league from Plombiéres, having one day come into that city to sell some goods, heard from the street the sound of an instrument which was unknown to him. He asked permission to enter the house from which the sound proceeded; it was granted him; he was introduced into an apartment, where a lady was playing on the piano. Ravished into ecstasy, he wished to know this instrument in all its detail; they satisfied his curiosity; he examined it with much attention; and after having comprehended the whole and the different parts, he said that he could make one like it. In fact, without any other aid than some

coarse tools, such as a plane, a hammer, and a file, he made, alone, the case, the wires, the keys, and put all together with marvellous industry. The forms, the proportions were observed. He afterward made two others, which have not the elegance of the pianos of Erard, but which are worth many of those which bear the names of well-known makers.

This was not all; after this trial, he wished to have a clock. He examined one, and made all the pieces, which he joined, and gave them all the regularity which a good clock-maker could have done.

This success did not puff up father Vincent. Another would have quitted the spade and the plough; but this rustic Vaucanson continued to cultivate his field, contenting himself with employing his new talent in his leisure moments, and solely to procure himself some enjoyment, or to ornament his house.

We every where see men, occupying eminent places, relax themselves from their habitual occupations by working at the lathe or in drawing. This taste cannot be attributed to peculiar feelings, nor to necessity, nor to very distinguished intellectual faculties.

On the contrary, we often see men endowed with very distinguished intellectual faculties, who absolutely know not how to do any thing with their hands. Lucian and Socrates renounced sculpture, because they did not feel any inclination for this art. M. Schurer, formerly professor of physics at Strasburgh, broke every thing he touched. There are persons who do not know how to mend a pen or sharpen a razor. Two of my friends, the one an excellent instructer, the other a great minister, were passionately fond of gardening, but I could never teach them to graft a tree.

On the other hand, the greatest mechanicians are astonishingly limited in capacity as respects every thing else. The greater part of them, like all geniuses, are ordinarily great masters without suspecting it.

I close by making the remark, that the exercise of

the mechanical aptitudes takes place the more servilely, and in a manner the more invariable, as the animal is placed lower down on the scale of perfection; on the contrary, the higher he is placed, the more liberty has he in the exercise of these aptitudes. The nest of the squirrel offers much more variety than the envelope of the caterpillar; it is thus, that we see this apparent freedom go on increasing in the proportion of the organization in general, and of the organ of art in particular, until we arrive at length at the draughtsman, the painter, the sculptor, the architect, the mechanician, who believe, that in the exercise of their art, they have not subjected themselves to any fetter; yet the limits, assigned in this respect to the human race, do not escape the eye of the philosophic observer, who compares the works of one artist with those of another; the works of the ancients with those of the moderns; the works of one nation with those of another.

Finally, I am far from denying, that exercise and models serve to perfect the products of art, as well as every thing else. But, as Ferguson says, "All the skill which man acquires in the space of many ages, is only the development of the talent, which he possessed from the earliest times. The hut of the Scythian offers to the eyes of Vitruvius the elements of architecture; the bow, the sling, and the savage canoe, present to the armorer and the builder the original constructions of their trade."

Faculty of Constructiveness in Disease.

It is not rare to see idiots, who manifest an astonishing talent for mechanics.

Pinel relates the example already quoted of a madman, who imagined, that his head had been changed, and who made the most ingenious machines, which were the result of the most profound combinations.

Doctor Spurzheim mentions the case of a woman on whom the organ of constructiveness, whenever she became pregnant, was in such a state of excitement, that she had actually a mania for building. Doctor Rush cites two cases, in which the talent for drawing showed itself during madness, and adds that there is no insane hospital in which we do not find examples of individuals, who, having never before shown the least trace of mechanical talent, have constructed the most curious machines, and even ships completely furnished.

Seat and external Appearance of the Organ of the Arts in Man.

It is the convolution VII. rolled in a spiral, Pl. IV. V. VIII., which constitutes this organ. In Pl. VIII. it is almost half covered by the very considerably developed convolutions of the middle lobes. When it has acquired a considerable development, it manifests itself in the cranium by a protuberance in the form of a segment of a sphere, the base of which has an inch and more in diameter. It is placed sometimes a little higher, or a little lower, according as the neighbouring organs are more or less developed immediately behind the organ of music, and above that of numbers. An unpractised eye might easily confound it with the organ of the propensity to acquire;* but the form of this last is lengthened from behind forwards, and when the cushion which it forms is very considerable, it extends to the external edge of the superciliary arch. The protuberance formed by the organ of the arts is, on the contrary, round, and placed above that of the organ of the sense of property.* See Pl. LXXXV. fig. 5, the portrait of Raphael, and fig. 6, that of Michael Angelo.

* Acquisitiveness.—Ed.

We sometimes meet with great mechanical talents, which, instead of having the temporal regions as prominent as the zygomatic, have them rather contracted. This is in consequence of the deficient development of the organs, placed in the anterior lateral part of the forehead.

This protuberance gives to the temples a prominence equal to that of the zygomatic regions; on this account great mechanicians have a head apparently enclosed between two parallel planes. In very distinguished artists this region is extremely prominent, and appears like a cushion, which engravers, painters, and sculptors regard as a deformity, and therefore never express it in its whole development.

At Vienna, several very respectable men brought me a subject, on which they begged me to give them my opinion. I told them, that he must have a great genius for mechanics; these gentlemen thought I was mistaken, but the person in question was much struck by my decision; it was the famous painter Unterberger. To give evidence, that I had judged correctly, he declared that he had always had a passionate taste for mechanics, and that the art of painting, which he exercised, was only his trade; he carried us into his house, where he showed us several large apartments filled with machines and instruments, which he had partly invented, partly brought to perfection. Moreover drawing, so necessary to the painter, depends on the organ of constructiveness.

Doctor Scheel of Copenhagen had attended one of my courses at Vienna; thence he went to Rome. One day he suddenly entered my house when I was surrounded by my pupils, and presented me a skull in plaster, on which he begged me to give him my opinion. I immediately exclaimed, that I had never seen the organ of constructiveness developed to the degree, that it was in this cranium. Scheel continued to question me. I requested those present to observe a considerable development of the organ of

Physical Love, and that of Imitation. "How," continued he, "do you find the organ of coloring?" I had not paid attention to it, for it was only moderately developed. M. Scheel then declared, with all the marks of the most lively joy, that it was the cast of the skull of Raphael which he had just sent me, and that, during his residence in Italy, he had found my ideas confirmed by the study of the antiques.

Many of my hearers spoke to me of a man endowed with an extraordinary genius for mechanics. I described to them beforehand the form, which his head ought to have, and we went to find him. It was the skilful inventor of mathematical instruments at Vienna. His temples were swollen into two misshapen cushions. Before this, I had found nearly the same form in the head of the celebrated mechanician and astronomer David, an Augustine friar, and of the famous Voigtlænder, maker of mathematical instruments.

At Paris the Prince of Schwartzenberg, then minister of Austria, wished to put M. Spurzheim and myself to the test. At the moment when we rose from table, he led me into a neighbouring apartment, and introduced to me a young man without saying a single word. I went to rejoin the company with the Prince, and begged M. Spurzheim to examine the young man; during his absence I told the company what I thought of him. Spurzheim had hardly seen the individual, when he came to join us in the parlour, and likewise declared, that he thought him a great mechanician, or, a great artist in some similar department. In fact the Prince had induced him to come to Paris on account of his great talent for mechanics, and furnished him the means to prosecute his studies there.

At Vienna and in the whole course of our travels, we found among all the mechanicians, architects, draughtsmen, and sculptors, this organ developed in proportion to their talent: for example, in Messrs. Fischer and Zauner, sculptors at Vienna; Grosch,

engraver at Copenhagen; Plœtz, painter; Hause, architect; Block, at Wurtzburg; Canova; Müller, engraver; Danecker, sculptor at Stuttgardt; Baumann, maker of mathematical and astronomical instruments; in a young man, whose instruction the late king of Wurtemburg had confided to Danecker, because he had observed in him a great talent for mechanics; in Hœslein at Augsburg, who in 1807 had constructed, from description alone, an hydraulic engine, which, with an inclination of two feet, raised water more than forty feet; Ottony and Pfug at Jena; Hueber, drawer of insects at Augsburg; Baader and Reichenbacher, at Munich; Baron Drais, inventor of the velocipede, and of a new system of calculation; Bréguet and Régnier, at Paris, &c.

It is then on this organ, and not at all on the number and nature of the sensations, nor on the degree of the intellectual faculties in general, still less on the hands, that the talent of the artist depends; and Lessing is perfectly correct in saying, that Raphael would have been a great painter, even if he had been born without hands.

Observations on Constructiveness in the Arts, and its Organ in Man.

The reader will have no trouble to determine, what ought to result from the combination of the organ of the arts with the other organs. From its combination with the organ of numbers, which exists in friar David, Voigtlænder, Lindner, Bréguet, &c., results the talent for those branches of mechanics, which require great calculations; from that with the organ of music results the talent of the inventor and maker of musical instruments, &c. There are also those different combinations, which determine the talent of the engraver, painter, sculptor, &c., for such a department in particular, for history, battles, religious, voluptuous subjects, &c.

Climate appears to act on this organ as on the others; that is, sometimes it favors its development, and sometimes it thwarts it. The models and the lessons of a master will never be able to supply, what heaven has denied the pupil. Already, in the sixteenth and seventeenth centuries, many artists of all countries used to go to Rome; yet there never returned from that city a Raphael, nor a Michael Angelo, nor a Leonardo da Vinci, nor a Carracci, in regard to drawing. Even Rubens, notwithstanding all his genius, all the fire of his imagination, and the profound study he had made of the antique, of history, and anatomy, cannot be placed in the first rank for composition and drawing.

The Italians seem to be endowed with a talent for drawing, better developed than that of the inhabitants of more northern climes, as the Flemish, the Germans, &c. This is the reason, why Italy has more and greater painters of history, than any other country; for, in this department, the faculty of the arts is more essential than that of colors. Almost all the Italian painters have sketched their pictures either with white chalk, or with brown and white crayons; many among them have sketched them only with the pen; we often find the outlines corrected; we never find them colored; a very strong proof, that they have worked only by the inspiration of the faculty of the arts. Most of the Italian prints betray a very pure taste in regard to outline, as well as the study of anatomy; frequently the subjects are such, that it would be impossible to treat them, without being endowed, to a high degree, with the faculty of the arts.

We see, without difficulty, how far these observations may be extended; and how interesting it will one day be, to compare the heads and the skulls of different nations, in regard to their talents for the arts.

It is then proved by experience, that the faculty of the arts, as well as its organ, may have acquired a very high degree of activity from infancy, while the other qualities or faculties are much less developed; that

the faculty of constructiveness may, at every age, exist to a degree of activity very different from that of the other qualities or faculties; that it may continue to manifest itself, and even with energy, when the other faculties are degraded to idiocy; that it may manifest itself in mania, and even appear in all its integrity; an unusually active faculty of constructiveness may be transmitted from father to son, and even to the grandson; that certain species of animals are endowed with it, while other species, though placed higher in the scale, are wholly destitute of it.

The faculty of constructiveness must, therefore, be considered as a particular faculty, independent of all the others; that is to say, a fundamental faculty; it ought, then, to have its organ.

Now, then, if we cannot deny either the facts which I have just related, or the consequences which flow from them, it must be admitted, that the objects on which this organ is destined to act, exist without us; that, consequently, there exist laws of motion, drawing, sculpture, taste; in fine, that this organ of the faculty of the arts, is only the material condition, by means of which the Creator places us in communication with this part of the world, and by the aid of which, he has wished to reveal to us this fragment of the universe.

It would be, I think, very superfluous to prove, that these laws exist in the external world. Every person, who has studied the first elements of physics, knows the laws of equilibrium and of motion; and it is not expected, that I should develope the laws of painting, sculpture, and architecture.*

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* "Independent of Greek architecture which all nations have adopted," says Mr. J. F. Sobry, in his Practice of the Arts, p. 374, "there exist also many other kinds of architecture, such as the Egyptian, the Chinese, the Gothic, and the Arabesque.

"All these kinds of architecture are very distinct, and yet they all set out from the same principle, which is the primitive construction; they refer themselves to it in their details." And p. 584: The "Chinese, like all other nations, have palaces, gates, aqueducts, triumphal arches;

But what I have just said must convince every person, who is not irrevocably attached to received ideas, that the arts are not a product of our sensations and reflections; that, on the contrary, they are really an institution of nature.

Thus far, in speaking of the arts, I have made mention neither of composition nor expression; because these objects relate to other faculties of which I shall speak hereafter. It remains to me to speak of the organ of construction in animals.

Of the Organ of Constructiveness in Animals.

This organ, however little it may be developed, is most of the time very easy to recognise in man; but as in the great part of the animal species, sometimes these organs, sometimes others, exist or are wanting, in the anterior inferior region of the head, there must hence result many variations in the form of the regions where the organ of construction is placed. It must have, in the animal whose organs of localities, of music, and of construction are at the same time much developed, a different form from what it assumes in an animal which is endowed solely with the organ of construction, or with this organ accompanied with one only of the two preceding.

This organ in general is very difficult to distinguish in most of those animals, who burrow or build. Those who have not yet acquired full knowledge of comparative anatomy, must not commence the study of organology, either with the organ of the faculty of localities, or with the organ of the relation of tones, or with that of construction. In man, these organs are placed higher in the head, and have a perpendicu-

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and all the ornaments of these buildings are equally drawn from the primitive constructions; manner and customs in vain put differences in the forms; we find every where the same principle."

lar direction. In animals, as they are destitute of several intermediate organs, and in general their organs are smaller, these three are placed lower, and their direction is horizontal.

The practised observer, as I have already shown for the organs of localities and of music, will also discover the organ of construction in animals, and will not confound this with the other two. The organ of music in animals is placed towards the middle of the orbitar arch; that of construction is farther back. Moreover, the organ of localities is farther forward; and though sometimes, as in the mammifera, on the external angle of the frontal, it yet always occupies the superior region of the forehead; whereas the organ of construction is not only more retreating, but more depressed towards the sides.

In the hamster, Pl. LXXII. fig. 9, the marmot, Pl. LXX. fig. 7, the beaver, fig. 8, it is very easy to recognise the organ of construction. The crania, too, of these three animals greatly resemble each other in the region where this organ is placed. In general, we must seek it in all the *rodentia* immediately above and before the base of the zygomatic arch. The more highly these animals are endowed with the instinct of building, the more prominent is this region of the cranium.

Now, we shall find, without difficulty, the answer to the following question. Why does not the hare, which, as far as concerns his limbs, resembles the rabbit, burrow in the same manner? Compare this region of the cranium with that of the other, and you will be convinced, that in the rabbit it forms a prominence, while in the hare it is depressed. We find the same difference in the crania of birds who build nests, and those who do not. The best means perhaps to familiarize one's self with this organ, is to compare animals of the same genus, of which some species build, while others do not. Thus, in comparing the head of the rabbit with that of the hare, the species

of birds that build nests with those that do not, we gain a complete conviction of the existence and seat of this organ. In regard to the organ of music, I have said, that it was necessary to compare, not only the singing birds in general with those that do not sing, but especially the birds of the same genus, of which certain species sing, while others do not. For example, there is among the different species of tomtits, several which sing, and others destitute of this power. There are blackbirds that have no note, and others that sing marvellously well. Among the falcons, we know only a single species that sings well, the musical hawk, (*falco musicus.*) We shall obtain the same result in comparing the head of our beaver, which, left to its instinct, builds so well, with the head of another species of beaver, which is said to be destitute of that instinct.

Though the head of the badger and of the mole in the region alluded to, have a sensible prominence, it is, notwithstanding, very difficult to observe, unless one is very familiar with this organization.

The more we familiarize ourselves with the organization of the brain of the different species of animals, and the more knowledge we acquire in regard to their instincts, the more we shall be convinced of the truth of organology.

Several of my adversaries have declared themselves against the idea, that it is the same fundamental faculty, which leads the beaver to build his house, a milliner to invent her fashions, and Raphael to conceive his immortal designs. To put thee, divine Raphael, on the same ground with the hamster, the beaver, and the milliner! Professional wits may attach some importance to such observations, but the philosophic naturalist knows very well, that a power expressed in one instance by three, in another by a million, may be very different in its modifications, though its nature remains the same.

"May there not be," says Demangeon, "in some

unexplored region of the brain, bundles of fibres still unknown, and fit to explain the differences of mechanical industry? For, it is difficult to believe, that the little circular swelling which is perceived behind the organ of music, in the direction of the external angle of the orbit, is sufficient for the varied conceptions of the field-mouse, the beaver, the bird which builds nests, the architect, the statuary, the draughtsman, the machinist, the clockmaker, and of so ingenious a mechanism as that of the Vaucansons and the Maelzels. What surprises me is, that an organ, circumscribed in so small a space at the base of the brain, can control all those of which it requires the aid, to the extent of subduing them to itself and impressing its own seal upon them."

Demangeon finds it hard to believe, that a little circular swelling can suffice to the conceptions of the field-mouse, the beaver, the building bird, &c. Is it more easy for him to conceive, that the little brain of the ant, the bee, the spider, the field-mouse, the penduline, is sufficient, not only for their mechanical instincts, but also for their other instincts, so varied and so astonishing? How long has the philosopher thought himself justified in demanding of nature, what ought to be the dimensions of such or such an organ, in order to produce such or such an effect?

After having treated of the faculty of coloring, of music, of arts, of constructiveness, &c., it appears to me superfluous to notice at length, how much those are in error, who say of the sense of sight, that it becomes for man the source of sublime ideas and of several liberal arts, such as painting, sculpture, architecture, mimicry or pantomine, &c., and who attributes to the touch, our superiority over the brutes.

Intellectual Faculties and Moral Qualities, most of which essentially distinguish the Human Race from all the other Species of Animals.

The instincts, propensities, talents, or the moral qualities and intellectual faculties which I have hitherto considered, are all found, at least, in their rudiments, in animals. But it is only man, who unites them all, though no one is exclusively his property. All the organs of these faculties, as I have shown, are placed in the inferior anterior parts, and the inferior anterior lateral parts of the brain, and however elevated, in proportion to the extent of their functions, they may be above those of animals, however marvellous may be their results, we can point them out only under the denomination of organs of inferior intellectual faculties, which man has in common with a great number of brutes.

My readers, after having so long seen man associated with animals, will finally be impatient to know, what are then the moral qualities and intellectual faculties, which give to man his immense superiority over animals? What are the qualities and the faculties which constitute the essential distinctive character of humanity?

Nothing is so easy as the answer to this important question, for those who still love to believe, that animals are only machines, automatons, destitute of all perception, of all consciousness, of every moral and intellectual principle. On this supposition, man alone is endowed with an immaterial principle, and possessed of will and reason. It is the soul which gives exclusively to man the character of humanity. Every ulterior research is forbidden, and would tend to compromise the dignity of our species.

We cut short the difficulty in the same manner, when we consent to grant to brutes, consciousness, propensities, memory, judgment, but maintain, that all

their qualities and faculties are either material powers, or the result of an occult principle, of a vital principle independent of organism, a substitute for a soul; while the same powers in man emanate from a spiritual substance, equally independent on the exercise of its powers and on organization.

Those, on the contrary, who thoroughly examine things, and who desire to oppose truth to error and superstition, find the problem of the distinctive character of man, surrounded by the greatest difficulties. The more we have followed animals in the exercise of their instincts, inclinations, and faculties, the more the difficulty of determining the boundaries of their knowledge, increases. How often do the astonishing perfectibility and the mute acts of the dog, the elephant, the ourang-outang present the most illusory images of the intelligence and morality of man! Many philosophic naturalists have not feared to maintain, that the human species differs from the other species of animals, only in its capacity of knowing and adoring a God.

In order to obtain a reasonable opinion amidst this uncertainty, and not to engage myself in the search of primary principles, or in questions impossible to solve, the eternal obstacle to every positive discovery, I still limit myself to material conditions, having recourse to the comparative anatomy and physiology of the brain. We have already seen how much more voluminous the brain of man, in its anterior inferior parts, is than that of animals; we have also seen how much the functions of these cerebral parts are more extended and more perfect in man, than the functions of the same cerebral region in brutes. Now compare the anterior superior part of the forehead of man with the heads of animals. While the anterior inferior parts of the brain in animals fail only by the want of development, the anterior superior parts are entirely wanting in them. In man, the forehead rises to a height much more considerable, than in any of the

animals even the most perfect. Besides, the cerebral parts of this region, as well as the forehead, advance more or less beyond the orbits. What a striking fact, for those who are convinced of the intimate relation, which exists between physical and moral nature, between the cerebral organization and its most noble functions!

It is this region of the brain, that we are going to analyze; it is there, that we shall discover the material cause of the distinctive character of man. After having studied, one after another, each of the fragments of which the whole moral and intellectual character of man is composed; after having shown physically, that each new moral or intellectual power is constantly and necessarily accompanied by a new cerebral part proper to man alone; we shall be able to say with the satisfaction arising from the highest probability, here is the barrier between man and animal; it is here, that mere animal nature terminates, and humanity commences! And I shall have proved, that the surest and the most fruitful method of studying man, is the successive study of the organs of the brain.

We have said, elsewhere, that the frontal bone is divided in its anterior part, its superior part, and in its lateral parts. The organs, placed in the anterior inferior part and anterior inferior lateral part, have been explained in the first section. It remains to inquire, what are the organs which are placed in the anterior, superior, and the anterior superior lateral parts of the frontal bone. I begin by the examination of that which occupies the median line, and to which, consequently, nature appears to have attached the highest degree of importance.

XX. *Comparative Sagacity, Aptitude for Drawing Comparisons.* (*Vergleichender Scharf-sinn.*)

History of the Discovery.

I often used to entertain myself on philosophic subjects with a philosopher, endowed with great mental vivacity. Whenever he was embarrassed to prove the truth of his assertion, rigorously, he had recourse to a comparison. By this means he, in a manner, painted his ideas, and his opponents were often thrown off the track and led away; an effect, which it would not have been possible for him to produce by his arguments.

As soon as I perceived, that this custom was a characteristic trait with him, I examined the form of his head. I already knew, that we ought not to seek the external marks of intellectual powers among the organs of animal sentiment, but on the forehead; and I observed in the external superior middle part of the frontal bone, a great lengthened prominence, to which I had not given attention till that moment. This prominence commenced in the anterior superior middle part of the forehead, where it was about an inch broad, and contracting itself in the form of a cone, reached the middle of the forehead, where it touched the organ of educability.

I then sought for men who followed the same method in their discourses or writings, to see if they had the same organization. On the other hand, I ascertained the progress of the mind in persons, in whom I remarked the same protuberance. All my observations confirmed my supposition. I concluded, therefore, that there exists a connexion between the great development of the cerebral part placed under this protuberance, and the faculty of finding analogies, resemblances, &c.

At the same period I observed the heads of two ex-jesuits, both distinguished preachers, who were equally

esteemed by the educated and by the common classes. In their sermons, by the aid of combinations of comparisons and of parables, they rendered clear, and in a degree evident, the precepts, which they wished to inculcate on their hearers. At a later period I also examined the head of the famous father Barhammer, Pl. LXXXIII. fig. 2, a preacher much followed by the people. Arguments were not his forte, but in a style (*à la père Abraham*)* little elevated or refined, he knew how to keep the attention of his audience alive, by numerous comparisons, always taken from objects best known in common life. I have often seen half of the faithful assembled fall asleep, or at least remain very indifferent to the sermons of preachers, much more eloquent, but who made use of philosophical reasonings. The minds of men but little educated, are incapable of following a long series of arguments; but comparisons, parables, spread a gentle and beneficent light, produce the effect of conviction, and carry along the most clownish multitude.

In these three heads, the middle anterior superior part of the forehead was likewise vaulted into a conical eminence. The more my observations of this kind were multiplied, the more I was convinced, that the tendency of a mind to seek comparisons, analogies, &c., results from the favorable development of a particular organ.

Farther proofs that the Faculty of Comparison is founded on the Action of the Middle Cerebral part of the Anterior Superior Region of the Forehead.

In treating of the fundamental faculties, which exclusively belong to man, I have not at my disposal so many proofs, as for those which are common to man and animals. All the resources, which comparative anatomy and physiology afford me, to sustain

* Franklin, Almanac.

my assertion, in relation to the organs of which I have treated hitherto, now fail me; and I am obliged henceforward, to confine myself to man alone: and man being infinitely more complicated than animals, and consequently more difficult to observe, it becomes more than ever necessary to multiply facts, and to draw inferences with the most judicious reserve.

Sagacity and wit are commonly regarded as two faculties, not only very distinct, but even opposite. It is maintained that sagacity (*Scharf-sinn*) or *perspicacity*, consists in seizing contrasts, and wit, (*Witz*) in finding resemblances. But, as he, who has the faculty to discover resemblances between different objects, must necessarily also seize their contrasts, it follows that both of these faculties are modifications of the same fundamental powers.

The expression perspicacity, sagacity, spirit of comparison, seems to me to designate exactly this operation of our understanding. I remark in general, that persons, in whom this cerebral part has acquired a high degree of development, seize and judge well the relations of things, of circumstances, and events, and are generally well fitted for business.

Children, in whom this organ is considerably developed, prefer fables to all other subjects taught them. I own a bust of La Fontaine, in which this part is extremely developed, and the other parts are smaller than they appear in the prints. My bust coincides with that in baked clay, which is seen at the museum of French monuments.

I have often said to individuals in whom I found this organization to a high degree; *in your writings, and even in your letters, in your discussions, you make frequent use of comparisons.* After some moments of reflection, they acknowledged within themselves this peculiar tendency, which they had not till that moment suspected. On making at Frankfort the acquaintance of the famous preacher Hufnagel, (Pl. LXXXIII. fig. 1,) we saw, that he had this organ very

much developed; and it was with lively joy, that we saw it at Weimar greatly developed on the forehead of Goethe; accordingly we find analogies and comparisons, on every page of the writings of this fine genius.

This organ is in general of great use to poets; with it every thing becomes an image, so that certain poets attribute their talent entirely to the faculty of speaking by images, and have not the least idea of what really constitutes poetical talent. I find this organ much developed in the bust of those of the ancients, who have distinguished themselves by their sagacity; for example, in that of Cato, Solon, Pl. LXXXVII. fig. 6, Macænas.

Saint Thomas Aquinas, (Pl. LXXXVII. fig. 4,) of all the scholars of barbarous times, was without question, the most profound, the most judicious, and the clearest; accordingly the organ of comparative perspicacity is very visible on his forehead.

The head of St. Francis de Sales (Pl. LXXXVII. fig. 5,) is in general very handsome, very elevated, high, and of an extremely noble character; but we observe especially a great development of the organ of comparative perspicacity, and large, depressed eyes, such as are usually found among philologists. Accordingly, he shows every where great erudition, and there is not a page of his introduction to a devout life, in which we do not find some analogies and even some sustained comparisons. I open the volume, I fall on page 164, and I read; "If we are punctilious for rank, precedence, titles, besides exposing our qualities to examination, to inquiry, to contradiction, we render them vile and abject; for the honor, which is noble when received as a gift, becomes mean when exacted, sought, and demanded. When a peacock spreads his tail to exhibit his fine feathers, he bristles up all the rest, and shows all his most inferior parts: the flowers, which are beautiful while planted in the ground, fade when handled. And as those who smell the mandrake

at a distance, and in passing receive pleasure from the odor, and those who approach closely become stupified and sick, so honors give a sweet consolation to him who smells them gently from afar, without amusing himself with them or caring for them; but to him who attaches himself to them and feeds on them, they become extremely offensive and prejudicial."

So true is it, that man betrays the secret of his organization in his thoughts and his writings.

On the Education of the Human Race.

What can have been the object of the Creator, or of nature, in placing this organ in the median line, where the most essential organs are always found? Let me be permitted here to make a philosophical digression; it may be pardoned, I think, to a man who is persuaded, that organization is the principal source of psychological phenomena.

I have said that, by the aid of the organ of comparative sagacity, man makes comparisons; that is, by the aid of this organ he recognises the resemblances and differences of objects. Now, it is certain that it is precisely by this means, that the education of the human race commences. Man has a natural propensity to compare his feelings with the impressions he receives from without, and the same impressions with the sensations he experiences within. By means of these comparisons his sentiments and impressions are converted, not only into ideas, but also into images and pictures; by this means his language does not limit itself to a collection of material sounds without life; it becomes an animated, and, if we may so speak, a personified language. By means of such a language, man is enabled to communicate, that is, to paint to his fellow men his feelings, as well as the impressions he has received; this is the spirit which reigns in all mother tongues; it is the organ of hieroglyphics, and

of all signs which imitate objects more or less; it is for this reason that, even now, the rudest men, in order to communicate their sentiments, make use of emblems, that they paint a heart with flames escaping from it, an arrow, &c. This, in fine, is the origin of mythology.

Man, in comparing together the impressions which he has received from abroad, endeavours to imitate them by his language; he becomes an imitator, a painter of the external world. The horse *neighs*, the lion *roars*, the sheep *bleats*, the frog *croaks*, the ox *lows*, the dog *barks*, the wolf *growls*, the cat *mews*, the turtle dove *coos*, the hog *grunts*, the hen *clucks*, the serpent *hisses*, the hand-bell *tinkles*, the thunder *roars*, &c.; words which imitate the sound they express. It is thus, that a number of words take birth in the parent languages, and have been transferred into those languages, which are derived from them.

Man acts likewise in regard to his own sentiments. He familiarizes himself with these, as easily as with impressions received from without. Why then do so many philosophers derive our first ideas from impressions on the five senses? The internal sentiments furnish the materials for our language, as early and as abundantly. The sentiments also require to be painted, and the images by which we depict external objects, are as often derived from these sentiments, as those, by which the sentiments are pictured, are from external objects. If we say, the blood *boils;* the heart *palpitates* and *beats;* the soul *burns* and *freezes;* beauty *fades;* that *tears* my soul; that *pierces* my heart; reason *seizes;* the mind *penetrates;* he has a *light*, a *heavy* understanding; *sharp* or *dull* faculties; a *narrow* mind; the heart *corrupted*, *hard*, *broken*, *tender; ripe* reason; the soul *prostrated;* a *flat* expression; we also say the vine *weeps;* the weather is *dull;* the sea *rages;* the billows *roar;* the winds *howl;* the oak *braves* the storm; he lifts towards heaven an *audacious*

front; rust *gnaws* the iron; the sun *vivifies;* nature *awakes;* the earth is *thirsty;* the willow *loves* moisture; the vine *fears* the frost, &c.

Almost all proverbs, and all popular modes of speaking, are but comparisons and analogies, arising from accidental observations. The singed cat fears cold water; to put the cart before the horse; to let the wolf into the fold; to strike while the iron is hot; to straighten the tree while it is young; a good name is better than a golden girdle; idleness is like rust, it consumes faster than labor; a rolling stone gathers no moss; you laugh in your sleep, but you will weep at your waking; what is not good for the swarm, cannot be good for the bee.

Now, it will be conceived, why those, who had it more at heart to render a service to humanity, than to gain the reputation of a brilliant eloquence in the instructions which they addressed to the people, preferred the form of the parable, and emblematic modes of speaking to every other. This was the vulgar language of the Egyptians, and Pythagoras enveloped his precepts of morality in the veil of allegory and apologue. Let us recollect the woman who seeks the penny she has lost, and who has such great joy in finding it; — the shepherd who abandons his flock to go and seek the stray sheep. — "Ye are the salt of the earth; but if the salt have lost its savor, wherewith shall it be salted? It is good for nothing but to be cast out and to be trodden under foot of men. — Ye are the light of the world; a city that is set on a hill cannot be hid; neither do men light a candle and put it under a bushel, but on a candlestick, and it gives light to all that are in the house, &c. — Behold the fowls of the air; they sow not, neither reap, nor gather into barns, &c. — Consider the lilies of the field, how they grow; they toil not, neither do they spin. — You shall know them by their fruits. — Do men gather grapes of thorns, or figs of thistles? A good tree cannot bring forth bad fruits, nor a bad tree, good fruits. —

The wise man built his house on the rock, and the rain descended, and the floods came, and the wind blew and beat upon it, and it fell not, for it was founded on a rock. —The foolish man built his house on the sand; and the rain fell, and the floods came, and the winds blew and beat upon it, and it fell, and great was the fall of it."—

"When a woman is in travail.....likewise you are now in distress."

"I have given you milk to drink, and have not given you meat; for you were not able to bear it."

We find on each page the most excellent comparisons, in which we manifestly see the intention. "I have spoken to you in parables." It is thus, that the most wholesome truths are best introduced under the veil of fable.

Æsop, who assumed the mask of allegory and the charm of fable, was more listened to at the court of Crœsus, than the austere Solon. A senator appeased the sedition of the Roman people by a fable, which the wisdom and authority of the consuls had not been able to repress. And the courtiers of Louis XIV. were more willing to be corrected by the apologues of La Fontaine, by the comic fictions of Molière, and by the poignant pictures of La Bruyere, than by the sublime and profound thoughts of Pascal.

What philosopher would have spoken better to the ambitious, than Petrarch, when he says to them: To look to power, in order to live in security and at rest, is to ascend a high mountain to avoid the winds and the thunder.

We may then maintain, that the education of the human race has been commenced principally by means of the action of the organ of comparative sagacity. Now we may conceive, why nature has placed it in the median line.

Metaphysical Depth of Thought; Aptitude for drawing Conclusions. (*Metaphysischer Tief-sinn.*)

I have a long time observed, that some men, to whom a great philosophic spirit is attributed, had the anterior superior part of the forehead singularly large and prominent. Such are Socrates, Democritus, Cicero, Bacon, Montaigne, Galileo, La Bruyere, Leibnitz, Condillac, Diderot, Mendelsohn, &c.

But the tendency of the profound genius in these men, is not the same in all of them. The domain of one, is the material world; the domain of another, is the spiritual. One wishes to know what is; endeavours to discover the conditions, under which that which is, exists; makes observation the basis of all his meditations, and investigates the relation of cause and effect; another, disdaining the material world, raises himself into the world of spirits; and, creating to himself a universe of ideal beings, contemplates mind in its effects as mind, and takes no account of the material conditions of its functions; he is occupied in the investigation of general truths, of general principles; and, according to him, all which exists here below ought to conform to these general ideas; such is the ideologist, the metaphysician.

In these heads two cerebral parts are developed, one on each side, XXIII. Pl. IX. at the side of the organ of comparative sagacity. In those the parts of the forehead which immediately touch these cerebral parts, are found prominent, and form, by themselves alone, or jointly with the organ of sagacity, two segments of a sphere, placed on each side of the forehead in the horizontal line.

At Vienna I knew men endowed with very distinguished intellectual faculties, zealous followers of Kant. The too great generality of the assertions, which constitute their doctrine, always convinced me, that it is without any practical utility. Their dogma,

for example, that time and space are only a form to which our understanding is subjected, appears to me so general, that it finds no application to any science or any art. It is on this account, that they and myself have never been able to understand each other. They reproached me, as the followers of the transcendental philosophy have since done in the rest of Germany, with not having raised myself above the lowest step in the ladder of observation. In return, I reproached them with losing themselves in the void beyond the limits of the sensible world; with wishing to determine the laws of the corporeal world according to those of the spiritual; and with constructing the whole external world with pretended materials, collected within themselves, instead of making observation the basis of their reasonings.

During our travels, they gave us a cast, moulded on the head of Kant after his death. It was with a lively pleasure, that we saw the extraordinary prominence of the two frontal parts which I have pointed out. See his portrait, Pl. LXXXII. fig. 3. Afterward, we became acquainted with Fichte, and found the same region of his forehead still more prominent than in Kant. We saw the same organization in Schelling; we need take no notice here of those numerous followers, who do nothing but repeat the words of their master.

It seems to be proved by experience, that so long as man is condemned to inhabit this earth, there is no advantage to be drawn by him from the speculations of this sublime philosophy, and consequently that we shall do well to confine ourselves within that sphere of activity, which the world of realities offers us.

Sometimes, it is true, we are forced to admire the depth of the human mind, when, at distant intervals, we see those men, if not by the sole force of reasoning, at least by induction from a small number of data, discover truths, to which the naturalist dares not give his consent till after a numerous and painful succession

of experiments. Still these results, as brilliant as rare, are bright rays of light, doubtless, but such as it is very difficult to distinguish from the meteors, which usually dazvle the mind of the metaphysician.

The ancients probably had already perceived the relation, which exists between this organization, and the tendency to be occupied with things beyond the reach of the senses, and consequently beyond the sphere of observation. They give to their Jupiter Capitolinus the same prominence in the anterior middle superior part of the forehead; a characteristic mark, which suits perfectly with supreme intelligence,

I am far from denying, that *interior intuition* may likewise become an object of observation; but when I see, that this intuition leads, in each individual, to different conclusions, and tends, consequently, to no certain observation; when I see, that in the midst of the corporeal world, in the midst of institutions founded on matter and on bodies, metaphysicians, as Berkeley did more than a century since, go so far as to call in doubt the existence of matter, by the most puerile sophisms, whether in the intention of repelling the charge of materialism, or because by a similar extravagance they pretend to raise themselves above the humble observer of nature; when I see in all ages the efforts as frivolous as profound, of the ideologist, to destroy and renew themselves by turns; when I see, that the metaphysicians by profession, affect an aversion for researches on man, such as he is; I doubt whether such an employment of the metaphysical spirit could ever pretend to any other merit, than that of simple speculation.

XXII. *Wit.* (*Witz.*)

A third peculiar manifestation of the intellectual faculty, is what the Germans have called *witz*, and the English, *wit*. I know of no French word which

accurately expresses the same idea. This faculty considers objects under a point of view altogether peculiar, finds in them relations altogether peculiar, and presents them in a manner altogether peculiar, which constitutes what is called *salt*, *causticity*, and sometimes *naïveté*. To give my readers a just idea of this faculty, I see no better means than to cite men whose dominant faculty was what I suppose this to be; such was Lucian, the Voltaire of the Greeks, both by his boldness and by the turn of his mind; Rabelais, Cervantes, Marot, Boileau, Racine, Régnier, Swift, Sterne, Voltaire, Piron, Rabener, Wieland, &c.

In all persons eminently endowed with this faculty, whom I have had occasion to examine, I have found the anterior superior lateral parts of the forehead considerably prominent, in a segment of a sphere.

When this organization predominates, it carries with it an irresistible propensity to ridicule every thing; to spare neither friend nor brother; and as there are persons who, for want of better subjects, rob themselves, so there are found those who, for want of other objects, launch their satire against themselves.

Aristophanes was so bitter, that he did not spare his own family. Socrates and Euripides were the butts of his sarcasms. Henry IV. has been blamed for being too fond of jesting; he has been reproached for his gaiety in the midst of a combat, for his jests in poverty and misfortune, and for the sometimes untimely sallies of his lively mind.

Baron Grimm said of Piron; "This poet was a machine for sallies, epigrams, flashes of wit. In examining him closely, it was seen that these things were entangled one with another in his head, came out involuntarily, urged themselves confusedly on his lips, and that it was no more possible for him to avoid uttering *bon mots*, and epigrams by the dozen, than it was to avoid breathing. Piron was a real study for the philosopher."

Mathurin Régnier showed, from his youth, his propensity to satire. His father chastised him several times to correct him. Punishments, prayers, all were useless.

Diogenes, the cynic, a biting wit, amused himself with all the follies of the age.

Cicero had an extreme inclination to raillery. Horace, a merry philosopher of the court of Augustus, usually manages his satire with delicacy. Juvenal, the unrelenting censor of the reign of Domitian, destroys all that he touches.

If we consider the busts and the portraits of Diogenes, Aristophanes, Henry IV., Cicero, Cervantes, Rabelais, Pl. LXXXIII. fig. 4; of Boileau, Racine, Régnier, Swift, Piron, fig. 5; of Sterne, fig. 6; Voltaire, Pl. LXXXIV. fig. 4; of Wieland, &c., we shall find in all of them, the anterior superior lateral part of the forehead projecting into two segments of a sphere.

Other persons want this talent, and sometimes to such a degree, that, like Crebillon, they hate and despise whatever is satire or epigram. In this case, the same region of the forehead is contracted. (Pl. LXXXII. fig. 5.)

It is therefore no longer permitted to doubt, that this talent is indicated by the organization, which I have described. The manner in which it manifests itself, whether by offensive sarcasms, or by jests without bitterness, the choice of its subjects, &c., all this depends on the greater or less development of other organs.

It is the convolutions, XXIV. Pl. VIII. fig. 9, which constitute the organ of wit.

"The spirit of wit," says Demangeon, "this Proteus of the understanding which assumes all forms to produce gaiety, marking with its seal all the sciences and all the arts, by striking contrasts, irony, raillery, ridicule, pleasantry, punning, buffoonry, satire, the grotesque, caricature, &c., this wit, which sports with all the faculties, has it really its principle in a single organ? I think it must depend on several cerebral apparatus

and that having gaiety for its essence, it is perhaps only the result of a happy organic symmetry, by which each faculty obtains its share of activity and satisfaction. It seems, besides, that this wit manifests itself only by contrasts or comparisons, and Mr. Gall admits no peculiar organ for comparison, nor for contrast of which he makes a common attribute. The thing then would be very well designated in French by the single word, *esprit*, under which we comprehend all the intellectual faculties, in whatever they present most prominent and least studied."

Thus Demangeon still reduces all the intellectual faculties to a single faculty, designated by the word *esprit*. It is apparently in the dictionary of the academy, that Demangeon has gained this information. We have the idle spirit, and the active spirit, the light spirit, and the heavy spirit, the easy spirit and the dull, the brilliant and the dry, the fruitful and the sterile, the unquiet, factious, turbulent, capricious, insinuating, supple; there is the spirit of gaming, of chicanery, of sophism, of business; there is a good and an evil spirit, an *esprit fort*, a *bel esprit;* one has much spirit, but little judgment; one has not the spirit to seize the spirit of a work, or of a discourse, &c. This *esprit*, therefore, suffices to give one all the moral qualities and intellectual faculties; hence, a single organ of *esprit* is the wonderful organ of the most opposite propensities and talents. But how happens it, that, with an abundance of *esprit* one so often has no decided talent? That with the most obstinate spirit of generalization, one has no exact knowledge, no precise notion? If the spirit of repartee depends on several cerebral apparatus, and having gaiety for its essence, is perhaps only a result of a happy organic symmetry, by which each faculty obtains its portion of activity and satisfaction; then every buffoon, every farce player, or harlequin, &c., must be a perfect man; and every man of talents must be more or less a buffoon or a farce player.

In all his objections, Demangeon forgets the reciprocal influence, which the different organs exert on each other. Certainly, according as the caustic spirit is accompanied with other faculties or other dominant propensities, it will exercise itself in a thousand modified modes on other objects, &c.

Causality, Spirit of Induction, Philosophic Head. (*Causalitæt, Folgerungs-Vermægen.*)

In discussing (VOL. II.) the means of knowing the measure of intelligence, I showed, that with the same volume of brain, different individuals may have very different moral qualities and intellectual faculties. If it be required to know, what are the most active qualities and faculties in an individual, the volume of the cerebral mass is no longer the object of consideration; it is necessary to know, what are the parts of the brain, which in this individual have acquired the greatest development. Already, sect. III. of the same volume, I had indicated the different results, according as the different regions of the brain are more favorably developed than others. I have likewise shown, that the more or less general contraction of the brain, involves the deadening of all the qualities and faculties; idiocy, more or less complete; a preponderating development of the organs, which belong to the functions common to man and to animals, subjects man to the empire of the animal qualities. Free will is the more restrained, as the faculties, proper to man, are less active. The propensities are only very feebly counterbalanced. If a man, with such an organization, distinguishes himself, it is by qualities of an inferior order, by brutal sensuality, by ambition, the love of conquest, the instinct of destruction, or by the rage for combats, &c.

Few men have been destined to play a great part, either in regard to animal qualities, or in regard

to intellectual faculties. In the greater part, the moral and intellectual powers are confined to a rather narrow sphere of activity. To beget children, to bestow the first cares upon one's offspring, to gain a livelihood by some labor, to cultivate the earth, to fish and to hunt, to obey the strongest, to defend one's property and country, to give himself up to gross enjoyments, these are the occupatious of the majority, and which require a very feeble exertion of the characteristic faculties of our species. Accordingly it is demonstrated by the most constant observation, that the frontal region, where we have seen the seat of the distinctive faculties of man, rarely surpasses a very moderate degree of development. How should elevated thoughts, profound vlews, a fondness for the arts and sciences, arise in these individuals? The propensities and the sentiments alone are keenly felt; because commonly their organs are much more voluminous, than those of the intellectual faculties. It is not reasoning, it is the propensities and the feelings, which influence their judgments and determine their actions. It is as easy to lead, as it is difficult to convince them. The too feeble development of the anterior superior cerebral parts, leads them to false judgments, to credulity, prejudice, and snperstition. Hence a blind confidence in the imaginary power of the most frivolous things, in talismans, amulets, (gris-gris,) scapulaires, dreams, oracles, favorable or unfavorable presages attached to the meeting of certain objects presented by chance; hence, the confidence felt in the cries of nocturnal birds, in the flight of a raven, in the entrails of an animal, in the auguries of fortune tellers, the power of socery and of witchcraft, &c. &c.

And if such weaknesses are rather the characteristic of the female sex, otherwise well-instructed, and very talented, the reason is, that usually the anterior superior cerebral parts acquire a much less development in women, than in men, and that, consequently they hardly realize, that there can be no effect, no event, without a cause.

In proportion as the cerebral parts, placed in the anterior superior region of the forehead, are more developed, the characteristic faculties of the human mind are more fully expanded. The man raises himself more and more, not only above the brute, but also above the crowd of his fellow-men.

We have just exhibited the results of the very favorable, but insulated development of the different cerebral parts of this region. These partial developments do not yet embrace all the extent of human intelligence. The views, although profound, are likewise still partial; and again, certain relations of things always escape these incomplete intellectual geniuses. These are the Pythagorases, the Heraclituses, the Anaxagorases, the Pyrrhos, the Democrituses, the Portas, Spinosas, Lockes, Malebranches, Berkeleys, Helvetiuses, and generally the authors of the most celebrated aberrations of the human mind.

But nature has not ordained, that our species should be always and entirely abandoned to error. No one, it is true, has the privilege of being secure against the assaults of illusion. Yet there sometimes exists an organization of the anterior superior cerebral parts sufficiently happy, to secure the best disposition of the intellectual faculties. In the same manner as, by an extraordinary development of certain parts of the posterior region of the brain, certain individuals gain the government over others, others again are called by a uniform aud extraordinary development of all the organs placed in the anterior superior region of the brain, to constitute themselves the instructers of the human race. It is by means of this organization, that the true philosopher seeks the wisdom of the world. It is this organization, which involves the necessity and the faculty of discovering the relations which exist between an effect, a phenomenon, and its cause; of pursuing a long series of data: of embracing a vast field of observation; of subjecting some to others; of discerning the unknown by means of the

known; of comparing facts; of eliminating what is accidental, and recognising what is constant; of determining the laws of phenomena; of establishing principles and deducing their consequences; of ascending from particular facts and consequences to general laws, to principles; from effects to causes, and to descend from principles, from general laws to consequences, to particular facts; from causes to effects; of enriching nations with new truths; of spreading like a fire the beneficent rays of his light; of breaking the yoke of despotism and destroying the machinations of imposture.

It is *reason* then, the result of a happy development of all the anterior superior cerebral parts, which constitutes the essence of man, the true barrier which separates man from the brute. Though certain animals take advantage of the combination of events, they never elevate themselves to the discovery of general laws; they never gain general principles.

It is therefore, also, the different degree of development of the same cerebral parts, which, in respect to the intellectual faculties, distinguishes man from man. And if it has been given to the philosopher to penetrate the sanctuary of truth, he also acknowledges that the empire of prejudice, superstitions, and dissensions will endure for ever; since these moderate organizations must be perpetual.

My readers will now perceive how one may have a quality, a talent very much distinguished, be, for example, an excellent musician, mathematician, architect, poet, warrior, &c., and in regard to the philosophic spirit, be confined to the most absolute mediocrity.

The philosopher will direct his views to different objects, according as other organs still exercite a very energetic influence. Hence the class of pious philosophers, as Pascal, Bonnet, Montaigne, professor Sailer of Landshut; hence the natural philosophers, the poetical philosophers, Homer, Lucretius, Horace, Voltaire, &c.

Now examine the heads, portraits, busts of great philosophers of all ages, of Socrates, Pl. XCII. fig. 1; of Plato, fig. 2; of Bacon, Pl. LXXXII. fig. 6; of Galileo, fig. 4; of Leibnitz, Pl. XCII. fig. 3; of Wolff, Voltaire, Rousseau, Diderot, &c., and we shall no longer be astonished, that the artists of antiquity had already perfectly caught the organization or the form of the head of men, extraordinary for the development of their intellectual faculties.

Compare the cerebral organization of men, most distinguished for the development of their superior intellectual faculties, with the almost universal organization of women, and you will be satisfied that the inferiority of women, in this respect, is neither owing to the education they receive, nor to certain inconveniences peculiar to them; but solely to the less dovelopment of the cerebral parts placed in the anterior superior region of the forehead; this is the organic cause. As to its effect or physiological result, as I would not risk being disgraced with the fair sex, and as at 65 one stands more than ever in need of its good offices, I will adopt the words of a medical philosopher, who, for many years must have accustomed himself to dispense with the favor of the ladies.

"The differences," says Cabanis, "observed in the turn of ideas or in the passions of men and women, correspond to those, which we have remarked in the organization of the two sexes, and in their mode of feeling. There is no doubt, in their mode of feeling, a great number of things common to both, which refer themselves to human nature in general; but there are several essentially different, and it is these last which belong to the peculiar nature of the sexes. The point of view, under which objects present themselves to us, cannot fail greatly to influence the judgment we pass upon them; now besides, that woman does not feel as man, she finds herself in different relations with all nature, and her manner of judging is relative to other ends and other plans, as well as founded on other considerations.

"Judging differently of the objects which have not the same kind of interest for her, her attention does not make the same choice between them, she attaches herself only to those, which have relation to her wants to her faculties. Thus, while on the one hand she avoids painful and dangerous labors, while she limits herself to those which are more suited to her weakness, which exercise at the same time the delicate address of her fingers, the quickness of her glance, and the grace of all her movements; on the other hand, she is justly alarmed with those mental labors, which involve the necessity of long and profound meditation; she chooses those, which demand more tact than science, more vivacity of conception than force, more imagination than reasoning; those in which it is sufficient for a ready talent, to glance lightly over the surface of the objects.

"She ought also to reserve to herself that part of moral philosophy, which bears directly on the observation of the human heart and of society; for, in vain does the art of the world cover both individuals and their passions with its uniform veil; the sagacity of woman easily distinguishes each trait and each shade. The continual interest of observing men and her rivals gives to this species of instinct a promptitude and a certainty, which the judgment of the wisest philosopher could never acquire. If it be permitted so to speak, her eye hears all words, her ear sees all movements; and, to complete her art, she knows how to conceal this continual observation under the appearance of heedlessness or a bashful reserve.

"But, if the evil destiny of women, or the unfortunate admiration of misguided friends, urges them into a different path; if, not content with pleasing by the graces of a natural wit, by agreeable talents, by that social art which they doubtless possess to a higher degree than men, they wish also to astonish by displays of force, and join the triumph of science to gentler and surer conquests; then almost all their charm vanishes;

they cease to be what they are, in making vain efforts to become what they wish to appear; and losing the attractions without which beauty itself can maintain neither certain nor durable empire, they gain nothing of science but its pedantry and affectation. In general, learned women know nothing thoroughly; they ruin and confound all objects and all ideas. Their lively conception has seized some part, and they imagine they know the whole. Difficulties disgust them; and their impatience overleaps them. Incapable of fixing their attention long enough on one thing, they cannot experience the lively and profound enjoyment of deep meditation; and they are even incapable of it. They pass rapidly from one subject to another, and nothing remains to them but some partial incomplete notions, which usually form in their heads the most grotesque combinations.

"And for the small number of those who can obtain some real success in those departments altogether foreign to the faculties of their mind, it is perhaps yet worse. In youth, in maturity, in old age, what will be the place of those uncertain beings, who are not, properly speaking, of either sex? By what attraction can they fix the young man who is seeking a companion? What aid can infirm or aged parents expect from them? What pleasures will they diffuse over the life of a husband? Will they be seen to descend from the elevation of their genius, to watch over their children and their household? All these so delicate relations, which make the charm and the happiness of woman, then exist no longer. By wishing to extend her empire she destroys it. In a word, the nature of things and experience equally prove, that, if the weakness of her muscles forbids woman to descend into the gymnasium and the race course, the qualities of her mind and the part which she ought to play in life, still more imperiously forbid her to exhibit herself in the lyceum or the portico.

"Some philosophers have been seen, however, who,

making no account of the primitive organization of women, have regarded their physical weakness as the effect of the kind of life which society imposes on them, and their inferiority in the sciences and in abstract philosophy, as depending solely on their deficient education. These philosophers have sustained themselves by some uncommon instances, which prove merely, that, in this respect as in others, nature may sometimes by accident pass her own limits. Besides, woman belonging to that species of living beings whose fibres are altogether the most supple and the strongest, is assuredly very susceptible of being modified by habits contrary to her original dispositions. But the question is, if other habits do not suit her better; if she does not answer them more naturally; if, when nothing accidental and predominant controls her natural tendency, she does not become such as I have said she ought to be? What is certain at least, is, that these extraordinary women, whom they oppose to us, were all more or less unfitted for the purpose assigned them by nature, and for the functions to which they ought to confine themselves, in order to fulfil it. It is certain, that in the midst of all this parade, man hardly perceives that which alone can attract and fix him. Now, the happiness of women will always depend on the impression they make on men; and I think that those who truly love them, will have no great pleasure in seeing them carrying the musket and marching to the charge, or teaching from the elevation of a pulpit, and still less from the tribunal, where the interests of a nation are discussed."

XXIII. *Talent for Poetry.* (*Dichter Geist.*)

Every body allows that *poeta nascitur*, the poet is born a poet, because experience has proved that the poetical talent is not acquired. But it is of poetical genius as of the organ of the soul; every body agrees,

that the brain is the organ of the soul, and, from the moment when we attempt to define this assertion accurately, we constantly fall into contradictions. From the moment when I say, I am going to show that poetical talent is innate, that it is produced by the favorable development of a peculiar cerebral part, every body cries out against this idea, and the poets more than all the others.

For myself, I was for many years opposed to admitting this point of doctrine. I knew that poetical talent could not be acquired by studying the principles of the art; I knew that the poet found within himself the principles of his art, as the musician, without thinking of the laws of vibration and the relations of tones, reveals them in a manner, by the music which he creates; but I had a difficulty in conceiving, that there was a peculiar organ, whose exaltation determined the poetical talent. I saw in it only the result of the action of several other organs, endowed with great energy. If I had confined myself to this idea every body would have been of my opinion. Whenever I inquire of a poet, to what intellectual faculty he attributes his talent, he answers by enumerating a great number of faculties and acquisitions. A sure tact, he says, a refined taste, the faculty of representing by images, sentiments, ideas, events, and of offering an interesting picture of them, a fruitful and ardent imagination, invention, these are the elements which constitute the poet, and these elements themselves suppose several intellectual faculties.

But we must renounce this generally received opinion, if the most exact experience and observation belie it. I begin, then, by showing, that the poetical talent is not the result of several eminent intellectual faculties taken collectively; but that it depends on the energy of a peculiar fundamental faculty, whose manifestation may indeed be modified, but by no means determined from the first by other powers. Then I shall show, that a very favorable development of the

organ of this faculty is, in fact, met with in all the great poets.

Before all, however, I must observe to the reader, that we should not honor every versifier with the title of poet, as is too generally done. I well know that measure gives a certain charm to the subjects which poetry treats. I am not ignorant, that poetical genius ordinarily manifests itself in the first place by verses; but no one will deny that one may be a great poet in prose. The Telemachus of Fenelon, the Idylls and the Death of Abel of Gessner, are examples. The Iliad and Odyssey, translated by Bitaubé, the Paradise Lost, by Mosneron, are still poetry, though deprived of the charm of verse.

A Talent for Poetry depends on the great Activity of a pvrticular Fundamental Faculty.

Poetry, like all other things for which we have received from nature a peculiar faculty, is subjected to certain laws. These laws have not been invented by man in order to be able to teach them to others; they are revealed to him by the aid of a peculiar organization. Whenever this organization has acquired all its fulness, or at least a considerable degree of activity, there result productions in which these laws are observed. Such productions only inform the observer of the existence of these laws, and they are collected for the use of those who are less happily organized.

This explains to us why certain individuals attain a high perfection in such or such a science or art, before having had the time to instruct themselves in its rules. It is thus with all poets possessed of great genius. The study of rules and models may modify the innate talent, and adapt it to circumstances and the taste of the times; but the talent itself is as independent of all these external modifications, as the

weight of the ball is independent of the shock received by the bodies, it strikes in its descent.

"This explains why there is no tribe of barbarians who have not their rhymes of passion or of history; why men, in the earliest periods of society, take delight in compositions in verse; why a savage, born a poet, clothes his conceptions with images and metaphors. 'We have planted the tree of peace;' says the American orator, 'we have buried the hatchet under its roots; we will hereafter rest beneath its shade. We will join to extend the chain, which unites our nations.' Such are the accumulated metaphors, with which the public harangues of these people are filled. Thus have they promptly adopted those lively figures, that liberty and boldness of style, which subsequently learned men have judged so proper to express the rapid transitions of the imagination, and the emotions of a passionate soul.

"In the earliest ages of Greece, priests, legislators, philosphers gave their instructions in verse; they joined to them the charm of music and of heroic fiction.

"That poetry should have been the first kind of composition among all nations, is a less surprising thing, doubtless, than to see a style, so different in appearance, and so removed from common usage, almost universally the first which arrives at maturity. The most admired of poets lived before the times of history, and, to use the expression, before the time of tradition. The artless songs of the savage, the heroic legends of the bards, have sometimes a beauty to which the perfection of language could add nothing, and in which the most refined criticism can find nothing to reform.

"Although in the conceptions of Homer the discernment is equal to the sublimity, we cannot go back beyond these times, and we see no light which announced the torch of his genius and the divine flame of his soul. What in others is invention, in him is inspiration; and we perceive, that it was not so

much reflection, as a natural instinct, which presided over the choice of his thoughts and expressions.

But, whatever be the propensity of men for poetry from the earliest times, whatever advantages they have for succeeding in this kind of literature, whether poetical compositions arrive first at perfection, only because they are the first cultivated, or whether poetry has a peculiar charm for those lively imaginations, which are best fitted to perfect the eloquence of their natural language; it is a remarkable fact, that not only in those countries, where all kinds of composition are indigenous, and arise according to the order of natural progression, but even in Rome and modern Europe, where they have been introduced from abroad, we find, in all languages, poets who are read with pleasure, while the cotemporary prose writers present nothing worthy of attention.

"In Greece, Sophocles and Euripides preceded the historians and the moralists. Among the Latins, not only Nævius and Ennius, who wrote the Roman history in verse, but Lucilius, Plautus, Terence, we might add Lucretius himself, were anterior to Cicero, Sallust, and Cæsar. Italy made her boast of Dante and Petrarch before she had a single good writer in prose. Corneille and Racine in France open the golden age of proasic composition; and England had not only Chaucer and Spenser, but Shakspeare and Milton also, while her essays in science and history were yet in their cradle, and deserve consideration only from the subjects to which they relate."

I have transcribed these passages, because they prove, that poetical talent depends rather on one active and independent faculty, than on any union of intellectual faculties. What Ferguson says of Homer is also applicable to Petrarch and Dante, who are perhaps as astonishing men as Homer; like him they had no predecessors, no rivals; like him, they came out already formed from the womb of that profound obscurity, in which their country was buried. It might

be said, that the day waited for them to appear, and then displayed itself suddenly in its full splendor.

It appears to me in general, that poetry is too jealous a divinity for art, study, imitation, to be able to supply its inspiration. I repeat it, study may enable the poet to conform himself to the taste of his age, and to avoid certain faults in execution; but this is all. There are very few examples of distinguished poets, who have not found out their talent at a late period by some accidental circumstance. La Fontaine, for example, at twenty-two years was ignorant of his talent for poetry. The beautiful ode of Malherbe, on the death of Henry IV., made him feel from that moment, that he was a poet. The tragical end of Henry only made him attentive to a faculty, which, though it had not manifested itself till that moment, did not the less exist in all its force; it did not create it.

Most generally the poetical talent manifests itself in early youth, or at least without any previous study relative to this subject, and in a great disproportion to the other intellectual faculties.

Pope, at twelve years of age, made an ode on rural life, which the English compare to the best odes of Horace. At fourteen, he produced some passages translated from Statius and Ovid, which they place by the side of their originals. At sixteen, he wrote pastorals worthy of Theocritus and Virgil.

Tasso, when only seven years of age, composed verses. At seventeen, he wrote his poem of Rinaldo. At twenty-two, he commenced his poem of Jerusalem Delivered, and finished it at thirty.

De la Grange-Chancel wrote a comedy in three acts at the age of nine years; his tragedy of Jugurtha, at sixteen.

Richardson, at the age of twelve years, sketched the character of a lady who enjoyed a high reputation, and whom he suspected of profound hypocrisy.

Metastasio, at the age of ten years, made verses which astonished the connoisseurs; he was only fourteen when he composed his first tragedy.

Voltaire made verses at the age of seven.

Billaud, a joiner known under the name of Master Adam, became a poet in his shop, without any knowledge of literature.

Every one knows the famous shoemaker poet of London. At Paris the shoemaker François, the author of the Siege of Palmyra, offers us a similar example. The latter had no sooner collected some historicalnotions on his subject, than he produced his tragedy in the style of Corneille. The productions of this astonishing man sufficiently prove, that he would have been a distinguished man in his nation, had not the ingratitude of his cotemporaries exiled him from Parnassus and confined him to his shop.

Neither in these last cases, nor in those where the poetic talent has shown itself from the earliest youth, can we say, that it is the union of several intellectual faculties, developed and cultivated by study, which constituted the genius of the poet.

The examples of men, who have withdrawn from their original destination, to devote themselves to poetry which they passionately loved, also prove, that this faculty is determined by a *tendency* of mind altogether peculiar.

Ovid was destined to the bar, but poetry possessed irresistible attractions for him. His father, fearing that his passion for verses would debar him from that fortune, which his talents promised him, wished in vain, that he should devote himself to speaking. Ovid was born a poet, and was such in spite of his father. *Et quod tentabam scribere versus erat.* Still, not to appear entirely to disdain the paternal counsel, he studied the orators and composed declamations. But his inclination for poetry predominated, and he reconciled himself to the muses.

Petrarch, also destined to the bar, soon conceived the greatest aversion to jurisprudence.

The friends of Cervantes wished to make him an ecclesiastic or a physician ; but he was born for poetry, and made verses in spite of them.

It was thus that Molière, subdued by his passion for verses and the theatre, triumphed over the opposition of his family, and became the first genius of his age.

Boileau, whom his father had placed with a notary, showing an invincible disgust for chicanery, it was proposed to him to become an ecclesiastic; but theology did not please him, and he resigned himself entirely to his inclination for making satires.

Schiller first studied jurisprudence, which he soon renounced in favor of surgery and medicine, with which he likewise became disgusted in a short time. Neither the remonstrances of his parents, the counsels of his friends, nor the absolute orders of his sovereign, could turn him from his dominant taste for poetry, the ancient languages, history, and the higher philosophy. He says in his works, speaking of himself; "Fortune, by one of her ridiculous caprices, wished to condemn me to be a poet in my native city. An irresistible inclination for poetry infringed the laws of the institution where I was educated, and thwarted the plan of its founder."

So much, adds the biographer, J. J. Berché, in men of superior genius, does all-powerful nature overcome the principles and even the object of education.

Whatever may be the talents and acquirements, which direct a distinguished poet in choice of his subjects, it is not the less certain, that these talents and acquirements do not constitute poetical genius; that, to make a poet, requires a particular faculty, independent of all others. But what constitutes the fundamental power on which this talent depends; that is, what functions does the organ of poetry fulfil in those cases, in which it has acquired only an ordinary degree of development? This I should not dare to decide. But I can affirm, that it is the considerable development of a determinate cerebral part, which produces poetical talent. I can indicate, with exactness, the region of the head where this cerebral part is placed, and de-

scribe the prominence, by which it manifests itself on the cranium.

Of the Poetical Talent in Mania.

"I was troubled, sometimes," says Pinel, "to follow the incorrigible garrulity and a sort of flow of unconnected and incoherent words of an old scholar, who, at other times, fell into a stern and savage silence. When any piece of poetry, in which he had formerly delighted, suggested itself to his memory, he became capable of continuous attention, his judgment seemed to regain its rights, and he composed verses, in which there reigned not only a spirit of order and of justness in the ideas, but also a regular supply of fancy and some very happy sallies." In another place the same author expresses himself thus:

"Certain facts appear so extraordinary, that they have need of being borne up by the most authentic testimony, in order not to be called in question. I speak of the poetical enthusiasm, which is said to have characterized certain paroxysms of mania, even when the verses recited, could nowise be regarded as an act of reminiscence. I have myself heard a maniac declaim, with grace and exquisite discernment, a longer or shorter succession of the verses of Virgil or Horace, which had been a long time effaced from his memory, inasmuch as, after his education was terminated, he had been twenty years absent in the American Colonies, given up to the pursuit of wealth, and the reverses, occasioned by the revolution, had alone thrown him into this distraction of mind. But the English author, whom I have already cited, attests that a yound girl of a feeble constitution, and subject no nervous affections, had become insane, and that during her delirium she expressed herself in very harmonious English verses, though she had before shown no sort of disposition for poetry. Van Swie-

ten also relates another example of a woman, who, during her paroxysms of mania, showed a rare facility for versification, though she had before been occupied with manual labor, and her understanding had never been enriched by culture."

We know that Tasso made his finest verses during his paroxysms of mania. How often are poets obliged to provoke inspirations by spirituous liquors, which they take to the extent of producing intoxication, or plunging themselves into a state of madness?

I have already spoken of one Leon, of Vienna, who, during the paroxysms of a nervous fever, made verses in the manner of Klopstock.

Seat and external Appearance of the Organ, whose great Development produces the Talent for Poetry.

The first poet, who struck me by the form of his head, was one of my friends, who often composed extempore verses when least expected to do so, and had thus gained for himself a kind of reputation, although, in other respects, an ordinary man. His forehead immediately above the nose, rose perpendicularly, then retreated and extended itself much laterally, as if a portion had been added to each side. I remembered having observed the same form of head in the bust of Ovid. In other poets, I did not always find this forehead first perpendicular and then retreating, so that I regarded this form of forehead as accidental. But in all, I remarked these prominences in the anterior lateral part of the head, above the temples. I began, thenceforth, to regard these prominences as the distinctive mark of poetical talent. Still I spoke of them to my hearers with the tone of doubt, and the more so, as I was not yet convinced at this period, that poetical talent was a fundamental faculty. I waited, therefore, before deciding definitely, till I had collected a larger number of observations.

Soon after, I procured the head of the poet Alxinger, in which this cerebral part, as well as the organ of attachment, is very much developed, while the other organs are only feebly so. Soon after the poet Junger died, I also found in his head the same prominences. I however saw these cerebral parts still more strongly developed in the poet Blumauer, who united to it the organ of sarcastic spirit. At this period Wilhelmine Maisch gained, at Vienna, a reputation by his poetry; I found in him the same enlargement above the temples. I found the same organization in Madame Laroche, at Offenbach, near Frankfort; in Angelica Kauffmann; in Sophia Clementina de Merken; in Klopstock; in Schiller, whose cast I own; we found it also very marked in Gesner, at Zurich.

When at Berlin, I spoke of this organ in my public lectures, always expressing myself with much reserve in regard to it; Nicolai invited Spurzheim and myself, to go and see a collection of nearly thirty busts of poets, which he possessed. To our great joy, we found in all, the region indicated, more or less prominent, according to the more or less decided talent of each poet.

From this moment I taught boldly, that, however improbable this assertion might seem, we must admit a peculiar organ for the talent of poetry, and that consequently poetical genius supposes a particular fundamental faculty.

All the observations, I had occasion to make afterward, confirmed this idea; and now I maintain without hesitation, that there never has existed, and never will exist a poet, in whom the cerebral parts referred to, are not very greatly developed.

At Paris I moulded the head of Legouve after his death, in which this part is likewise very decided. Spurzheim and myself opened the head of the late Delille, and pointed out to several physicians, who were present, the considerable development of the convolutions placed under the protuberances which I have

mentioned. They exceeded all the others. I have the cast of one of the hemispheres of his brain.

In a rather numerous company they asked me, in order to put organology to the test, what I thought of a little man at some distance from me. As it was dusky, I said, that in truth I could not see him very well; but however, that I distinguished, that he had the organ of poetry extremely developed; they then told me, with all the marks of astonishment, that it was the famous cordwainer-poet François. Afterwards I moulded his head, and I now exhibit his bust to my hearers, as having the external appearance of the organ of poetry.

In the brain it is convolution xxv. Pl. viii. and ix. which constitutes it.

By the considerable development of this convolution, there rises from each side of the cranium a prominence, which commences at about half the height of the forehead in front, above the temples, and extends obliquely from below upward, and from before backward, about two inches. These two lengthened protuberances give to the superior part of the head, a great breadth and so singular a form, that painters, engravers, and sculptors rarely venture to present them in all their prominence.

Now let us pass in review the portraits and the busts of poets of all ages, and we shall see, that this conformation is common to them all. I greatly regret, that the long hair of Corneille, and the ample peruque with which Racine is dressed, prevent our seeing these organs in them. But compare Pindar, Pl. xcii. fig. 5, Euripides, fig. 6, Sophocles, Heraclides, Plautus, Terence, Virgil, Tibullus, Ovid, Horace, Juvenal, Boccacio, Ariosto, Arétin, Tasso, Milton, Boileau, J. B. Rousseau, Pope, Young, Gresset, Voltaire, Gesner, Klopstock, Wieland, &c.

I found the same organization in the princess of Salm, in Messieures Andrieux, Pl. xcii. fig. 4, Lemercier, Dupaty, &c.

This is especially the form of Homer's head, which must strike every one; its superior lateral part forms two extraordinary prominences. I am not ignorant that some *savans* have expressed doubts in regard to the authenticity of this bust, and consider it as ideal.

But whether it be an ideal composition or a portrait, the existence of these prominences is nevertheless a remarkable phenomenon. Why should this form have been given to the head of the father of poetry, if this head were not really the portrait of the author of the Iliad? Doubts have likewise been raised in regard to the authenticity of Raphael's bust; but the extraordinary development of the organ of the arts, joined to that of the organ of imitation, seems to me to prove, that it is really the portrait of this inimitable artist.

After all, if the bust of Homer is ideal, how has the artist been able to divine that form which, of so many innumerable conformations which nature offers, is the only true one? Did he choose the most distinguished poet of his time, for the model of his bust of the author of the Iliad? In this case the observations of the artist would serve as a confirmation of my discoveries.

In a hospital I found this organ rather developed in an insane man; I said to the physicians who accompanied me, that I found in him the external mark which indicates a talent for poetry. He really had this talent; for, in his state of alienation, he continually made verses which sometimes did not want vigor. This man was of the lowest class and without any education. We saw in the collection of Esquirol, the bust of a mad woman, who was continually making verses; in this head the organ of poetry is considerably more developed than the others.

Now, if in all cases in which poetical talent is manifested to a high degree, the portion of the brain referred to is considerably developed; if, with a great mediocrity of the other talents, the poetical talent may manifest itself alone to a high degree, (and in this case the cerebral portion in question is strongly marked,) if,

even in mania, in the heat of fever, this faculty may exist alone, or be alone in a state of inaction; cases of which I have adduced examples above; one must be the blind slave of received prejudices, not to acknowledge, that poetical talent is a fundamental faculty, and that the organ of this faculty is placed in the region, which I have pointed out.

If I am asked why poets choose subjects so various, why one writes romances, another tragedies, comedies, idyls, odes, epic poems, &c., let us remember, that this question presents itself for all the fundamental faculties. The musician, the painter, &c. choose such or such a subject, according as other organs are suited to the predominant organ. Poetical talent, joined with the sense of elevation, produces the odes of Pindar and of J. B. Rousseau; with the sense of devotion the Psalms of David, the Paradise Lost; with the instinct of murder, the tragedies of Shakspeare and Crebillon; with the instinct of physical love, the Art of Love of Ovid and of Gentil Bernard, the sportive works of Piron, of Grecourt, of Arétin; with the spirit of observation, Lucretius's work on the Nature of Things and Fenelon's Telemachus.

The bust of Quinault, the author of Alcestes, of Theseus, Atys, &c., presents the organ of music to a very high degree. This explains why Lully prefers him to all the other poets; he found in him alone all the qualities which he sought; a delicate ear which chose only harmonious words, a great facility for rhyming, and an extreme docility, to lend himself to the ideas of the musician.

These observations also prove that even the highest degree of activity of the other fundamental faculties, does not suffice to present the objects, with which they are occupied, clothed in the charms of poetry, and to create the poet in their department; for, in this case, every epicurean, great general, ambitious man, would be a poet. It requires a peculiar and proper

power to animate all the others with the sacred fire of Apollo.

XXIV. *Goodness, Benevolence, Gentleness, Compassion, Sensibility, Moral Sense, Conscience.* (*Gutmæthigkeit, Mitleiden, Moralisher-sinn, Gewissen.*)

As this faculty is common to our species and to brutes, I might have treated of it in connexion with the other qualities and faculties, which are common to us with them; but I have preferred to follow the same order, which nature herself has established, in the arrangement of the organs of man, the principal object of my researches. In this manner I shall hardly be liable to commit errors; whereas any division I might make of the qualities and faculties into determinate classes, might be subject to many modifications.

History of the Discovery.

One of my friends used often to say to me, as you are engaged in the researches of the external marks which indicate the qualities and faculties, you ought to examine the head of my servant Joseph. It is impossible to find goodness in a higher degree, than in this boy. For more than ten years that he has been in my service, I have seen nothing in him but benevolence and gentleness. This is astonishing in a man who, without any education, has grown up in the midst of an ill-bred rabble of servants. Though at this period I was very far from placing what is called a good heart in the brain, and consequently from seeking a mark of it in the head, the repeated solicitations of my friend at length awakened my curiosity.

I recalled to myself the constant conduct of a young

man, whom I had known from his tenderest childhood, and who distinguished himself from his numerous brothers and sisters, by the goodness of his heart. Though he passionately loved the sports of his age, and his greatest pleasure was to scour the forests in pursuit of birds' nests, as soon as one of his brothers or sisters was sick, a more irresistible inclination kept him at home, and he bestowed on the patient the most assiduous attentions. When there were distributed to the children grapes, apples, cherries, he had always the smallest part, and rejoiced to see the others better provided for than himself. He was never better pleased, than when any thing agreeable happened to those he loved; in this case he often shed tears of joy. He took care of sheep, dogs, rabbits, pigeons, birds; and when one of his birds died, he wept bitterly; which never failed to draw on him the ridicule of his companions. And even now, benevolence and goodness are the distinctive character of this individual.

His character has certainly not taken this turn from education. On the contrary, others, in regard to him, have pursued a conduct, which should have produced an opposite effect. I began to suspect therefore, that what is called a good heart, is not an acquired quality, but innate.

At the same time I spoke of the goodness of heart so highly extolled, of the domestic Joseph in a numerous family. "Ah!" interrupted the eldest daughter, "our brother Charles is precisely the same; you must really examine his head. I cannot tell you how good a boy he is," &c.

I had therefore in sight three subjects, whose goodness of character was well acknowledged. I took casts of all three: I put their busts side by side, and examined them till I had found the character common to these three heads, otherwise very differently formed. In the interval, I had applied myself to find similar subjects in schools, families, &c., in order to be prepared to multiply and rectify my observations. I also

extended these observations to animals, and I collected in a short time so great a number of facts, that there is no quality or fundamental faculty and organ, whose existence is better established than that of goodness, and the organ on which it depends.

Natural History of Goodness, Sensibility, Benevolence in Man.

Is man born good or wicked? This question, so often agitated by philosophers and moralists, has necessarily remained undecided till this moment, because the true sources of our propensities, the different motives of our actions, have remained unknown. The study of organization, and of its influence on the exercise of our innate dispositions, has been neglected; hence the vagueness and arbitrariness, which prevail in all discussions on the true character of the human race. Some are struck only by examples of wickedness, malice, persecution, oppression, injustice, vengeance, treason, infidelity, perjury, envy, ingratitude, calumny, imposture, selfishness, &c. Others are touched with traits of goodness, benevolence, justice, generosity, gratitude, pity, compassion, disinterestedness, generous pardon, resignation, &c. The former quote in support of their opinion the characters of Tiberius, Nero, Commodus, &c., &c. The latter boast of Marcus Aurelius, Antoninus Pius, Henry IV., &c., &c. Thus the detractors of our species are as well sustained in saying, that man is born wicked, as the partisans of the other opinion in maintaining, that he is born good. But, on either side, there is the mistake of embracing the one or the other of those opinions exclusively. Let us examine man under the double relation of his proneness to good and to evil.

The Creator has destined men to live in Society. It was therefore necessary to bind them strongly by the principle of sympathy. They had to share their pleas-

ures and their pains, and often to suffer more from the misfortunes of others than from their own. In this, Providence manifests itself in a striking manner. If the sufferings of our fellow-men excited aversion in us, the first thing we should do at the sight of an unfortunate or suffering man, would be to banish him from us, instead of running to his relief. This sympathy, this sentiment of benevolence, therefore, is the cement of human society, of public happiness.

We shall hardly find a family, however small, in which there are not some individuals distinguished by their good heart, by sensibility, by a benevolence resembling that, of which I have quoted some examples, in the history of the discovery of the external sign of this excellent quality: while other individuals shall give evidence of a disgusting insensibility, of selfishness, love of mischief, and sometimes even of a propensity to cruelty.

Every day I meet the sad spectacle of animals inhumanly treated; it may be a poor sheep struck with repeated blows, while dragging him to slaughter; it may be an unhappy horse, sinking under his load, while his pitiless driver mangles him with the lash, after having unmercifully overloaded him. But I am not the only one, whose heart bleeds at this inhuman treatment. Young and old, men and women, strangers and inhabitants, burst out with indignation against this cruelty. There is no one, who has not formed the wish, that the animals were taken under the protection of public benevolence. If, sometimes, the great find pleasure in putting at bay an unhappy stag, at least there is no flatterer so vile, as to have counted these remains of ancient barbarity, in the number of royal virtues.

Man is naturally rather good, just, and benevolent than wicked and unjust, especially when he is calm and not impelled by passion in a different direction. Men of simple manners, the easy peasants, the great mass of the people, industrious artisans, are very benev-

olent towards their fellow-creatures. We rarely see among them an orphan, who fails to find all the succour which his situation requires; and their custom is to treat him as their own children, often, even with more tenderness. Rarely does the poor man, who has knocked at their door, retire with his hand empty; in fine, the direct impulse is always that of benevolence for the unhappy.

Children are accused of cruelty, because they amuse themselves with tormenting animals, which insensible persons sacrifice to their wantonness; but they have no idea of the sufferings they cause to a bird, to an insect, because the signs of pain, in these beings, are neither sensible enough, nor sufficiently analogous to our own, for the commiseration of children to be excited by them. If they are playing with a dog, and he utters a cry of pain, their natural pity is almost always awakened. It is rare to see them resist this feeling.

The populace runs with eagerness to executions; they seek with ardor the spectacle of these bloody sacrifices. Perhaps we ought, in this case, rather to accuse them of coarseness than of barbarity. Abundant tears always attest the compassion of the greater number of spectators. The horror, which the criminal inspires, is often annihilated, to give place to pity alone. In this I perceive another secret motive; every power demands to be exercised. It is especially the sentiment of benevolence, which experiences this necessity. All tragic scenes attract a crowd of spectators; every one loves to stop, to become penetrated with pity, to identify himself with the sufferings of others. There are but a small number of beings so ill organized, as to enjoy the sufferings inflicted on their fellow-men.

Several moralists have already given, as an evidence of the benevolence of mankind, the universal tenderness with which men are seized at tragic spectacles, when a well managed representation gives a probabil-

ity to the events, which are exhibited. It is easy to observe all that is added to an impression generally felt, by the communication of feelings; and the rapidity, with which the emotion is propagated, does not allow us to suppose, that it is owing to any reference to one's self. In romances, when the situations are introduced in a natural manner, when a happy tissue of probable events has so attached us, that the fabulous has disappeared from our eyes, the personages interest us, and we share all the emotions by which they are themselves agitated. It results from this, that it is sufficient to make men forget their private interests, in order to restore them to nature, and consequently to pity. Here again is felt the necessity of exercising benevolence. In ordinary life, we rarely meet scenes so interesting, so sad, so touching, as tragedies and romances represent them. It is this same necessity, and not that of being moved in general, nor that of being occupied, nor is it always curiosity, which leads men to seek events calculated to excite compassion, and to take the part of an unhappy man; to interest themselves for those who are a prey to persecutions and all sorts of dangers: it is this same necessity of exercising the feeling of benevolence, which finally lends a peculiar charm to all great misfortunes, to all disastrous events.

A superficial glance on what ordinarily passes in life, might lead us to believe, that the care of subsistence, and interest in general, is the principal motive of human actions. In many persons it prevails, in fact, to the extent of not suffering the concurrence of any other object of attention or desire. But, if interest were an exclusive motive, an injustice which impairs our fortune, or a benefit which augments it, would produce in us the same emotions, as a torrent which lays waste our possessions, or a rain which fertilizes them. We should consider, in our fellow-men, only their influence on our interests. Now observe men, when they see others a prey to misfortune and

to suffering. We daily observe men precipitate themselves into water or rush amid flames, to save those who are threatened with destruction. Hardly have public calamities, such as conflagrations and floods, ravaged the property of our fellow-men, when every body is eager to repair their losses: we make collections, and give spectacles and concerts for the relief of the unfortunate. Those, whose means are too limited, often have a painful contest to sustain, between this want of power and the natural impulse, which leads them to do good. The child, that utters cries of pity when he sees his brother attacked with convulsions; the man who abstains from asking an office, when he learns, that his friend, burthened with a numerous family, makes the same request; the soldier, who presents himself to receive the fatal blow, which would have reached his commander; Saint Vincent de Paul, who had himself chained among the crew of galley-slaves, in order to restore an unhappy criminal to his wife and children, plunged in the most extreme misery, &c.; such beings, assuredly, cannot be suspected of having acted from selfish feelings, from a regard to personal interest.

Is there any one, who is not touched even to tears, when he learns, that measures have been taken to relieve indigence and misery? When he sees the innocent acquitted, pardon granted to an accused man more unfortunate than criminal, or the sick restored when apparently about to sink under the weight of disease? Are the saloons ever better filled, than when they give spectacles and concerts for the benefit of the unfortunate? And in those moments, when we ourselves are a prey to affliction, is there any thing which more calms and animates our hearts, than the recollection of the good we have done, and the compassion, with which we see others moved in our favor?

The pleasures derived from benevolence, are as personal to us, as those, which come from any other

desire whatever; and the exercise of this sentiment is one of the principal sources of our enjoyments. Every act of goodness or attention from parents to their children; every heartfelt emotion towards our friends or any other individual, are true pleasures. When we experience this tender sympathy, we cannot avoid approving ourselves; we rejoice in being so constituted; and this sentiment becomes an inexhaustible source of satisfaction. Pity and compassion themselves, regret and sadness, when they arise from sensibility, participate in the nature of the emotion which has given them birth; if they are not positively pleasures, they are at least sweet and noble pains, which one would willingly undergo for the satisfaction of aiding those, who are the objects of them. In this class of affections, even excesses in liberality and generosity, never draw after them those regrets, that remorse, which accompany hatred, envy, avarice, and wickedness.

When benevolence is threatened with becoming enfeebled towards those, who are neither our parents, neighbours, nor acquaintances, it deludes itself, and is converted into zeal for the public good, and enthusiasm for humanity. All the inhabitants of the world are then worthy objects of its attention and its exercise.

The simple recital of events, which happened in distant ages and countries, produces in us admiration, pity, or indignation. Benevolence makes an interesting spectacle of human life, and persuades without ceasing even the most indolent, to take one side or the other in the scenes, which have passed among our ancestors. It sheds pleasure on the present life, on domestic life, on all which surrounds us; and by the expression it gives to the physiognomy, it surpasses the charms of beauty; it is from this that the situations of life, derive what they possess most touching. The price of a favor has no longer any bounds, when it bears the impress of the goodness of the soul; and the misfortune, which is not the result of ill conduct,

is supported with resignation. By a spontaneous emotion, we grant our friendship to those, in whom we think we discover the marks of goodness. Even the hero, who sheds his blood for his country, appears to us to deserve our love and admiration, only so far as he is benevolent, compassionate, generous. Can one pronounce the names of Bayard, Duguesclin, Turenne, Scipio, &c., without experiencing that virtuous emotion, which awakens the idea of true goodness?

Benevolence extends even to posterity. The philanthropist sacrifices his personal well being to his heirs, to those who will see the day long after him. It is for them that he plants trees, that he bequeaths legacies to beneficent institutions. It is for them, that he labors day and night, that he braves insults, calumnies, persecutions, because he knows, that a time must come, when his works will be blessed for their beneficent influence on humanity. Without this sentiment of general benevolence, how many facts, how many useful discoveries would be buried under the weight of the envy, the jealousy, the bad faith, and the ingratitude of contemporaries!

In all ages, the pardoning of evil doers and enemies has been commanded by the most elevated morality. Man, endowed with an energetic sentiment of benevolence, is naturally disposed to that noble and virtuous resignation, to that self-denial, which to every one else appears so painful, that we regard such acts of generous pardon, especially when it goes so far as to return good for evil, as the most admirable and most sublime efforts of human nature. The sensitive man, when he is injured, experiences a primary emotion of resentment, of vengeance. No one is so secure from self-love, that he cannot sometimes be surprised into unworthy emotions. But hardly has the benevolent man returned to himself, when every project of vengeance disappears, as contrary to moral greatness; he pardons, and contents himself with pitying and despising the intrigues of baseness and malice.

The wicked man, on the contrary, charges the benevolent and generous with weakness; he boasts of that force of character which, to judge by what he says, is necessary to put in execution his vindictive conceptions. I shall call that man, so inclined to vengeance, *strong*, when he has learned how to conquer himself, and to renounce that satisfaction so sweet in his eyes, of rendering evil for evil. Was Marcus Aurelius weak, when he refused to see the head of the rebel Cassius; when he burned his letters, in order not to be obliged to punish those, who had been concerned in revolt, and pardoned all the cities which had embraced the same party? When Titus condemned all accusers by profession, to be scourged and sold as slaves; when he pardoned his brother Domitian, and loaded with favors two senators who had conspired against him, were these acts of weakness? Has Antoninus ever been judged weak, because he despised and banished informers; because he restored to Rome, by his goodness, a repose of which his predecessors had deprived her by their ill-conduct? Was Henry IV. weak, when he pardoned all the leaguers; when he answered to one who spoke to him of an officer of the League by whom he was not beloved, "I will do him so much good, that I will force him to love me, in spite of himself?" When he replied to those, who exhorted him to treat with rigor some places of the League, "The satisfaction, we derive from vengeance, endures only for a moment; that, which we draw from clemency, is eternal?" The modest and generous Turenne, when he contented himself with banishing from the army a wretch, who had come into his camp with the design of poisoning him, can he be accused of weakness? The élite of great men rise in mass to refute this paradox, invented and approved by the despicable genius of vengeance.

In fine, let us place benevolence on the throne; shortly it will be nothing but strict necessity, that will dictate imposts; the cities and villages afflicted by

calamities will be consoled; the patrimony of the prince will be consumed in acts of beneficence, as if he had renounced the right of property; acts of rigor will be reserved for the incorrigible offender; the love and happiness of the people, will be the principal end of government; informers will be despised and banished; conspiracies will be strangled in their birth, before they have time to draw in the imprudent to their ruin; war, almost always a public pest, will be avoided, and the life of a good citizen, preferred to the death of a thousand enemies; man, being attached to nothing so strongly as to the worship, which he has been taught from infancy to believe, the most acceptable to his Creator, there will be not only tolerance, but entire liberty of conscience. Credulity, superstition, error, imposture, charlatanism, slavery, chicanery, the seizure of the goods of orphans and wards, will be the only objects of reform and persecution. To soften brutal passions, and to dispose the people to honest enjoyments, moral, religious, and civil instruction will be imperative on all classes; even the malefactor will be judged worthy of compassion. Every where we shall see the institutions of benevolence multiplied; hospitals for the sick, for the insane, for the deaf and dumb, the blind, the incurable, old men, invalids, &c. The brothers and sisters of mercy will have the first claim to public esteem. We shall see asylums formed for lying-in women, for foundlings and orphans. Every where schools, academies, universities, museums, libraries will foster the arts, sciences, &c., for the purpose of increasing the happiness and ennobling the enjoyments of men.

Such are the precious results of goodness, benevolence, sensibility. Who then will dare to doubt, that this beautiful quality is inherent in human nature? Henceforth am I not right, when according to the example of Marcus Aurelius, I build to it a temple in the most perfect organization which exists on the earth? But is this the primitive fundamental

quality? Is not benevolence, as I have thus far represented it, rather the energetic action of another quality, which would be the primitive destination, and to which the organ in an ordinary development would be devoted, as happens with self-defence, the voracious propensity, and the sense of property?

Moral Sense, Sentiment of Justice and Injustice.

The reader will remember, that I have been able to determine the organs only in their extraordinary development, which has for its result a very energetic disposition. This disposition, when it becomes active, sometimes puts on a character, in appearance altogether different from its ordinary manifestation. The propensity to libertinage results from the undue development of the organ of propagation; and a too great activity of the sentiment of property, induces the propensity to theft.

It is the same with benevolence. The individuals, who had become remarkable by peculiar goodness and benevolence, offered also a very great development of the cerebral part indicated in the historical sketch. Consequently, goodness, benevolence, sensibility, are not the primitive destination or ordinary function of this organ, but the manifestation of its exalted function. Is benevolence, then, something more than the primitive function of the organ from which it emanates? What is this primitive function?

It being too difficult to make positive observations on the fundamental original destination of an organ, I am under the necessity of resorting to reasoning. I think I have reasons sufficiently plausible to establish, that the primitive destination of this organ is, to dispose man to conduct himself in a manner conformed to the maintenance of social order. I call this disposition the moral sense, the sentiment of justice and injustice. Let us first make some reflections on the ex-

istence of this sentiment, and on the difference, which is thought to exist between it and benevolence, and we shall then be led to the conclusion, that this last is only a more elevated degree of action of the moral sense.

Since man was destined to live in society, the moral sense has become indispensable to him. Without it no association, no family, no union, no nation could exist. If there is no obligation imposed on me towards you, you will acknowledge none towards me. We shall be obliged to isolate ourselves from each other; without reciprocal duty there can be no mutual assistance. Each one will set up as master; our relation will be that of the beasts of prey; eternal war will be our destiny. Now, since men have formed societies in all ages and in all countries, it follows necessarily that each one is convinced, that in his individual capacity, he is only a part of the whole, which demands all his regard; that nature has imposed on each a tacit condition of contributing to the public good; that is, that all men are endowed with a moral sense, with a sentiment of what is permitted, of what is duty, and of what is forbidden.

"The Author of Nature, in endowing man with free will has obviously destined him to be a moral agent; we have such need of morality, that the sentiment of justice and injustice ought to commence with our being, and precede the exercise of reason."

M. Laromiguiere maintains his position by an observation of Rousseau, who says: —

"I shall never forget having seen a young child struck by his nurse. He was immediately silent. I thought him intimidated; I was mistaken. The unhappy boy was suffocating with anger; he had lost his breath; I saw him turn purple. A moment after came shrill outcries. All the signs of the rage, of the resentment, of the despair belonging to his age were in his accents. If I had doubted, that the sense of justice and injustice were innate in the heart of man, this example alone would have convinced me. I am sure, that

a burning coal, dropped by chance on the hand of this child, would have been less sensibly felt than this blow, so light, but given with the manifest intention of offending him." (Emile, B. I.)

"There is no one," continues M. Laromiguière, "who has not had an opportunity of making the same observation as Rousseau, and who has not adopted the same conclusion, which he draws from it."

Rousseau draws the inference, that the sense of justice and injustice, is innate. M. Laromiguière adopts this conclusion. "I will nevertheless," says he, "hazard one remark on the expression *innate sentiment*. Strictly, the sentiment of justice is not innate. There is in the soul something which precedes it, be it only for a moment. I place the period, at which this sentiment manifests itself, immediately after birth. The child must attribute a will to the external agent, but nothing is more natural to him, nothing more ready; since he hardly exists, before he perceives himself endowed with a will."

Does the moral sense then judge only of the actions of others, and are the faculties and propensities innate only for the reason, that their exercise supposes a will?

The object of the moral sense is not always so determinate, as that of benevolence. Its province is confined to generalities; to abstain from doing ill to others; to be just towards every body; to do one's duty; this is what the moral sense includes.

But the ideas of men upon what is good or evil, upon what is just or unjust, upon what is duty or not duty, are in many respects very different, often contradictory among individuals and among nations. It has been attempted to define all actions conformable to human nature as being *good*. Bad actions are those which are conformable to the will of one, who is governed by evil propensities. Even if we acknowledge as good, those actions only which accord with public expediency, it will still be extremely difficult to apply this principle to particular actions. The estimate of actions varies,

according as the degree of ignorance or knowledge, the different interests, habits, and customs of a nation change. How often have public morals and legislation been clothed with forms altogether different? This diversity not only marks the opinions and actions, which concern the different religious and political sects, but bears also on things which appear to interest morals exclusively. Theft, polygamy, polytheism, incest, adultery, suicide, and even parricide, have been regarded in turn either as crimes, or as acts permitted, and even meritorious.

In Italy and Spain, freemasonry is condemned as a criminal association. In Austria, it is regarded as dangerous to the government. In France, and the north of Germany, men boast of belonging to it, and it does no harm whatever, &c.

It is only when it is agreed, that such a thing is good or bad, just or unjust, &c., that the moral sense becomes the regulator of our actions. The command, to do well and to avoid evil, has been given to all men. All have the innate sentiment of this duty, and all agree in it. And accordingly, the moral sense is not the principle of a determinate act, but the principle of duty, in general.

Philosophers, who have neglected this essential distinction, have thought they could deny the existence of the innate moral sense, and have regarded this as the artificial growth of society. But in this they have committed the same error, that they would do in denying the existence of hunger, because this want can be satisfied by a thousand different aliments.

Perhaps I shall make the properties of the moral sense more evident by putting it in comparison with benevolence. This parallel will serve, at the same time, to show the analogy between these two sentiments. To abstain from doing evil, to do one's duty, is the law of the moral sense, and of justice. To diffuse happiness is the law of charity and benevolence.

Amidst the instability of the opinions and judgments of men, there are an infinity of things, which are gen-

erally acknowledged as just or unjust, and which, even before the origin of laws, impress on morality a uniform and immutable character. The just man has a detestation of oppression exercised on his fellow-men; of lying, perfidy, perjury, treason, informing, spying, hypocrisy, intolerence, calumny, cabal, usury, seduction, debauchery of every kind, counterfeiting, and all other thefts, cruelty, murder, &c.; in one word, for whatever wounds the order and peace of society. The just man feels himself obliged to observe even arbitrary laws, to obey his parents and superiors, to fulfil his promises and engagements, to pay his debts, to repair a wrong done to another, to restore a deposite which has been confided to him, to reveal no secret, to give no pernicious counsel, to maintain good faith and equity towards every body. He respects all property, not only moveable and immoveable property, but also those of talent and of mind; rights and privileges are equal for all men. Every law, which is not of urgent necessity, in his eyes, is an injustice, because it multiplies the cases of misdemeanours and crimes; he rejects violent means for forcing from accused persons uncertain confessions, &c.

Thus the moral sense is confined to things of the first importance, without which, the idea of society would be only a chimera; to things which man is not free to do or not to do; which are commanded him by the laws of nature, and the transgression of which involves culpability, and provokes the resentment of the social body. The moral sense is therefore the basis of all legislation and of the law of nations; it precedes laws. "For, if good and evil did not exist before laws, if they differed not widely from each other, right has no foundation, no justice. Laws would be the fruit of blind caprice, they would be attempts against the liberty of man; to submit to justice would be to submit to the yoke of a tyrant." *

* Anti-Lucretius, Vol. I, p. 179.

The object of benevolence, though less necessary, is of a more elevated nature. The just man does only his duty; his acts are not meritorious; he is not the object of love and admiration. The benevolent man forgets himself; he sacrifices his personal well-being to that of his neighbour, friend, wife, his children, his country, the human race. He exercises acts of humanity, of beneficence, generosity, heroism, magnanimity. These acts, without being the attributes of duty, are, nevertheless, more beautiful, meritorious, and virtuous than those of the just man. The omission of acts of benevolence is not always considered as a crime; their fulfilment, on the contrary, is always an object of approbation and reward. Even savages never speak of acts of benevolence and generosity with the impression of duty. To do an act of kindness is to satisfy a natural desire, an innate sentiment. It is admitted among men, that the marks of benevolence and affection are the touchstone of what is meritorious, and the rule by which we appreciate actions, is taken from the influence they exert on the general good.

In acts of pure duty, man is moved by no lively or exalted sentiment. This is the reason why, frequently, men, forgetting their duty and the most ordinary acts of justice, give evidence of the noblest benevolence, when unfortunate events have awakened their sensibility.

For the same reason, the misfortunes which interrupt the habitual happiness of certain men, become salutary to them and to others; reverses awaken them from lethargy, teach them the sufferings of others, and dispose them to acts of sympathy and compassion. We need to have been sick, to appreciate the delight, inspired by those who come to console us.

When benevolence gives too much latitude to wickedness, and this grows bold through indulgence, the sentiment of justice resumes its rights. It is not just, that gooodness should become the sport of envy, malig-

nity, and ingratitude. Experience has too often proved, that the wicked man is rarely touched by a generous act of pardon. It is just and necessary, that he be confounded, that his projects be defeated; that vice and crime be repressed and punished. As the wicked man is ever inclined to malicious constructions, and as he sets down to the account of weakness or insensibility that, which goodness has led him to experience, justice makes it a duty to repel his attacks with vigor, and to convince him of his own impotence by the force and superiority of an exact retribution.

Such are the shades of distinction between the moral sense and benevolence. But is it not essential always to avoid evil and to do good? Do we not see, that the difference is in the degree only, and that it must be permitted to presume, that goodness or benevolence is only a gradation of the moral sense, which is itself the primitive destination, the fundamental quality of the organ of goodness?

Further, I have remarked with pleasure, that all authors, who have treated of benevolence, as of a quality inherent in human nature, constantly confound acts of pure duty and justice with acts of benevolence; all regard this last as the source of all morality and all virtue. Let us examine the precepts of morality and moral actions, and we shall see, that beneficence constitutes an essential part of their nature.

If we consult history, she tells us, that the most moral and the most virtuous persons, have always been, at the same time, remarkable for their great benevolence. "Virtue alone equals men to gods; to need little one's self, and to do to others all possible good; to be severe towards one's self, and indulgent towards others; to bear with men such as they are, because we cannot make them such as we would have them." Such are some of the maxims of Marcus Aurelius, the author of the Gospel of the Pagans, of the most beautiful moral system of antiquity. Who does not know the goodness and the moral char-

acter of Socrates? Trajan, when reproached with being too good, replied: "I wish to do what I would have an emperor do toward me, if I were a private man." The benevolent Scipio, though passionately fond of women, honorably sent back the wife of Mardonius to her relations, and restored to Allutius his betrothed, whose charms he could not withstand. Bayard and Turenne, did they not also restore to their fathers, husbands, lovers, the most beautiful women, who had been brought to them as the reward of their valor? And L'Hôpital, Franklin, and Vincent de Paul, how many institutions of beneficence and acts of generosity attest their extreme goodness! In fine, the maxim, Do to others as you would that others should do unto you, did it not emanate from the founder of the most sublime moral system, from the source and fulfilment of all benevolence? This principle, founded on sympathy, on reciprocal regard, is the most conformable to our nature, the best felt, the most easy to interpret, and includes in a few words all human morality.

It is proved, then, that there exists the most intimate analogy between the moral sense and goodness, and that it is impossible to separate acts of benevolence from moral acts. Consequently, I am justified in deriving goodness, sensibility, benevolence, from an energetic action of the moral sense, and in admitting for these two modified sentiments only a single organ.

Of Conscience.

That pain or pleasure, which we experience within ourselves, in consequence of an evil or good action, or an action which we esteem wicked or otherwise, is called conscience. It is asked, if this sentiment, this internal judge, is a fundamental quality, belonging to a peculiar organ, or if it is solely a modification of

another quality, of another organ? I shall examine the nature or the natural history of conscience. It will appear, according to my reflections, that conscience is only a modification, an affection of the moral sense, of the sentiment of justice and injustice, of benevolence; as an agreeable or painful sensation is nothing but an affection, a modification of the organs of perception, in general.

Our judgment, whether such an action is good or bad, is determined according to two data of a very different nature. Either it is our natural disposition, or, it is the ideas received by the influence of external things, which make us judge a thing, an action, as permitted or forbidden, as good or as bad. In the first case, it is *natural conscience;* in the second, *artificial conscience.* This distinction will give us the facility of speaking pertinently and with truth, of a sentiment which, in the eyes of certain moralists, is a sure guide of our actions, and, in the eyes of others, is only a fruitful source of errors.

Let us first examine the natural conscience in all its shades, according as it is the product of different dispositions or of their different degree.

The natural conscience is always proportioned to the degree of the moral sense and of the sentiments of benevolence, with which an individual is endowed. Very benevolent and very sensitive persons have also a very delicate conscience. Scruples, repentance, and often the most keen remorse, pursue them after the most innocent action, provided they have induced consequences painful to their extreme benevolence. My father and mother, before they knew of inoculation, had witnessed the death of one of their children by small pox. Oftentimes I have found them bathed in tears, and examining with the tenderest inquietude, whether they could have any thing with which to reproach themselves. Yet there do not exist any parents who fulfil their duties with more exactness. I shall never forget the despair of a father

whom I had advised to inoculate his eldest son. Imbued with principles of metaphysics, he judged inoculation contrary to Divine Providence. A short time after, he lost this beloved child, a victim of this terrible pestilence. I fear that this father can never escape the remorse of conscience. His refusal of the benefit of the art, however, was founded on a pure and religious motive. — We are the innocent cause of a walk, which by accident proves fatal to a beloved friend; and then we reproach ourselves always, as if we had been the cause of misfortune to a friend. A physician loses his patient, after having made every physical and moral effort. Is it possible, perhaps, he will say, that I could have deceived myself? Perhaps if I had not done such a thing, if I had acted in such a manner, the patient would not have died. More than once I have succeeded in regaining my tranquillity of mind, only by opening the body of the deceased, that final test of our knowledge and of our errors.

How much more poignant will remorse be, when persons, still endowed with energetic moral sense, and great benevolence, allow themselves to be led into actions, in themselves bad or criminal. No sooner will they have regained the entire use of their habitually predominant characters, than the opposition, the contradiction between the action committed and their natural disposition, will make itself strongly felt, and the deepest remorse will seize their minds. Let a tender mother, abandoned by her lover and disgraced in the eyes of the world, in an instant of wildness and despair, lay a trembling hand on her first born, and deprive it of life; when the fatal concurrence of circumstances, and the frightful internal emotions have passed away, the innate sentiment of maternal love, the sentiment of horror at her act will revive. A terrible combat will arise between her natural disposition and her crime; the murder of her infant will always be present to her eyes, and will poison her existence. A good and honest man, in a violent paroxysm of anger,

had killed his wife; he was condemned to perpetual confinement. He would have preferred death a thousand times, because he felt, that for the rest of his days he should have his mind torn by the most terrible remorse.

What happens suddenly in these cases, fails not to happen sooner or later to those, who, being good and benevolent, are governed at the same time by bad propensities. It is these men, who do not always the good they would do, and who often do the mischief they would not do; it is an evil propensity which controls them; when they wish to do well, they experience another power which opposes it. There results from this a confusion of character and an alternation of action, which appears inexplicable to those, who are not familiar with the internal and often contradictory motives of our actions. The best men are sometimes a prey to the most deplorable vices, to the most shameful debauchery, to theft, &c. Did not Trajan and Adrian, both, dishonor themselves by irregular passions, in particular cases? To-day they walk in the high road of sinners; to-morrow they hide themselves in a corner among penitents; and it is thus, that the life of such is passed between vice and remorse, according as they consent to follow, sometimes this impulse and sometimes the other. When, in fine, they are worn out by irregular indulgences, or the illicit desires become appeased, they experience a salutary return to themselves; they sincerely disapprove their past life, and repair the evil and the scandal by a conduct, the more exemplary, as their sense of justice and benevolence inspires them more thoroughly.

When the moral sense is not warmed and enlightened by the gentle flame of benevolence, it should no longer be trusted. It gives itself up to the errors of reasoning, to the instigations of self-love and egotism.

Examples and customs lead it astray and serve it for rules, rather than the true notions of good and evil.

The symptoms of indifference, and of the change of the sentiment of justice and injustice, every where manifest themselves. Men do, they see done, and imitate, without regret or remorse, things evidently immoral. They no longer distinguish between good and evil, except as the law expressly commands or forbids. The laws are evaded; good faith is betrayed in transactions, provided they can adroitly escape the resentment of justice. In the intercourse with traders, artisans, agriculturists, &c., the beautiful words, "do to others as you would, that they should do to you," are considered antiquated notions; the confiding man is always the dupe of fraud, without any one pitying him, without any one blaming the deceiver; in the slightest undertaking it is necessary to envelope one's self with a thousand formalities; a rich harvest for chicanery and every kind of artifice; epigrams, scandalous reports, the retailers of calumny and malice, are the favorite objects of the public; to attack and blacken merit, and to take from it the means of defending itself, is one of the maxims in vogue; seduction of innocence is a sport; conjugal fidelity is out of fashion; mothers trust their children to mercenary hands, without any other reason, than that of following the torrent of fashion, and to free themselves from the too painful cares of education: children are ambitious to free themselves from the power of their parents. Thus much for the proofs of the enfeebling of the moral sense, by the spirit of the age!

Let us, finally, follow man, organized unhappily enough to be wholly a stranger to the sentiment of benevolence, and of justice and injustice, and who is, moreover, powerfully disposed to give himself up to acts opposed to duty and the public good. Rarely will such an individual find his judge in himself. The preverse inclinations are predominant; they compose his character; consequently, evil actions are in harmony with him, and rarely is the contentment of his mind ruffled by them. This view of depraved man will

perhaps displease those, who dream only of the dignity of the human race. But look at the usurer, the libertine, the villain, and you will see, that each of them finds himself happy, only in proportion as he satisfies his desires. I have made from my youth the sad and alarming observation, that the most perverse men take pride in their talents for deceiving and abusing, and that they always dwell with a feeling of delight, on the striking incidents of their criminal life. Go into the prisons, place yourself in the midst of their inmates, avoid the appearance of a person in office, in order not to be deceived by a feigned repentance, and inspire those men with confidence and frankness; with what internal satisfaction, with what vanity and joy in having done evil, will the great criminals recount to you, without forgetting the most insignificant details, both their crimes and the particular manner in which they committed them! If perchance one of them takes the trouble to speak of them with a pretended horror, he allows to escape him a malignant smile, which shows his hypocrisy. The greater part exert themselves to utter the gayest pleasantries on the most atrocious acts, and frequently at the moment they see you shudder with horror, they burst into a laugh. Count in the prisons all those who have been committed a second time, and you will see how few have repented.

Finally, examine the great criminals in judicial proceedings; follow them to the scaffold; with what obstinacy do some deny the most evident facts! with what surprising audacity do they insult the witnesses who accuse them! with what bare-faced effrontery, and what scrupulous exactness do others recount a series of frightful crimes. A soldier had committed robberies in twenty churches; he was led to the gallows where he expected to receive pardon; but in place of showing any repentance, he said to confessor Wiedemann, at Vienna: "I see clearly that there is no more to do here, I will try to go elsewhere." At Vienna a certain Z. assassinated his mistress with a

knife, in order to rob her of three hundred florins; he cuts up the body to hide it more conveniently in a box; then he goes to a ball, there passes the night, spends all his money, and gives himself up to all the excesses of grovelling enjoyments. M. Bruggmanns, at Leyden, showed us the cranium of the chief of a band of Dutch robbers. This man had thrown several persons into canals, merely to see them struggle for life. What can they do to me, he said, in his trial, am I not an honest man? Schinderhannes, and Hekermann, his accomplice, had extreme pleasure in recounting their crimes; their eyes sparkled during their recitals. All the accessary circumstances, which were calculated to place them in a striking light, caused them the most lively joy. A daughter, who had aided her mother to kill her father, never testified the slightest repentance. When spoken to about her crime, she shrugged her shoulders and smiled. Rossignol boasted of his barbarity. "Look at this arm," said he, "well; it has butchered sixty-three priests at the *Carmes de Paris!*" Having escaped several times from prison, he commenced and redoubled his robberies and cruelties, and the most disgusting debaucheries. There are some of these wretches executed, who, at the moment of their execution, in calling to mind all the enjoyments in which they had indulged during life, have boasted, that none equalled those which cruelty had caused them. About fifty years since a man, guilty of several murders, was broken upon the wheel at Lyons. After having his limbs broken on the wheel, he laughed immoderately. The executioner having asked the cause, he answered that he could not help it, thinking of the contortions which that tin-founder made, when he had poured the melted tin into his throat. Gabrino Fundulo, famous for his perfidies and cruelties, being condemned to be beheaded, said boldly to the confessor, who in vain urged him to repent of his crimes, that there was only one subject of regret he had in dying; it was, that he had not

hurled from the top of the tower of Cremona, Pope John XXIII., and the emperor Sigismund, when they had the curiosity to mount it with him. Read the biography of the tyrants, who have desolated the earth, and see if one among them has renounced his crimes, before public vengeance or death has cut him off from society.

The physiological study of great villains proves, therefore, that they are inaccessible to repentance or remorse. Why, said Cardinal Polignac, should vicious men, for whom crime has attractions, and who do not think themselves criminal, why should they repent?

To conclude our analysis, it is certain, that, in many cases, the moral sense does not enlighten us in relation to the morality or the immorality of an action; that it often deceives us in regard to the objects, on which it ought to be exercised; that, active in all its energy, or graduated to goodness, benevolence, sensibility, it often exaggerates to us an evil which does not even exist, and disturbs the tranquillity of our soul by trifling scruples and unmerited remorse; that, in individuals in whom this organ has received only a feeble development, and in whom, on the other hand, the evil propensities are predominant, it is silent, remains dead, does not produce even a shadow of its existence. What lesson must the moralist, the instructer, the legislator, necessarily draw from these observations? It follows, that it is necessary to dissipate the illusions of the too exalted moral sense, to rectify its wanderings, and to replace its absence by the creation *of an artificial conscience*, that is, that we must put in action all means to enlighten men, in relation to what is really good or bad, just or unjust, commanded or forbidden. It is here, that the maxim, "Ignorance is the source of all evil," finds its entire application. Man, instructed as to the influence of certain actions on his own interest and that of society, familiarized with the evil which menaces himself, and with that which he causes to his fellow-men, will no longer be the victim except

of just remorse; and, when his propensities are opposed to the principles of a pure morality, he will find in these a sure guide, a regulator of his actions; for there is no one who does not think himself bound to do good and to avoid evil, which constitute the sole end and principle of the moral sense inherent in our nature.

Must I again observe, that the artificial conscience becomes the more indispensable, as an individual is more disposed to do evil, and that it is against evil dispositions in particular, that all the efforts of moral instruction must be directed?

It follows, from all that I have now said on conscience, that it can by no means be considered as a fundamental quality; that it is really only an affection of the moral sense or of benevolence, and that, consequently, no particular organ can be assigned to it.

Seat and External Appearance of the Organ of Benevolence.

We have taken a view of the organs, which are placed on the anterior inferior, and the anterior superior, part of the frontal bone. We now come to the organs which have their seat under the superior part of the frontal bone. This superior part of the frontal bone divides again, in its relation to organology, into its superior anterior, and its superior posterior part. These two parts are covered with hair, however imperfectly it may be.

Within each of these two halves, in the median line, meet corresponding cerebral parts of the two hemispheres, and these parts, when greatly developed, form a lengthened protuberance in the anterior part, and a similar protuberance in the posterior. If, on the contrary, the organs, placed under this region, are only very moderately developed, in place of rising, either in its anterior or its posterior half, it remains flattened to the summit of the head, where it meets the anterior superior edges of the two parietal bones. (Pl. LIV. fig. 2.)

Now I have found, that all persons eminent for their benevolence, all those who distinguish themselves by very great philanthropy, have the superior anterior middle part of the forehead, or the middle part of the superior anterior part of the frontal bone, projecting in a lengthened protuberance, and, consequently, that the cerebral part XIV. Pl. IX. XI. XII. is the organ whose energetic action constitutes goodness, benevolence, the gentle character.

Since the discovery of this organ, hardly a day has passed, that I have not discovered confirmations either positive or negative of this truth.

Sooner or later, and sometimes on the slightest occasions, we shall discover in persons, in whom these cerebral parts have acquired only a very feeble development, mischievousness, a malicious, vindictive, hard, and ungrateful character, and a spirit of detraction. Let it be admitted, that it is so because, in this case, there exists no organ whose activity holds the balance against that of the other organs, and that in this manner selfishness becomes predominant; or let it be conceded, that the feeble development of this cerebral part itself involves these malicious dispositions; still, it is certain, that persons thus organized, when motives of a high order do not come to their aid, will never be capable of lasting benevolence. What I have said above of negative qualities, is again applicable here. As the appetite may degenerate into a disgust for food, the inclination for physical love into antipathy for the sex, the sense of tones into aversion for music; so benevolence and goodness may degenerate into wickedness, by the indulgence of joy at the misfortunes of others.

Compare all the personages, ancient or modern, who have distinguished themselves either by their benevolent character or by cruelty and wickedness; and we shall find between them a marked difference in the superior anterior middle part of the frontal bone. I confine myself to the recital of a small number of examples.

Compare Tiberius, Caligula, Caracalla, Nero, Catherine de Medicis, the Nero of the north, Christian, the cruel, perjured, and perfidious; Danton, (Pl. LXIX. fig. 3.) Robespierre, fig. 4, with Trajan, Marcus Aurelius, Antoninus Pius, (Pl. XCIII. fig. 1;)* St. Vincent de Paule, (Pl. XCIII. fig. 1;) † Henry IV., L'Hôpital, Camille des Moulins, John Baptist Cloots, Madame de Geoffrin, Dupont de Nemours.‡ Observe in general, all philanthropists, all men of benevolent character, and who are drawn without thinking of it into beneficence, confidence, loyalty, cordiality; and compare these men with the wicked, the vindictive, the perfidious, with those who every where seek and meditate fraud, cabal, the ruin of others, &c., and you will soon be forced to confess, that benevolence is a fundamental quality, independent of all others, and that its organ is placed in the median line of the superior anterior part of the frontal bone.

All the crania of the Caribs, (Pl. LXXIV. fig. 1 and 2.) which I have seen, as well as the crania of a tribe of negroes of the Carib islands, which is remarkable for cruelty, are depressed in the organ alluded to.

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* Adrian said, "Of all men whom I know, I know that Antoninus is the one who least desires empire: but I know also, that he is the most worthy of it." Accordingly we find the upper part of the head very high, the organs of ambition and of pride, on the contrary, very little developed.

† St. Vincent de Paule, founder of the establishment for foundlings, of the sisters of charity for the service of the sick poor, and to whom the hospitals of Bicêtre, Saltpetrière, la Pitié; those of Marseilles for criminals, and of St. Nom de Jesus for old men, owe the greater part of what they now are.

‡ I quote a single passage of this benevolent naturalist and philosopher. In speaking of the window swallows, he says; "When one of the couple dies, it is rare that the other does not follow in a few days. The sweet prattling has ceased; there is no more chasing, no more laboring. A dull repose, a mournful silence are the signs of grief to which the survivor falls a victim."

I apprise young people of this, who, though otherwise good and amiable, amuse themselves in shooting at these birds, because they are hard to hit. My friends, shoot at nuts in the air, which are more difficult still to hit, and spare these amiable birds. Remember, that every shot which takes effect kills two swallows; the last by a protracted torture.

According as this organ coexists with other organs likewise much developed, there must result different modifications from these different combinations. The robber, endowed with benevolence, gives to the poor a part of the fruit of his robberies. It is thus, that St. Francis de Sales cheated at play, that he might aid the indigent. The voluptuous man divides his fortune with women who are deserted; the devout does good works for the love of God.

As this organ is common to man and brutes, we might ask, why, in man, it is not placed immediately in connexion with those organs which are common to him with the other animal species? Why is it placed in him above the organs of the intellectual faculties?

This exception in the arrangement of organs, may serve as a proof to the reader, that I have not let myself be carried away by reasoning, but that I have taken facts for my only guide. In reflecting on it, we find, that nature may have had very wise reasons for thus placing the organ of goodness. Perhaps nature proposed to herself a very high purpose in thus combining the action of the organs of goodness, of benevolence, of generosity, of love of one's neighbour, of the moral sense, with that of the organs of the intellectual faculties. The Author of all which exists, was not ignorant that the judgments and actions of man are much more determined by his feelings and inclinations than by his judgment. It is also apparently for a similar reason, that the organ of the moral sense, of the sentiment of justice and injustice, is immediately followed by the organ, which leads man to the adoration of the Supreme Being.

Of the Action of the Organ of Benevolence in mania.

This organ performs, more frequently than is supposed, its particular functions in mania, both in madmen, who gave themselves up to all sorts of malice and mischief, and in those, who wish to overwhelm every body with kindness.

A hussar, who had always manifested the greatest goodness of character, became insane. He no longer allowed the slightest clothing on himself, but gave away every thing. He said unceasingly, that he wished to make every body happy; and in all his projects of beneficence he mingled the holy trinity. His cranium proves, that he had the organ of goodness and that of devotion, both extremely developed.

When I proved the plurality of the organs of the brain, and the natural independence of the moral qualities and of the intellectual faculties, I quoted several cases in which, by the side of an alienation or a complete imbecility in regard to all the other faculties, certain propensities or talents manifested themselves with great energy, such as the venereal desire, cunning, the propensity to theft, the talent of imitation, extraordinary verbal memory, &c. Others overwhelm every body with demonstrations of regard and attachment; others, on the contrary, are real demons in wickedness and malice, and break and tear whatever falls into their hands, maltreat and torment men and animals, and take vengeance for the slightest reasons. M. Spurzheim quotes two such facts mentioned by M. Haslam. "W. H. V., a boy aged about seven years, was received into the hospital the 8th of June, 1799. The mother, who often came to see him, mentioned, that about a month before she was delivered of this child, she had a severe fright. Immediately after its birth, the child was subject to agitations, and the least indisposition caused it convulsions. At the age of one year it appeared

more lively, and slept less than the other children. When it was two years old, the mother perceived, that she could not control it even by frequent corrections.

"All its physical and intellectual qualities developed themselves slowly. At fifteen months the teeth had not yet protruded; at the age of two years and a half, he could not yet walk alone; at four years, he just began to speak. On entering the hospital, at the moment when he left his mother, he shed some tears, but his grief was of short duration. He was placed near the women; the novelty of his situation appeared to be agreeable to him; each object excited his curiosity, without fixing his attention; constantly in a turbulent agitation, he was ever traversing the apartments of the house. His manner of conducting with the other patients had something in it rude and insolent; sometimes he gave them kicks, sometimes he made a thousand grimaces or spit in their faces. As soon as the guard appeared, he ceased his pranks and promised to be more tranquil. In vain did they try several times to make him understand the importance of truth: he could never be made to confess the faults he had committed; he always avoided the trouble by some falsehood. In a very short time he gained great skill in the art of mimicry; he practised himself in mimicking the sick in their paroxysms of derangement, and particularly those who were shut up, because he could do it with impunity.

"In the space of three months he made progress in knowledge, but he borrowed his language from all those who swore or made use of obscene expressions. It was in vain, that they attempted several times to teach him the alphabet. The lessons displeased him continually, and nothing could stimulate him, whether they employed gentleness or made use of violence; he could not fix his attention long on the same object, though he could learn and retain the names of arbitrary characters.

"At the age of thirteen years he had grown much,

and enjoyed good health. He immediately recognised Mr. Haslam, and repeated to him the words *school, Moorfields, bad medicine.* At this period he had made comparatively great progress in language. He knew the names of common things, and could pronounce and point exactly the name of the street, and the number of the house, where he lived. Having contracted at the hospital the custom of making use of a vessel for his natural wants, he obstinately preserved it. His disgusting filthiness went so far, as to soil his own room with all sorts of excrements. It was always with extreme pleasure, that he saw other children give themselves up to any excesses in their sports. Incapable of uniting himself with them, he took no part in their recreations. When he was calm and in his natural state, he appeared to love his mother tenderly; he was often seen even to caress her: but in his paroxysms of mania, his heart was closed against fear and tenderness. Twice he threw his knife at her. Every bright object fixed his attention, but more particularly the sight of soldiers and warlike music, of which he so well knew how to retain the notes, that he whistled them correctly. His phrases were short, and he never employed particles to unite them; he always spoke of himself in the third person, and never made use of pronouns. His attention was never awakened, except by strong tones, or striking causes; to ordinary things he was insensible.

"In the month of July, 1803, I was consulted for a boy of ten years, who had been sent here accompanied by a young man of gentle manners, charged with his superintendence. The parents of the child did not recollect, that any member of the family had ever experienced any mental affection. This child at the age of two years became so wilful and intractable, that they were obliged to banish him from the house of his father, and sent him to his aunt. There they satisfied all his desires, but he did not correct himself, and, at his ninth year, had become an obstinate and

capricious child, the plague of his family. At this period, by the advice of a physician, he was placed under the care of a stranger, and a different system of treatment was adopted. His superintendent was advised to correct him for every fault that he committed. He then refused to dress or undress himself, though he was still capable of it. If his hands were free, he tore his clothes, broke every thing which surrounded him, or which he could reach; and often refused to take any kind of nourishment. Constantly in opposition to the advice which was given him, he answered only by caprice to the questions, which were addressed him. For several months his superintendent treated him as had been agreed on, perhaps, however, not using all the severity which had been recommended; for, it is to be presumed, that, after some instances of severity, the voice of humanity prevailed over the orders of the physician. When the child became the subject of my observation, he enjoyed good health, and his head was well formed. Several distinguished anatomists, to whom he was presented, concurred in this opinion. His tongue, though excessively thick, did not prevent his articulating words very distinctly. His physiognomy evidently betrayed idiocy: he was of small stature, but strongly made; his soft and clear skin was destitute of sensibility. He bore the whip and the cane, manifesting less sensibility than other children. His pulse was natural, and his bowels regular. He had a good appetite without voracity. He could bear the privation of food for a long time without complaining. He appeared to need much sleep.

"Almost insensible to pleasure, he could, nevertheless, render a sufficiently exact account of what was agreeable to him. As he could not bring to any subject a sustained attention, and his attention could be excited only by lively and deep impressions, it may well be supposed, that he had not learned the letters of the alphabet, and still less, the art of copying them.

Several times they tried to send him to school, but he could never raise any favorable expectations in the masters, to whom he was intrusted, although they were distinguished for their patience and the vigor of their discipline. We may conclude, therefore, that under the discipline of the schools, he had derived all the benefit which could result to him from privations of every kind, and the most severe corrections.

"At our first interview he found means, in the space of three or four minutes, to break a square of glass and to tear the bosom of my shirt. Sworn enemy of all frail vessels, he broke all those which came within his reach. During his walks in the street, his superintendent took the precaution to place himself inside of him, for if he came within reach of windows, he broke the glasses, though so adroitly, that he never wounded himself. It was not without experiencing extreme joy, that he tore the lace and the most elegant fabrics of women; finally he scarce ever went out without turning to profit some occasion of satisfying his destructive propensities.

"Incapable of attaching himself to any feeble animals, far from having for any of them the friendship, which children usually lavish on them, he treated them with savage ferocity. An oppressor of every feeble being, he avoided those whose strength he feared. Having convinced himself of the superiority which he had over his cat, he tore out her whiskers with inconceivable barbarity, whenever she approached him; and, to render his own expression, said, 'I must tear out her beard.' When he had thus tortured her, he threw her into the fire, or out of the window. If a little dog approached him he kicked him away; if he happened to be large, he did not look at him. The sports of childhood had no attraction for him; and accordingly he took no part in them. Ignorant of the ties of friendship, he treated all children, without distinction of sex, with the same cruelty, and would have bitten or struck a girl, as soon as he would a boy.

Insensible to the marks of interest which were lavished on him, if an orange was given him, or any fruit, he received it as a favor, and threw it in the face of his benefactor.

"He appeared endowed with a kind of attachment to his guardian. If he went out of the apartment, or pretended to wish to leave it, he uttered cries, saying, 'What will become of me if he leaves me. I love him because he carries the cane which makes me a good boy.' In spite of these protestations, his preceptor often declared the intention of ceasing his superintendence when he should become older, persuaded, that he would kill him, when he found the means and the occasion.

"Sensible of his disease, he was often heard to express the desire of dying. 'God,' he said, 'had not made him like other children.' If he was irritated, he manifested a desire to destroy himself. Being led one day to the asylum at Bethlehem, when they showed him a subject more turbulent than the rest, and more closely confined, he was heard to say with emotion; 'Here is a place which would suit me wonderfully well.' We shall omit a number of other details, for which we refer to the work of Mr. Haslam."

These really curious facts, which cannot be accounted for, on the common principles of philosophy, may readily be explained by our *physiology of the brain.* In fact, some idiots are gentle and others malicious; and this is a rule common to all beings. In idiots, some of their faculties are capable of being developed with extraordinary rapidity, while others, on the contrary, may be, so to speak, annihilated; and, as attention is the result of the activity of the faculties, it is possible, that this attention may be developed in some respects, and remain dormant in others. The second child, of whom Mr. Haslam speaks, directed his attention towards all the objects, which could satisfy his destructive propensity, and remained insensible to the

pleasures of friendship and to the sufferings of other creatures. Malicious idiots are not very rare; and Dr. Halleran speaks also of several idiot children who, he was assured, had this propensity from their birth, and who, since they have been subjected to his observations, have continued to give unequivocal evidence of derangement.

The automatic functions, of complete or incomplete idiots from birth, are often without energy, and operate with more or less pain, especially as it concerns the functions of the intestines; still those of automatic life are altogether natural, and often operate with vigor.

Complete idiots are rare in comparison with the incomplete; and among these last, there are a thousand different degrees. The natural language always announces the degree of idiocy. The most idiotic are remarkable for the stupidity of their physiognomy; they habitually gape, the saliva continually escapes from their mouths; they have a silly look, and turn their head from side to side continually. The characteristic traits of incomplete idiots are a vague and wandering look, which nothing can fix, a continual agitation, and an absolute impossibility of collecting their ideas, or of combining the impressions which they experience; but, in proportion as their intelligence is developed, their language becomes clear, and has more sense and expression.

Natural History of Benevolence and Docility in Animals.

There is a great difference in animals, both as respects species and individuals, in regard to benevolence and docility of character. Some species and some individuals have naturally a good and gentle character; others are malicious, and on all occasions bite, kick, butt, and strike with the horns. The chamois has not so gentle a character as the goat and the

sheep; the tiger is more cruel than the lion; the hyena, more to be feared than the wolf; the wolf, more than the dog; the angora cat is more gentle than the common cat. And among monkeys, what malice exists in the baboons, and what gentleness of character, in the ourang-outang and several varieties of apes! The same difference is manifest in birds. The speckled hen (pintada) is much more malicious than the hen of our farm-yards; the cuckoo, though destitute of weapons, becomes very malicious as soon as he is irritated. There are varieties of parrots which we cannot by any means keep from biting; there are others, which caress every body, and always wish to be caressed.

Let us now extend our comparisons to individuals of the same species. Who does not know bulls, cows, oxen, sheep, goats, dogs, cats, cocks, extremely mischievous, without our being able to attribute their wickedness to any external circumstances, as education, &c.? I have already spoken of two of my dogs, of whom one was as good as the other was wicked. They came from a litter of five pups. Before their eyes were opened, I remarked in them a very different conduct: one, when you took him in your hands, testified by his motions, that he was pleased; the other growled, cried, and resisted till he was restored to his place. Hardly were they fifteen days old, when one testified by the movements of his tail his contentment and good will, not only to the other little dogs, but to all persons who approached him. The other, on the contrary, growled without ceasing, and bit whatever came in his way. From that time, I attentively observed these two animals. As I was not ignorant, that men attribute such differences of character to education, I charged all those who habitually approached these dogs, to lavish caresses on both of them equally. I took all imaginable pains to soften the character of my little wicked one; but nothing could change him; he even bit his mother, if she disturbed him ever so little. In their sixth month,

they were attacked with disease, and gently as both were treated, the wicked one did not cease to growl until his death, and to bite whatever approached him. The other, on the contrary, did not cease to his last moment, to show marks of attachment and gratitude to all who took care of him. Even my domestics were extremely struck with the difference of manner in these two dogs. All persons who have raised canary birds, must have remarked that, in the same covey, there are found some of a malicious and fretful character, and others, who are kind and gentle.

It is wrong to say, that nothing but the element of goodness exists in animals, and that this sentiment in them is limited to a passive gentleness. It is certain, that many animals are so controlled by this instinct, that they even risk their life to aid each other, when in the most imminent dangers. Swine, monkeys, dogs, several maritime animals, several species of birds, lend each other mutual assistance, and warn each other of danger by cries of alarm. Dupont de Nemours relates the following fact: "I saw a swallow," says he, "who had unhappily caught her claw in the running knot of a cord, the other end of which held to a gutter of the college of the Four Nations. Her strength being exhausted; she hung and cried at the end of the cord, which she sometimes lifted in attempting to fly away. All the swallows of the valley between the Tuilleries and the Pont-neuf, and perhaps some from a greater distance, had collected to the number of several thousands. They came in a cloud, uttering the cry of alarm and pity. After a long hesitation and a tumultuous council, one of them hit upon the means of delivering their companion, communicated it to others, and commenced the execution. They took their position; those who were nearest flew by, (as in the game, *running at the ring*,) pecking at the string as they passed. These blows, directed to the same point, succeeded from second to second, and even more rapidly. An half-hour's labor suf-

ficed to cut the cord, and set the prisoner at liberty. But the flock, only a little thinned, remained until night, still twittering, but without anxiety, as if addressing to each other their mutual congratulations."

I have observed a similar fact. A bee was caught in a spider's web stretched near the hive. Immediately several bees threw themselves on the web and on the prisoner, until their unfortunate companion was released. A thousand examples prove that animals practise arts of compassion, and of the most active benevolence, not only towards their fellows, but also towards mankind. Do we not every day see dogs throw themselves into the water, to save persons who are in danger of drowning, and attack robbers with fury in order to preserve the lives of their masters? It would not be difficult even to prove, that several species of animals are furnished, to a certain degree, with a moral sense, with a sentiment of justice and injustice. Elephants, dogs, horses, monkeys, offer frequent examples of this, as well in their conduct to their fellows, as in that towards men.

External Development of the Organ of Benevolence in Animals.

This organ has its seat, in animals, as well as in man, on the median line in the superior anterior region of the upper part of the frontal bone; it likewise forms in them a lengthened protuberance from before backwards. But we must not forget that the anterior superior part of the forehead is wanting in animals; which causes their foreheads to be much shorter then that of man. Besides, as I have said elsewhere, this superior anterior part in many animals, has a different direction from that in man. In the horse and the ox, in general in all animals who carry the head so that the mouth is directed downwards, the superior part of the frontal bone is directed forwards; which causes us to call it the forehead; but

in fact it is the part, which in man corresponds to the superior anterior part of the head. By placing a horse's head on a table, one may easily convince himself, that what in him is called the forehead, is only the superior part of the head. In animals who carry their head like man, in such a manner, that the mouth is in front, the organ of goodness is situated as in our species.

Examine the region alluded to of the head or of the cranium of animals, who are distinguished, either by the savageness or the gentleness of their character, you will find it much more level in the tiger than in the lion; in the hyena and in the wolf, much more level than in the dog; in the common cat, more level than in the angora cat; absolutely flat and depressed below the level of the eyes in baboons. (Pl. LXVII. fig. 1. and 2.) You will see it, on the contrary, prominent in the ourang-outang, (Pl. LXXIX. fig. 4,) and in all the species of monkeys of a gentle character, (fig. 1, 2, 3.) When I see a forehead thus formed in a monkey, I do not hesitate to approach him.

A collection of heads of different individuals of animals of the same species, collected with reference to the benevolence or wickedness of their character, or the close observation of living animals made with the same purpose, furnishes undeniable evidence of the truth of what I advance. The adversaries of organology are as little disposed to form a collection, as to make observations; still, so long as they will not adopt this course, their objections will have no weight. It is only facts, such as nature offers, which are decisive.

Since a collection, such as I have indicated, may be of the greatest utility, even for economy both domestic and rural, I will give the reader some directions about it.

In the horse, the organ of benevolence is placed in the middle of what is called the forehead, three fingers breadth above the eyes. When this region is sunken

or retreating, we may be sure that the horse is vicious, unsafe, and disposed to bite and kick. (Pl. LXIV. fig. 1.) Gentle, docile, good horses, on the contrary, have this region on a level with the eyes, or even prominent, (fig. 2.) I have made thousands of observations on this subject, and have never found an exception.

Jockeys have another mark by which they distinguish the character of the horse. A gentle and docile horse stands with confidence, however spirited he may be in other respects, with his fore feet perpendicular, and the eye directed in such a manner, that we cannot see the white of the ball. A vicious horse, on the contrary, takes a position which indicates distrust; he places his fore-feet a little obliquely forward; when his conformation permits, he holds his head raised and a little retreating backwards; the direction of his eyes is consantly such, that a part of the white is visible. These signs are just; but they are not the organic cause of the good or bad character of the animal; they constitute only its representative.

I requested Col. Henry, director of the stables of the military school, to procure me two heads, one of a horse remarkably docile and good, the other of a horse remarkably vicious. The Colonel had the politeness soon to oblige me. Neither Mr. Henry nor the assistant veterinary surgeon saw any marked difference in the two heads; yet in my lectures they serve to demonstrate the character of the two opposite organizations. In that of the docile horse the region referred to, is arched nearly an inch higher than in that of the other.

A coachman at Neuilly bought, at a low price, a horse, which no one could use because of his extreme viciousness; but he was an excellent courser. In the first week, he bit off from his driver two fingers and an ear. This man hoped to correct the horse by beating him severely; but chastisement only rendered him still more mischievous; he therefore resolved to treat

him with gentleness; this plan succeeded to a certain degree. The region indicated is much depressed in this horse, and the same conformation will be found in all those, to whom we are obliged to apply muzzles to prevent their biting.

If, besides the characters which I have just described, is added, that the two ears are close together, the horses are at the same time skittish and vicious. (Pl. LXIV. fig. 1.) It is of these that we should be particularly careful; those that are mild, but good, are less dangerous.

The excellent princess of Schwartzenberg, who met so tragical an end at Paris, one day conducted me into her stables at Vienna, and begged me to point out to her, according to my organological discoveries, which of the thirty horses which were there, was the most gentle. The one which I pointed out was found to be the saddle horse of the princess herself; he had been reserved for this service on account of his extreme gentleness.

At Berlin, at the stables of M. de Beyme, the minister of state, M. Spurzheim and myself pointed out, among forty cows, those that were most vicious.

M. the Marquis de Boisgelin presented me with the head of a tame wolf, which, from its birth, had been remarkable for his gentleness. Even at the moment when he was set at bay by sending him out with the hounds, he licked his master's hand, as if to implore his pity. In the region above described, his head is much more prominent, than that of wolves generally.

The heads of the two dogs, of which I have spoken, are distinguished by the same characteristics as the heads of the two horses first mentioned. One is prominent in the anterior part; in the other, there is, on the contrary, a depression in the same region. One may infallibly distinguish, by this sign, between a snarling dog and a gentle one. Snarling dogs, especially when more than a year old, always exhibit a lengthened

depression in the middle of the anterior superior part of the head, which in other respects is flat. (Pl. LXX. fig. 4.) Good dogs on the contrary, have this region prominent, and the anterior superior part of their head especially is much rounder. (fig. 3.)

I possess a considerable collection of crania of dogs. The formation of each of these has confirmed the observations, which I had made on the living animal; but I would here observe, that we must not confound ill-humored dogs with vicious ones. There are dogs who always seek to fight, who growl continually, but never bite; there are among men similar characters; benevolent tormentors. What appears at the first glance to be malice, is a restive, odd, and testy humor, rather than malice, strictly speaking; traits by which Xenophon has characterized Xantippe: all my numerous heads of cats, whose dispositions I have known in regard to gentleness or viciousness, confirm my observation. The heads of the vicious cats are always much more depressed and flattened in the anterior superior region, than those of cats of a mild, social character.

At the king's garden, we made observations in this respect on the tiger, the panther, the hyena, and on wild animals of various species, which are perfectly satisfactory. Those animals, which have the region alluded to the most depressed, are always the most wicked, and the most intractable. Compare the head of the Indian hog possessed of a very gentle nature, (Pl. LXVI. fig. 6,) with that of the wicked hamster, (fig. 7;) the head of the latter is so much depressed, that it seems to be broken.

The brown bear has the head much more elevated than the extremely ferocious and savage white bear. Among pigeons, the most vicious columba nicobatica, crested pigeon, has the most flattened head.

Amphibious animals, crocodiles for example, as well as ravenous fishes, such as the pike and the shark; the eagle, (Pl. LXIV fig. 11,) the falcon, the chamois

(Pl. LXXIII. fig. 1.) have this region sometimes flat, sometimes depressed. The sheep, the goat, the roebuck, (Pl. LXV. fig. 3 and 4,) on the contrary, have it swelled into a lengthened protuberance.

In the cock, the canary bird, and many other species, whose character I have long observed, this fact is likewise confirmed. This character may generally be referred to for all animals, in which the internal table of the frontal bone is parallel to the external, as in the horse, the monkey, the dog, and several species of birds. It is otherwise when the internal table of bone diverges from the external. It is therefore necessary to know the structure of the cranial bones in the species, on which one wishes to pass judgment. In the elephant, the hog, &c., we cannot infer from the contour of the cranium, the form of the brain. In the bull and the cow, the internal table diverges indeed from the external, but they are parallel in the region where the organ of benevolence is placed; on that account, when a bull or a cow has this region depressed, we may conclude, that they are mischievous, and that they are gentle, when this region is flat or even prominent. The same thing takes place in cats.

What I have said above explains, why the character of animals, that have received the same education, and been placed in the same circumstances, may yet totally differ. The reason of this difference is not such as we have seen it in external objects; it depends on a peculiar cerebral part, of which the greater or less development does not itself depend on external circumstances, but on a law of original organization, which is still unknown to us.

XXV. *Faculty of Imitation, Mimicry.*

History of the Discovery.

When I was talking with one of my friends, respecting the forms of the head, he assured me, that his own had a very peculiar one. He then directed my hand to the anterior superior part of his head; I found this region considerably bulging; and behind the protuberance, a depression, a cavity, which descended on each side, towards the ear. At this period, I had not observed this conformation. This man had a peculiar talent for imitation. He imitated in so striking a manner the gait, the gestures, the sound of the voice, &c., that the person was immediately recognised. I hastened to the institution for the deaf and dumb, to examine the head of the pupil Casteigner, who had been received into the establishment six weeks previous, and who, from the first, had fixed our attention by his prodigious talent for imitation. On Shrove Tuesday, when a little theatrical piece is usually represented in the establishment, he had imitated so perfectly the gesture, the gait, &c., of the director, inspector, physician, and surgeon of the establishment, and especially of some women that it was impossible to mistake; a scene, which amused the more, as nothing like it was expected from a boy, whose education had been absolutely neglected. To my great astonishment, I found in him the superior anterior part of the head, as prominent as in my friend Annibal.

Can the talent for imitation, I asked myself, be dependent on a peculiar organ? and I sought opportunities for multiplying my observations. I visited families, schools, &c., and examined the heads of individuals, who possessed the talent for imitation in an eminent degree. At this period, M. Maix, secretary to the minister of war, had gained great reputation by several parts, which he played in a private

theatre. I found in him the region of the frontal bone alluded to, as prominent as in Casteigner, and Annibal. In all the other persons, whom I examined, I likewise found this region more or less prominent, according as they were endowed with the talent of imitation to a greater or less degree. They relate of Garrick, that he possessed a faculty of imitation so astonishing, that he forgot nothing of the retinue of the court, composed of Louis XV., the duke d'Aumont, the duke d'Orleans, of MM. Aumont, Brissac, Richelieu, the Prince of Soubise, &c. All these personages, whom he saw but once passing by, were fixed in his memory. He invited to supper the friends, who had accompanied him; Garrick, impatient to amuse his frieuds, says to them: "I have seen the court only an instant, but I am going to prove to you the accuracy of my eye, and the excellence of my memory." He then arranges his friends in two lines, goes out, and an instant after returns to the parlor. All the spectators exclaimed, "There is the king; there is Louis XV.!" He imitated in succession all the personages at the court; they were all recognised. Not only had he imitated their gait, their walk, their figure, but even the lines and the character of their physiognomy. I soon perceived, that this faculty must constitute a considerable portion of the talent of the comedian. I therefore examined the heads of the best actors which we then had; Müler, Lange, Brockmann, Schræder, Baumann, Koch, and his daughter, &c. In all I found the region alluded to prominent. I procured the head of Jünger, the poet and comedian. His cranium serves me now for demonstrating the organ of imitation.

In our travels, M. Spurzheim and myself found the same organization in all the great comedians, that we had occasion to examine; in Ifland, Madame Bethmann, Nagelman at Berlin; in Ochsenheimer at Leipsig; in Kruys at Amsterdam; Madame Brede at Bremen; Manteufel, Talma, &c.

Examine the portraits of the great comedians, that

have the region of the head alluded to, bald, and you will see, that it is very prominent; as in Shakspeare, (Pl. XCIII. fig. 3,) and Müler, (fig. 4;) or even when this region is covered with hair, the hair forms a tuft which rises perpendicularly, by reason of the protuberance on which it grows, as in Lekain and Garrick. In others we remark distinctly, that the superior part of the frontal is prominent, as in Clairon, Boran, Molière, Corneille, Pylade, Préville, Siddons, Eckoff, Molé, Messrs. Fleury and Larive, &c.

In the house of correction at Munich we saw a thief, who had this organ rather developed. I told him, that he was a comedian; surprised by this discovery, he confessed, that he had for some time made part of a strolling company. In the establishment they were entirely ignorant of this circumstance, which, until that time, he had carefully concealed. Since then I have so greatly multiplied these observations, that I think myself authorized to admit, that the talent of imitation, the talent of mimicry, that is to say, the faculty of personifying, in some measure, ideas and sentiments, of representing them with justice by gestures, is a proper fundamental faculty, which is dependent on a particular organ. This organ contributes without question to make of the poet, a dramatic poet, such as Terence, Shakspeare, Corneille, Molière, Voltaire, &c. There is no doubt, that it is to this organ, that we are indebted for comedy.

This talent for imitation will manifest itself with so much the more energy and extent, as it is accompanied with a greater vivacity of feeling, and a greater number of other distinguished faculties. The variety of other organs, which accompany that of imitation, constitutes the difference in actors. The parts of waiting-maids, valets, simpletons, buffoons, fops, lovers coquettes, tyrants, sharpers, demand, each a peculiar energetic disposition. And if an actor is equally great in opposite parts, we must conclude, either that he has a complicated talent, or, that he is indebted rather to study, than to nature, for his success.

Confirmation of the Existence of the Fundamental Faculty of Imitation, and of its Particular Organ.

Most of the great comedians were originally destined to a different employment, but have withdrawn themselves from their primary destination, to devote themselves to this art, toward which they were drawn by an unconquerable passion. Garrick quitted the counting-room of a merchant, to join a company of strolling players; Lekain was first occupied in making surgical instruments; Clairon, born of a poor cook, and not disposed to follow the career of her mother, embraced the theatrical profession. Molière, son of a valet-de-chambre, upholsterer of the king, left his trade, feeling himself drawn by an irresistible passion to the theatre. Corneille was destined to the bar.

This talent is often manifested in a very active manner from the most tender age, and at a period when the other faculties are by no means developed. William Henry West Betty was fourteen years old, and had yet received no instruction in acting or in declamation; when he appeared in public for the first time, he had never seen but a single representation; he had seen the death of Rolla played in a small town. Jackson, the manager of the Edinburgh theatre, asserted, that he had never seen his equal. West Betty was often playing in the streets with the boot-blacks, and they were obliged to go and seek him in the midst of them, to make him appear on the stage. The faculty of imitation is exercised sometimes even in idiots and madmen. "A young idiot," says M. Pinel, "whom I have long had under my eye, has the most marked and irresistible inclination to imitate all that she sees done in her presence; she repeats mechanically all that she hears said, and imitates with the greatest fidelity the gestures and actions of others, without much regard to propriety. I would refer here to the

history, which I have already quoted from Mr. Haslam, of the malicious idiot, who, a short time after he was received at the hospital, showed a great talent for counterfeiting the insane.

Cabanis reports the history of a man, so restless, that he was forced to repeat all the movements and attitudes of which he was a witness. "If he was prevented from yielding to this impulse, either by seizing his limbs or by making him take contrary attitudes, he experienced insupportable agony; here," adds Cabanis, "as we see, the faculty of imitation is carried to the extent of disease."

All the phenomena, which I have related, are inexplicable, unless we admit, that the imitative talent is a fundamental faculty.

This organ is in general more useful, than it appeared at the first glance. It is of great use to the orator, inasmuch as it animates his discourses by just declamation, and by accompanying them with gestures appropriate to his words.

But, it is especially in the arts of design, that this faculty is important. It is that, which gives expression and life to the works of art. I have already said, that I have found the organ of imitation extremely developed in the cranium of Raphael, who, in regard to expression, holds the first rank among painters. I find it likewise very decided in Dominichino, in Rubens, Poussin, Lesueur, who distinguish themselves particularly by the force of expression.

I know several persons, women especially, who have the talent of imitation to a very high degree, and who are never more happy, than when an occasion presents itself for masking. It is the same with children thus organized, who are usually the mimics of the family.

I have even observed in monkeys, a singular propensity to disguise themselves. One of my monkeys, a male ape, had no greater pleasure than to throw a

towel over his head, and then spring thus muffled on his female, or on persons whom he wished to terrify.

External Development of the Organ of Imitation.

It is to be remarked, that the organ of imitation does not always manifest itself under the same form. In most cases, it forms a prominence in the shape of the segment of a sphere, a little higher than the organ of benevolence. But sometimes, also, it forms two lengthened prominences, which extend from before backward, placed by the side of the organ of benevolence. The cause of this difference is as follows.

By the side of the two convolutions, which constitute the organ of benevolence, are found placed the two convolutions XXVI., Pl. VIII. IX. X. As the two last are very near the two first, they elevate all the middle of the superior anterior region like an arch, or segment of a circle ; this happens especially when the organ of benevolence has not acquired any considerable development. Generally, the organ of imitation is distinguished from that of benevolence, inasmuch as it is placed a little higher, and has a more rounded form. Yet, as I have just said, it also happens, that the last, by a great development of the convolutions which constitute it, presents itself under the form of two prominences; probably because the two convolutions are more distant.

Of Visions.

Certain persons have apparitions of the dead or absent. How happens it, that frequently men of much intellect believe in the reality of ghosts and visions? Are these visionaries, fools; or, are they impostors? Is there a peculiar organization in man, which thus deceives? How can this deception be explained?

Let us commence by giving the facts.

Socrates used often and very willingly to speak to his disciples, of a demon or genius, which he pretended served him as a guide. What was this familiar demon, this divine voice, this spirit, which answered constantly, when he consulted it? I know well how persons, who do not understand the peculiar organization of which I am going to speak, explain this genius: "It was nothing but the force and justice of his judgment," &c. But what reasons could Socrates have for imposing on his disciples? Even in his defence, he still expresses himself in an enigmatical manner. "As to the particular genius, of which I hear the inspiration, it is not a new divinity, it is the eternal instict, the eternal genius of morals. To guide themselves, some consult sybils, others, the flight of birds, others, the hearts of victims. For myself, I consult my own heart; I question my conscience; I converse in secret with the spirit which animates me." These words, if you wish it, prove that he was persuaded, that his genius dwelt in himself, but by no means that he had confidence in any thing but the soundness of his own judgment. Besides, he tried to justify himself, also, for not admitting the divinities of Athens. If Socrates himself had not believed in this genius, the generally diffused opinion, that he had one, would have been lost after twenty-three years, when Aristophanes made it a subject of ridicule, and this genius would not have been reproduced among the points of accusation.

Nicolas Gabrino, (Rienzi,) as well as Cromwell, is quoted for a hypocritical impostor, making religion serve as a cloak to his designs, and putting in operation revelations and visions, in order to gain authority from them. I every day hear similar charges made by persons, who do not reflect that others, with the best faith in the world, may have different sensations, impressions, sentiments, from themselves, and consequently, believe in something different from the objects of their own faith.

Joan of Arc was still in the flower of her age, when, with a disposition of mind already exalted by preceding circumstances, she imagined, that she saw on her right, and from the side of the village church, a great light, whence proceeded an unknown voice. Some time afterward, the same voice was heard, and celestial beings offered themselves to her observation. St. Michael said to her, that God had taken pity on France, and ordered her to go and raise the siege of Orleans, and then have king Charles VII. consecrated at Rheims. Her visions induced her parents to present her to Baudricourt de Vaucouleurs. . . . . .

The Jesuits Maffey and Bouhours certainly were right in attributing visions to St. Ignatius.

Tasso pretended one day to have been cured by the aid of the holy virgin, and of saint Scholastica, who appeared to him during a violent paroxysm of fever. In the historical notes, which accompany the life of Tasso, we read the following anecdote taken from the memoirs of Manso, marquis of Villa, published after the death of his friend Tasso.

"Tasso, in his delirium, thought he conversed with familiar spirits. One day, that his friend the marquis tried to get this idea out of his head, Tasso said to him:

"'Since I cannot convince you by reasoning, I will convince you by your own experience: you shall see the vision in which you will not believe.'

"I accepted the offer, and next day, while we were sitting, talking near the fire, he turned his eyes toward the window; and looking fixedly, appeared so much absorbed, that, when I called him, he did not answer. 'There it is,' said he, at length, 'that familiar spirit which does me the favor to come and talk with me.' I looked with all attention, and saw nothing pass into the room. During this time, Tasso entered into conversation with this mysterious being. I saw and heard Tasso only. Sometimes he questioned; sometimes he answered; and by the sense of his

answer, I comprehended what he had heard. His discourse was so sublime in its subject, so lofty in its expressions, that I felt a sort of ecstasy. I dared not interrupt Tasso, or address him any questions on what I did not see, and it was a long time before the spirit disappeared. I was informed of this event by Tasso, who, turning towards me, said: 'In future you will have no doubt.' That is, said I, I shall have more than ever, for though I heard many marvellous things, I saw nothing whatever. He replied, smiling: 'You have perhaps heard and seen more than' — He stopped there, and fearing to importune him by questions, I let the conversation drop."

Swedenburg thought himself miraculously called to reveal to the world the most hidden mysteries. "In 1743," says he, "it pleased the Lord to manifest himself to me, and to appear to me personally, to give me knowledge of the spiritual world, and to put me in relation with angels and spirits, and this power has been continued to me until this evening." Swedenburg, say the authors of the English Biography, was the most sincere man in the world, the most extravagant of enthusiasts; an opinion in which I fully concur.

Doctor Jung Stilling, whom we saw very often at the late grand duke of Baden's, was in his youth, a tailor, then an instructer, afterward doctor of medicine, moralist, religious writer, journalist, illuminati, visionary. He believed firmly in ghosts, and wrote a work in which he seriously lays open his doctrine. We shall see, in regard to this man, that his whole life bears the impress of his organization.

I have already spoken above of the fanatic, who was pointed out to us in the house of correction, at Berne. Hardly had I seen him descend the stairs, when I exclaimed, they are bringing me a visionary. He was the same, to whom Jesus Christ appeared in the midst of a light, as brilliant as if it had been

formed by many thousand suns, to reveal to him the true religion.

A man, who is admitted into the best society at Paris, wished to know my opinion of his head. The only thing I told him at the first view, was, that he sometimes had visions, and that he believed in ghosts. He leaped from his chair in astonishment, and told me, that he often had visions, but that, until this moment he had never spoken of it to any one, for fear of being thought over credulous. I said to the physician, Dr. W., that I saw by the form of his head, that he had a great propensity for the marvellous, and the supernatural. "For this time," he answered, "you are mistaken, my dear Doctor, for I have a rule for myself, never to admit any thing as true, which is not mathematically proved." After having conversed with him on several subjects of science, I turned the conversation to animal magnetism, which appeared to me a very proper test, by which to appreciate the mathematical rigor of my estimable brother. He became very animated, and again assured me, that he regarded nothing as true but what was mathematically demonstrated; but that he was convinced, that a spiritual being acted in magnetism, and that this being acted at great distances; that there was not, in fact, any distance which was capable of preventing his action; and that by reason of this, he could sympathize with persons placed in any part whatever of the world; "it is the same cause," he continued, "which produces apparitions. Apparitions and visions are indeed rare; but they undoubtedly exist; and I well know the laws, according to which they take place." I said to myself: Here organology has not been at fault.

I have also spoken above of one Hallerau, of Vienna. This man was constantly accompanied by his familiar genius; he saw him and conversed with him. When he had reached his sixtieth year, it seemed that his genius wished to quit him. There

were afterward only certain days in the month, when he had the good fortune to see him.

I knew at Gersbach, near Durlach, in the Grand Duchy of Baden, a curate, who was put in durance because he had likewise a familiar spirit. There is at Manheim, a man, who always thinks himself accompanied by several spirits. Sometimes they walk by the side of him, in visible forms; at other times, they accompany him only under ground. Pinel speaks of a very dangerous maniac, who was calm only during the day; but who, during the night, believed himself always surrounded by ghosts and phantoms; who converses in turn with good and evil angels, and who according to the character of his visions, is benevolent or dangerous, inclined to acts of kindness or to acts of barbarous cruelty.

History, both ancient and modern, furnishes a great number of examples of the same kind.

If it be ridiculous to admit the reality of apparitions, demons, and familiar spirits, it is also unjust to accuse of imposture, those who pretend to have had them. There are few persons in whom one can suppose address and wickedness enough, to counterfeit fraudulently those phenomena, which the observer alone knows in all their shades. I shall show, that these men are the sport of too energetic an activity of a part of the brain.

Organization which Disposes to Visions.

In the first fanatic whom I saw, I was struck with the rounded prominence of the superior part of the frontal bone. This prominence does not form in the middle of the head a lengthened protuberance, as the organ of benevolence; neither is it the elliptic protuberance of imitation. Here all the part of the frontal bone is prominent in the form of the segment of a sphere.

Between convolutions XXV. which constitutes poetical talent, and XXVI. formed by that of imitation, is placed another convolution, Pl. VIII. IX. X. of which the considerable development involves probably the disposition to visions. Does this convolution make part of the organ of imitation, and does its excessive development exalt the talent for imitation, so as to cause it to give to ideas of its own creation, an external existence, and make them appear as coming to us from without? Or does this convolution at the same time make part both of poetry and imitation? Or, in fine, does it constitute a particular organ? This is what further researches alone will be able to decide.

As it is very possible that visions are only the blended result of an exalted action of one of those two organs, or of the two together, I have not thought it necessary to consider it as a particular organ.

Now let the reader examine the heads of all those persons who, without being attacked with a mental malady, were peculiarly disposed to visions. Let him compare the portraits and the busts of Socrates, Pl. XCII. fig. 1; of Gabrino, Pl. XCIII. fig. 5; of Joan of Arc, of St. Ignatius, fig. 6; of Tasso, fig. 7; of Cromwell, Pl. XCV. fig. 4; of Swedenburg, &c.; the same organization, which they there remark, is found likewise in Jung Stilling, in Hallerau, in M. de F., and in Dr. W.

Till now I have mentioned only facts, and in what I have said, have had nature alone for my guide. I shall now give an explanation, the value of which the reader will judge.

Explanation of Visions and Inspirations.

The explanation which I have given of dreams, Vol. II. p. 506, opens to us the way for the explanation of visions and inspirations. During dreams, all that we see, all that we hear, as passing in the external

world, is in fact passing within us. The furious horses and the carriage, with which we are thrown over a precipice, the torrent which sweeps away our child, is ourself. That, which in the state of waking, would be a lively impression, a clear idea, becomes, during sleep, the very object which produces the impression, which gives rise to the idea. It is thus, that the man who dreams, becomes for himself the most perfect comedian. The animal and the man during waking, have the faculty of distinguishing the impression and the idea from the external object, which produces it. This faculty is lost during sleep. Now, as we cannot have the consciousness of these objects as existing within us, by virtue of a law of nature, we place them without ourselves. In this sense, every dream is a vision, an apparition.

Whenever, in health or disease, the sentiments and ideas are produced with such rapidity and vivacity, that we cannot distinguish them from the objects which produce them, (in consequence of the laws of our sentiments and our ideas,) we give to them external existence, or personify them and have a vision.

When this extreme activity of the internal senses is temporary, when the person has time to recollect himself, when other feelings and other ideas come to weaken the first, when certain movements which are performed involuntarily, give a different course to the circulation of the blood, and recall us to ourselves, the vision or apparition disappears; we again distinguish the sentiment or the idea, from the object which produces it; the dream we had ceases when we wake. In this case, this state is a temporary alienation which, however, for the most part, leaves such an impression, that it is very difficult to undeceive persons who have had such visions. In certain persons, these visions are periodical, and take place usually at the periods of an accession of irritability, of hemorrhoids, of the menstrual discharge, &c.

In others this state is more durable, in proportion to

the duration of the excitement. An habitual nervous excitement, an exertion of mind too long continued and fixed on the same object, fasts, prolonged watchings, plethora, suffice to excite it. Nervous or plethoric persons, endowed with the organization in question, are usually those who pretend to have a familiar spirit. As they do not feel themselves ill, it is very evident, that they place in the external world, what really exists only in themselves. They are in the same predicament with madmen, who seem to embrace the object of their affection, to fight against robbers or against the devil. And as it is impossible to convince a maniac that he is insane, so also is it impossible to make a visionary understand, that he is deranged.

Now it would appear, that an extreme development of the convolutions, placed between the organ of imitation and that of poetry, disposes to this excessive irritability. And what is there in fact more analogous than the poetical talent and the talent for imitation, and the tendency to visions? I am not far from believing that the exaltation of the organ of propensity to religion contributes, at least in many cases, very much to visions. These visions explain, why all visionaries carry in their outward demeanour, the impress of sanctitude, exaltation, inspiration, something in fact more than human.

It appears, that inspirations must not always be referred to the same source. In many cases, they are only the effect of the irregular and involuntary activity of a single organ, by means of which man feels a violent impulse, which seems to him to act independently of himself, an impulse which he attributes to a force without himself, and which, on that account, he must regard as an inspiration, an order, a command received from elsewhere. We must pardon the ignorance and superstition which seek, in the impulse of beneficent spirits or malicious demons, what the naturalist finds in the vicious action of an over-irritated organ.

Visions are not rare in mania. "Nothing is more common in hospitals," says M. Pinel, "than the nightly or daily visions, experienced by certain women attacked with religious melancholy. One of them thinks she sees, during the night, the Holy Virgin descend into her cell in the form of tongues of fire. She asks to have an altar built there, to receive in a worthy manner the sovereign of heaven, who comes to converse with her and console her for her sufferings. Another woman of a cultivated mind, whom the events of the revolution have thrown into profound melancholy and a maniacal delirium, goes constantly to walk in the garden of the hospital, advances gravely with her eyes fixed towards heaven, thinks she sees Jesus Christ with all the celestial court, march in order of procession in the upper air, and warble songs accompanied by melodious sounds; she herself advances with a grave step to accompany the procession; she points it out, fully convinced of its reality as if the object itself struck her senses. She gives herself up to violent passion against all those, who would persuade her to the contrary." *

This would be the place to treat of animal magnetism; but as this singular subject would be too long an interruption of the exposition of the organs, I shall defer it to the sixth volume of the work.

XXVI. *God and Religion.*

God and religion have always been objects so important to man, that all, which can be said on this subject, seems exhausted. There are no ideas relative to these subjects, from the grossest superstition to atheism, which ignorance or the different sects of philosophy, have not tried either to accredit or to refute. According to certain philosophers, it is man, terrified by the great phenom-

* Of Mental Alienation, 2d, ed. p. 108, 109, § 122.

ena of nature, who has referred their cause to omnipotent beings; according to them, the doctrine of the existence of God is the work of human prudence, an artifice of legislators to lead the people by fear, imposture, and superstition. Interrogate the history of nations on the origin of their belief; there is not one, which does not boast a supernatural origin, a divine revelation of its religious mysteries.

Not wishing to treat this noble subject, except as a naturalist and physiologist, I shall limit myself to examining whether man, by means of his organization, has been prepared for belief in an independent intelligence, in a God, religious sentiments, and worship.

History of the Discovery of the Religious Sentiment, as a Fundamental Quality, and of its Organ.

There were ten children of us in the house of my father; my brothers and sisters and myself all received the same education, but our faculties and tendencies were very different. One of my brothers, from his infancy, had a strong tendency to devotion. His playthings were church vases, which he sculptured himself, copes and surplices, which he made with paper. He prayed God and said mass all day, and when he was obliged to miss service at church, he passed his time at the house, in ornamenting and gilding a crucifix of wood. My father had destined him to commerce, but he had an invincible aversion to the business of a merchant, because, he said, it forced one to lie. At the age of twenty-three years, he lost all patience; having lost all hope of pursuing his studies, he fled from the house and turned hermit. Five years after, he took orders, and, till his death, lived in exercises of devotion and penance.

I observed in schools, that, independently of other faculties, certain pupils had no susceptibility for receiving religious instruction, while others were very eager

for it. I had also remarked in all the classes, that those, who designed themselves for the ecclesiastical profession, were either studious, pious, decent young persons, or idle, indolent, and without talents; these last had no other intention than to be supported at the expense of their fellow citizens; the first, on the contrary, felt an inward call to the profession to which they aspired. This inclination was born in them, without its being known how, and without its being possible to attribute it to example, education, or surrounding objects. Most of these young persons devoted themselves to this career, contrary to the wishes of their parents and their instructers.

Afterwards, no sooner had some fundamental qualities or faculties fixed my attention, than I recalled the observations, which I had made in my infancy on myself and on my fellow pupils. I examined the form of the head of persons, who were distinguished by their devotion, for, I was then already persuaded, that the tendency to piety and to the exercises of devotion, is innate. I visited the churches of all sects, and devoted myself especially to observing the heads of those who prayed with most fervor, or, who were most absorbed in their pious contemplations.

I was first struck by the circumstance, that the most fervent devotees I had seen, were almost always bald. Yet, I asked myself, what can baldness have in common with devotion? Women are rarely bald, yet they are more devout than men. I soon observed, however, that bald heads often rise gradually to the top, and that it was precisely this form of head, which had first struck me. As soon as I was convinced by a considerable number of observations, that most devout persons have their heads so formed, I visited the monasteries and observed the monks, taking care to collect, at the same time, exact informatin in relation to their moral character. My observations were confirmed in those who performed the functions of preacher and confessor, but not always in the servants, as the butlers, cooks,

&c. I made the same investigation with regard to the heads of other ecclesiastics. I was especially struck with the difference of conformation, which existed among several ex-jesuits. All those, who applied themselves to the exercises of devotion, had the head greatly elevated toward the crown. I could therefore presume, that I had discovered the organization which disposes to devotion, and which gives birth to religious sentiments.

I have remarked, at the same time, that the portraits of ecclesiastics, known by their zeal in their religious functions, have always the head greatly raised in the crown.

The ancient artists represented high-priests and sacrificers, with venerable heads thus formed.

Before citing my last observations, which I have always continued to multiply, I will describe the natural history of the belief in God, and of the disposition to religious worship. I hope in this way to produce in my readers the conviction, that the sentiment of these two august objects, is inherent in our nature: that consequently, it is a fundamental sentiment, to which a part of the brain of man is particularly adapted.

Natural History of Man, in Relation to his Belief in God and his Propensity to Religion.

Every where and in all ages, man, urged by the feeling of his dependence upon every thing around him, is forced continually to acknowledge the limits of his strength, and to confess to himself, that his fate is controlled by a superior power. Hence the unanimous consent of all nations to adore a Supreme Being; hence a necessity, ever strongly felt, of recurring to Him, of honoring Him, and of rendering homage to His superiority.

Men necessarily formed to themselves very elevated

conceptions of the First of powers. The idea they necessarily formed, was that of a Being superior to all others, of a spirit diffused throughout the universe, which animates all, which sustains every thing by its presence, which is the principle of generation and production; it was the idea of a flame ever burning, of Omniscience whose providence watches without ceasing over all, and extends to all; in a word, of a Being to whom, by reason of his independence and his superiority, they had given different names, but always corresponding to some one of his infinite perfections, and which ever bore the character of that sovereign dominion, which belongs only to the Great Ruler of all things.

To this idea of the ancients, correspond perfectly those of the idolatrous nations which still exist; the terms of their language manifestly designate a Superior Being. It is not only cultivated nations, which have these marks of the knowledge of a First Cause, such as, among the Chinese, *Tien-Chu*, that is, Master of Heaven, and the *Xang-ti*, the sovereign emperor and sovereign master; among the Indians the *Kertar*, he who makes all things, and the *Serjenhar*, the creator of the world. Among the tribes of Peru, the *Pachacamac*, or the Supreme Being, and the *Viracocha*, which is the God, Creator. The same traces are likewise seen among all the nations, which pass for barbarians. Generally, all those of America, whether wandering or sedentary, have strong and energetic expressions which can refer only to a God; they name him the Great Spirit, sometimes the Master and the Author of Life. Even down to the Ouraoars, (*Ottawas*,) who, among all these nations, appear the most brutal, and least refined, there are none who, in their invocations and their apostrophes, do not often name him the Creator of all things.

That great spirit, known among the Caraibs under the name of *Chemiin*, under that of *Manitou*, among the Algonquins, and under that of *Okki*, among those

who speak the Huron language, is designated in a manner the most singular, and applicable only to the Supreme Being, by the name of Areskoui, among the Hurons, and by that of Agriskoue, among the Iroquois.

Such then is the sense of the Divinity, that there is not a single nation, however barbarous, however destitute of laws or of morals, it may be, which does not believe, that there are Gods. The belief in God is as ancient as the existence of the human race. Nature herself has engraven the idea of God in all hearts; and this idea is too sublime for man to have been able to conceive it, if Nature herself had not conducted him to it.

Now the sense, or the knowledge of a Divinity, infallibly brings with it a religious worship, that is, an assemblage of duties, by which man makes to it an humble confession of his dependence, by the homage which he pays to the dignity of its being, by his obedience in submitting himself to the laws which it prescribes to him, by his gratitude for the benefits he receives from it, and by the recourse he is obliged to have to it, for the benefits he receives, and those he hopes for.

This is the reason why the means, which men put in operation to render themselves agreeable to the Divinity, are as ancient as the belief in a God; and to prove the universality and high antiquity of this belief, is to prove the universality and the remote antiquity of religious worship. Moreover, as every religion supposes the idea of a Supreme Being, whoever shall prove the universality and the high antiquity of any religion whatever, will also show the generality and high antiquity of a belief in God. Men always have been led by an instinct, by a secret impulse, to acknowledge an omnipotent Being.

But the human mind, too limited, has not been able to collect under a single point of view the infinity of

the attributes of God. It was obliged to make a kind of division, to represent each one by different names, emblems, of which each one marked only the perfections which it attributed to him. Man can only see God in a mystery, as St. Paul says; he figures him to himself under sensible images, which are so many symbols raising themselves to him by degrees.

Hence, however, results the origin of idolatry, and of the well merited reproach, that man is a superstitious animal. In fact, man adores every thing, fire, water, earth, thunder, lightning, meteors, grasshoppers, crickets. The Mexicans adored Viziliputzli, the God of war, and Tescaliputza, the God of repentance. The negroes and the savages of America have the worship of the gods Fetiches; it has for its object animals or inanimate beings, even the most absurd. The striped snake is the natural divinity of the nations of Judah. Several American tribes have crocodiles for gods, as the Egyptians, or salt water fish, as the Philistines. In the peninsula of Yucatan, children are placed under the protection of an animal chosen by lot, which becomes the tutelary divinity of his person. The Laplanders and the Samoïedes render divine honors to several species of animals, to stones, which they anoint, as formerly in Syria they adored the stones called boetiles, and as in America they still adore conic stones. The ancient Arabians had for their Divinity a square stone, and the god Casius of the Romans, whom Cicero calls Jupiter-Lapis, was a round stone cut in halves. Jacob himself erected and anointed a stone in the place, where God had manifested himself to him in a dream. The Hebrews, like most other nations, had a great veneration for mountains, *high places*, and woods. The ancient Germans, had, for their Divinity, tufted trees, fountains, and lakes; they adored, as the Laplanders now do, shapeless trunks, which they regarded as the representation of the divinity. The Francs adored wood, water, birds, and beasts. These first forms of worship established

among the Egyptians, Hebrews, Germans, are again found among the ancient nations of Greece, and one cannot but be struck by the conformity. Stones, shapeless trunks, rude cippi, were afterward the principal gods of the Greeks. The Venus of Paphos was a white pyramid; the Diana of the isle of Eubœa, was an uncarved block of wood; the Thespian Juno, the trunk of a tree; the Athenian Pallas and the Ceres, a simple stake which was not stripped; the Matuta of the Phrygians was a black stone with irregular angles, which was said to have fallen from heaven to Persinun, and was afterward carried to Rome with much respect. Men, besides these absurd national divinities, have had different peculiar objects of worship, from whom they expected peculiar and individual protection. Such were the Mannikins of Laban, the household gods among the Romans. In the kingdom of Issini, one chose for his Fetiche a block of wood, another the teeth of a dog, of a tiger, of an elephant. The seas were peopled with Tritons, with Nereids, with Divinities of different orders. The country was filled with Nymphs and Fays; the forest, with Dryads and Hamadryads. Every stream, every fountain, village, and city, had its divinities. All agreed in thinking, that these divinities exacted honors, that they were easily irritated, but that they were appeased by bloody sacrifices. Barbarity was every where urged, even to the immolation of human victims. Add to all this, the adoration of trees, the idols of the Chinese, the palladium of the Trojans, the sacred buckler of the Romans, the universal confidence which men have in talismans and amulets, in divination, dreams, and oracles, in the meeting of different objects presented by chance, as, for example, the unexpected encounter of a dead body, of a cat, in the cry of nocturnal birds, in the flight of birds, in penitences and mortifications of every kind.

This hasty sketch shows us plainly enough, that from east to west, from north to south, the people have

not only the same objects of adoration, but nearly the same manner of worship, and a uniform practice of the same maxims. "The divinity offers himself under the moral relations, which constitute his essence, only to men enlightened by elevated instruction; but the ignorant man, in all countries and ages, will naturally be an idolater, naturally an adorer of idols and of supernatural things, because they arrest and fix his attention, because they act upon the mind rather than upon the sight; because, in fine, they make him think and reflect." *

Yet, however degraded man may appear in this light, he perhaps deserves our pity as much as our blame. His ignorance, and his natural tendency to superstition, have converted into sensible images, abstract ideas and truths, which are beyond the reach of the ordinary intelligence of ignorant men, and have caused him to address to the creature, the worship due only to the Creator. Fear has made as many idols as there are objects of terror. But the essential point, namely, the acknowledgment of a Supreme Being, and of religious worship, has always remained invariable.

The sun, honored by a peculiar worship in Peru, among all the nations of America, and by the chosen people, was always regarded as the most expressive symbol of God. The Divinity became sensible to them in this globe, which animates the world, and every where produces a happy fruitfulness. The sun was so much the hieroglyphic symbol of divinity among all nations, that all the names given to the gods of paganism, are referred to the sun. This was the first of the works of God, which attracted the attention of men, and in which they were naturally led to honor their sovereign master. The chosen people turned toward the rising sun to address their prayers to the Highest. Even the Scripture makes

* Poetry of the Arts, by J. F. Sobry, p. 36.

use of the expression, that God has placed his tabernacle in that body.

How should nations so different from each other in their characters, so widely opposite in their modes of thinking, who, in things the most necessary to life, have conceived ideas so entirely at variance, how should they yet have been able to agree on the existence of a Supreme Being, and on a religious worship, if the Author of the universe had not graven the sense of these things in the hearts of all men ; if God had not impressed them upon the organization of the human race ?

Notwithstanding these undeniable proofs of the universality of the belief in God, and of the tendency to a religious worship, we still meet with men, who deny, that these sentiments are innate in the human species. There are, say they, nations in which we discover not the least trace of religion, nor the least trace of an idea relative to a Divinity.

I will not contest the possibility of the fact. Climate and the concurrence of other circumstances may impede the development of the cerebral part, by means of which the Creator has willed to reveal himself to the human race, just as climate and other influences may favor the development of the same organ. In Egypt, the cradle of so many religious sects, this organ had received a high degree of development, and of activity ; the contrary occurs among the Caraibs, the Hottentots, &c. If there existed a people, whose organization was altogether defective in this respect, it would be as little susceptible of religious ideas and feelings, as any inferior animal. Such a diminution of any organ whatever would involve the same result in regard to its function. These are actually partial imbecilities.

But I know no people that is in this situation. Some travellers, seeing among certain nations, neither temples, nor altars, nor idols, nor any religious worship, have concluded, that the mind of these men did

not go farther than their monuments, and have pronounced too lightly, that they lived like brutes, and rendered no divine homage to any thing visible or invisible. We know that we find nearly the same customs in regard to divine worship, not only in the island of Crete, in the isles of the Archipelago, in Phrygia, in Thrace, in Asia Minor, but also in Colchis, in Bactria, as far as the Caspian gates and the Indies, which were, for the ancients, the farthest limits of the known world. We know also, that the Caraibs have their great spirit Chemiin, that the Hottentots and the Pampoux pay homage to the gods Fetiches. It is therefore certain, that the sense of the existence of a God, and of the need of a religious worship, has always been an attribute of all nations.

It is still objected, that ideas relative to God and religion, never arise among the deaf and dumb; and hence it is concluded, that there is not in man any natural disposition to these ideas.

But can it be believed, that the man of the most cultivated mind could arrive at those ideas of God and religion, which we have, if he had not been brought up in these ideas? The faith of sectarians is the work of education, of arbitrary instruction, and the ideas, which the philosopher forms of God, are the fruit of the most elevated abstractions. We cannot expect either the one or the other from a deaf and dumb man, whose education cannot have been directed towards this point; but from what we see all rude people do, we might divine what the deaf and dumb would do, if living together in tribes; for, the want of hearing does not prevent the deaf and dumb from forming to themselves, the same idea of the external world, which other men form of it, and from drawing the same deductions from the events, which pass under their eyes.

I have presented the successive developments, the shades and the modifications of the religions sentiment and of the idea of a divinity, in an inverse order

from that which is adopted by most authors; it is ordinarily supposed, that men, uncertain as to the nature of the powers, the secret influence of which they feel every moment, at first attributed these powers to animate bodies, to Fetiches, for example, and afterwards to living creatures. It could only be after they had attained a certain degree of culture and civilization, that they would rise to the adoration of beings. Afterwards, in this supposition, they adopted tutelary gods for each individual, villages, cities, and even for rivers and forests; and, after many efforts and combinations, they ended by conceiving the abstract metaphysical idea of an independent intelligence, of a God, the sole creator and master of the universe.

The order in which I have explained the progress of nations, in regard to religious ideas and sentiments, appears to me more conformable to tradition and reason. Experience teaches us, that in all ages, just ideas on the nature of the Divinity have degenerated into superstition and idolatry. The Hebrews knew Jehovah; but, notwithstanding the prohibitions of God, their inclination for idolatry was such, that they always relapsed into it. They could not abandon the great veneration they had like other nations for mountains, high places, and woods.

Since the Christian era, and the solemn proclamation of a true God, they have not been able to limit the worship to the Most High alone; they must still have secondary divinities, they still need images, relics, amulets, tutelary angels, saints, so many beings in whom they suppose a particular power, and whom they invoke in the confidence of a special protection.

In other respects, whatever hypothesis we adopt, it will always be difficult to keep clear of the obstacles, which oppose themselves to the direct proof of the advance, which nature has led mankind to make, towards his most important interests.

Whatever opinion we adopt, it still follows, that men have always instinctively recognised superior

beings, either beneficent or malicious. Under whatever form they have represented these powers, it is always the idea more or less obscure, more or less refined, of a superior being, which constitutes the basis of all creeds, and of all forms of worship, even the most absurd. Men were not long content to adore their household gods; they devoted temples and altars to them. "The first edifices," says M. Sobry, "which social order demands, are temples. Men wish to assemble, to render to God a service which consoles, unites, reconciles, and improves them. It is a duty, a want, a necessity. All ages, nations, and places, are subjected to this sacred custom, as ancient as the world, as widely diffused as the human race."

Now, it is not difficult to conceive, why it is with the belief in God, and with religious worship, as it is with all the qualities and faculties, which have been given to man by means of his organization. No one has invented the propensity to physical love, the love of offspring, attachment; men will never think of seeking in the records of history, the first who gave combat to one of his fellow-men, the first who made war, and who created the spirit of domination to raise himself to the head of a tribe or nation. No one has the glory of having invented painting, music, calculation, the mechanic arts, eloquence, poetry. So there is no one, neither legislator nor conqueror, who can be quoted as the first author of a religion, before whom it can be shown, that there was not any received religion. There was one before Numa, among the Romans. Moses, whose writings are anterior to any other work we have, shows, evidently, a religion coeval with the creation. If we read his books, we shall there see a religion formed among all the nations of which he speaks, particularly among the Egyptians and Canaanites; we shall see a religion already changed and corrupted among these ancient nations. What was the golden calf, if not the symbol of Isis, and one of those monstrous divinities of Egypt, already idolatrous?

Even in the time of Abraham, Chaldea was infected with idolatry. Religion being natural to men, it should be coeval and coexistent; and I repeat it, the idea of God is too sublime for man to attain by reasoning, if it were not inherent in his organization.

But some timorous devotees are alarmed by the assertion, that there is an innate disposition to religious ideas; because, say they, to seek within man the source of religious ideas, is to render revelation superfluous.

If God had resolved to reveal a peculiar religion, man should be made susceptible of receiving it by means of a natural disposition. Let one try all imaginable means of giving to an idiot ideas of God and religion, it is wishing to make of a brute an architect or a poet; the natural disposition, the susceptibility is wanting in both. Thus the seed of the sublime lessons of revelation had fallen upon stony ground, if man had not been rendered susceptible of profiting by the dispositions, which the Creator has given him. Revelation has guided his steps in the way, where his natural tendency to idolatry was bewildering him in darkness; it has purified and fixed the idea, which he formed to himself of God and his duties. Thus, then, the natural tendency of men to religious ideas, not only is not in opposition with revealed religion, but revelation would have been absolutely impossible, if the human race had not been prepared for it by means of its organization.

It is remarkable, that even those, who derive every religious idea from the personal intercourse of God with the first men and with Moses, make use, as by instinct, of the same expressions which Seneca and Cicero employed, to account for the universality of the belief in God. They all say, that this sentiment is engraven in the heart of all men, the most ferocious as well as the most humane.

This hypothesis explains how uniformity, in the fables relative to the existence of God and to certain

moral principles, and uniformity of rights, indicative of the same or similar principles, is found among men, in spite of partial changes introduced by different nations.

On the same supposition, it is still easy to conceive how religious ideas must have passed from generation to generation, as a heritage common to all.

As this organ coexists with other organs, likewise very active, devotion combines itself, in different ways, with the qualities or faculties, which result from them. The devout warrior, as Gustavus Adolphus, and the bloody Suwarrow, will invoke God before battle, to obtain victory from him, and will urge his soldiers to prayer. The cruel devotee, as Louis XI., Philip II., and others, will prove his pious zeal by arming the inquisition, by making auto-da-fés, and by performing with his own hands, the duties of the executioner. The devout artist, as Philip Champagne, will scrupulously avoid all that is licentious, and will represent only sacred subjects. The devout philosopher and naturalist, as Newton, Bonnet, Kleinjogg, and Clarke, will every where see in nature the finger of God, and in every thing render honor to the Creator, or even like Malebranche, will derive all our ideas from God, and will maintain, that we see God in all. The devout poet, as Milton and Klopstock, will sing the mysteries of religion.

I know a devout libertine, who pays public women by giving them prayer books. In this man the organ of devotion and that of propagation, are both greatly developed.

These combinations are infinitely various, for the organ of devotion as well as for all the rest; in health as well as in mania.

As all propensities may become the source of evil, so the most elevated propensity of the human race, is not altogether exempt from every inconvenience. If men are limited in their capacities, they cling to objects of veneration of their own creation, and to which they attribute a supernatural power. A con-

stant phenomenon, observed in all nations, proves that this tendency too often degenerates at the expense of the moral sense. Every where and in all sects of religion, men consider themselves much more obliged to fulfil the duties, they impose on themselves towards the idols of their imaginations, towards Fetiches, &c., than to meet the obligations of pure morality. A man may be on his knees before an image, be the slave of blind fanaticism, and endure penances as painful as ridiculous, while he makes no scruple of infringing the laws of society and of nature. Who has not seen that, where the ministers of religion entertain the people only with mysteries and dogmas, there intolerance, fraud, perjury, theft, murder, rape, incest, &c., are committed with deplorable indifference. One would rather lose his life, than break the vow of a certain abstinence.

The mind of the people is not sufficiently exercised to be able to embrace sentiments and ideas of a different nature. Once imbued with sterile dogmas, it is entirely devoted to them; it is more strongly impressed by them, than by precepts drawn from social life. In the first case, he supposes himself connected to omnipotent beings by mysterious and invisible forces; in the second, to human laws alone, the strict observance of which often demands a resolute self-denial and a repression of inclinations, the most dear and the most imperative. Preach up maceration, abstinences, fanaticism, mortifications, mysteries, &c., and the crowd will follow you; but exact a severe morality in action, and you will be abandoned. It costs much more to be virtuous, than to be devout.

Religious Propensity in Mania.

"Nothing is more common in hospitals," says M. Pinel, "than cases of alienation produced by too exalted a devotion, scruples carried to fatal excess, or religious terrors."

As this species of mania often occurs without there being any lesion of the other qualities or faculties, physicians ought long since to have concluded, that it belongs to the lesion of a peculiar cerebral part.

In the hospital of Amsterdam we saw a madman who was tormented with the idea, that, contrary to his will, he was forced to sin, and that he could not be saved. He has the organ of devotion greatly developed.

I have spoken elsewhere of an ecclesiastic, who despaired of his salvation. Another madman also had the idea, that he was condemned to eternal fires. The organ of devotion was greatly developed in both.

A female was brought to me, named Elizabeth Lindemann. I saw, at the first glance, that she had the organ of devotion unusually developed. She stood upright before me, raising from time to time her eyes to heaven, and testifying, in all her gestures, sadness and anguish. From her youth she had devoted herself excessively to prayer; for some time past she had been subject to convulsions, and maintains that she was possessed: the devil, she said, entered into her heart through her mouth, and tried to draw her into hell.

"A young man, at the epoch of the revolution, was astounded at the overthrow of the catholic worship, in France, and, overcome by religious feelings, he became a maniac and after the usual treatment at Hôtel Dieu, was transported to Bicêtre. Nothing can equal his gloomy misanthropy; he speaks only of the torments of the other life, and thinks that, in order to escape them, he must imitate the abstinences and the macerations of the ancient anchorites; thenceforth he refused all nourishment, and towards the fourth day of this invincible resolution, his state of languor induced fears for his life. Friendly remonstrances, pressing invitations, all are in vain; he rejects with harshness the soup which is served him, and even throws off the straw from his couch, to rest on the board."
(*Pinel*, p. 207, &c.)

"A madman of mild character unceasingly invokes his good guardian angel, or some one of the apostles, and is satisfied with nothing but macerations, fasting, and prayer. I was fond of conversing with a devout madman, who, like the ancient diciples of Zoroaster, rendered peculiar worship to the sun, prostrated himself religiously before this body at its rising, and consecrated to it, during the day, his actions, his pleasures, and his pains." (*Pinel*, 118.)

In the collection of M. Esquirol, I have seen the casts of the heads of three persons attacked with religious mania. The organ of the religious sentiments is extremely developed in all the three. I have quoted analogous examples when speaking of the organs of murder and of poetry. If M. Esquirol continues to take casts of the heads of the insane and to preserve their crania, he will not fail to be one of the most zealous and most learned followers of organology.

I knew a peasant named Michel Schayer, and his sister; both were subject to periodical attacks of religious mania. The organ of devotion is unusually developed in both.

As, in health, this organ performs different parts, as it coexists with such or such other very active organs; so, likewise, in the state of disease, these different associations produce different species of pious mania.

"We remark a singular gradation," says M. Pinel, "in the moral affections of young melancholic subjects, endowed with an ardent temperament; they usually run into the most exalted piety, and address to heaven the most fervent prayers, to combat the propensities of nature, and to come out victorious from this painful struggle.

"A young girl of sixteen, brought up in rigid principles, is placed with an artisan to learn embroidery; she there first receives the attentions of a young man of the same age, and finds herself exposed to all his fascination; the sentiments of piety, which she owes to her education, awaken in all their force, and there

is established a sort of internal struggle with the affections of the heart. Melancholy succeeds with all its fears and its perplexities; she can no longer eat or sleep, and a furious delirium manifests itself. Conducted to the hospital, and given up, alternately, to convulsive movements and to all the estrangements of reason she seems assailed by the most incoherent ideas; and often uttering inarticulate sounds and broken phrases, talks of God and of temptation.

"A waiting maid, from her youth lively and passionate, at the age of thirty years experienced all the development of an ardent temperament, though otherwise very prudent and very pious; and there arose a kind of painful struggle between the propensities of the heart, and the severe principles, which she had for a long time observed. These internal combats, and the alarms of a timid conscience, plunged her sometimes into despair, and made her seek for means of destroying herself, such as taking poison or throwing herself from a window. In her extreme perplexity, she had recourse to an enlightened and compassionate confessor, who sought to restore her courage, and often repeated to her, that she must attach herself to God, in order to regain her peace of mind. 'But I feel myself,' answered the girl with simplicity, 'inclined rather to the creature than the creator, and that is precisely, what causes my torment.' The good priest persevered, addressed to her consoling language, and urged her to *await with resignation the triumphs of grace, after the example of many saints and even of a great apostle.* Thus, far from inspiring her with fears in regard to the future, he sought to bring back calmness into this agitated soul, and to oppose the best remedy for the passions, patience and time; but disquietude and prolonged watching ended by producing a mental alienation, which was treated at Salpetrière according to the same moral principles, and which was of short duration." (*Pinel*, 270.)

It is not at all rare, that the organ of devotion and

that of physical love, are found injured together, and hence the reason why cases of mania, compounded of erotic and religious insanity, are so frequent.

Religious mania may become exceedingly dangerous, when a propensity to murder is joined to it.

I have seen a man, in whom the instinct of murder and that of devotion, were both extremely developed; he had already had two violent attacks of mania, in which he threatened to murder all who did not profess the catholic religion, though he himself was a protestant.

Sometimes the propensity to suicide is joined to religious mania. A man of Weil in Suabia, well constituted, had been very religious from his infancy; for some years he had given himself up, more and more, to religious fanaticism, and ended by experiencing terrible agony. He was tormented with an idea, that he could not be saved, because he was possessed of the devil. In spite of all resistance to these melancholy ideas, which beset him, he finally fell a victim to his propensity to suicide; the first attempt he made to destroy himself was unsuccessful, but he finally ended by cutting his throat. This man was reasonable in every other respect; in examining his head, I found the organ of devotion and that of circumspection, extremely developed.

A huzzar, of whom I have spoken in connexion with benevolence, and who had always been of a very good and humane disposition, fell into a state of derangement. In this state he manifested a desire to effect the happiness of the whole human race, and in all he said and did, he constantly called to witness the holy Trinity.

Very frequently the lesion of the organ of devotion is accompanied with a lesion of the organ of pride. The wife of a tailor passed a part of the day in churches with her well dressed children, treated her very complaisant husband with the greatest disdain, and ended by demanding, that he should serve her on his

knees, and see in her a privileged soul, endowed with supernatural powers. Another woman of high birth, whose husband had fallen into misfortune, thought to find consolation, first in long meditations and very fervent prayers, then in her ecstasies of delight, in which she believed herself raised to the bosom of the divinity, and which were the prelude of decided insanity.

M. Pinel says of these madmen, that, "We cannot deny certain difficulties in dissipating this sort of illusion, which belongs to a very exalted devotion or to fanaticism. How can we bring back to sanity a madman, puffed up with pride, who thinks only of his high destinies, who considers himself a privileged being, an envoy of the most high, a prophet, or even a divinity? What arguments can counterbalance the effect of mystic visions and revelations, of the truth of which the madman is angry, that others can form the least doubt?"

It is then shown by the state of disease, as well as by the state of health, that the sense of the existence of a superior being, and the propensity to religious worship, are fundamental qualities of the human race, and that consequently, they must belong to a peculiar cerebral organ.

Let us still add some proof as to the external appearance of this noble organ.

External Appearance of the Organ of the Sense of the Existence of a God, and of the propensity to Religious Worship. Continuation.

If we consider the busts and the portraits of men who, in all ages, and in all sects, have been most ardently attached to religious ideas, we find in them the organization, which I have pointed out in the history of the discovery of this organ. We constantly find in them, that the great development of the cere-

bral parts XXVII, Pl. VIII. IX. XI. XII. makes the posterior mean part of the superior half of the frontal, project considerably. Of the great number of examples that are known, I will cite only the following: Constantine, Pl. XCIV. fig. 1. Antoninus Pius, Pl. XCIII. fig. 1. Marcus Aurelius, St. John, Chrysostome, St. Ambrosius, St. Athanasius, St. Stephen I., king of Hungary, Pl. XCIV. fig. 2. St. Brun, St. Bernard, St. Dominic, Aubusson, St. Ignatius de Loyola, Pl. XCIII. fig. 6. Charron, St. Francis de Sales, Pl. LXXXVII. fig. 5. Gustavus Adolphus, Pl. XCIV. fig. 4. Charles I. of England, Louis XIII. Pl. XCIV. fig. 5. Bourdaloue, Malebranche, Antonine Arnauld, Benoit Joseph Labre, Pl. XCIV. fig. 6. Joseph of Paris, Pl. XCIV. fig. 7. The philosophers and naturalists, Newton, Montagne, Pl. XCIV. fig. 9. Bonnet, Kleinjogg, Clarke, Lavater, Sailer, Pl. XCIV. fig. 10. The poets, Milton, Pl. LXXXIV. fig. 2, and Klopstock. The pious artist, Philippe Champagne, Pl. XCIV. fig. 3.

This organ is very remarkable on the head of the priest, who gives the communion to St. Jerome, when dying; a painting of Domenichino, exhibited in the gallery of the museum.

The small cranium, Pl. L. is of a very devout woman, very superstitious, a fortune-teller, who favored two lovers at the same time. The cranium, Pl. XXX. is of an ex-jesuit, an excellent preacher, who unites the organ of devotion with that of comparative perspicacity. The author of *Indifference in Religion*, the Abbe F. de la Mennais, Pl. XCV. fig, 2. Combine a great development of the organ of devotion and of that of the sense of localities, and you will have the missionary James Leonard Perocheau, Pl. XCV. fig. 3.

How much all these elevated heads differ from that of the atheist Spinosa, flattened on the top! Pl. XCIV. fig. 8.

I have intentionally chosen men, whose occupation and duties varied greatly. We see, that it is sufficient

to have the part of the brain referred to, much developed, in order that they may devote themselves to religious sentiments, whatever may be their habits in other respects.

We shall no longer be supposed to see the same conformation in the heads of the Christ of Raphael. In the same heads, the posterior parts are flattened, and consequently, the organs of the qualities common to man and to animals, are very inactive. The organs, on the contrary, placed under the median line of the anterior superior and superior posterior parts of the frontal bone, are greatly developed; whence it follows that these heads convey the expression of sagacity and of penetration, of benevolence and of the sense of Divinity; in fine, of the source of the purest morality.

But, has this divine form been invented, or can we presume, that it is the faithful copy of the original?

It is possible, that artists may have imitated the form of the heads of the most virtuous, the most just, most benevolent men, in order to give a character to the head of Christ, which they wished to represent. In this case, the observation of these artists would confirm mine. Yet this course supposes some idea of organology, or, at least, more circumspection than appears to me probable.

It is more probable, that the general form, at least, of the head of Christ, has been transmitted to us. St. Luke was a painter, and, in this character, why should he not have wished to preserve to us the features of his master? It is certain, that this form of the head of Christ is one of very high antiquity; we find it in mosaics, and in the most ancient paintings. The Gnostics of the second century possessed images of Jesus and of St. Paul; so that neither Raphael nor any other more ancient artist, invented this admirable configuration of the head of Christ. Pl. xcv, fig. 1.

When devotion is found in men endowed, in other

respects, with qualities different from it, or which are even diametrically opposed to it, we usually charge such men with hypocrisy, or at least, with sinister motives. We are slow in believing that Gustavus Adolphus, Pl. XCIV. fig. 4, and Suwarrow, could, in good faith, on the eve of a battle, have performed themselves, and imposed on their soldiers, the most severe religious exercises, prayers, fasts, &c., either to obtain a general absolution, or to gain a victory.

Gabrino Rienzi was generally accused of being an impostor, a hypocrite, and of making religion serve his purposes, by putting in operation revelations and visions, to authorize his ambition and his cruelty. The inspection of his portrait, Pl. XCIII. fig. 6, explains all the contrasts of his conduct.

Now, that we understand how the most revolting contradictions may exist in the same individual, we shall no longer be astonished to see the devotees Lewis XI., Pl. XCIV. fig. 11, and Philip II., Pl. XCIV. fig. 12, commit all acts of cruelty, make auto-da-fés and perform, with their own hands, the office of the executioner. It is organology alone, which gives the most reasonable explanation of the horrors of the inquisition.

The life of the conqueror Cromwell is an enigma for most of his biographers. Was his devotion real? Was it a calculation of hypocrisy? The following is the manner in which M. Villemain explains himself, in speaking of the mysticism of Cromwell.

"That official mysticism, so to speak, employed by Cromwell, in the communication he addressed to Parliament, is found at the same time in his private letters. Must we, on this ground, suppose as Voltaire does, that Cromwell was for a long time, sincerely a fanatic, and that he became a hypocrite in proportion as his mind was refined by the progress of his power? Or, must we believe that Cromwell, like Mahomet, made his first dupes in his own family, and commenced by the delusion of his own friends, the deception which he wished to extend to those about him?

"Besides, here are some of the religious letters which Cromwell, when already powerful and celebrated, wrote to his family. The first, dated 1646, is addressed to his daughter Bridges:

"'DEAR DAUGHTER,

"'Your sister Claypole is tormented by some unquiet thoughts (I trust in the mercy of the Lord) she sees her own vanity and the carnal disposition of her mind; she laments it, and seeks him who alone can purify her. Thus to seek, is to belong to the happiest sect, to that which finds, as every humble and faithful seeker will find. *Happy seeker! Happy finder!* Who has ever tasted how sweet the Lord is, without experiencing some returns of self-love and of weakness? Who has ever tasted the sweetness of God, and can become less zealous in his desire and less anxious to obtain the full enjoyment of the Lord? My dear friend, always seek the Lord; let neither your husband nor any thing in the world, weaken your affections for Jesus Christ. I hope that he will be for you an occasion of exciting them the more, that which makes thy husband most worthy of thy love, is that he bears in him the image of Jesus Christ. There fix your eyes upon that, think it is what you must love above all things, and all things for that,' &c.

"Another letter of Cromwell to his wife, presents the same character, and is not less curious:

"'MY DEAREST,

"'It rejoices me to know, that thy soul prospers, and that the Lord increases more and more his favors to thee. The great good, which thy soul may desire, is that the Lord may shed on thee the light of his protection, which is better than life,' &c.

"I submit to the reader these ascetic letters which seem to me more worthy of madame Guyon than of a conqueror: if there is not is them a cant and an intention of deceiving, which is powerful, only when it

is constant, we may conclude, that Cromwell was an honest man. Independently of the various proofs which I have opposed to this opinion, and of the testimony of the enemies of Cromwell, who, whether fanatic or not, accused him of hypocrisy, I can cite the authority of an impartial and indifferent witness. Debordeaux, the ambassador of France, wrote on the subject of the zeal, which Cromwell manifested for protestanism: 'The reports which they spread of the general, are not true: he affects great piety, but by a peculiar communication with the holy spirit; he is not so weak, as to allow himself to be led away by flattery. I know that he laughed about this with the ambassador of Portugal.'" (*Thurlow's State Papers*, vol. i. p. 256.)

M. Villemain says, in a note of the 11th book of his *History of Cromwell:*

"We find in a letter, written after the death of Cromwell, by a man who was intimate with him, some details respecting his character and person, which serve to make known, what he was, and what he appeared. The most curious trait in this picture shows apparent tendernsss of feeling, often remarked in the life of Cromwell, and which makes Whitelock in his memoirs say, that the protector was a very good man; *a kind of sensibility, sometimes altogether physical, which does not reach the soul, and which is compatible in certain men with the cool blooded contemplation of the greatest cruelties.* The following are the terms of this letter: 'The protector was of a powerful and robust constitution; his height was under six feet, (two inches I believe,) *his head so large, that you would believe it must contain a vast treasure of intellectual faculties; his temper excessively inflammable;* but this flame fell partly of itself, or was soon extinguished by the moral qualities of the protector. He was, by nature, compassionate to beings in suffering even to the degree of weakness. Although God had given him a heart, in which there was little

room for the idea of fear, except that which he himself inspired, yet he carried to excess his tenderness for those who suffered; he lived and died in perfect union with God, as judicious persons, who were near him, have observed.'" (*Thurlow's State Paper*, vol. I. p. 766.)

In fact, the form of the head of this extraordinary man, Pl. xcv. fig. 4, proves in an indisputable manner, that this devotion, as well as his other qualities are in harmony with his organization. In general I do not think, that sovereigns, especially when they are powerful, take great pains to appear different from what they really are; and we shall never fail to find the explanation of their most singular contrasts, and their apparent hypocrisy, in a peculiar combination of organs, developing themselves simultaneously with great activity.

We see how essential it is, that artists should renounce their mannerism in taking the portraits of the men, whom they wish to hand down to posterity; since they can furnish, by an exact resemblance, the means of ascertaining the true motives of their actions.

Proofs of the Existence of God, taken from Organology.

After all I have said, it can no longer be doubted, that the human race is endowed with an organ, by means of which it acknowledges and adores a God of the universe; this is the noblest prerogative, which man possesses above the brutes. Man was to be the only really free creature of the earth; consequently man alone was to be capable of motives of action of a high order: he alone was to have the faculty of weighing and appreciating moral motives, before deciding upon actions prompted by his propensities; moral good and moral evil have an existence for him alone: and, as his own strength is not always sufficient

to control the disorderly workings of his desires; as he too easily finds means to elude the laws of society; and, in fine, as there exists no check for those, whom their power or even the social compact has placed beyond all responsibility, it was necessary, that eternal Providence should place another powerful law in man himself; it is necessary for the human race, that each individual should find and fear in himself a secret censor, a censor, which supposes a supreme judge, from whom it is impossible to escape. Let us apply organology to this innate sentiment, and let us take possession of it, as of a new proof of the existence of God.

All our senses are in relation with certain external objects; of what use is the mouth, the sense of taste, of hearing, of smell, of sight, if, in the external world there did not exist objects of touch, molecules, emanations, vibrations, and light, fit to produce savors, odors, tones, and visions? The natural history of the five senses would therefore be incomplete, if we abstracted external objects, and the reciprocal action of the two on each other.

In the same way, all the propensities and faculties of man and animals, are predicated on external objects, with which nature has established an immediate relation. The male and the female are the objects of the instinct of propagation; young ones and children satisfy the love of offspring; the instinct of self-defence combats the enemies of one's preservation; the carnivorous instinct every where meets animals to prey upon; the imperious man finds individuals and nations to subjugate; the organs of place, painting, music, calculation, mechanics, are exercised on the laws and the relations of space, colors, tones, &c.

Thus all these propensities and faculties, and their organs, would be without object, if there were no external objects, on which they might operate. Nature would have trifled with man and with animals, if, in giving them instincts, propensities, faculties, she had

refused them external objects to satisfy them. Their state, at the first moment of their existence, would be a state of privation, of painful inconsistency; the second would be that of their death. It is, therefore, certain, that nature has created no sense, no organ, without having prepared for it beforehand, in the external world, the object of its function.

Now; it is certain, that, in all ages and all countries on the earth, the organization of man has led him to the knowledge of a Supreme Being: it is certain, that, in all ages and all countries, man feels his dependence on a first cause; that he feels the necessity of having recourse to a God, and of rendering homage to Him. Who would dare to think, that this single sentiment, this single organ was deprived of its object in the external world? No; nature cannot so far wrong men in their most important interest! There is a God; because there exists an organ for knowing and adoring Him!*

XXVII. *Firmness, Constancy, Perseverance, Obstinacy.*

The character of man depends much more on his feelings, than on his faculties. The feeble, undecided man, and the man of firm character, cannot know why the former wavers from one project to another, nor the man of firmness, why he maintains strongly the ground

* If certain philosophers would consider well, what I have just said on the innate feeling of the existence of a Supreme Being, and on the natural propensity to religious worship, they would see the necessity of modifying entirely their specious arguments, which they support by historical notions not less rash in favor of atheism. According to their view, would they not also find means to explain the origin of the propensities to propagation and to murder, of the love of offspring, of the sense of property and of pride, of the talent of music, calculation, architecture, poetry, in general of all the propensities and faculties? Such illusions are inevitable whenever, in order to explain the phenomena of living beings, we disregard their organization, and their internal powers.

he has taken. Cicero, that orator and philosopher, always uncertain, and wanting firmness, neither knew how to adopt an opinion promptly, nor to maintain firmly that which he had adopted. As he allowed himself to be intoxicated by success, so was he liable to be cast down by reverses, and he passed rapidly frem the excess of confidence, to abject despair.

Cato of Utica, on the contrary, discovered, from his youth, that inflexibility of character, which he exhibited through the whole course of his life. Pompedius jestingly begged of young Cato his recommendation of him to his uncle. The child kept silence, and manifested by a look and an air of discontent, that he would not do what was asked of him. Pompedius insisted, and wishing to urge the child to his purpose, took him in his arms, and carried him to the window, threatening to let him fall if he persevered in his refusal; but fear had no more effect on him than prayers. — He afterwards killed himself to escape submission to his enemy.

Children daily offer us examples both of firmness and of softness of character. Some are self-willed and obstinate; *when they have set their hearts upon a thing*, nothing can turn them from it. Others are supple, have no will of their own, cannot say no; such are the first traces of their future character; and in neither case has reflection the least influence on their manner of action.

Properly speaking, firmness is neither a propensity, nor a faculty; it is a mode of being, which gives to man a peculiar impress, which is called character; he, who wants it, is the sport of external circumstances, and of the impressions which he receives; he is a weather-cock turned by every gale. To-day he cries huzza for the republic, to-morrow, huzza for the tyrant. He lends faith and homage to every kind of idol. Constant only in his inconstancy, he quits, with astonishing rapidity, one standard for another; he is the man of all parties, and consequently the object of contempt to all.

The immoveable man is he, who is endowed with firmness to the highest degree. As he is unchangeable in his mode of viewing objects, we may calculate beforehand what will be his conduct, if a given event takes place. He is a man in whom we can have confidence; he undertakes difficult things in preference: difficulties and obstacles, which would deter feeble minds, are only encouragements which redouble his ardor. *Tu ne cede malis, sed contra audacoir ito*, is his motto. He does what he considers his duty; example for him is nothing: it is as difficult to mislead as to correct him; menaces and dangers improve his firmness into audacity; he repeats with L'Hôpital; *si fractus illabatur orbis, impavidum ferient ruinæ.*

Firmness and obstinacy flow from the same source. The weakheaded man, the child, are obstinate, intractable; the reasonable man is constant, immoveable, persevering, firm. *Tenax propositi vir.*

Seat and External Appearance of the Organ of Firmness.

This organ is formed by convolutions XIII. Pl. VIII. IX. XI. XII. placed immediately on the top of the head under the two superior anterior angles of the parietal bones, at the point, where these meet the superior posterior edges of the frontal. When these convolutions have a considerable development, they give to the crown of the head a spherical protuberance. The crown of the head is prominent in persons endowed with firmness; while it is level or depressed in the feeble and irresolute.

Lavater himself, as I learned after my ideas were already fixed in this respect, perceived by means of the numerous *silhouettes*, which he had collected, that the form of the head I have now pointed out, is proper to persons of a firm character.

Nothing is more easy than to multiply observations

on this subject. There is no family, no school, no society, which does not furnish the opportunity. The cranium Pl. XCVI. is that of the famous painter Unterberger; this man continued all his life immoveable in what he undertook; he undertook only things difficult of execution, and which required many years to bring them to perfection; though this disposition of mind by no means facilitated the means of providing for the wants of the numerous family, with which he was burdened. In this cranium, we see, on the summit the projecting elevation, of which I have just spoken, well marked.

This protuberance is much more remarkable in the cranium of a highway robber, extremely hardened in crime; this wretch was long kept in a narrow prison to force him to declare his accomplices; when it was seen, that this means was insufficient, recourse was had to blows with a stick; this torture appeared too painful to him, and he strangled himself with his chain. After his death, I found the parietals disunited precisely in the place, where the organ of firmness is placed. Was this separation an effect of the violent strangulation? Must we attribute it to the excessively energetic activity of the organ of firmness? Is it an effect of chance? Perhaps we shall have occasion to observe similar cases, which will aid us in resolving this question.

Dr. Spurzheim and myself saw in the house of correction, at Strasburg, a desperate robber, who, for a whole year, had pretended to be dumb; this man had the organ of firmness extremely developed.

Firmness of character must not be confounded with perseverance in certain propensities; as with the uninterrupted manifestation of certain faculties, which may exist in the most vacillating character.

How happens it, that certain persons, to procure enjoyment, are obliged to change every moment the object of their favorite propensities, while others are opposed to every kind of change? Lodging, friends,

mistresses, every thing, in fine, is dearer to them, the longer they remain in their possession. There are persons who have a rage for building. Hardly is one of their plans executed, when they are again changing; to make changes is their occupation through the whole year. There are likewise men, who love the fair sex, and feel the desire to unite themselves to woman by indissoluble ties, and to anticipate happiness from such a union. But no sooner do they possess the object of their desires, than it loses, in their eyes, all the charms it possessed; the spell is broken; in vain do they change; with each change they only wander farther from the end they propose to themselves. Does this disposition depend on the want of firmness of character, or, on a defect of the principle of attachment, or rather, on a deficient development of both these qualities?

Conclusion of the Exposition of the Organs, and of their Functions.

If I had treated of all the fundamental faculties, and of their organs, I should have made known all the instincts, propensities, and faculties of man and of animals — I might say, thus far extends the province of man, and no farther. But, probably, those, who will follow me in the career which I have opened, will still discover some fundamental powers, and some organs, which have escaped my researches. Yet it is to be presumed, that they will never discover as great a number, as some philosophers seem to believe to exist. We must be cautious of admitting a particular organ for each modification of a quality or faculty. Nor must we deduce from a particular organ the qualities or faculties, which are only the result of the simultaneous actions of many organs. Now; if we reflect on the number of possible combinations, which may result from twenty-seven to thirty fundamental

qualities or faculties, from the reciprocal action of as many organs, we shall no longer be astonished at the infinite number of varieties met with in the characters of men. How many different combinations result from ten figures, from twenty-four letters! How many different faces result from the different combinations of the small number of parts, which compose the human face! How many shades, colors, and concords result from the combination of the small number of primitive colors and fundamental tones!

I have constantly adopted the principle of advancing nothing, which I could not either rigorously prove, or, at least, render very probable by strong arguments; it is for this reason, that, for the qualities and faculties, of which I maintain the existence, I have confined myself to that degree of activity, to which I could discover them and observe their manifestation. I am not ignorant, that it would have been more philosophical to bring back always to their fundamental forces, the qualities or faculties, which I have been able to detect only in their exalted action; but, I have preferred to leave something for those to do who will come after me, rather than to put them under the necessity of undoing, what I might have prematurely established.

Besides, the difficulty of determining the primitive forces, is perhaps only apparent. Though all individuals of the same species are endowed with the same qualities and faculties, all are not endowed with them to an eminent degree. All dogs are not attached to their master; all are not courageous; all have not the faculty of directing their course; all bitches are not good mothers. Nevertheless, we say with truth, that all dogs possess the organs of attachment, of courage, of localities, of love of offspring. All have not an exquisite smell: can we therefore say, that dogs do not possess the faculty of scent? So, likewise, all men, though essentially furnished with

the same moral qualities, and the same intellectual faculties, are not geniuses in any respect. Most are limited to the simple disposition, to the capacity, to a moderate exercise of human power. It is given to only few individuals to be original. The Homers, the Ciceros, the Euclids, the Raphaels, the Michael Angelos, Titians, Mozarts, Canovas, St. Vincent de Pauls, &c., are rare; but every body is sensible to the charms of poetry, eloquence, painting, architecture, music, acts of beneficence. Thus, every body, with few exceptions, has the capacity to enjoy the productions of individuals, more happily organized. Why should not a person have the organs of poetry, of sculpture, of music, although unable to compose an Iliad, a Saint Madeleine, *une Flute enchantée!* These reflections, applied to organs, whose fundamental function seems not to be well determined, will perhaps prevent my successors from changing the denominations, which I have adopted conformably to the very energetic manifestation of a quality or a faculty.

There are presumptuous men, who think they can do every thing better than it has been done, and who say to me: "I doubt not, that there exists different organs in the brain; I only doubt whether we ought to admit those, which you pretend to have discovered." I would urge these persons to publish their discoveries, as well as the proofs on which they rest them. If their ideas are more conformable to nature, their proofs more convincing than mine, I will receive them with the more eagerness, as I attach more importance to a doctrine of the functions of the brain, which should leave nothing to desire.

Others, again, make exceptions to my physiology of the brain, inasmuch as they pretend, that I admit too great a number of fundamental qualities, and faculties and organs. It is not astonishing, that from twenty-seven to thirty fundamental qualities, and as many organs, should appear much too numerous to philosophers, capable of deceiving themselves to the extent

of believing one, two, three, or at most six fundamental forces, sufficient to explain all the qualities and all the faculties of man.

When I commenced my researches, I was very far from knowing what I should discover. I had as little prepared myself to find a single fundamental power as to find twenty. Each of those, which I admit, is clothed with distinctive characters of fundamental qualities or faculties. Each one fulfils the following conditions announced at the commencement of the volume.

1st. That the organ is neither developed in the same time with the others, nor degrades itself simultaneously with them.

2d. That, in the same individual it is more or less developed than the other organs, and its functions takes place with more activity than that of the others.

3d. That when, in complete imbecility and in complete loss of mind, the function of this organ is alone in activity, this organ has alone acquired a certain degree of development.

4th. And that this organ alone remains in arrear in its development, in cases where its activity is alone more feeble, than that of the other qualities and faculties.

5th. That in mental diseases, the primitive force in question, may alone be injured or remain untouched, that is, that its organ may be singly injured, or be found singly untouched.

6th. That the fundamental function and its organ exist in certain species of animals, and are wanting in others.

7th. That often the same fundamental forces are found to exist in different degrees in the two sexes, and that, in this case, the organ of the quality or faculty has a degree of development differing in the two sexes.

These modifications certainly cannot be explained either by the aid of a single fundamental force, or of

three, or of five, or of six; and every hypothesis, which renders no reason for the daily phenomena which the state of health and the state of disease offer us, is necessarily false.

Now, as it is precisely these modifications, which constitute the character of a fundamental power, and as they are found, either wholly or in part, in all the moral qualities and intellectual faculties of which I have treated, I must necessarily receive them as so many fundamental powers.

All, that may seem incomplete to the reader, will be completed hereafter, when I shall treat of the philosophy of man.

CONFIRMATION OF THE TRUTH OF ORGANOLOGY, AND CONSEQUENCES WHICH FLOW FROM THIS DOCTRINE.

Agreement between the prevalent Form of the Head and the moral and intellectual Character of Nations.

The philosophers, who have hitherto made a collection of the crania of different nations, sought for characteristic signs, not only in the osseous box, which encloses the cerebral mass, but likewise in other bones of the cranium. They sought rather to find the marks by which they might distinguish the head of the negro, the Carib, the Iroquois, the Tongusian, the Samoïede, the Chinese, the Arab, Laplander, Kalmuck, than to discover the material or organic causes of the characters, by which these nations are distinguished. We see, by all that I have said in the preceding sections, that, in order to find the external signs of the difference of these characters, it is only necessary to study the osseous box of the brain.

In treating of each quality and of each individual faculty, I have pointed out for almost all, the influence which climate exercises on them. I may therefore

confine myself for the present, to presenting some general ideas.

It is certain, that different qualities and faculties characterize, in a particular manner, certain countries, and that there is a marked adaptation, as well for certain races of men, as for the energy of certain moral and intellectual powers. It is under the temperate zone, that man has attained the highest degree of perfection of which his nature is capable. Under the extremes of heat and cold, his activity is impaired. Under the one, he is dull and stupid, moderate in his pacific desires; under the other, he is violent in his affections, feeble in judgment, and given up to animal pleasure; under both, he manifests a mercenary soul.

"It is to the southern nations of Europe, both ancient and modern, that we are indebted for the invention and embellishment of that mythology and of those ancient traditions, which even now present the most fertile field for the imagination, and an inexhaustible source of poetical allusions. We owe to them the romances of chivalry, and those succeeding models of a more rational style, by which the imagination is excited, and elevated, and the spirit is purified."

The north has been more fruitful in the productions of industry, and it is there, that the sciences have received their most valuable additions: the efforts of imagination and of feeling have been more successful and more common in the south. While the borders of the Baltic were made illustrious by the labors of Copernicus, Tycho Brahe, Kepler, those of the Mediterranean produced men of genius in all departments, and abounded iu poets and historians, as well as in philosophers.

In the north, science is still confined to those departments, which furnish scope for the judgment and memory. Faithful details on public events, without much discernment in regard to their respective importance; the treaties and the claims of nations, the

genealogies of sovereigns, the dates of their birth; these are the great objects, which the literature of the north has endeavoured religiously to preserve; while it has allowed the faculties and feelings of the soul to remain neglected. The history of the human heart, the interesting memoirs furnished us by the free and natural incidents of private life, as well as the brilliant events of high office, the spirit of wit, the piercing shafts of satire, all the varieties of eloquence among the ancients and the moderns, are confined, almost without exception, to the latitudes of the fig and the grape.

The burning desires, the fiery passions, which are enkindled between the sexes in one climate, in another shrink into cold regard, or reciprocal pardon for mutual disgusts. One is struck by this difference, in crossing the Mediterranean, in ascending the Mississippi, in crossing the mountains of Caucasus, in passing the Alps and the Pyrenees to the Baltic Sea.

On the frontiers of Louisiana, woman governs by the double ascendency of superstition and passion. Among the natives of Canada, she is a slave, and is valued only for her labors, for the domestic duties which are her lot.

The fires of love, the tortures of jealousy, which have so long reigned in the seraglios and harems of Asia and Africa, and which, in the south of Europe, have hardly been influenced by the difference in religion and of the civil establishments; by a diminution of the heat of climate, and in higher latitudes, easily change into a momentary desire, which takes possession of the soul without enfeebling it, and leads it to acts of gallantry. Farther north, it is a spirit of gallantry, which occupies the mind and the imagination, more than the heart, which prefers intrigue to enjoyment, and substitutes affectation and vanity, for desire and feeling. In proportion as we leave the tropics, this passion degenerates more and more into a habit of domestic union, and cools to such a degree of insen-

sibility, that, if the two sexes had the liberty of choice, they would hardly prefer this kind of society."*

The history of the human race forms an inexhaustible source of similar reflections. Researches of this nature will be more multiplied, and will have more importance, in proportion as men are more convinced, that intellectual operations depend on the animal organization.

As to the examination of heads in particular, I deem it my duty to recommend the following precautions.

To observe a small number of crania is usually thought sufficient, in order to be prepared to draw deductions from them; it would in fact be so, if the moral and intellectual character of all individuals composing a nation, were the same. According to my observations and those of Spurzheim, there is, in this respect, the greatest difference between man and man, even among nations to whom a decided national character is attributed with reason. Spurzheim saw at London twelve Chinese, and found them as different from each other as the Europeans. The resemblance between them existed only in the countenance, and especially in the position of the eyes. M. Diard gave me two crania found at Coulpi, on the borders of the Ganges. If I except the organs of the love of offspring, and of the sense of property, which have acquired an equal degree of development, all the others offer striking distinctions. We see the same differences in negroes, though these resemble each other in the mouth and nose, especially when they come from the same district of country. Among three negroes, whom Dr. Spurzheim saw at London in the establishment for mutual instruction, was a young man, eighteen years of age, endowed with extraordinary talents and a very agreeable face; I have seen several negroes of both sexes, whose features were far from

* Ferguson, Essay on the history of civil society, vol. I. p. 315, &c.

being disagreeable. I see the same form in individuals of different nations, so that it would be impossible to distinguish by that circumstance alone, whether a man was French, German, Italian, Spanish, or English. It is precisely for this reason, that we find individuals of all nations, who have precisely the same moral and intellectual character. We therefore pass a hasty judgment, when we think to discover the general character of a nation, in a small number of crania.

In order to discover this general character, we must have it in our power to study a great number of individuals, whole masses, the whole nation, if possible. With such facilities, it would be easy for the organologist to discover, in the structure of the head, the material cause of the character of a people. It is true, that, generally, the negro is inferior to the European in intellectual faculties; accordingly, in general, negroes have the head smaller, and a cerebral mass less than the inhabitants of Europe. It is true, generally, that the English and the French have less disposition for music than the Italians and the Germans: accordingly, the organ of tones is less developed in the former than in the latter. We may also explain, by comparing the forms of their heads, why the English and Germans are disposed to seek the connexion between cause and effect, while the French confine themselves to individual facts, and despise abstractions and generalizations, &c.

It is in this respect, that the study of the forms of national heads may be useful to organology: and, at this moment, one might make on this subject a very interesting work. It is of little consequence to the physiologist, that the general character of a nation depends on the influence of the climate, upon the kind of life, the habitual occupations, nourishment, the form of the government, religion, or on original race; for, in most cases, the question might be actually insolvable. It will often be easy to deny, that the climate exercises a predominant influence.

The history of all ages and all nations teaches us, that the most striking contrasts, both in regard to physical beauty and to the intellectual faculties, are found placed near each other. One nation will live thousands of years in one country without gaining civilization or the character of natives. On the other hand, we should sometimes be tempted to say, that the change of the form of government and of the religion has also changed the character of a nation; while in fact it is not changed; it is only compressed or has been temporarily modified. If you see a people to-day seized with religious fanaticism, to-morrow a prey to the passion for conquests, and the next exalted by the desire of liberty, finally, at all times, varying from moment to moment in its judgments and in its desires; if the same nation, which formerly was the cradle of the arts and sciences, now grovels in idleness and sensuality; avoid saying that its organization and its character have changed. It appears to be a part of the plan of nature, that sometimes one organ, sometimes another, should exercise supreme power over the same nations.

I subjoin some observations on the heads of the Papous, extracted from a memoir read to the academy of sciences by M. Gaimard, physician and naturalist of the expedition of discovery around the world, commended by Capt. Freycinet, and one of the compilers of the zoölogy of the great work, in the press, in relation to this expedition.

"We brought," says he, "from the island of Rawak six heads of the Papous, which we found on the threshold of the tomb of a chieftain. On our arrival at Paris, having submitted these heads to the examination of Dr. Gall, we have now the satisfaction to offer, with more confidence, such of our observations as will support the doctrine of this celebrated physiologist. At the first examination of the crania, M. Gall remarked in all an inequality, which he called *rachitic deformity*, and which led him to believe, that the men, to whom

it belonged, inhabited low and damp places. It was with surprise, we must say, that we confirmed the truth of so delicate an observation. In fact, most of the inhabitants of this Archipelago, living principally upon fish and shells, scarce ever leave the seaboard, which in these countries is so marshy, that one can in a manner sail in the woods. The inhabitants, whom necessity obliges to remain in such unhealthy places, endeavour to escape their influence by raising their houses on piles. They have probably learned by experience, that places constantly submerged, are less dangerous than those occasionally so, whence the custom which they follow of building their habitations above the waters of the sea.

"The heads of the Papous present a flattening of the anterior and posterior parts, and at the same time a widening of the face.

"The summit of the head is elevated, the parietal protuberances are prominent, the temporal very convex, and the coronal, at the place of the semicircular line of the temples, presents a remarkable prominence.

"The bones of the nose, almost vertical, flattened from before backwards, have little prominence; they are narrowed at their middle part and widened above and below. The form of the nose corresponds to this arrangement, which is still increased by the breadth of the rising apophyses of the superior maxillary bones, directed forward. These bones themselves are much broader than in the European race, which depending especially on the development of the malar apophysis, gives to the face the breadth, which is remarked in all these nations.

"The anterior opening of the nasal canals is very much widened at its inferior part; this widening is even more considerable than among the negroes.

"The malar bones are more directed forward, and the zygomatic apophyses are broader and more prominent.

"We observe, in one of the heads, the greater

breadth and depth of the maxillary and frontal sinuses, discovered by the fracture of the bones. The draughtsman, M. Chazel, has faithfully copied this accident, as well as the scar, made by a cutting instrument, which has altered the left parietal.

"The alveolar arch is of very remarkable thickness in the part corresponding to the molar teeth; the roof of the palate, more developed in the transverse diameter, is less extended from before backward.

"The anterior palatic opening is larger. Would not this disposition indicate a more considerable development of the naso-palatic ganglion and a more perfect organ of taste?

"One of these heads, which was not drawn, is irregular, offers in the two halves of the cranial box a considerable difference. The flattening, instead of being in the direction of the anterior posterior diameter, is obliquely from right to left, and from behind forward. The left parietal is likewise much flattened, which greatly diminishes the capacity of the cranium on this side, whence there must have resulted a great inequality in the cerebral hemispheres. This head resembles in this respect that of Bichat, with the difference, that the posterior depression is found on the opposite side. A similar conformation may be met with among all nations.

"Another head presents two osseous prominences in the auditory passage.

"Finally, the last, which is smaller, seems to be that of a woman: the anterior part, less broad and less elevated, announces more limited intellectual faculties; the occipital, more prominent at its superior part, by indicating a decided love for children, enables us to divine the maternal character, and the squamous portion of the temporal, more flattened, denotes less propensity to cruelty; which again comes in aid of the opinion of the sex of the individual, to whom this head belonged. It was, very probably, a woman; she was young, because the osseous prom-

inences are not marked, and because no suture is ossified.

"If, after the examination of the osseous prominences, we pass to that of the faculties, which, according to the discovery of M. Gall, they announce, we shall see the development of the parietal protuberances indicate circumspection, whence results the distrust to which the Papous are subject. We might say, that this is an instinct in half savage men, as it is in most animals. We may add, that in the Papous, distrust must often be brought in play by the wars, made on them by the Pirates of the surrounding islands, who fall upon them unawares and make them slaves. Without entering here into fuller details as to the customs, which belong more particularly to the history of the voyage, I will only say, that, when in a simple canoe, one of us (M. Quoy) visited the village of Boni, all the inhabitants fled into the woods, before it was possible to speak to them. It is, without doubt, this state of alarm, almost habitual to these islanders, which had led them to place their houses almost opposite dangerous reefs, of which they alone knew the passages, in order to have time to escape their oppressors.

"In one of the heads drawn, the lateral portion of the frontal, which we see below the semicircular line of the temples, and which touches the anterior inferior angle of the parietal, offers a remarkable convexity, and indicates a manifest disposition to theft. We know, that theft is a habit, to use the expression, proper to all these tribes, and that they execute it with more or less cunning and industry.

"But the most marked trait, denoted by the elevated temporal bone and temporal fosse, is the carnivorous instinct which is sufficiently developed, to lead to murder: a frightful propensity to which these islanders abandon themselves, and of which the bones in question are probably the result. The chief, or Kimalaha of Guébé, assured us, that there existed anthro-

pophagous tribes in the interior of the land of the Papous. This assertion reminds me, that, in landing at the island of Ombai, I saw suspended in the cabin of a native, in the village of Bitoka, a row of jaw bones. Six months before, a dozen Englishmen were killed and devoured by the ferocious Ombayens, in this island, where we, being few in number, incurred the greatest dangers.

"The elevation of the superior posterior and middle part of the frontal, and of the corresponding part of the parietals, is a sign of exaltation in religious ideas, whence flows the tendency to superstition. We ought here to say a word concerning the perfect arrangement and religious care, which these natives exhibit in the construction of their tombs. These are small huts in which several persons might be contained in an inclined attitude. The body there reposes in a box, which most generally encloses small idols rudely carved, bracelets, a comb, and hair. Sometimes we find nothing; in this case they are simple sarcophagi, raised to the memory of those who, having perished in combat, may have fallen into the power of the conquerors. At other times, a statue, placed under a small hangar, (*shed*,) indicates the place of the burial; or the spoils rest on piles, and are covered with a canoe reversed.

"The top of the head very elevated, announces inflexible firmness. We have no fact in support of this opinion.

"The posterior flattening of the cranium, which we have observed in five heads, shows that the organ of philoprogenitiveness, or, of the love of children is deficient. We see it prominent only in that, which, we have reason to believe, belonged to a woman. Our opinion coincides with that of M. Gall. It is in fact persons of this sex, who take care of the children; the men have no concern with them, and even appear indifferent to them. Among the negroes, on the contrary, M. Gall has almost always remarked the de-

velopment of the prominence, which indicates the existence of this faculty, the preservative of the species.

"The observations, which we have made on the Papous, the justness of which appears to us to be confirmed to a certain extent, by the study of the character of the individuals, who form the subject of them, seem to us to contradict the paradoxes of those morose philosophers, who, angry with the vices of men as they exist in society, have represented the man in the state of nature such as he is not, and have made of him an ideal being, in order to bestow on him attributes of power and means of happiness, which civilization can alone confer.

"We ought to add, that the Papous would be susceptible of education; that their intellectual faculties would require only to be exercised and developed, to make them hold a distinguished rank among the numerous varieties of the human race." (QUOY et GAIMARD, *Zoölogy of Capt. Freycinet's voyage round the world.*)

We see by this relation, that other travellers have given a very mistaken idea of the organization of the head of the Papous, by representing it as extremely defective. The two heads here described are now preserved in my collection.

Of Physiognomy, or the Talent of Knowing the Interior of Man by his Exterior.

We understand by the expression *physiognomy*, the art of knowing the moral and intellectual character of man, by the sole external conformation, not of his face alone, but of all the other parts of the body, without these parts being put in action.

Not only the vulgar, but even philosophers, give to this art the preference, over the physiology of the brain. Others imagine, that my researches on the

functions of the individual cerebral parts, and on the inferences to be drawn from a certain form of head, are of the same nature as those of the physiognomists. There is, however, absolutely, no relation between the two. A physiognomist, Lavater for example, is not at all guided by the knowledge of anatomy and of physiology; the laws of the organization of the nervous system in general, and of the brain in particular, are unknown to them; they have no idea of the different composition of the brain in different species of animals; they take no account of the different results of the different development of the cerebral parts. They know not the influence, which the brain exerts on the form of the head; they have no notion of the changes, which the encephalon and the cranium undergo in the different ages of life, in different diseases, in mania, &c. They are still imbued with prejudices imbibed in regard to the causes of the different moral qualities, and the different intellectual faculties, and to the divisions of them, which philosophers have established. Now, if we consider, that the material cause of all the qualities and all the faculties exists in the brain, how can we expect ideas conformable to nature, from men wholly strangers to the knowledge of the structure and functions of the brain?

Accordingly, all the observations of the physiognomists are founded on extremely variable indications. Physiognomists have not yet established a single solid principle, a single immutable sign. All that they have advanced amounts merely to *sensiblerie* and declamation. Read all the writings of Lavater, and you will every where find the same wanderings of the imagination, the same exaltation so contrary to the spirit of observatiou. The same character has its sign sometimes in a certain form of the eyes, sometimes in a certain form of the nose, mouth, hand, and even in a peculiar position of the teeth. This is easily explained; when the physiognomist knows the character of the person, and finds in him any part

formed in a manner which strikes him, this conformation becomes for him the distinctive mark of this character. When a criminal is led to the scaffold, there is no one who does not read his character in his face; whereas so long as he kept his place in society, no one saw, what is now seen written in such distinct characters.

Submit the same head, the same drawing to the judgment of three zealous physiognomists. Each of them is persuaded of the infallibility of his knowledge; and yet each of them will pronounce a totally different judgment. I have often shown a collection of four hundred casts to physiognomists, fully persuaded of the truth of this science. My casts give very faithfully all the forms of the forehead, of the nose, eyes, cheeks, lips, chin, &c., and yet not one of these physiognomists has ever either determined the general character, or indicated even a particular quality or faculty of either of the originals of my four hundred casts. All have constantly been deceived.

That, says one of my readers, would not have happened to me; a hundred times have I judged the character of persons from their physiognomy, and I doubt if I was ever deceived. Have you judged persons whose character was previously unknown to you? Have you given yourself the trouble, and have you had time to substantiate your judgment? Have you eaten a bushel of salt, with each of the persons whom you have judged? And how do you announce your judgments? *This is a good man, an essentially honest soul; this man has something deceitful in his eyes, I would not trust him; that is an amiable woman and of angelic temper; what a venerable matron!* &c. But what is there determinate in all these judgments? Do they teach us by what quality or what faculty, such an individual is distinguished?

I have proved, that the brain is exclusively the organ of the soul. There is then only the form of the brain or that of the osseous box, as far as it is deter-

mined by the form of the brain, which can enable us to judge of the qualities or faculties. There can exist no relation whatever between any other part, and the qualities or faculties. There is not, either in the nose, or in the teeth, or in the lips, in the jaws, hand, or knee, any thing, which can determine the existence of a quality or a faculty; these parts, therefore, cannot furnish any indication relative to the moral or intellectual character.

I know well, that, according to the physiognomists, there exists a certain harmony between all the parts of the body. "It is evident," says Lavater, "that the intellectual life, the faculties of the human understanding and mind, manifest themselves especially, in the conformation and situation of the bones of the head, and principally of the forehead; although, to the eyes of an attentive observer, they are sensible in all the points of the human body, on account of its harmony and its homogeneousness." On this hypothesis, it would be matter of indifference to take for the subject of observation, the nose, the knee, the foot, the chest, hand, or brain.

I have conversed on this subject with the most learned artists. Generally, they hold the opinion, that the form of a determinate part of the body being given, one can determine the form of the other parts; that the nose suggests the forehead, and the whole head; that a determinate form of the forehead necessarily supposes such a form of the nose. These assertions have induced me to make the most exact researches. I have examined with care, devotees, poets, philologists, voluptuaries, warriors, ambitious men, who had each the cerebral organ of their dominant quality or faculty extremely developed, and in each, I have found a different nose, different lips, different hands, &c.

In general, the physiognomists have recourse to more than one gratuitous hypothesis. They go so far as to say, that it is the soul, which builds itself its

external envelope, and, consequently, that this last must necessarily bear the impress of the qualities and faculties of the former.

1st. This assertion is proved by nothing.

2nd. It supposes that the cause of the difference of the qualities and faculties of the soul depends on the soul itself, and not on the material organs.

3d. Experience proves, that, both in man and in woman, the virtues and the faculties are not proportional to the beauty of the different parts of their body, or, of the harmony which reigns among them.

And after all, when a physiognomist has pronounced a judgment, by what has he been determined? Will he be able to tell me, what kind of eyes, nose, mouth, the person has, whom he has judged? He has, therefore, not judged from the forms of the parts, and, consequently, not as a physiognomist. The gestures, the movement, the habit of body, the motion of the eyes, the speech, &c., have determined his judgment, without his being able to render an account to himself, how he has passed a pathognomic judgment; that is, he has judged of the motion, and not of the form of the parts; in this case, we shall be able to understand each other.

It is not without a kind of confusion, that I mention the opinion, according to which one may judge the character of a man, by the resemblance he has to some animal. Where are these resemblances found? Again in the nose, the jaws, the eyes, the mouth; and what can they, consequently, indicate? Let two persons undertake to guess what animal I resemble, and each of them will name a different one. Yet, say they, Socrates resembled a Satyr, and he confessed himself, that he had the inclinations of one. But what kind of animal is a Satyr? And where is the strong head, whatever its physiognomy, which has not to struggle against the desires of the flesh?

Of Pathognomics, and of Mimicry or Pantomime.

I have said, that one does not judge as a physiognomist, when he pronounces a judgment on the character of a person, without taking an exact account of the forms of the parts, on which he founds his judgment. If the parts in question are in motion, and if it be the motions which we judge, we pronounce a pathognomic judgment; for the act of judging a person by his gestures, by the whole habit of his body, is *pathognomy*.

This art is founded in nature herself; for, it is nature that prompts all the gestures, the attitudes, the movements, finally, the whole pantomime, by which men and animals express all their feelings and ideas. Pathognomy has its fixed and immutable laws, whether we apply it to man or to animals, so long as the question relates to the same feelings and the same ideas. Pantomime is the universal language of all nations and of all animals: there is no beast, there is no man, who does not learn it; there is no beast or man, who does not understand it; it accompanies language and strengthens its expressions; it supplies the defects of articulate language; words may be ambiguous, but pantomime never is so.

Who does not recognise by his pantomime, the voluptuary, the bully, the boaster, the vain man, the devotee, &c.? Have men ever been deceived in regard to the expression of anger, despair, jealousy, the desire of vengeance, grief, tenderness, irony, gaitey, confusion, envy, &c.?

There are those, however, who pretend, that the expression of the affections, passions, feelings, ideas, is not subjected to invariable laws; that it is arbitrary, and varies with the man or the animal, that makes use of it.

There is no doubt, that the sentiments and the ideas are modified differently in every animal, that experi-

ences them, and that consequently the pantomime of each of these individuals, must be differently modified. Still, in essential points, all human individuals feeling and thinking in the same manner, their pantomime must also be essentially the same. If this pantomime were arbitrary, how would children and even animals understand it?

Another reason again, why the pantomime of the affections, &c. cannot be absolutely uniform in all its details, is, that there is almost always a complication of different affections, and that it is not, far from it, the complication of the same affections, which constantly takes place. Jealousy, for instance, expresses itself very differently, according as it is complicated with anger, with a repressed desire of vengeance, with confusion, pride, grief to see one's self betrayed, contempt, irony, &c. The pantomime must necessarily be complicated with the expression of the different sentiments, ideas, and passions, which affect the individual simultaneously.

What would become of engraving, painting, sculpture, the comic art, eloquence, poetry, if the expression of the sentiments and the ideas were not subjected to immutable laws? What means would they have in their power to paint modesty, prudence, contrition, fear, despair, baseness, remorse, innocence, joy, anger, contempt, pride, meditation, contemplation, devotion, or firmness? How would the eye of the dying gladiator say to us, *I die, but I am neither surprised nor grieved.* How would Laocoon present to us the image of man, sinking under sufferings without too much weakness? Who could comprehend their language? Would not the expression of love be confounded with that of hatred; the expression of envy, with that of benevolence?

Where, in fine, is the man or the animal, who takes time to deliberate on the manners, in which he would make his feelings and his ideas understood by others? Even at the moment, when the feeling and the ideas

arise, they are written on the exterior in characters discernible by all the world. It is certain, therefore, that the feelings, ideas, affections, passions, are manifested without, by suitable expression according to determinate and invariable laws.

But how happens it that each affection, passion, feeling, and idea, produces a peculiar and proper pantomime? Why does the humble man walk meekly along, with his eyes fixed on the ground, while the proud one struts with expanded chest and head erect? Why does the devotee raise his head forward, and direct his looks and hands toward heaven?

These are bold questions, and the bolder as no one as yet has entertained the idea of seeking the cause of these phenomena. Let us see if organology is capable of throwing any light on these mysteries.

Of the Internal Sources of Imitation in general, and of the Imitation of each Feeling, of each Passion, &c., in particular.

The brain is the source of all the feelings, ideas, affections, and passions; their manifestation, therefore, must depend on the brain and be modified by it. The brain is connected with the instruments of all the senses, and by aid of the spinal marrow, is equally so with the instruments of the voluntary movements. It controls the senses and the muscles, and consequently, the extremities; it puts in action each of the parts; by its activity it determines the movement they must make, the position they must adopt; as soon as it is at rest, the senses, the muscles, the limbs are inactive.

But the different cerebral organs are placed in different regions. The action of the brain, according as such or such an organ is active, must then commence from different regions. Each of the cerebral organs, in a manner peculiar to itself and suitable to its place, brings under its influence the instruments of the senses,

the muscles, the extremities. Each organ, therefore, expresses its action by a peculiar play of pantomime; consequently this play of pantomime is the peculiar language of the organ in question, and reveals, not only the nature of the feeling, the idea, the affection, the passion, but also the seat of the organ, from which their movements have proceeded.

Organology may then draw from mimicry two advantages equally valuable: 1. Mimicry may serve to indicate the place of the brain, where the organ which acts in such a particular case is found, and thus prepare for the organologist the way to arrive at proofs, which place beyond doubt, what at first he had only suspected: 2. It serves as a confirmation to him by concurring to prove, that the organ, of which he observes the action, is in fact placed where, guided by other facts, he had located it. In treating of the organs in particular, I might have reported in regard to each of them, what has relation to expression. I have not done it, because I thought I could dispense with this redundancy of proof, and I preferred to explain without interruption all that has relation to pathognomics.

The reader is now prepared to divine and to judge the expression of each organ in particular. But, before entering into any detail, I am going to determine the general principles of the external manifestation of the action of the organs.

1st. The organs, which have their seat in the inferior regions of the brain, when they act with energy, carry the head downward, depress and shorten the body.

2d. Those of the organs, which are placed in the superior regions of the brain, during their energetic action, elevate the head and the whole body.

3d. The organs, placed in the superior posterior regions of the brain, depress the head and the whole body backward and downward.

4th. The organs, placed in the inferior anterior regions

of the brain, direct the head and the whole body forward and downward.

5th. The organs, placed in the superior anterior part of the brain, elevate the head and the body and carry them forward.

6th. The organs, placed at the superior posterior part of the brain, elevate the head, the body, and carry them backward.

7th. The organs, placed in the inferior region of the brain, in a perpendicular line with the great occipital opening, depress down perpendicularly the head and the whole body.

8th. The organs, placed in the superior region of the brain, perpendicularly above the great occipital opening, elevate perpendicularly the head and all the body.

9th. When the twin organs of each function act simultaneously, the head and the whole body move symmetrically from above downward, from before backward, &c., according as the organ which acts, is placed in the anterior, posterior, superior, or inferior region of the brain.

10th. When there is only one of the two equal organs, which acts, the head and the body move on the side on which this organ is placed, from above downward, from below upward, from before backward, from behind forward, according as the organ acting is placed in the superior, inferior, anterior, or posterior region of the brain.

11th. When the two double organs act alternately, the head and the body perform alternately the motions belonging to their action, sometimes on one side, sometimes on the other.

12th. When the double organs, having their seat in the perpendicular axis of the brain, act alternately, the head moves on its pivot from right to left, and from left to right, from above downward, and from below upward, according as the acting organ is situated in the superior or the inferior part of the brain.

It is in consequence of these laws, that, when, in man or in an animal, a fundamental force is strongly in action, the senses, the limbs, and the head execute certain determinate movements, without the animal or the man having any deliberate consciousness of them. These movements are, therefore, a purely automatic language, and for that reason generally intelligible.

I shall examine the pantomime of most of the organs of the fundamental qualities and faculties, of which I have hitherto treated. In describing this pantomime, not such as I have invented it, but such as nature made it, I shall have occasion, not only to explain the twelve laws above announced, but also to add to the proofs already adduced new proofs, that the organs are situated in the region which I have assigned to them.

Natural Language of the Activity of the Instinct of Propagation.

The organ of this instinct being placed in the inferior part of the brain, in the occipital fossas immediately behind the great occipital opening, the head and the body must, conformably to the third law, be drawn backward, and from above downwards, whenever this organ acts with energy.

Que l'on observe, pendant l'accouplement, le taureau, l'étalon, le cerf, le bélier, le bouc, la souris, les oiseaux, etc., et l'on verra qu'ils retirentl a nuque et portent le nez en avant, Pl. LXI. fig. 1.

Aussi de tous les temps les artistes out indiqué, par cette attitude, le plus haut période de la jouissance amoureuse. Que l'on se souvienne de l'excellent tableau de Carlo Cigniani, représentant Joseph qui échappe aux brûlans désirs de la femme de Potiphar; l'impudique amante, le sein découvert, la nuque retirée en arrière, la bouche entre-ouverte, le regard en-

flammé, retient l'objet de sa passion avec ses deaux bras étendus. Qui ne connaît cette représentation si vraie du Titien, des amours de Jupiter et d'Io, Pl. LXI. fig. 2, et les vers de Lucrèce :

"Atque ita suspiciens tereti cervice repostâ,
Pascit amore avidos inhians in te Dea visus,
Eque tuo pendet resupini spiritus ore."

Lorsque ces caractères ne se rencontrent pas dans la jouissance, elle n'a point été complète.

J'ai déjà montré, à l'occasion de l'organe de l'instinct de la propagation, que dans la jouissance amoureuse, c'est au cervelet que se rapportent tous les gestes; j'y ai cité les jeux par lesquels les oiseaux, les chiens, les chats, préludent au mystère amoureux, C'est en conformité de cette loi encore que l'Amour tient son bras passé autour de la nuque de Psyché.

Natural Language of the Organ of Attachment.

This organ is placed by the side of the organ of the love of progeny; the head and the body ought, therefore, during its energetic action, to be slightly inclined sideways and backward. This posture again has been very faithfully given by the ancients. There is a beautiful group of Castor and Pollux, in which we see their arms resting on each other's shoulders, and these friends pressing together their organs of attachment. In the Madona *au lapin* of Raphael, Mary presses this region of her head against the corresponding region of the head of the child, Pl. XCVII. fig. 1. Observe the pantomime of women very susceptible of a tender friendship, when they express to their friend the deep feeling, which animates them; they place themselves side by side, embrace the shoulders of each other, and press together the posterior lateral parts of the head. We see the same attitude whenever we request two female friends to give each other proofs of their sincere friendship. Even when

two monks, meeting in their monastery, salute each other, each of them passes his arm over the shoulder of the other, and brings his own head near that of the other in the region, where the organ of attachment is found. The usual friendly salute between two men who meet, consists in touching each other's hand, moving it and pressing it gently, while one usually turns the side of the occiput toward that of the other.

Cats to testify their attachment lift their backs, turn the head laterally backward and from above downward, rubbing gently the organ of attachment against him, whom they caress.

If this pantomime is not always in reality as characteristic as I have described it; it must be remembered, that friendship is not always as lively, as the usual protestations would seem to indicate.

Natural Language of the Organ of Self-Defence.

This organ, as we have seen, has its seat at the inferior posterior angle of the parietals. It is placed on one side and a little below the organ of attachment. When it acts with energy, therefore, the head must be drawn a little backward and between the shoulders. When only one of the two double organs is active, the head should be drawn aside, backward, and against the shoulder of that side whose organ acts. Pl. XCVII. fig. 1. When the two organs are active to the same degree, this movement must take place alternately on one side and on the other.

It was the expression of the organ of self-defence, which first suggested to me the idea, that it is the seat of the organs, that determines the nature of gestures. I saw two coachmen fight; one threw himself like a madman on his adversary, who was much smaller than himself; the latter, leaning a little on one side, clenched his fist, drew his head between his shoulders, depressing it slightly, and repulsed victoriously the

attacks of his enemy by vigorous blows. Pl. XCVII. fig. 3. In fine, the greater one endeavoured by turning to take him in the flank. The smaller leaned still more, took the attitude of the fighting gladiator, bent his body forward, with head drawn back between the shoulders, and continued to repulse his enemy with success. The larger one, in the hope of flooring him, seized him in his arms; his antagonist, with his chin against the chest, grappled him with such force, that he overthrew him; the concourse of spectators put an end to the combat. While admiring the courage and address of my little victorious athlete, I made the following reflections.

1st. The organ of self-defence was here in full activity, and produced all the movements of the combatant. I was struck especially with his placing himself with the legs separated, the body drawn up, the occiput bent backward between the shoulders, a position which gives great steadiness to the whole body, but particularly with his advancing his chin a little. I naturally attributed this act of stiffening the neck, and drawing the head backward, to the state of excitement of the organ of self-defence, since these movements took place so near the seat of the organ; I was still confirmed in this idea, when I saw, that my athlete drew back the head towards one of the shoulders, taking an oblique attitude.

Above all, I saw manifestly, that, when there is only one of the double organs in action, the head is turned toward the side of this organ. At this period, I had already remarked, that animals, when they wish to regard an object attentively, turn the head sometimes on one side, sometimes on the other, according as they look or hear attentively with one or the other of the eyes or ears. I saw then, that the same thing takes place in the organs of the qualities or faculties.

Struck by this idea, I considered the expression of each of the organs which I had then discovered, and, to my great astonishment, I found that this expression

always corresponds to the seat of the organ which acts, and that the movements of all the other parts, the hands, feet, &c., correspond to this seat. Never should I have imagined, that it was given to man to penetrate into secrets of this nature, and I confess, that the joy of having made this discovery, which furnished, at the same time, such beautiful confirmation of all that I have previously discovered on the subject of the organs, nearly deprived me of my reason. To understand my ideas on expression, requires such an exact knowledge of the organization of the brain, of the seat of each of the organs, qualities, and faculties, and of the manner in which each of these organs manifests itself, that neither my hearers nor my readers will be able to agree with me, when this part of my doctrine shall be presented to them. The connexion, I establish between the expression and the seat of the organs, is too new and too profound a thought to be perceived at the first glance. Most persons even refuse to admit, that expression exists as I describe it. I have invented it arbitrarily, say they, in consequence of my reveries. It is only those, whose attention has been fixed on these objects, and who, having observed themselves and others, have thus become convinced, that the pantomime of the same quality, or faculty, for example, of boldness, of devotion, &c., is essentially the same in all individuals, that gradually become disposed to admit, that all the movements which compose it are involuntary, and that, consequently, they must proceed from the same determinate and immoveable cause.

When we direct our attention further into nature, we soon become familiarized with these ideas. In the state of health and in the state of disease, we execute all our movements according to the same laws. Who understands not the natural language, which accompanies the use of the external senses? Hardly can we perceive savory dishes, before our mouth waters; we observe the motions of the nose and mouth, when

we are attentive to an odor or a flavor. Before the animal or the man, who is tormented with thirst, reaches the cup, the mouth is already open, and the tongue applied to the lips to refresh itself in the liquid. Observe the effort of the eyes and the ears, when we look at an object, or when we listen to any noise. When we are menaced with a danger, before having any deliberate consciousness of it, we first give to the most exposed part the movement, which is most proper to diminish the danger. Not only the feet, the arms, the hands, but the whole body is involuntarily put in motion in a determinate manner. Those parts, which are more nearly threatened, contract even convulsively.

In the state of disease, in man as well as in animals, it is by the motions of the patient, that the physician frequently knows the seat of disease. When an animal is tormented by worms or by pains in the intestines, he always carries his mouth towards the place where he feels the pain. In the staggers, it is by the manner in which the sheep holds his head, that we judge of the part of the brain, where the hydatid is situated. A person without consciousness, stunned by a fall or a blow, always carries the hand to the suffering place, &c.

Those of my hearers who follow the course of my ideas in these reflections, will be convinced, that in fact the exterior man is only an impress of the interior. I hope it will be so, likewise, for some of my readers at least. But it is time to return to my subject. In the natural language of the instinct of self-defence, all the body in a manner concentrates itself; the muscles contract, the neck stiffens, the arms are drawn a little back, and the hand closed, the teeth are clenched, the eyes as well as the mouth threaten the adversary. The coward scratches his ears as if to excite the organ. Every day I see the same language even in animals, so far as the structure of their frame allows it; for example, in dogs, who are going to throw

themselves on each other. Cocks, at the moment of fighting, draw their heads briskly backward several times. Bucks, before throwing themselves on each other, raise themselves on their hind legs and bend back the neck. And thus these movements coincide with the seat of the acting organ.

Natural Language of the Instinct of Destruction, and the Instinct of Murder.

The organ of murder, or of destruction, has its seat immediately above the ears, in the perpendicular line of the vertebral column. The head, therefore, during the energetic action of this organ, is drawn back between the shoulders, and is carried neither forward nor backward, but makes a rapid movement, or rather it turns rapidly from left to right, and from right to left.

Sometimes my hearers have guessed admirably well the action of this organ; for, I am in the habit of giving the language of the organ of which I am discoursing. When one is so enraged against another as to exclaim; "If I had him I would tear him in pieces; if I meet him,"—he raises his two fists, and shakes them, one on each side of his head, with great force, he sets his teeth, and makes a violent movement from right to left, and from left to right, with the head drawn back between the shoulders. Notice in Pl. LXIX. fig. 1, the position of the woman, Albert, at the moment when she prepares to murder all her family. The head is strongly drawn back to the neck; she poises in her hand the hatchet, the instrument of her crime; and yet this is the only position she recollected, as she recalled it to her memory, when the artist asked her in what attitude she was, when she committed the deed.

In the chase, we hold the dogs at the moment, when, thirsting for blood, they are going to rush on

their prey, they set the teeth with violence, foam at the mouth, bark furiously, and shake the head with violence. Often in the combat of animals, at Vienna, I have seen oxen and bulls in their rage, in presence of the enemy, whom they threatened to annihilate, groan, bellow, and throw into the air with their feet, sand and stones, shaking with fury their heads, which they had drawn back upon the neck. So the lion, breathing nothing but carnage and death, shakes his mane with fury. If animals shake with violence, their prey, which they are strangling, the movement may be attributed to the same cause.

Natural Language of Cunning.

The organ of cunning is placed in the lower part of the forehead in front, but not altogether in the anterior part. Hence it follows, that, during the energetic action of this organ, the head and the body must be carried forward and downward. When the double organs act alternately, the head and the body are gently turned from right to left, and from left to right. While turning thus, the cunning man looks aside, and accompanies the movement of his head and body by an analogous movement of his fore-finger, which he holds extended. Hence the expression, *a low, vile flatterer, a cringing man.*

When an Italian wishes to warn you against a perfidious and false man, he looks aside at this man with an expression of distrust; he points to him stealthily and downwards with the fore-finger of one hand, and with that of the other he depresses one of his own cheeks. Pl. XCVII. fig. 4. The expression would be still more just, if he carried the fore-finger to the temple, which probably too is the original gesture. When by cunning one has accomplished his object, one of the eyes is partly shut, or throws an expressive look on one side; he walks with a wolf-like tread;

the fore-finger points out the dupe; and he gently elbows his companion, to announce the victory, as mysteriously as he performed the trick; or, he designates the dupe by making a slight motion of the head one side, Pl. XCVII. fig. 5, all, movements, which represent the mode of address of the cunning man, and which are always in relation with the seat of the organ.

The tiger and the cat, when they watch their prey, or approach it with the wolf step, place the head flat on their fore paws, or lie with the body flat, and the fore and hind paws extended before and behind, the eyes and the tail moving gently, sometimes to one side, and sometimes to the other. The fox has the same gait, when he creeps out of the wood.

Even dogs, when in playing together they wish to surprise their comrade, either place themselves straight on their feet, which have an oblique direction forward and backward, the head horizontally extended, or they lie flat on the ground, the head extended, and drawing themselves gently forward in zigzag direction, until finally they leap with petulance on their adversary. The sparrow, when any thing is offered him to eat, provided he has not yet been tamed, approaches it only by giving to his body, a direction more or less oblique.

Natural Language of the Instinct of Property, or Avarice.

As the organ of the instinct of property is also placed laterally in the temples, but more forward than backward, during its energetic action the head will be carried forward and a little on one side, the arms stretched forward, the hands sometimes opened wide, to receive, sometimes the fingers curved, as in the act of catching a fly that is escaping. A beggar, who asks alms of you, will never walk straight up toward you;

he always advances obliquely, with his head forward and his hand half open.

Natural Language of Circumspection.

The organ of circumspection is placed in the superior external lateral part of the parietals, a little backward from the perpendicular, which passes by the centre of the occipital opening. Consequently, during its energetic action, it raises the head and the body, and gives the head a rotary movement, at the same time that it carries it backward. Observe a man, who, after having reflected a long time, arrives at some particular plan, and dwells on the means of putting it in execution. While he reflects on the course he ought to follow, his body is bent forward; once decided, he raises himself suddenly, turns his head, sometimes to the right, sometimes to the left, holding it slightly inclined backwards, while the eyes wide open, follow the movements of the head, and their direction corresponds to the place of the organ. Pl. xcvii. fig. 6.

The roe-buck is too circumspect to take flight immediately when chased, like the boar or the fox, who save themselves by stealing off at the first noise. The roe-buck delays deciding, he hesitates and wanders here and there, until he is seen nearly on all sides. Thus, with the head raised, he looks on all sides, seeking to discover hills and bushes: finally, obeying the impulse of his terror, he endeavours to make his way through the hunters and the waylayers. I have seen a marten, which was pursued into a granary, follow the same method; she had not perceived me; sometimes she raised the head, and turned the eyes from one side to the other with anxiety: when she perceived, that she was approached more nearly, she retreated by lying flat on the belly. We may observe the same language in the rabbit, the squirrel,

and even in the circumspect birds, the woodpecker for example.

Natural Language of the Sense of Hauteur, and of Pride.

The organ of pride has its seat in the median line, in the superior posterior part of the head. Consequently, during its energetic action, it elevates the head and carries it a little backward.

See the proud man bridle up, straighten himself, and carry his head high. See how he carries his arms forward, in the attitude of command; sometimes admiring himself he raises them: then throwing from his high elevation a look of contempt on all that surrounds him, he crosses them on his breast, or gesticulating with his right, he supports the palm of his left on his side, with the elbow advanced. Pl. XCVII. fig. 7. Ask this man to interest himself in your behalf with the king: he will protect you with a look, he will carry one of his hands on his breast, in testimony of his powerful influence, he will straighten himself on the points of his toes, and a gracious movement of the head directed upward and backward, will say to you: *Leave it to me.* The more profound the feeling of pride is, the more audaciously does the man swell and erect himself; the more does the look, which he throws about him, express self sufficiency and contempt; the more space does he pass over in his solemn walk. The man, who has a consciousness of his own merit, of his own talents, likewise raises his head with dignity, straightening the whole body. Pl. XCVII. fig. 8. A very lively lady expressed to me her regret, at having made an inconsiderate step through pride. Cursed pride! said she, carrying her half open hand to the seat of the organ. In general the case is not rare, that, at the moment of the extreme activity of an organ, the hand is hastily carried toward its seat.

Thus, then, in the expression of pride, all the gestures indicate a tendency to raise one's self, to enlarge, to lengthen the stature. "I know no people" says Engel, "no race of men, in whom pride does not carry its head high, does not raise all the body, and cause the man to elevate himself on his feet, in order to appear taller."

In speaking of pride as a fundamental quality, I have spoken of the expression of those, who are maniacs through pride. This expression is essentially the same in the maniac, as in the sane man; only, by reason of the subirritated state of the former, all the gestures are outraged into caricature.

The attitude of the proud courser magnificently caparisoned, of the cock that has just vanquished his enemy, coincide with the attitude of the proud man, so far as the relation of the form of these animals to the human form permits it. In each case the head is high; the movement, grave and measured.

When we wish to express humility, submission, respect, our natural language is precisely the reverse. The head and the body are bent forward; every thing tends to contract our person: from the profound reverence of kneeling, to the oriental salute on the face, all demonstrations of respect are only the true or simulated expression of the absence of all pride, of all feeling of one's own merit; an expression dictated by the intention of making evident a devotion without bounds, an entire submission, unequalled humility, profound respect. Every where a shortening of the stature, a contraction of the body, and carrying it forward. Pl. xcvii. fig. 9. This expression is a language generally received, consequently natural and founded in the nature of man: it can be explained only by the absolute inaction, and the complete apathy of the organ of pride. Never, and in no country, will man express respect, obedience, submission, by raising his head and carrying it backward.

Confusion results from wounded pride. Accordingly

the mortified man retires, not only with the language of humility, but he also covers his face; he endeavours to escape all observation; he would wish to hide himself in the centre of the earth.

Natural Language of Vanity.

The organ of vanity is placed a little farther backward than that of pride, and more on one side. Consequently, with an energetic action of this organ the head and the body must be raised and carried backward: and, as the double organs are further apart than those of pride, the body and the head must be turned alternately, sometimes on one side, sometimes on the other; hence results a balancing of the whole body. So long as vanity manifests itself tranquilly, the vain man, like the vain woman, holds the head raised; they walk balancing themselves, and turning the head on one side and the other, to see if they are admired.

The fop, vain of the most frivolous advantages, struts, separates his legs, makes gestures to the right and left, squares himself, draws his head backward, and advances with an important air, carrying himself as much sideways, as forward. Pl. XCVII. fig. 10.

In treating of the organ of vanity, I spoke of the sensibility in animals, both to praise and to disapprobation. Observe in his cage, either a canary bird or a goldfinch; while you address him in a kind tone, you will see him turn from side to side, and answer you in affectionate accents, expressive of his pleasure. I here recall to the reader the interesting pantomime of my little dog, when she was receiving praise, while she carried my slipper in her mouth, and I beg him to re-examine the article on the organ of vanity. He will here see movements, which proceed from the region, where the organ of vanity has its seat, or which are referable to that region.

Natural Language of the Organ of the Memory of Names and Words.

This organ has its seat above and behind the eyes. When a person is embarrassed in recalling a name, he holds the eyes fixed and raised, passes the palm of his hand over the eyebrows, presses and rubs the lower part of his forehead, as if to excite the activity of the subjacent cerebral part. Men ordinarily make the same movements, when they try to recite a piece learned some time previous. There are persons, who accompany with several other movements the tension of the eyes, and the action of rubbing the forehead; they bite their fingers, strike their thighs with their hands, &c. But these gestures belong only to individuals; whereas the movement of the eyes, and the action of carrying the hand above the eyebrows, and rubbing the forehead, are always seen.

Natural Language of the Organ of the Arts.

This organ has its seat in the temples, nearly at the height of the superciliary ridges. During the energetic, alternative action of the double organs, the head and the body must sometimes be carried to one side, sometimes to the other, and make a movement similar to that of a bird, which looks at an object sometimes with one eye, sometimes with the other, or that of the dog, which, in watching, hearkens sometimes with one ear, and sometimes with the other. Observe a milliner making a hat; in order to judge of it well, she never places it directly before her, but holds it obliquely, bends her head forward, and views it alternately on one side, and then on the other: she brings to it, therefore, sometimes the right organ, sometimes the left. This is manifest; for, otherwise, why should she not hold the hat directly

before her, and look at it with both of her eyes at once?

Pl. XCVII. fig. 2, a sculptor examines his works with an attentive eye; he is placed a little obliquely; with the left hand, he sustains the elbow of the right arm, and with the expression of thought, places the two fingers of the hand precisely on the organ of the arts. His head is obliquely bent on one side. When he is fatigued with this position, he assumes the corresponding one on the opposite side.

We see on the tomb of Piranesi, a fine statue, which represents this artist, reflecting on his art; it has the position which I have just described.

Natural Language of Music.

The organ of music being placed on the anterior inferior edge of the forehead, its energetic action imparts to the head and body an oscillating movement, from behind forward, and from side to side. Every body knows the natural language of a passionate amateur, who hears fine music. He keeps time with his head and with his body; and manifests his delight by inclining his head, and turning it from side to side.

When I see a person play on any instrument, the body motionless, I am sure that his playing is without soul. When, on the contrary, he sometimes gently inclines on his instrument, and raises himself, with his eyes directed obliquely upward, balancing himself, it is an evidence, that he is filled with his subject.

A musician of my acquaintance, passionately fond of his art, almost to madness, traverses his chamber, trilling, and even walks the streets almost without consciousness; commonly he holds his head bent forward, sometimes he raises it suddenly with his eyes fixed, and his looks obliquely directed towards heaven; this is always the moment of inspiration.

We have some portraits of musicians, which repre-

sent them in this attitude. The engraving of Dussek, among others, presents the moment of inspiration. Pl. LXXXVI. fig 1.

I know a composer, who, while composing, constantly strikes himself on the seat of the organ of music. When he gives himself to a different kind of mental exertion, he exhibits wholly different movements.

M. Garat, in my presence, was requested to sing. At the moment of commencing, he passed his hand first on the organ of tones on the right side, and then on the left. Did he make this movement to animate the organ? Or did the organ already in action, give this movement to his hand? At a party, Madame Catalini could find no language to express the gratification which singing caused her; in this state of embarrassment, she carried on each side the palm of her hand on the organ of tune; rubbing this part with the expression of the most lively joy. These, without question, are movements which proceed from the organ of tune, and which re-act upon it.

Natural Language of the Sense of Localities.

The organ of the sense of localities is placed in the anterior inferior part of the forehead, by the side of the organ of educability. We very rarely have an opportunity to observe its action. But in the following instance, however, I had it in my power to do so. One day, while I was talking with a philospher on the subject of the city of Vienna, the latter, not being able to recall to his memory one of the streets of the city, placed before his eyes the index and ring finger, which he held separate, and which he moved gently, and then with his eye fixed he ran over the different quarters of Vienna. We perform nearly the same action, when we are doubtful at the entrance of a court.

Natural Language of Poetry.

The organ of poetry is placed in the superior lateral part of the head, above the temples, and extends obliquely from below upward and backward. The individual before mentioned, who, while he composes music, vibrates his finger on the organ of tones; when he writes a poem, raises himself obliquely towards heaven. We shall never see a poet in any other attitude, at the moment when his genius inspires him. So much was this the favorite attitude of Pope and Schiller, that the artists have represented them in this position. Pl. XCVII. fig. 12. Usually the poet places his finger on the poetical organ. Let me not be told, that this position of the hand is for the support of the head; we have seen, that, during the activity of the other faculties, it is placed in a different region.

Natural Language of Satire.

Those, who have a decided inclination to make epigrams, and to utter sarcasms, during the paroxysms of their caustic humor, carry the hand or the finger to the superior lateral region of the head, where the organ of satire has its seat. This was the favorite attitude of the satirical Born, author of the Monachology. Pl. XCVII. fig. 13. It is in this attitude, that Sterne was engraved. Pl. LXXXIII. fig. 6. Here the position of the hand is very different from that of the poet and the sculptor, &c.

Natural Language of Meditation.

The organ of comparative sagacity, which acts in meditation, is placed in the anterior superior part of

the forehead. Every body knows the expression of profound meditation; but, as this act is most generally complex, its expression ought also to vary greatly; still, the movements, both of the head and the hand, indicate that the exertion takes place in the anterior superior frontal region. Sometimes the arms are crossed, and strongly pressed against the chest, the eyes motionless, the head sometimes raised, sometimes depressed forward. Pl. xcvii. fig. 14. The whole superior part of the forehead, is supported in the palm of the hand; the eyes are shut; the fore-finger is placed on the middle superior region of the forehead; sometimes the head is dropped; sometimes the eyes are raised, as if seeking for an object, and when the idea is caught, the individual raises himself hastily, and carries his hand, extending the fore-finger, as if he were pointing to what he had discovered, saying to himself, "that is it." Pl. xcvii. fig. 11. When we wish to induce any one to reflect, we apply the finger to the summit of his forehead, saying to him, "come, collect your ideas." When, through haste, we have committed any folly, in the moment of anger, we strike the forehead, saying, "stupid fellow that I am."

Natural Language of Benevolence.

The organ, the energetic development of which determines benevolence, has its seat in the median line of the anterior superior part of the forehead. It must necessarily be directed toward the object of its action. As the organs of friendship of two individuals tend to touch each other; so the organs of benevolence seek to place themselves in reciprocal contact. In a group of small children, we sometimes see two, who, penetrated with friendship and benevolence, bring together their heads precisely at the place of the organ of this feeling. This expression has given rise to the saying in German, *die Kinder bockeln*, that is, the chil-

dren strike their heads together like bucks. See also the beautiful compound expression of surprise and benevolence, Pl. XCVII. fig. 16., the arms extended towards the person welcomed, and the direction of the head: how could benevolence be better expressed?

Natural Language of Devotion.

The organ of devotion is placed in the median ine, in the upper part of the upper half of the frontal bone near the top of the head. Consequently, during its energetic action, the body and the head are carried forward and upward. The arms and the eyes are directed towards heaven. Pl. XCVII. fig. 16. Sometimes the hands are united, sometimes each on its own side is gently elevated or inclined, according as it is joy, hope, or resignation, which prevails. When, in fine, it is the idea of the grandeur and of the omnipotence of the Supreme Being, which exclusively takes the lead, the man humbles himself, and penetrated with profound veneration, adores in the dust; an expression of which I have already made use while speaking of the organ of pride. I have seen a man making a fervent prayer, who had absolutely inclined his head against the ground, and who made every effort to touch the pavement, not with the forehead, but with the organ of belief in God and religion.

The act of raising one's self to heaven, it is said, is founded on the belief, that God dwells there on high, and has nothing in common with the seat of an organ.

But, who has told us that God dwells on high? From our infancy we are taught, that he is present every where. If then our action proceeded from our belief, when we were under the influence of religious feelings, we should turn ourselves in all directions. But, whenever we are influenced by a feeling, whenever an organ acts in us with energy, we do not think of what has been taught us; it is an internal force that

directs our movements. There is no one who, under the influence of surprise, in an emotion of joy, or sudden terror, does not carry his head and his eyes toward heaven, exclaiming, my God! my God!

Finally, why, in spite of instruction, which tells us the contrary, cannot we get rid of the idea, that God is on high? It is simply because the organ, which renders man capable of raising himself to the idea or perception of God, has fixed its throne in the most elevated part of the brain, whence it always has exerted, and always will exert its influence on all the other forces of man.

Natural Language of Firmness.

The expression of firmness has its seat immediately at the top of the head; during its energetic action, therefore, it holds the head and the body elevated perpendicularly. At the instant we adopt the firm resolution, not to allow ourselves to be turned from our purpose by any thing, we raise the whole body vertically, we raise ourselves a little from the ground, place our legs firmly on the earth, and, with the neck extended, prepare to brave all obstacles. It is to this attitude, that is referred the expression of an immutable will, of an inflexible character. Pl. XCVII. fig. 18.

To these partial expressions of each particular organ let us also add some general expressions, which designate a certain general state of the brain: Pl. XCVII. fig. 19, the melancholy man abandons himself, without resistance, to his chagrin; fig. 20, the entire inaction of the brain of the idiot; compare these states of apathy with the expression of the man, all whose attention is fixed on the recital of an interesting event, fig. 21, and especially compare them with the expression of excessive joy, fig. 22.

The reader will pardon me, if I submit to him also two drawings, which may well be regarded as simple

objects of curiosity. My friend Kummer, who was attached to the unfortunate expedition of the Medusa, sent them to me, making the remark, that the head-dresses appeared to him to be a confirmation of the discovery of the seat of the organs; fig. 23 represents the head-dress of a lady of Kacundy; the distribution of the hair, in particular tufts, is conformable to the organs of propagation, of the love of progeny; the organ of pride is even surmounted with a kind of plume. Fig. 24, the head-dress of a Moorish lady of Krarsas, which shows the organs of propagation, of the love of offspring, of attachment, of self-defence, of cunning, of circumspection, of the religious sentiment, of firmness. An unaccountable occurrence, if it is not allowable to presume, that it is the action of the organs of the brain, which has determined this singular manner of arranging the hair.

M. Demangeon, in his analysis of my large work, has very well caught the spirit of my principles and my opinions, in relation to pathognomics. After having advanced that the art of the physiognomist does not exist, that is, that it is impossible for any physiognomist to determine any form of nose, of chin, of eyes, &c., which is always found in connexion, in different individuals, with any moral quality or intellectual faculty, he continues: "But he (M. Gall) attaches great importance to expressions, of which he treats fully in this same section, and from which he draws very many new proofs to the support of the organs, which he has determined, as if to corroborate the demonstration. According to him, it is pathognomy, and not physiognomy, which guides us in our judgments, when, in place of founding them on determinate external forms, we found them on the gestures and the whole carriage of the person. Pathognomy, or pantomime, is a language founded on nature herself, who inspires the gestures, the attitudes, the movements. It is a universal language, from which all nations and all animals derive the expression of

their affections, passions, sentiments, and ideas. There is no man, no beast that does not understand it. It supplies, enforces, renders precise, and illustrates spoken language, by developing irony, anger, confusion, desire, grief, sadness, tenderness, jealousy, despair, revenge, friendship, aversion, pride, vanity, fatuity, stupidity, deceit, cunning, the spirit of chicanery, devotion, sensuality, &c. Without pantomime, eloquence, poetry, the dramatic art, painting, sculpture, engraving, would fall to the level of purely mechanical arts, and no longer would have either expression or attraction. This language, therefore, is not one of pure convention, as some persons have thought; it is based on immutable laws, the violation of which would throw us into nonsense and folly, though it be not uniform in all its details, on account of the almost infinite complications of affections, and the extremely variable predominance of one over the other. After these general observations, M. Gall makes known the kind of expression proper to each organ, and thence draws new proofs in support of those, which he has already furnished."

Conclusion.

When hereafter my readers, by their own observations, shall have convinced themselves of the justness of the expression, which I have just exhibited for each organ, they will acknowledge, that it furnishes a new proof in favor of the region, where I place the seat of the organs. Each simple expression is the action of an insulated organ; it is therefore one of the elements of a complex expression; just as each of the fundamental forces is one of the elements of a complex idea or sentiment, one of the elements of every moral and intellectual character.

Every man, therefore, who wishes to express certain sentiments or certain ideas with truth, or render

them intelligible to others by means of the language of action, must fulfil one of the two following conditions:

Either; the actor must know exactly the simple expression, in order to know of what gestures, of what movements of the muscles, of what positions he shall compose the play, by which he will attempt to render with truth the complex sentiments and ideas, which he is most frequently called on to represent. This condition can then be easily fulfilled by him, who has familiarized himself with the expression, which each organ produces, conformably to its seat. For such a connoisseur, there is no pantomime which he cannot reduce to principles; that will not happen to him, which happened to Engel, in his excellent work on expression, for want of knowing the true origin of gestures. This author often designates such a pantomime as perfectly in harmony with nature, but without being prepared to reduce to certain rules the precepts which he gives. When men are convinced of my doctrine, pantomime and a great part of the art of declamation, will no longer be abandoned to an obscure and uncertain feeling, but will be found reduced to sure and invariable principles.

Or; again, he who undertakes to render faithfully, and in all their degrees, complex sentiments and ideas, ought to be endowed with the faculty of impressing himself with these sentiments and ideas to such a degree, that, in order to render them, he may need nothing, but the inspiration of his own genius. Such are those natural actors, who, in all parts suited to their talents, are true and inimitable, without effort and instinctively. Such are the men of whom I have spoken, in treating of the organ of expression. If, every where, the parts were assigned only to those chosen persons, the stage would always present to us nature herself; but I mean nature idealized, nature fulfilled. National prejudices would soon disappear in all coun-

tries; all would soon have the same taste; every where applause would be offered only to the image of nature; all extravagance and bombast would be pronounced prejudicial to that illusion, which constitutes the first object of the dramatic art.

So far as the action of the internal organs marks durable traces on the exterior man, it is right for us to draw from these marks, which are the results of this continually repeated action, inductions relative to the habitual occupations and the fundamental character of a person. By such impresses we can doubtless distinguish the superficial man from the profound thinker; the good liver from the devout man; the man of repartee from the dull idiot. We easily distinguish the rich man from him who is oppressed by misfortune; but it is not certainly by the original proportions of his face, nose, mouth, ears, &c., but simply by the influence, which the internal forces exert on the external parts. It is, therefore, a pathognomic judgment, and not by any means a physiognomic one, which we pass in such cases.

Of Universal Language.

We know what Leibnitz, and Descartes before him, have written on the possibility of a universal language. Since then, many philosophers have proposed means for realizing this idea; each, according to the measure and nature of his acquirements.

Those, who speak of a universal language, mean to speak of a language, which should be understood by every body. But when, at the same time, they propose a language formed of arbitrary signs, which it would be necessary to teach and learn, it is evident that such a universal language is impossible. How shall we work the miracle of uniting all nations in such a manner, that they shall all consent to adopt the same signs, whether words, gestures, alphabetic

signs, or manual alphabet, or finally, hieroglyphics? Accordingly all efforts, directed towards this end, have been thus far fruitless, and will ever be so.

There is not and cannot be any universal language, except what Nature herself has created. Men may learn to speak it better, to understand it better, but they will never perfect its elementary principles.

We have seen that each organ, however feeble its action, manifests itself externally and instinctively by certain movements of the muscles, by certain gestures, by certain exclamations or involuntary cries, by certain attitudes. Those movements of the muscles, gestures, cries, and attitudes, betray the organ which is in action. They consequently also betray the nature of the propensity, of the feeling, of the thought, which, at the moment, occupy the individual. This language, therefore, is the natural language; it is expression, it is the language of gestures or of action, the pathognomic language.

We shall know the alphabet or the elementary principles of this language, when we know all the fundamental qualities and faculties, as well as the particular expression, that accompanies each of their manifestations. Study the gradations of the qualities and faculties, as well as those of their expression, and if you wish to represent the expression of the union of several propensities, feelings, thoughts, make of these gestures, muscular movements, cries, attitudes, what you make of your words, of your alphabetic and numerical characters; combine these elementary principles as much as your feelings and thoughts are combined, and you speak, you hear, the universal language. You see the same language in brutes, and for the most part they understand you; you interpret justly the groans of the new-born infant, and the latter understands the caresses of its mother. It is the profound study of this language, that reveals to the actor the mysteries of pantomime, that adds to the recital of events a peculiar charm, which makes of the arts,

such as the arts of painting, drawing, sculpture, the most eloquent arts.

If this language is not as generally perfect, as it might be, it is because we have greatly neglected it; it is too easily replaced by the language of words. But observe the deaf and dumb, before they have received any instruction; the exactitude and the readiness, with which they communicate to each other the emotions of their souls, feelings, sentiments, thoughts, and their intentions, will prove to you, that the language of action has many advantages over spoken languages. Do we not daily see, that numerous collections of people interpret without mistake the pantomimes of our plays? Roscius engaged to translate, by gestures, the periods of Cicero with the greatest fidelity, even when it pleased the orator to change their character by varying the turn of expression, or transposing the words. According to this, it is wrong to say, that the language of action is not sufficiently developed, that it is not rich enough, and wants delicacy. It must at least be confessed, that it remains always the most energetic, and the only one of which we know the use in the excess of passion, when the violence of our feelings deprives us of the reflection, necessary to express them by purely conventional means. Even in idiots and in madmen, the language of action still serves us as interpreter of the feebleness and the disorder, with which their mind is struck.

The language of action will be the more perfect and intelligible, as the sentiments and the ideas, which it is wished to express, are more vividly felt. It is for this reason, that men and nations, endowed with great vivacity of character, employ commonly and simultaneously the language of action and the language of words. It is difficult for every body to dispense wholly with the former, although the latter alone would suffice to render us intelligible. We better support a violent declamation, than the sleepy

monotony of a discourse or a lecture, and there is no farce more revolting and ridiculous at the same time, than to hear words declaimed with contradictory gestures and intonations.

The intimate and immediate connexion, which exists between the language of action and the operations of the organs of the brain, is also the source of that sympathy, which, by means of the pathognomic language, gives rise in us to the same sentiments and the same thoughts, with which pantomime is itself animated. Hence this precept: *Si vis me flere flendum est primum tibi ipsi.* On this has been founded a theory of the influence, which signs exert on our feelings and on our ideas. But signs are nothing, and have no meaning for beings incapable of the feelings and the ideas which these signs express. These signs will not even be understood, they will awaken no feeling, no determinate idea, until the individual has previously experienced corresponding ideas and feelings. It follows, that the influence of the internal functions on the external signs, must necessarily precede the influence of the external signs on the internal functions ; that the functions are the condition *sine quâ non* of the signs, and not those of the functions. These remarks limit exceedingly the proposition adopted by the ideologist, that without signs we should not think. Without feelings and without ideas, there would be no sign, and any language, whatever, can never have more signs than those, who form it, have ideas and feelings. From long reflection it would not be difficult to arrive at the proof, that even spoken language is a product of the language of action. The latter is not limited to gestures. It is not less natural to man to produce sounds, cries, exclamations, when he is vividly affected, than to produce certain movements of his limbs. It is from this source that spoken language has drawn all its first elements.

We see by all that I have said, how much interest

as well as advantage, is offered by the study of the expression of the language of action, and if ever there is a prospect of a universal language, it can be realized only by the fullest knowledge of the influence of the interior on the exterior man.

Remarks on some passages of the work of M. Georget, entitled *Physiology of the Nervous System, and especially of the Brain.*

The great number of passages, which I have copied from M. Georget's *Physiology of the Nervous System*, must have convinced this young author how much I am pleased with it. But this very consideration leads me to correct some ideas which he has advanced respecting me and some other writers.

Vol. I. p. 78, he addresses me with compliments, and with the following language: "I say it openly, it is in the lectures and in the works of Dr. Gall, that I have reconciled myself with the study of the noblest attributes of man, that I have learned to familiarize myself with the knowledge of them; it is from this time only, that I have had a fondness for such studies, that I have known how to profit by the lucubrations of authors; it is doubtless also to these lectures, that I owe my having made researches on the other attributes of the nerves. Those, who see, or rather who admit of, nothing in the works of this philosopher, but hypothetic structures, but a doctrine of bumps, but divisions of the cranium into compartments, will perhaps be astonished at this eulogy; let them read and meditate on the works of M. Gall, this is my sole answer.

"Besides, they will see, that I am far from thinking, that this celebrated philosopher has not erred; that he alone has travelled the road of truth; that no one, before him has spoken of what he regards as the foundation of his doctrine; in this last respect, I shall even reproach him with having been too sparing of textual

citations, where they might have lost him the character of originality. After the works of M. Gall, I shall place those of Bonnet; they ought to be placed before, if we consider, that they were published at a much earlier period. This learned naturalist, this philosopher who wrote nearly sixty years ago, has given the soundest notions on the seat and the mechanism of intelligence. So long as he confines himself to the domain of physiology, his opinions conform to observation; it is only when he throws himself into metaphysical questions, that he forgets himself, and talks nonsense like a metaphysician. We shall quote from him some very remarkable passages, which perhaps will give no pleasure to Dr. Gall."

Page 3, he says: "I shall here reproach Dr. Gall. What motive could have induced him to pass over in silence the works of Kant and Bonnet? Could it be because their ideas had some analogy, as we have seen, with his own? How happens it, that he only attacks Descartes and Locke by bringing forward opinions attributed to them, and not their own expressions, which is not always the same thing; while he has great care to quote literally, and to refute at length (which he hardly does for the preceding writers) those authors who have advanced exaggerated opinions, purely gratuitous, and hence very easy to destroy?"

Page 143. "Doctor Gall thinks, that the brain is exclusively the organ of moral qualities and intellectual faculties; and he accumulates the most direct proofs which confirm this proposition.

"I shall also reproach this physiologist with having been unjust toward his predecessors; all whom he charges, *in globo*, with ignorance of the functions of the brain. Yet has he read Bonnet, who preceded him more than sixty years, in a career which he has run so gloriously, since he often places his name among those of his adversaries; Bonnet, who so posi-

tively says, and plainly proves by a great number of arguments, of which M. Gall too avails himself, that the brain in man and animals is the organ of thought and of feeling, that is, of the ideas and the passions. How many other examples might I not quote, which would show that it is not solely from the appearance of M. Gall, that we must date the origin of physiological knowledge on the mechanism and the seat of the intellectual functions!"

In the preface, which is at the head of the first volume of my large work, I have expressed myself in this manner: p. 31. "We hope in the course of all this work, never to humble ourselves so far as to say any thing whatever, for any other purpose than that of truth. To betray nature, in order to pay personal court, is a thing unworthy of the naturalist. The greatest men will therefore pardon us, if we seek to rectify the errors, which, we may think we have found in their works. Their errors and their prejudices deserve the more attention, as they are more likely to be propagated from age to age. Notwithstanding this we are not less filled with a sentiment of esteem and gratitude for the services, which they have rendered to humanity; and who in fact could forget the signal services which Reil, Prochaska, Sœmmerring, Scarpa, Walter, Cuvier, &c., have rendered to the study of the nervous system? But who also, even with the most penetrating and most scrupulous spirit of observation, does not sometimes err or find himself mistaken, when the point is to seize the most complicated whole? Who can foresee the discoveries reserved by another path to the person, whom happy circumstances, chance, or application shall aid? Who among us would not wish to recommence his works from the place where he has terminated them, or finds himself detached from them? The true investigators of nature, having no other object than truth, ought to desire that those, who succeed them, may not be dazzled and deceived by the false glare, with which either indi-

viduals or academies shine or glitter. The suffrages, solely based on the consideration of private individuals, are the less flattering, in proportion as they attest the weakness of those who bestow them.

We have also frequently proved in detail the falseness of the opinions of men, who, in the judgment of many of our readers, did not perhaps deserve any attention on our part. It is certain, that we should not have exposed ourselves to the reproach, which might be made to us in this respect, if we had not taken into consideration the history of the science, and if it had been possible for us to conceal the names of the authors and the partisans of certain objections. Whoever is once convinced of a truth by the evidence of facts, finds all objections equally insignificant; but it is not so with those, who doubt, nor with those, who read in order to be instructed. How will these do to distinguish a well founded objection, from one that is only futile?

It has happened but too often, that men of the greatest merit have proposed to us the most trifling scruples. Each has a chain of ideas of his own, with the points of contact and habits which are peculiar to him. Such an one, who in certain respects greatly distances his cotemporaries, finds himself, in other respects, ages behind them; hence the reason, that the greatest men fall sometimes into incredible misapprehensions. If we only answered the doubts and difficulties of men, who constitute authority, how many times should we run the risk of being accused of error in our choice? Here all depends on the degree of acquired knowledge. If we are asked, for example, whether it is the muscles that produce the protuberances of the brain? MM. Ackermann, Walter, Hufeland, Portal, adopt the affirmative without hesitation; while we are convinced with Sœmmerring, that it is in contradiction with the laws of organization and all facts. Is it the brain, which is soft, or, the cranium, which is hard, that impresses its form on the

other? If we decide for the first opinion, we shall have against us, perhaps, the greater part of our readers, almost all the physiologists and pathologists, though Galen already had caught a glimpse of this truth. In the North of Germany they consider as superfluous the arguments by which we establish, that the dispositions are innate in man, without his moral liberty being the less real: and besides, one has, on the contrary, much trouble to bring himself to the idea, of the coexistence of innate dispositions, with the faculty of not being wholly mastered by them. While in agreement with the fathers of the church, with moralists, and with instructers, we demonstrate the influence of organization on the exercise of the intellectual faculties, without, however, rendering the soul material, Walker, Ackermann, Steffens, and a host of others, raise the cry of materialism. Where then shall we begin or where shall we stop, in order not to speak of objections, important or insignificant in the eyes of every one? Each author and professor has his part and his sphere of activity. Such an one may appear at a distance, of colossal merit, but, on near approach, he inspires pity. Where again is the miserable writer, who, in taking part for or against an opinion, does not find his supporters in the friends or the enemies of this opinion? According to this, as we present without distinction the two sides of the question, in seeking to remove all doubts and all objections, we may hope that our readers will have for our explanations the same indulgence, that we have had for objections and doubts of every kind.

And p. 40. "In order to present the opinions of each author in all their force, we have almost always quoted his own expressions. In this manner no one will be able to complain, that we have abridged or disfigured his ideas, and all readers will be able to compare our opinions with those of others, and to pass on them an impartial judgment."

All my work is compiled according to these princi-

ples. Hence that great number of passages literally quoted from other authors; hence at the head of each treatise there will always be found the history of the subject. See, in vol. I. of my large work in 4to, the treatise on the great sympathetic nerve, p. 29; on the nervous system of the vertebral column, p. 47; on the difference of automatic life and animal life, p. 79; on the nerves of the head, p. 127; on the functions of the five senses, p. 149; on the method of examining the brain, p. 233; on the anatomy of the cerebellum and brain.

I have done exactly the same in the other volumes. After having established the innateness of our propensities and our faculties, and after having proved, that their manifestation depends on the organization, I directed myself to refuting the objections, and I have never failed to exhibit literally the opinions of Plato, Quintilian, Malebranche, Helvetius, Locke, Condillac, Bonnet, Haller, Buffon, Sprengel, Herder, Bichat, &c.

In the treatises on materialism, fatalism, and moral liberty, you see not only several passages of the most philosophic fathers of the church, but also those of Malebranche, Bonnet, Condillac, Leibnitz, Pascal, Cardinal Polignac, Helvetius, Lavater, Tracy, Ancillon, Kant, Fluenbach, Sonnenfels, Pinel, Prochaska, Fodéré, &c.

In the section on the organ of the mind, which constitutes the subject of the second volume, I have commenced by the exposition of the most striking opinions on the seat of the soul, and on the reciprocal action of the soul on the body, and of the body on the soul. The reader will be able to determine, whether, in my adversaries, I have addressed myself to feeble authors, and whether I have neglected to report literally the passages of my partisans, whether ancient or modern.

As the matter in the following volumes belongs almost eaclusively to me, there is less room for quota-

tions. Yet you will still meet the names and the passages of Laurens, Diemerbrock, Fichté, Blumenbach, Sœmmerring, Hufeland, Walter, Rudolphi, Richerand, Portal, Dumeril, Cuvier, Plattner, Ackermann, Fodéré, Dumas, Home, Sprengel, Esquirol.

Even in the particular treatises on the fundamental powers and on the seat of their organs, I have scrupulously quoted all that could have relation to my subject. For example, in connexion with the propensity to propagation, and that of the love of offspring, I have copied literally the passages of Apollonius of Rhodes, of Van-der-Haar, Tissot, Formey, Pinel, Richerand, Larry, Cabanis, &c.

One would not certainly expect to find in a physiology of the brain, the names of Ferguson, Sobry, Grimm, Dupont de Nemours, Rousseau, Laromiguiere, &c.

Could I quote more fully and report more literally than I have done, the opinions of George le Roi and professor Pinel, whose expressions are so infinitely more just and more in harmony, than those of Kant and Bonnet?

It must be allowed, that in all my quotations I have been impartial in my selection. The same author sometimes served me as a support, sometimes I treated him as an adversary, without any regard to authority, or to reputation, or to the influence of the person, the age, &c. It is in my nature to take the good wherever I find it, and always to attack the front of prejudice and error.

My proceeding is, therefore, the opposite of that of most French authors, who are willing, in a preface or in any other place, to designate lightly men whom they have read thoroughly, but of whom they make no mention in the body of their work. An excellent means of giving themselves all the latitude of usurping furtively the honor of others!

Since the question relates to quotations, who has more right to complain than I have? I should make vol-

umes, if I wished to enumerate all the robberies committed on my property. In order the better to conceal the fraud, they usually take the precaution to slide in some words of criticism or contempt against the author, whom they are preparing to plunder. We shall find proofs of this in almost all the works written in late times on the physiology of the brain, and it is only necessary to read the works of Richerand, and the article, *Touch*, of MM. Chaussier and Adelon, who have made an extract from my treatise on the functions of the five senses, as if they had not the slighest knowledge of my work.

Let us now look at the passages, which cannot be expected to please me, and appreciate at the same time the true value of the favored authors of M. Georget.

Vol. i. p. 124; M. Georget says: "It is especially in Charles Bonnet, that we shall find the plurality of the organs of the brain admitted in the most formal manner; we can never be wearied of quoting this great man. 'Without being initiated in the secrets of anatomy, one may know, at least in general, that a brain is an extremely compounded organ, *or rather an assemblage of many different organs*, formed themselves by the combination or interlacing of a prodigious number of fibres, nerves, vessels, &c. The prodigious multiplicity and diversity of the ideas, which arise from the different operations of our mind, may enable us to judge of the astonishing art, with which the intellectual organ of our thoughts has been constructed, and of the almost infinite number of parts, and of parts infinitely varied, which enter into the composition of this surprising machine, which, to speak in the spirit of the philosopher, incorporates an abridgment of nature. . . . . Hence, it follows, that an intelligence, which should understand thoroughly the mechanism of the brain, which should see in the greatest detail all that passes there, might read in it as in a book. This prodigious number of organs infinitely small, appropriated to feeling and to thought, would be to

this intelligence, what the characters of printing are to us. We turn over books, we study them; this intelligence would limit itself to contemplating brains. . . . Our feelings of different kinds belong to fibres of different kinds. . . . The degree of agitation determinesthe vivacity of the feelings, the species of fibre decides the kind of feeling. . . . In fine, how do we remedy that fatigue, that pain, which results from too long continued attention to the same series of ideas? By rest or a change of objects. Why by rest? Because it is a cessation of action. When the mind no longer acts upon the fibres on which it has acted, the tension, that it has impressed upon them, diminishes, because enfeebled and lost. Why by a change of object? Because the soul acts no longer on the same fibres. Each perception has fibres which are appropriate to it."

Page 141. M. Georget goes on to say: "The reader has not forgotten the quotations, we made from the Palingenesia of Bonnet, so very positive in relation to the seat of intelligence; I will add to them the following from the same author. 'Assuredly, if it were permitted us to see to the bottom of the mechanism of the brain, and especially of that part, which is the immediate instrument of feeling and thought, we should see the most attractive object presented by the terrestrial creation. We are never satisfied with admiring the apparatus, and the play of organs, destined to incorporate a piece of bread with our own substance. What, however, is this spectacle, compared with that of the organs destined to produce ideas, and to incorporate with the soul, the whole world? All there is of grandeur and beauty in the globe of the sun, yields without doubt, I do not say to the brain of man, but to the brain of a fly. . . . We are therefore led to believe, that the organization of the brain of animals, differs essentially from that of the human brain. We shall hardly run any risk of self-deception in judging of the relative perfection of the two machines,

by their operations; and how superior are the operations of the human brain to those of the brain of animals! How much has reason the advantage over instinct! It appears, therefore, that the brain of the brute is a machine incomparably more simple than that of man; the construction of the animal machines has been calculated on the number and the diversity of the effects, which they had to produce, in relation to the place, which was assigned to each species in the scale of animal life. The brain of the monkey, much less complex than that of man, is incomparably more so than that of the oyster.'"

M. Georget seems to wish to insinuate to his readers, that I have designedly concealed the names of the authors, who, before me, had already formed some idea on the functions of the brain, and on the plurality of the organs of intelligence. If M. Georget had read my work with less haste, he would have seen, vol. II. p. 214, in the statement of the most remarkable opinions on the seat of the soul, and on the reciprocal action of the soul on the body, and of the body on the soul, the names of the sects and the authors, who professed on this subject opinions more or less absurd. He would have seen the names of Stahl, Pythagoras, Plato, Galen, of the Stoics, of Aristotle, of Erasistratus, Herophilus, Servetto, Auranti, Van Helmont, Descartes, Varthon, and Schelhammer, of Drelincourt, Bontekoe, Lancisi, Lapeyronie, Willis, Vieussens, Ackermann, who all have had some suspicion, that the brain is the seat or organ of the soul. But, after these quotations, we must not forget to read also, p. 217, the solution of the question, whether, in the actual state of our knowledge in physiology, it is proper to be still making researches on the organ of the soul? and we shall see what confusion, what uncertainty and vacillation reigns in the opinions of Hippocrates, Reil, Dumas, Richerand, Sprengel, Pinel, Esquirol, Fodéré, Bichat, Sabatier, Roger, Darwin, Buffon, George le Roi, Vicq d'Azyr, Cuvier, Stahl, of

whom several even deny absolutely, the influence of the brain on the faculties of the soul.

Does M. Georget wish to accuse me, as the journalists formerly did, of having wished to make my readers believe, that I am the first, and the only one, who has conceived the idea of the plurality of the organs? Then I refer him again to vol. II. p. 356. Let him read again the statement of opinions on the difference which exists, as well between the different moral qualities, as between the different intellectual faculties, on the plurality of the organs, and on the seat of those organs; in which article I have made no change in this edition.

He will find in this statement the opinions, on these matters, of the Greeks, of Pythagoras, of St. Paul, of Galen, Gilbert, Gassendi, of Bacon, Van Helmont, Wepfer, Willis, Leibnitz, Frederick Hoffman, Haller, Blumenbach, Barthez, Casimir Medicus, Reil, St. Augustin, Plato, Anaxagoras, Aristotle, Stahl, Malebranche, Condillac, Vieussens, of the ancient Jesuits, Peripatetics, Arabians, of Vockerodt, Carpus, Gregory of Nissa, of Albert the Great, of Mundini of Luzzi, of Servetto, of Petrus Montaguana, Ludovico Dolci, Willis, of Charles Bonnet, p. 359, l. 25; of Lancisi, of Lapeyronie, of Haller, and Van Swieten, of Cabanis, Mayer, Prochaska, of Plattner, Malacarne, Chanet, Wrisberg, Tiedemann, Richerand, Cuvier, Degerando, Sœmmerring, Ackermann, Bérard, and Montègre, &c.

The passage of Bonnet, which so much interests M. Georget, I had quoted in my answer to the report of the Institute, p. 248, where he says, that an intelligence which should know fully the mechanism of the brain, which should see in all its details what passes there, would read as in a book, &c. I have quoted him, vol. II. p. 34 and 38, where he affirms with reason, that it is only by the physical, that we can penetrate into the moral constitution of man. I have quoted him, p. 77, acknowledging, as he does, that there is

no truth useless or dangerous. I have quoted him, p. 100, adopting his, the only just, definition of moral liberty. Finally, I have quoted him, p. 412, where he says, that, if fatigue ceases when the mind changes its object, it is because it then acts by other fibres.

All these literal quotations are very far from exposing me to the suspicion, of having intended to distract my readers from the ideas of Bonnet. As I have never ranked this philosopher among my opponents, whatever M. Georget may say, I will add also, some passages of the Palingenesia, which will give him pleasure. Let us first copy the passage, which M. Georget has himself reported, p. 103. "I have then supposed, that each species of sensible fibre has been originally constructed on relations, which are applicable to the mode of action of its object. Our brain has, therefore, been organized in a direct relation to those marvellous operations of our mind, by which it gradually brings itself to the most general and most abstract ideas. Rather a bold genius, (Helvetius,) and one who knows how to manage his subjects with as much art as grace, has thought, that he made a very philosophic step in discovering, that the horse differs from man only by the hoof. It appeared to him, that, if the feet of the horse, in place of terminating by an inflexible hoof, had ended in supple fingers, he would soon have attained to a level with man. I doubt whether a philosopher, who shall have deeply studied the nature of animals, will applaud the discovery of this ingenious author, whose merit ought not to be confounded with his opinions; he had not considered, that any animal whatever is a particular system, all of whose parts have a mutual harmony among themselves. The brain of the horse corresponds to his hoof, as the horse himself answers to the place, which he holds in the organic system; if the hoof of the animal were converted into flexible fingers, he would not be the more capable of generalizing his sensations; the hoof would still exist in

the brain ; that is, the brain would want that admirable organization, which enables the soul of man to generalize its ideas; and were it ordained that the brain of the horse should undergo a change corresponding to that of his feet, he would no longer be a horse, but another animal, which would require a different name."

Page 31. Bonnet says: "I maintain that, supposing all souls perfectly alike, organization would suffice to introduce varieties among them. And what is there more evident? A mixed being feels and perceives only by the aid of his senses. All his sensations and perceptions are always in a determinate relation to the number and the quality of his senses.

"Would the human soul, placed in the brain of the oyster, ever acquire notions of morals and metaphysics? Its nature, indeed would remain the same; but it could not display its activity, as it displays it in its own brain. It would, therefore, be extremely degraded by the sole diversity of organization; and if it were possible, that a soul so degraded should preserve a remembrance of what it had been in the human body, it would be a most terrible misfortune to it to be condemned to inhabit the body of an oyster.

"I suppose there is no essential difference between human brains; and this supposition seems to me legitimate, the number and nature of the senses being the same in all men; but all men do not derive the same advantage from their senses. What a difference in this respect, between Montesquieu and a Huron!

"The senses communicate with the brain, and produce there durable impressions, sources of imagination, of memory, of reasoning. A disease may derange all the economy of the brain, and annihilate imagination, memory, reasoning; it does not annihilate the soul, yet the latter is reduced to the state of the soul of the brute.

"If the brain is modelled in any way by external

objects; if there are fibres appropriated to each kind of perception; if these fibres retain the impressions which the objects have impressed on them; if such is the law of the union of soul and body, that to certain fibres, and to certain states of these fibres, certain sentiments, certain perceptions in the soul constantly correspond, we must admit that the soul of a Huron, lodged in the brain of a Montesquieu, would there experience the same sentiments, the same perceptions, as the soul of Montesquieu.

"It would there experience the same successions, the same combinations of sentiments and of perceptions; for, I persuade myself, that I have well established that the connexion of our ideas depends originally on that of the sensible fibres. If it were not so, how should it happen, that physical accidents, which can only affect these fibres, should destroy the connexion of our ideas?"

Thus far, all is perfect, all is excellent. But was Bonnet free from the prejudices of his time? Has M. Georget always understood him correctly?

Notice here, p. 110, Bonnet applies himself to the research on the location of the soul: "Whatever be the part of the brain, which is the seat of the soul, or the immediate instrument of its operations, we cannot help admitting, that there is, somewhere in the brain, an organ, which unites the impressions from all the senses, and by which the soul acts or seems to act on different parts of its body.

"We see clearly, that the action of objects is not limited to the external senses. The action of sound is not confined to the tympanum, nor that of light to the retina; there are nerves, which propagate these different impressions to the brain. Those, who, after having lost the wrist, still feel the fingers, show us satisfactorily, that the seat of the feeling was not where it seemed to be. The soul does not, therefore, feel by the fingers. Neither is sensation in the external senses.

"We are very little informed in regard to the intimate structure of the brain. Anatomy is lost in this dark labyrinth. It sees the nerves of all the senses converge there; but, when it endeavours to follow them in their course, they escape it, and it is compelled to conjecture or to grope.

"We must, therefore, give up determining precisely what is that part of the brain, which constitutes the seat of the soul. A celebrated anatomist (de la Peyronie), proceeding by way of exclusion, has maintained, that the seat of the soul is in the corpus callosum, because all the experiments, he has tried, have appeared to him to prove, that this is the only part which cannot be wounded or altered, without the functions of the soul suffering more or less.

"Another anatomist, Lorry, has contradicted this result, and attempted to establish on other experiments, that the seat of the soul should rather be in the medulla oblongata. He produces in its favor facts, which seem decisive. I will quote only a single one: we know animals which have no corpus callosum: the pigeon for example, has none according to what this anatomist says; and yet we cannot deny the pigeon a soul.

"However it may be with this question on the seat of the soul, it is very evident that all the brain is no more the seat of perception, than all the eye is the seat of vision.

"But, if we are not permitted to penetrate into the secret of the mechanism of the brain, we can at least study the effects, which result from this mechanism, and thus judge of the cause by its effects.

"We know that we have ideas only by the aid of the senses; this is a truth, which experience attests. Experience also teaches us, that our ideas of every kind are chained to one another, and that this connexion belongs to the combination, which the fibres of the senses have together.

"It therefore follows, that the different senses with

which we are endowed, have, somewhere in the brain, secret communications, by means of which they may act on one another.

"The part, where the communications take place, is that which must be regarded as the seat of the soul. It is the internal sense.

"This part, therefore, is, in some way, the epitome of all the senses; since it unites them.

"But it is also by this part, that the soul acts on its body, and by its body on so many different beings. Now the soul acts only by the agency of the nerves; it follows, therefore, that the nerves of all the parts, which the soul governs, must terminate in this organ, which we regard as the immediate seat of feeling and of action. It is in this sense, that I have said that this organ, so exceedingly complicated, was a *nervology* in miniature.

"We see sufficiently, by all that I have just stated, that it is of little importance to my principles, to determine precisely what is the part of the brain, which properly constitutes the seat of the soul. It is sufficient to admit with me, that there is in the brain a place, where the soul receives the impressions of all the senses, and where it displays its activity. I have shown, that this supposition is not gratuitous, since it flows immediately from facts which cannot be called in question."

Let us suppose that Bonnet is really of opinion, that each nervous fibre is endowed with a certain perception or faculty: of what avail would that be to enable us to arrive at the knowledge of any organ whatever? Let any one discover in the optic nerve the fibre which sees red, the fibre which sees yellow, &c., and here we should not have to do with organs of a different nature, but only with the modifications, with the different capacities of the same organ. Thus, the so much admired passages of Bonnet are not more significant than the suppositions of Albert the Great, of Servetto, Dolci, &c.; and had Bonnet a juster

knowledge of the fundamental qualities and faculties, for which alone it is possible to discover organs? It is for the same reason, that those who had some more reasonable presentiment of the plurality of the organs, have, notwithstanding, always despaired of its being possible to discover them: such was the definitive opinion of Haller, Van Swieten, Prochaska, Cabanis, &c.

If it be true, as Bonnet maintains, according to the philosophy of his time, that we have ideas only by the aid of the senses, how do you allow the innateness of a propensity or a faculty, and consequently how can you admit, that its organ previously exists in the brain? Thus every thing limits itself, in Bonnet's system, to a simple aptitude, a capacity of receiving such or such an impression, by the aid of the senses: to wit, that by their means such or such an operation might take place.

Finally, when Bonnet tells you, that all the brain is no more the seat of sensation, than all the eye is of vision; when he tells you, that the soul acts only by the agency of the nerves, that it therefore follows, that the nerves of all the parts which the soul governs must terminate in this organ, which he regards as the immediate seat of sensation and action; by the expression *sentiment*, he constantly means nothing more than sensation, the first impression made by the senses on the brain, and by no means the psychologic sentiments, such as the sentiment of pride, benevolence, &c. Consequently, M. Georget does Bonnet infinitely too much honor, when he lends him the idea, that the brain is the organ of sentiments, that is, of the affections, passions, propensities; and it is not sufficient to quote his authors literally, it is necessary to hear their language.

The general expressions of Bonnet frequently reveal sublime and very just ideas; but, as we have just seen, it is precisely this generality which imposes on us. As soon as he enters into detail, he betrays the

crudeness of his conceptions. He, who so well perceived, that the brain of the horse answered to his hoof, how could he all of a sudden abandon this luminous idea, and admit that "a single organ, a single sense, may have been constructed with so much art, that it may alone suffice to give to the animal a great number of ideas, to diversify them, and to associate them strongly together. It will combine them even with so much the more force and advantage, as the fibres, which shall form its seat, shall be more intimately united in the single organ."

"The trunk of the elephant is a beautiful example, and one that will well illustrate my idea. It is to this single instrument, that this noble animal owes his superiority over all other animals; it is by this, that he seems to hold the middle place between man and brutes. What pencil can, better than that of the painter of nature, express all the wonders worked by this sort of universal organ!

"This trunk," says M. Buffon, "composed of membranes, nerves, and muscles, is, at the same time, a member capable of motion, and an organ of sensation. The elephant can shorten, lengthen, curve, and turn it in all directions. The extremity is terminated by an addition in form of a finger; and it is by means of this, that the elephant does whatever we do with our fingers. He picks up from the ground the smallest pieces of money; he gathers herbs and flowers, choosing them one by one; he unites knots, opens and shuts doors by turning the keys and pushing the bolts; he learns to trace regular characters with an instrument as small as a pen.

"In the midst of this finger-shaped extremity is a concavity, in the bottom of which are found the common passages of smell and respiration. The elephant has, therefore, his nose in his hand, and is able to join the power of his lungs to the action of his fingers, and by a strong suction, to draw up liquids, or lift very heavy bodies, by applying to their surface the

extremity of his trunk and making a vacuum by inspiration.

"Delicacy of the touch, exquisite scent, facility of motion, and the power of suction, are found, therefore, at the extremity of the elephant's trunk. Of all the instruments, with which nature has so liberally furnished her favorite creatures, the trunk is perhaps the most complete and the most admirable; it is not only an organic instrument, but a triple sense, whose united and combined functions are at the same time the cause, and produce the effect, of that intelligence, and of those faculties, which distinguish the elephant and raise him above all animals. He is less subject than any other animal to the errors of the sense of sight, because he rectifies them promptly by that of touch, and making use of his trunk, as of a long arm to touch bodies at a distance, he forms, as we do, correct ideas of distance by this means," &c.

The eloquent historian of the elephant then unites, in a single view, the various services, which this great animal derives from his trunk. "Touch," he continues, "is that one of all the senses, which contributes most to knowledge; the delicacy of the touch gives the idea of the substance of bodies; the flexibility in the parts of this organ gives the idea of their external form; the power of suction, that of their weight; the smell, that of their qualities; and the length of the arm or trunk, that of their distance; thus, by a single limb, and, so to speak, by a single act, the elephant feels, perceives, and judges several things at once; now, a multiple sensation, is in some respects equivalent to a reflection; therefore, although this animal is like others deprived of the power of reflecting, as his sensations are found combined in the organ itself, as they are cotemporaneous and, as it were, indivisible; it is not surprising, that he has of himself, species of ideas, and that he acquires in a short time those, which it is desirable to give him."

I have already proved in several places, that it is

precisely the inverse of the relation of Buffon and Bonnet, which exists between the senses and the understanding. It is not the perfection of the senses, which gives intelligence to the brain; but it is the perfection of the brain, which determines the employment of the senses, or of external instruments. Why are the monkey and the idiot incapable of employing their hands in objects of art? Why does the rabbit construct a burrow, and the witwall suspend its nest so artfully between two boughs, while, with the same instruments, the hare and the cuckoo never do any such thing?

As respects Kant, I have always heard him spoken of, in Germany, with enthusiasm. But, by a singular fatality, I have never had a sufficiently transcendent mind to comprehend any thing of his philosophy. The books, whether of jurisprudence, medicine, or metaphysics, written in the style of Kant, Fichté, Schelling, &c., have always disgusted me by their bombastic, unintelligible, corrupted style. I shall endeavour to prove, in the following volume, how mistaken M. Georget is, when he thinks he finds some resemblance between my ideas and those of this too profound philosopher. The most sublime intelligence will never be able to find in a closet, what exists only in the vast field of nature.

The same reproaches, which M. Georget has addressed to me, having been made to me also by others, with a certain air of importance, these gentlemen will please hear with indulgence my profession of faith.

Few are more modest or humble than I am, when I take a view of that immensity of things, of which I am condemned to be ignorant, though they are immediately connected with my profession.

But when the question concerns the discovery of the structure and the functions of the brain, it is with unshaken confidence, that I consider myself in advance of all my predecessors, as well as my cotemporaries.

In fact, I may claim to be the first, that has established physiological principles, according to which the structure and functions of the brain ought to be studied; the first, that has passed the barrier, which superstition and philosophy, for thousands of years, had opposed to the progress of the physiology of the nervous system; the first that has conceived the idea of distinguishing general attributes, from the real fundamental qualities and faculties; the first, that has determined the instincts, propensities, sensations and talents, which belong to certain cerebral parts; the first that has had the courage, patience, perseverance, to examine and fix the relations, which exist between the energy of the moral qualities, of the intellectual faculties, and the different developments of the parts of the brain; the first that has extended these researches through all the animal kingdom; that has studied thousands of animals, in regard to their most striking instincts, propensities, faculties, and the configuration of their brain, both in individuals and species. No one, before me, has found and pointed out the only means capable of discovering the seat of each instinct and propensity, of each sensation and intellectual talent. I claim to be the discoverer of these seats and to be the first that has demonstrated them by numerous irrefragable, pathological, and physiological facts, and by an infinity of researches into the comparative anatomy and physiology of all the tribes of animals.

All these conceptions, and all these fundamental truths, even previous to our journey undertaken in 1805, were already diffused by my numerous hearers in all parts of the learned world; and if the anatomy and physiology of the brain have been perfected at a later period, it is still either to the works of M. Spurzheim and myself, or to that only true direction, that we have given to the labors of other anatomists, that this degree of perfection is due. Where is the author who, in regard to any essential part of my

doctrine, has ever manifested any thing but vague conjectures, lightly conceived and quickly dissipated. All have stopped at generalities, more or less plausible in appearance, and all have retracted as soon as the point was to fix a principle, an immutable proposition. You quote to me, and I myself quote the Mayers, Hallers, Van Swietens, Herders, Vicq d'Azyrs, Cabanises, Prochaskas, Sœmmerrings, &c.; well, all have despaired of the possibility of discovering any organ whatever; all have followed the paths of the sterile philosophy of Plato, Leibnitz, Wolf, Descartes, Locke, Condillac, &c. Not one has had the slightest presentiment of the nullity of all these doctrines; not one has dreamed of analyzing the moral and intellectual economy of man and animals; of determining the instincts, propensities, sensations, faculties! You quote to me the most celebrated of your naturalists, M. Cuvier, and I quote him also. But read his works from one end to the other; read his report on our memoir, presented to the Institute, in 1808; read the Dictionary of the Natural Sciences; read what, in his *règne animal,* he says on the impossibility of recognising the instincts by the form of their brain; what vacillation, what tergiversation, what uncertainty, what contradiction of his own opinions, appear on every page. And has this distinguished naturalist succeeded in making a single true application of his knowledge of comparative anatomy, to the physiology of the nervous system in general, and especially of the brain, in particular?

Let any one read with candor the history of philosophy; of the progress of comparative anatomy and of the physiology of the nervous system; read what is still objected to the plurality of the organs; how men still hesitate to admit the fundamental qualities and faculties, and the seats of their organs, without which the physiology of the brain is reduced to a mere chimera; and then maintain, that before me physicians, philosophers, conceived and taught a clear and exact idea

of the functions of the brain and its constituent parts!

Indeed, it may be said, that to me only the physiology of the brain owes its existence. That I have discovered it without the aid of any one whatever, the history of each of my discoveries sufficiently proves. It is with the physiology of the brain as with its structure. To unravel whatever might by chance have been found in the writings of authors, would have required infinitely more sagacity, than to divine, by means of observation, the mysteries of nature. I commenced, continued, and almost completed my discoveries without any previous instruction; and, if afterward I compiled quotations from others, it was rather to manifest my point of departure from them, than to strengthen my ideas.

Let us close these remarks by an objection, which M. Georget makes to the doctrine of the functions of the different cerebral parts: "But," says he, "there are very great difficulties touching the mechanism of the exercise of these faculties, which M. Gall has not resolved, or even assailed, at least so far as occurs to me. How do all these faculties communicate together, so that several are simultaneously in action, as happens in the smallest intellectual operations? How do they mutually derive the knowledge proper to each, as must happen to the metaphysical sense, to the poetical sense? &c. How do they receive impressions by means of the sensorium? Is it reasonable, credible, that twenty-seven or thirty-five faculties can communicate equally with the sensorial power, and be particularly stimulated by the impressions in relation with their destination? The difficulty, which appears to me the greatest and hardest to resolve, is this: how happens it, that there is only one *self*, one sentiment of existence, one single consciousness of the thinking being? Or, in other terms, how happens it that each of these members of the intellectual power has not its distinct consciousness, its intimate sense of existence? Why do all

the intellectual operations, sensations, perceptions, operations of the mind, passions, &c., produce the effects of being felt, perceived, executed, excited by a single power, and refer themselves to one single *self?*"

How happens it, that M. Georget, who has already so often rejected the insinuations of the metaphysicians, assumes all at once the air of wishing to place himself under their banners? How do all the organs of voluntary motion, how do the five senses communicate together, in such manner, that several may be simultaneously in action? For my answer I refer M. Georget to the axiom: *no difficulty whatever can destroy a fact.* You do not explain either fecundation, or life, or sensation, or thought, or digestion, and yet fecundation is effected, and life, sensation, thought, digestion, take place. In conclusion, I refer you to what I have said on these idle questions in several places of this work. And, if you are still eager for explanations, I refer you to the tribunal of metaphysicians, who explain every thing, *without knowing any thing.*

END OF THE FIFTH VOLUME.

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