THE

PROTOTYPE OF MAN.

GIVING

THE NATURAL LAWS OF HUMAN PROPORTION IN BOTH SEXES.

A Manual for Artists and Professors of Drawing.

BY

CHARLES ROCHET,

SCULPTOR, PAINTER, AND PROFESSOR OF ANTHROPOLOGY APPLIED TO THE FINE ARTS, PARIS.

Translated by

C. CARTER BLAKE, D.Sc.,

FOREIGN ASSOCIATE OF THE ANTHROPOLOGICAL SOCIETY OF PARIS.

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To

THE MEMORY OF

PAUL BROCA,

MASTER OF FRENCH ANATOMY,

AND

FOUNDER OF THE ANTHROPOLOGICAL SOCIETY OF PARIS,

This translation is dedicated

BY HIS FRIEND AND PUPIL,

C. CARTER BLAKE.

PREFACE.

This work which I give to the public has no nationality; it is of every country, as it will, I believe, be of all time. It is the product of forty years' study of human nature, of measurements on individuals, and investigations in books. It is an extract from the lessons that I gave in Paris at the Sorbonne, at the School of Fine Arts, and in various other places.

In 1876 I published a synoptic table of Human Proportions, according to the natural arrangement, under the name of 'The Human Prototype, or the Twelve Fundamental Laws of Form Geometry.'

The present work is infinitely more complete, and gives twenty rules instead of twelve.

It is at the request of my old pupils that I have published the work, and shall be happy if it prove of use, not merely for the cause of fine arts, but also to aid in the physical amelioration of human nature.

I place this modest handbook under the patronage of those who love study for the sake of study, science for the sake of science, and truth for the sake of truth.

CHARLES ROCHET.

Paris.

TRANSLATOR'S PREFACE.

A TRANSLATION of Dr. Rochet's important work seems at the present time necessary for those artists who have had but slight guides for the establishment of a fixed scale of human proportion. The attention roused by the teaching of Drs. Fau and Knox will no doubt lead to a careful examination of the elementary principles of anatomy. These Dr. Rochet eloquently and lucidly places before us, though passages in his work indicate that he is addressing an audience already trained in the principles of the higher anatomy, as expounded by the learned and laborious French school.

Not the least pleasing part of this elegant work is that wherein the author recognises that the principle of subordination to an originally conceived pattern, fixed by a force extrinsic to the tendency to vary in both species and individuals, is the dominant law operating in the formation of the human body. Here the Platonic conception of ideas has governed the definition of the prototype, which is, in fact, the archetype.

That English students may appreciate this philosophy has been for many years the hope of the translator.

C. CARTER BLAKE.

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ANTHROPOLOGY.

OUR PROTOTYPE, AND VARIOUS TREATISES ON HUMAN PROPORTION.

ANTHROPOLOGY.

Anthropology, or the natural history of man, is a science entirely of recent creation; it leads gradually to the solution of all philosophical ideas, theories, and systems which have been offered upon human nature.

Once well defined, this science, which impinges upon every other when touching that of man, will add powerfully to the splendour of the fine arts, and endow them with the character of usefulness they do not yet possess, for in natural history all is self-contained, and art is as useful to science as science is to art.

Anthropology thus invades the whole scientific world; it will also conquer the whole artistic world, so that studies may in time become double.

On one side are ranged the anatomists and doctors, who search for the causes of the ills of humanity, the subjects of alteration and of degradation of human nature, the inferior types of races, and their resemblances with animals.

On the other side, artists and men of the highest taste, taking man in an entirely different aspect, desire to become acquainted with him in his proper character: in the dignity of his noble nature, and in the laws of his perfection.

One sort of critics will be useful for the discovery of evil; the others for the recognition of good and of evil in external form.

OF THE PROTOTYPE; AND THE VARIOUS AUTHORS WHO HAVE SOUGHT FOR THE LAW OF HUMAN PROPORTION.

We shall indicate by the word Prototype* the most perfect type of human nature, so far as science may be able to define it.

This is the man of the human species exhibited according to the natural laws of his exterior constitution—man, in fact, as we may imagine him to have been created.

We shall only exhibit him to the artists as a model that they are obliged to follow, as Winckelmann acted with his Apollo; we shall not endorse his ridiculous supposition, but we affirm that every human individual who approaches this type is a being well designed.

Let us start from this assumption.

Knowing that we hold therein the key of the unity of existence, and the conditions which affect the real beauty of man, in spite of the great names that have been already inscribed, we say to artists, without any vain boasting, without the least assumption of arrogance, that, from this time, they may regard all the treatises on proportion before this one as things perfectly useless, or, at most, useful to be consulted as historical curiosities, but not able to render any service either to art or to teaching, as they are destitute of every scientific idea.

We have made a detailed and very minute analysis of all these works; and if a more complete abridgment of them should be made, it would take up matter for more than a volume.

We have examined their methods and studied all their systems; but for the sake of information we must say a few words.

Without recurring to Vitruvius or to Polycletus, and to all the great Greek artists who carried the love of physical beauty so far that it was elevated to the height of a worship—without going so far back, we find in modern times more than a hundred authors of whom it is necessary to explain the works and show the courageous attempts.

Firstly, we may speak of Albrecht Dürer with his four books, and diagrams covered with a mass of rays and of little numbers which do not tell us anything. He was nevertheless a great artist, from whom much has been borrowed. We have not found anything interesting in him except his nomenclature of things: this is very picturesque. It is of him that Michael Angelo said, 'Poca e debole cosa questo libro.'

There comes afterwards the Milanese painter Lomazzo, who made a more systematic work, but only indicates elementary facts.

* The word Prototype, as here used, is nearly equivalent to that of Archetype, as employed by Sir Richard Owen.

Leon Alberti wrote in ten books a production of which the most important part is borrowed from the ancients.

The principal author to be cited is still Leonardo da Vinci, a master alike instructed and sympathetic. We find in his 'Simmetria de Corpi umani' elements that have been gained to science, and of which we shall speak further on. What remains has been continued and completed by Giuseppe Bossi.

We shall find some other names among the masters of the Italian Renaissance, who searched for, without being able to find, the real rules of corporal beauty.

There was the celebrated architect Bramante; there was Ghirlandajo; there was Armenini of Faenza, a pupil of Raphael; Daniel Barbaro; Michael Angelo himself; without forgetting the greatest of all, Giotto, who even in the beginning of the fourteenth century already sought to fix the laws of human structure.

In France we have also a great number of artists who have left us writings on these matters.

The most ancient, and the most famous of all, whose work is still consulted in our days, is Jean Cousin,* who lived in the sixteenth century. His 'Art of Drawing,' in folio, 1550, published by P. T. le Clerc, is for the time at which it appeared a work of real value. He already employed geometry for the delimitation of forms of the human body.

Le Brun and Poussin were also occupied with this kind of researches. The latter had continued the researches of Leonardo da Vinci.

But one of the works most circulated, without being the better for it, was that of the engraver Gerard Audran, executed under the orders of Lebrun. It is composed of measurements taken from the antique. These measures are classified by *heads*, *parts*, and *minutes*. It was an insipid work, that could not evidently be useful to anybody.

Outside France many artists and learned men existed, of whom we may note their diligent work, which was not on that account more exact or more true.

Perhaps the Dutchman Van Hoogstaeten, in his 'Polymnia,' approaches the truth, with his theory of nineteen to sixteen palms, in half heads, which he gives to serve as a scale for the measurements of the whole body.

Jean de Laet, the editor of Vitruvius, also compared the head with the body.

* An exposition of the plan adopted by Jean Cousin will be found in the seventh edition of Fau's 'Artistic Anatomy.' Baillière, Tindall, and Cox, 8vo., 1879, page 21.

The painter at Liège, Gerard de Lairesse, desired also to continue Leonardo da Vinci.

His compatriot, Crispin de Pas, went further. He has left us in a folio volume, in four languages, the whole of a compilation, giving many types and many dimensions of figures, which throughout only illustrate the fat Flemish women of Rubens.

The Spaniard Martinez adopts the proportions of eight heads, but says nothing about their arrangement.

Another Spaniard, Borgoña, preferred measurements taken with the assistance of the facial heights.

The Englishman Flaxman, who was known to our young artists, and whom they loved to copy, has given, in his academic lessons, a theory of weight and some laws of proportion.

Let us also allude to the German engraver Lichtenberger, who issued in the last century a book on the arithmetic and geometry of human proportion.

His compatriot, George Bergmüller, had published before him an 'Anthropometria.' He was the first author who spoke of anthropometry. His work is dated 1723.

If at present we consult the works of savants and writers of our century, wherein anatomical studies have been pushed very far, we shall only find researches on human proportion amongst the Germans and the French.

Amongst the Germans, we have at the head the sculptor Godefroy Schadow, and his work bearing the title of 'Polyclete; or, Theory of Human Measurement,' Berlin, 1834, reprinted in 1866. This is the work which includes the greatest number of drawings of measurements taken on persons and on statues; these measurements are sometimes symmetrical, sometimes dissymmetrical, as individuals exhibit them; this work exhibits the continuation of the same errors as the others. This book is lacking in lucidity and arrangement, and can merely be of very slight assistance in teaching the fine arts.

Carl [Gustaf] Carus has also given a method of teaching human proportion. 'Die proportionslehre des menschlichen gestalt,' in folio, Leipzig, 1854. This work draws its importance from the learned anatomical researches of the author, but it does not give to the fine arts any acceptable rule either for the head or for the body.

Liharzik, a learned physician at Vienna, follows. He journeyed more resolutely to his final object. He published in French, Vienna, 1862, a collection of measurements taken by him on six thousand individuals, with the title, 'The Law of the Growth and the Structure of Man.' This

work, to which he devoted ten years, is evidently the one which is most serious and most conscientious of this sort ; it has been very useful to us, and confirms a great number of the laws that we have established. But this scrupulous investigator has not been able to summarize his subject; he holds hard to the theory of averages; so that the figure which he gives at the end of his book, and which appears to advocate his thoughts, does not show anything either useful or practical.

In France, Salvage has published a magnificent work on the 'Fighting Gladiator,' from the museum of the Louvre, but the work is treated from the anatomical point of view, and the part of proportions is not represented.

One of the finest works to consult is still that of Professor Gerdy, a learned anatomist, known by us in our youth, 'Anatomy of the External Forms of the Human Body,' one volume in 8vo., Paris; Brussels, 1829. This book is well done from the point of view of art and artists. Gerdy adopts the head as the modulus of all measurements, with eight heads of proportions for the entire man, but he does not go further. He admits also three divisions of the body. As for the rest, he copies from Jean Cousin and the antique.

Delaistre, an historical painter and a pupil of Gros, has also published a treatise on painting, Paris, 1842 ; but for the proportions he preserves the vulgar definition of seven and a half heads, which leads us nowhere.

Nearer to ourselves, we have the academician Charles Blanc, a writer of great merit, recently dead, and who professed æsthetics at the College of France. Nevertheless, his poverty of ideas on the subject was so great, that he found nothing more original than the disinterment of the forgotten canon of proportion left by the Egyptians, with the middle finger taken as unity, and the nineteen divisions of the body. This will not bear examination. M. Charles Blanc wished to combat and to discuss our system : we regret that we cannot do him the same honour, as it is impossible to discuss his own.

Finally, in an entirely different direction of knowledge and of studies, it is necessary to cite our learned and much-regretted colleague, Dr. Paul Broca,* founder of the Anthropological Society of Paris, which society has served as a guide for the creation of all subsequent ones. Broca, dying too early for science, was a man possessing many qualifications for solid merit ; he had, nevertheless, a habit of wandering, and of leaving nothing durable on the Anthropometry that he desired

* Paul Broca died July 8, 1880.

to found. He confused himself in a mass of measurements and figures that he left after him. For what result? Merely to build with sand and dust his scientific edifice of human measurements.

As for the Prototype we exhibit, we have nothing to say. It is there; anyone may judge of it; we fear neither criticism nor examination.

PROTOTYPE OF MAN.

FIRST PART.

THE HUMAN SPECIES IN ITS UNITY.

'Unity in variety makes species ;
Variety in unity makes individuals.'
(All Naturalists.)

CHAPTER I.

GENERALIZATIONS.

1*st Law.—The Human Species created in two sexes.*
2*nd Law.—The Median Anatomical line.*
3*rd Law.—Scale of Transverse, or Anthropometric lines.*

THE HUMAN SPECIES.

First Law.

The Creator has formed man under all possible conditions of beauty, health, and perfectibility, so that in a manner man may improve himself or become more perfect, or he may become more vile and degraded.

If he has not yet attained the degree of perfection to which he has a right to aspire, this is the fault of men, but not of the nature of men, and is attributable to their vices, their folly, their bad education, and the ignorance of what they are themselves.

Men, up to this day, have wished to know how they are made. They have never endeavoured to compare their species with other animal species, of which they are merely the prolongation and the sequence.

It is only by comparing man with man, and man with animals, and especially with the anthropoid ape that is nearest to him, that we may learn what we are, and how we should act in order to avail ourselves of our own proper nature and improve ourselves in every respect capable of

improvement; especially so far as regards our organic constitution and physical structure.

The science that has already made so many great and beautiful things will yet accomplish this marvel.

THE HUMAN SPECIES DOUBLED IN TWO INDIVIDUALS.

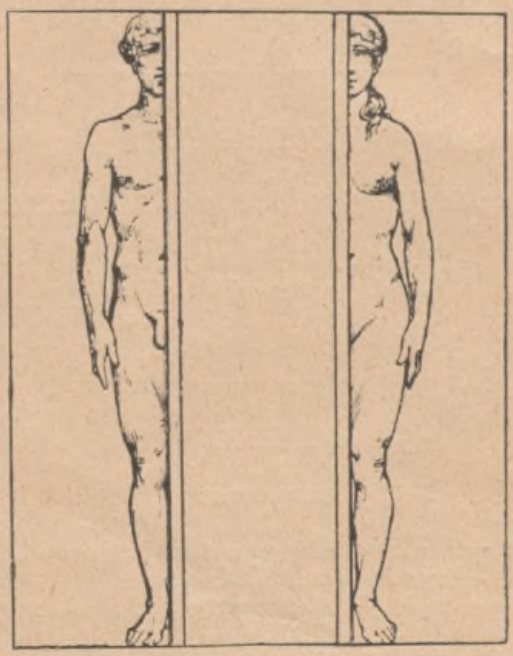

Fig. 1.

The human species, as all other animal species, is divisible into two* beings, the male and the female, as we represent on our first plate, where we see two halves of the human being. If we only show two halves, this is because those who have drawn them for us have not done more. The Creator of Being had only to produce two halves of the being to make the entire man, because the half that is not shown in our drawing is exactly similar to the half which is seen. If it is shown in front of a mirror we have the second part.

The whole human species is thus physically represented; and it is these two beings made and constituted which, thrown on our globe, are repeated or reproduced by the sole fact of their proper organization in the same form, repeat themselves in our days, and will be also repeated for ever; not undergoing any other variation, alteration, modification, or amelioration than those presented by and produced by the action of media, or the influence that men exercise on themselves.

* Division into sex is not, however, a constant character in the lower sub-kingdoms of animals. Many species exist which the elder school of anatomists would have justly termed hermaphrodite.

These two beings, man and woman, for us, for our *Prototype* (except a few modifications, more external than internal), are therefore two identical beings. The geometric laws of form which we are about to give are therefore for the one and the other absolutely the same. And once for all, what we can say about one will refer exactly to the other.

And if we have given in our diagrams sometimes a male, and sometimes a female figure, it is with the object of recalling attention to this fact, in order that it may be fixed in the mind of the student.

Second Law.

THE MEDIAN ANATOMICAL LINE.

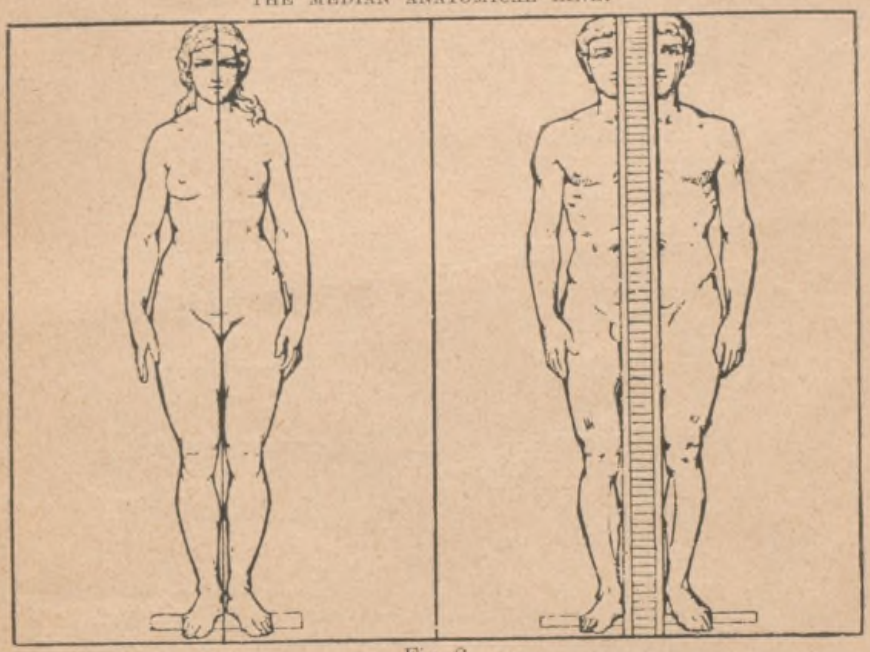

Fig. 2.

This line, the same for both sexes, takes its origin in the brain, which it separates into two lobes; it descends afterwards along the face and the body.*

This line is especially an internal one. The Creator has been pleased to make it disappear on the outside by simple reason of æsthetics, but there are many points indicative of it, as between the eyes, at the side, as well as the partitions of the nose, at the arch of the mouth, at the depressions of the lip and of the chin, in the hollow of the neck, at the line of the sternum, in the navel, etc.

It is this line which divides our bodies into right or into left hand. Thus all measure of proportion proceeds from this line, and is only valuable in this condition.

* The two cerebral hemispheres are, as anatomists well know, separated by a physical band of union and demarcation, the greater and less commissures as well as the median or longitudinal fissure.

It is by the aid of this line that we have been able to show in the preceding plate that the physical constitution of our being is complete in a single half.

Third Law.

SCALE OF TRANSVERSE OR ANTHROPOMETRIC LINES, GIVING THE EXPLANATIONS OF THE GEOMETRY OF FORMS.

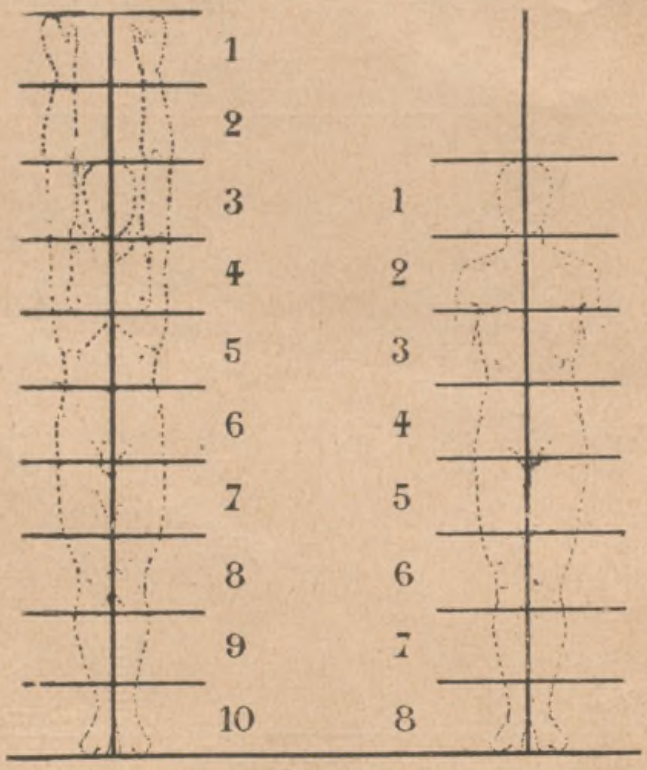

Fig. 3.

Before entering into the subject, it is good to show, as we have done in this figure, what is the geometrical scale established by nature, which gives the regular measure of forms.

This state of regularity is that which procures beauty of the human body, accord, and harmony in its parts, and we may regard as well made any individual taken amongst us, who approaches closest to this state.

Figure No. 3 is only here to illustrate a theory, the following figures will give the practical application.

These symmetric divisions are formed of lines and spaces; we give to the lines the name of 'equi-sections' and to the spaces those of 'equi-distances.'

CHAPTER II.

MEASURES BY FRACTIONS.

4th Law.—The Head, principle of unity.
5th Law.—The Torso, or the Trunk.
6th Law.—The whole Leg.
7th Law.—The Arm measured with a part of the body.
8th Law.—The three parts of the body united.

Fourth Law.

THE HEAD, PRINCIPLE OF UNITY OF ALL THE MEASURES OF THE BODY.

Fig. 4.

The head, a starting point for all measurements, is itself divided into ten parts, counting from the median line. We have only to treat here of the head by itself. This makes part of another branch of study (see our special treatise on the human face), but only of the face, as a base of the measures of the entire body, as a *criterium* of the laws of proportion.

We shall indicate further on (page 47) the manner of proceeding for the measurement of a head; this measure may be taken on the median line by putting the compass on the top of the head and under the chin.

On plate No. 4 we give to the head which occupies the centre four small satellites, to show that the head, like the body, has laws of constitution, and that it is divisible as easily as the body by halves, lengthwise as well as broadwise.

And it is not necessary for the measurement of the human body to search for any other principle than that of the head, as, if such is tried nothing will be found; those who have attempted it have all been wrecked.

Fifth Law.

THE TORSO AND THE TRUNK, THE NECK BEING INCLUDED.

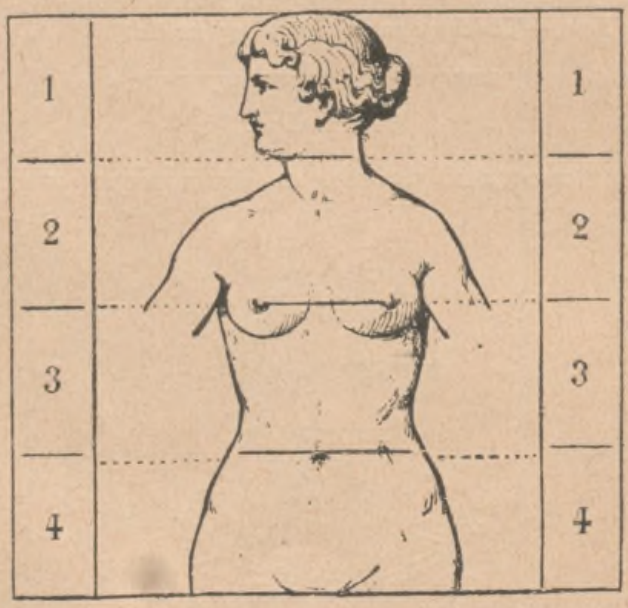

Fig. 5.

This part is the seat of the organs that are essential to life; it extends from the chin to the end of the pelvis.

The Creator has given it three heights of the head.

These heights are marked by spots that will be of importance to all, and which are

1. The line of the nipples, the centre of lactation.
2. The middle part of the navel, another evident point.
3. The end of the trunk, the seat of organs of a character and of an importance that cannot be denied.

Sixth Law.

THE WHOLE LEG AND ITS LOWER EXTREMITY COMPLETE, INCLUDING THE FOOT.

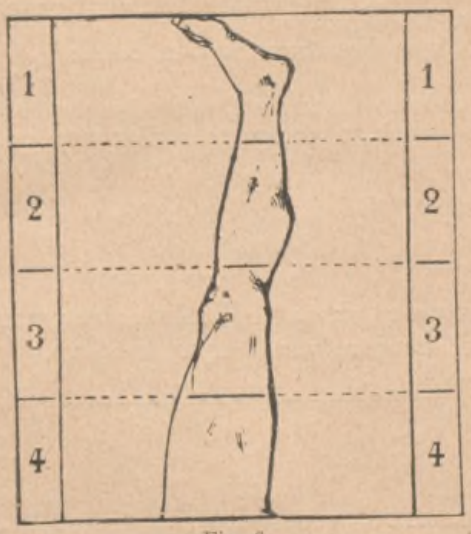

Fig. 6.

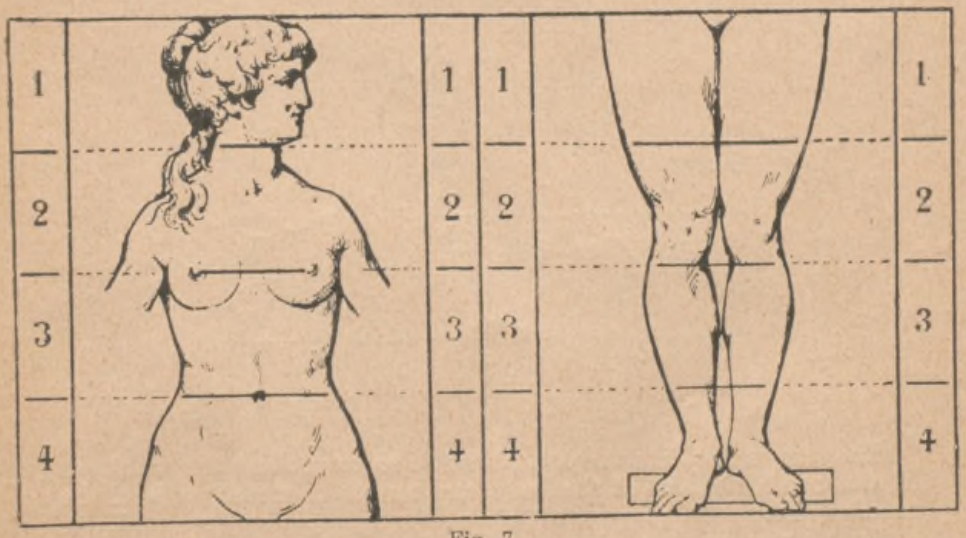

Fig. 7.

Measured on the median line from the spot where the trunk ends, the legs give in all persons of whom the growth has been complete, four head-heights.

It is, as we see, a height equal to that given by the head and trunk united.

But in order that this measure should be complete, it is necessary that the foot should be included. (See the explanations, page 37, Plate 20.)

As we also see, the thigh, including the knee, is two head-heights, and the leg, including the foot, two similar heights. It is then perfectly regular.

We only find these measurements well marked on individuals tall and well made.

This is better seen on the figure 7, where is shown the relation of the two legs with the trunk, marking two similar measures of four heads.

Seventh Law.

THE ARM, OR THE UPPER EXTREMITY MEASURED WITH THE PART OF THE BODY TO WHICH IT IS ATTACHED.

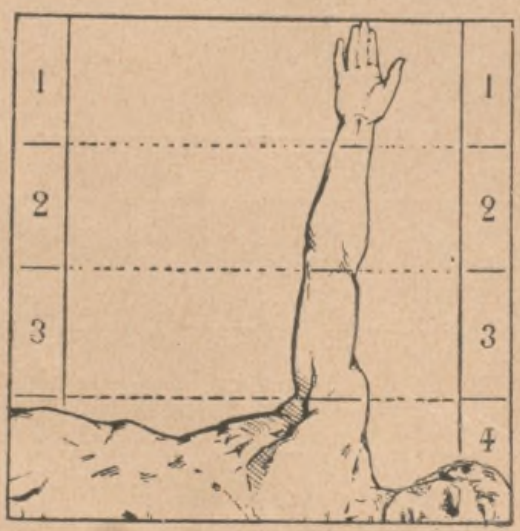

Fig. 8.

The arm is not, like the leg, placed so as to prolong the trunk; it is attached to the side of the body, and cannot be measured from the median line.

But we may, in the position in which it is on this figure, take it away from the median line; and in this case it is necessary to add the part of the breast to which it adheres.

Thus measured, as far as the extremity of the middle finger, it gives four head-lengths. This is a length equal to that of the entire leg.

This is a point very easy to observe.

Eighth Law.

THE THREE PARTS OF THE HUMAN BODY PRESENTED TO SHOW HOW THEY ARE OF A SIMILAR HEIGHT.

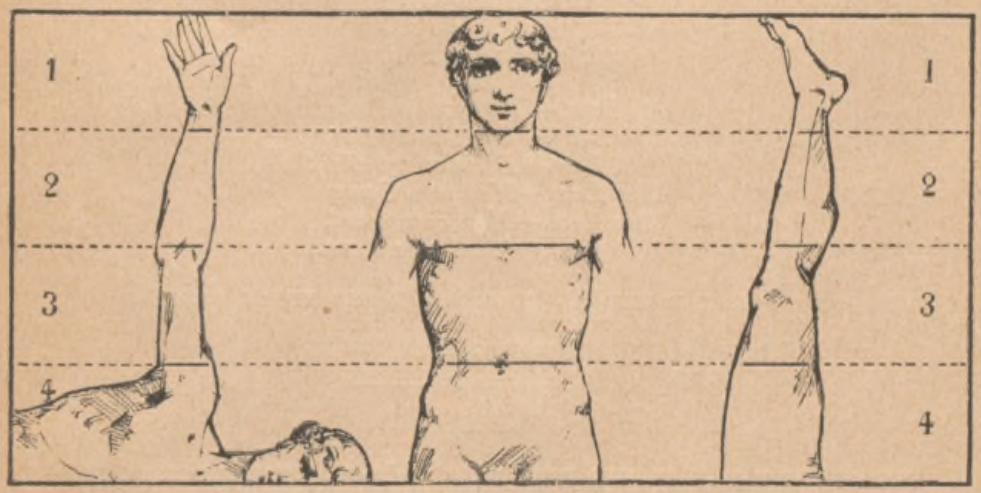

Fig. 9.

The trunk with head. Four head-heights.
The lower extremity complete. Four head-heights.
The upper extremity complete. Four head-heights.

In the presence of this demonstration, it is not necessary to insist on the recognition of the fact how important is the discovery of the relations which show distinctly what perfect and correct man should be.

This equivalency met with between our three great trunks enables us to comprehend that there is a division of forms established by the innate principles of the creation.

It is a curious thing that each of these parts should have an appendix,* the head, the foot, and the hand.

* Transcendental anatomy teaches us the difference between an 'appendix' and a 'diverging appendix.' See Owen: Principes d'Ostéologie Comparée. 8vo., Paris, 1855.

Parts of the jaw, and all the limb-bones, including feet and hands, are examples of the latter.

CHAPTER III.

ENTIRE MEASUREMENTS.

9th Law.—Division by Twos.
10th Law.—Division by Fours.
11th Law.—Division by Eighths.
12th Law.—Man in a Square.
13th Law.—Man spread out.
14th Law.—Man lying down.

THE OTHER DIVISIONAL MEASURES OF THE HUMAN BODY.

RECAPITULATION.

Ninth Law.

DIVISION BY TWOS; OR MAN FROM HEAD TO FOOT, SEPARATED INTO TWO SIMILAR HALVES.

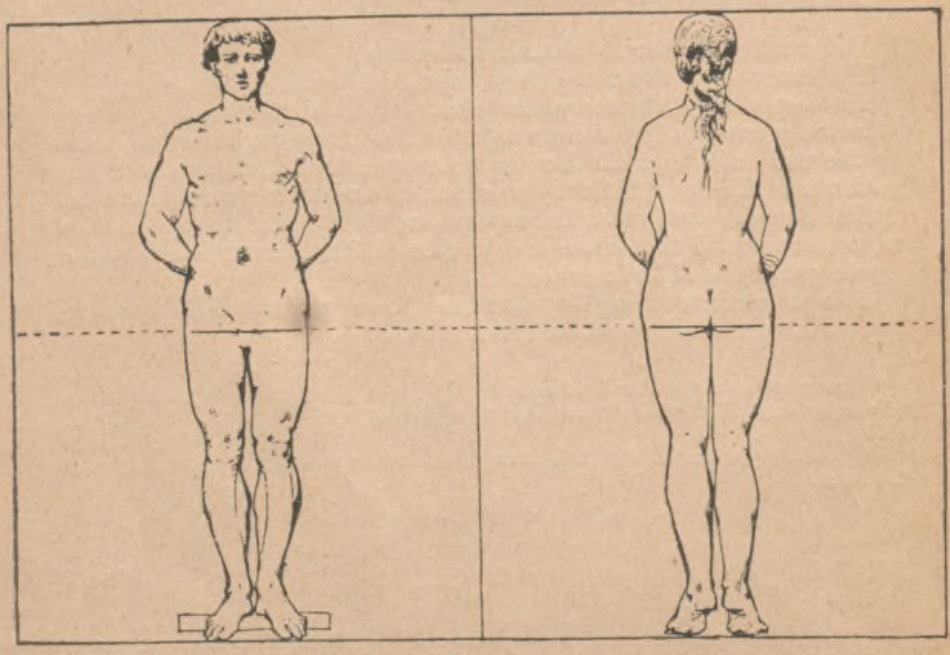

Fig. 10.

This is the first division of man, measured without the arms. The heels are raised to make the measure go down along the legs as far as the extremity of the feet.

Nature has placed this line of separation which centralises, in the two beings which represent our species, exactly at the seat of the organs themselves which serve to form them. As faithful observers of her laws, we have only to give the proofs of them.

This state constitutes that of real perfection and of beautiful proportion. A number of persons, men and women, have been arrested in their growths, or are descended from badly developed parents, and do not attain these fine proportions, the legs remaining too short. But this does not the less establish the real principle of the actual physical beauty of man.

Tenth Law.

THE DIVISION BY FOURS; MEASURING EACH TWO HEAD-HEIGHTS.

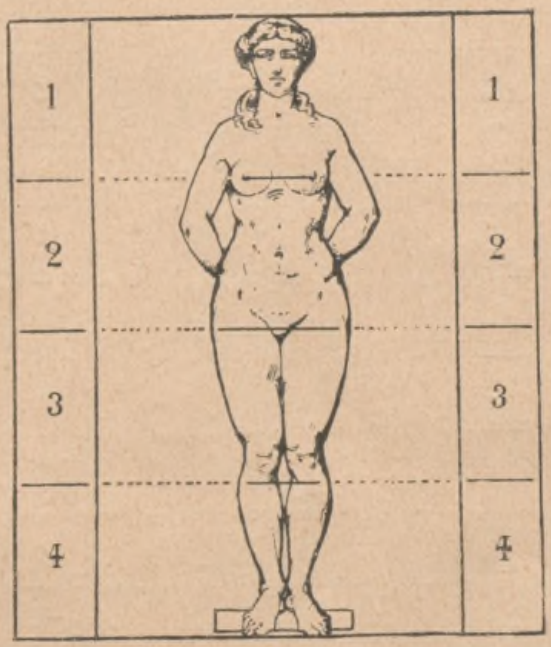

Fig. 11.

The human being is divided as well by four similar sections as by two. These sections are shown in nature by terminal points, of which the evidence will strike the observer. These are, for the spaces or equi-distances.

1. The bust; stopping at the middle of the breasts.
2. The whole abdomen; stopping at the end of the trunk.

3. The thighs; stopping beneath the knees.
4. The legs; extending as far as the end of the feet.

And for the lines of separation or equi-sections:

1. The line of the nipples, or centre of lactation, of which the male individual also possesses the indicating signs.
2. The line of the end of the trunk, and centre of the lower organs.
3. The line which gives the end of the two thighs, at the front of their folds, and divides them from the tibial leg.
4. And finally, the line which is given by the extremity of the two feet united, a spot where the man ends.

Eleventh Law.

THE DIVISION BY EIGHT; WHERE THE MAN HAS EIGHT HEAD-LENGTHS: RECTIFIED CURVE OF THE GREEKS.

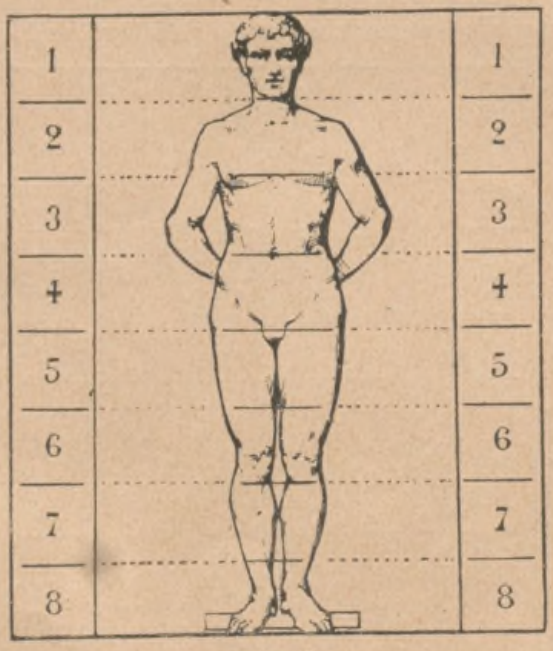

Fig. 12.

This division gives to each part of our being the height of the head alone. It is the final limit of the symmetric divisions of the human body. Who does not seek to go beyond nature will never go so far.

This division of eight heads was adopted by the Greek artists for the formation of statues of their gods, who thus became for the people their ideals of the greatest perfection. But their divisional system was defective, and led them to give to their sketches too small heads, and too long tibiæ. We have referred all this to the natural

laws, by the solitary addition that we have made at the end of the feet. (See page 37, article on ' Foot.')

This canon of the Greeks is still used in the fine arts, and serves at present as the almost unique recognised rule for the proportions to be given to statues of importance, in spite of defects which are apparent.

Time is necessary to destroy acquired prepossessions, especially when they are maintained under the respectable name of tradition. (See on this subject our memoir, read before the Academy of Fine Arts, at the meeting of 27th November, 1875, and the extract that we give from it, page 32.)

Twelfth Law.

MAN IN A SQUARE, OR MAN AS BROAD AS LONG.

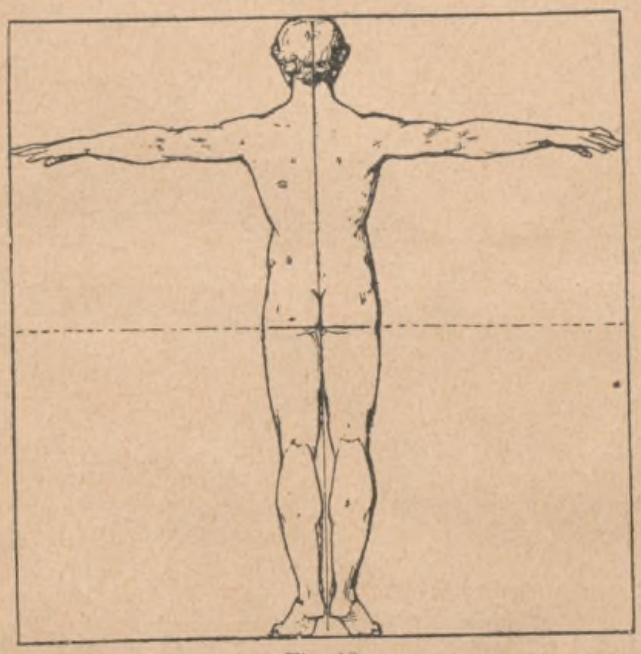

Fig. 13.

This figure represents the same idea as Figure 7 (which see) only it is double.

It shows that man, when robust, broad in the shoulders, and breast, as he ought always to be, is square, that is to say, that both arms being horizontally extended give him a breadth equal to his height from head to foot.

This drawing is the first that shows man in his entirety. We exhibit it because breadths, going from the medium line, only give very im-

perfect fractions. (See Plate 17, and the other manner of measuring the arms.)

Historical Remark.—Man indicated as being as broad as high, was not recently discovered; but notice has been taken by artists who have written on the symmetry of relations. Leonardo da Vinci mentions it, and the ancients already knew it.

Thirteenth Law.

MAN IN A CIRCUMFERENCE, OR SPREAD OUT LIKE A ST. ANDREW'S CROSS.

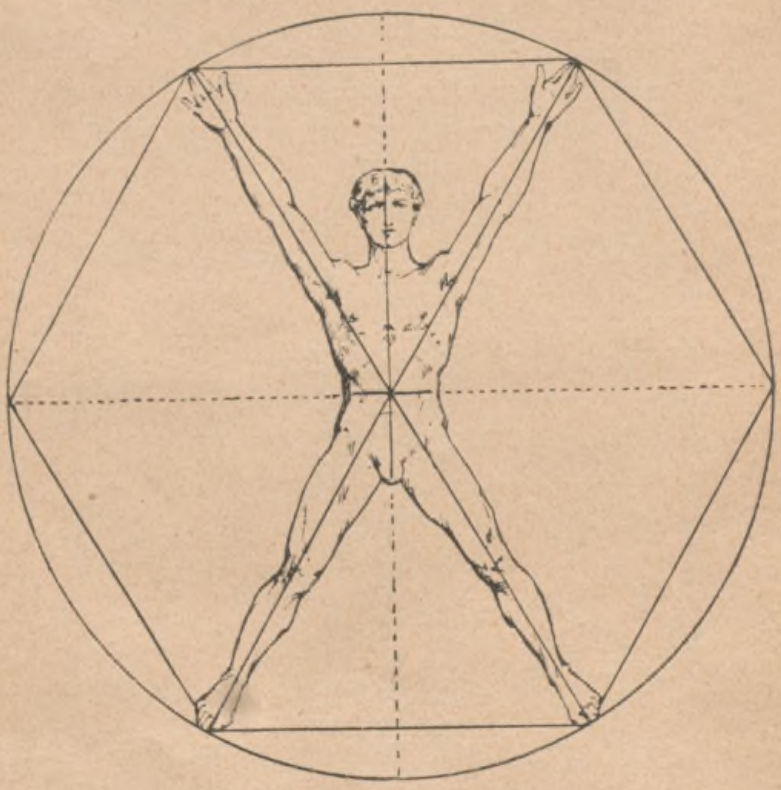

Fig. 14.

Man thus displayed gives ten head heights, five for the part of the arms, five for the part of the legs.

The measure to be correct ought to occupy the centre of the limbs, and to pass in a direct line from the foot to the opposite hand, by the umbilical centre. It is only well taken from a person extended on the floor.

This figure is the second that shows man in his entirety; in fact,

arms and legs are both in play, as in the preceding figure, and as in the subsequent one, so that a complete man is given three times.

Historical Remark.—This figure has been given by some authors, but it is almost always defective. They separate the limbs badly, in an X, and neglect to make the line pass accurately through the navel.

Moreover, in order that this figure shall be correct, it is necessary that all the parts should present a regular hexagon.

Fourteenth Law.

MAN LYING DOWN ALONG HIS WHOLE LENGTH ON THE MEDIAN LINE.

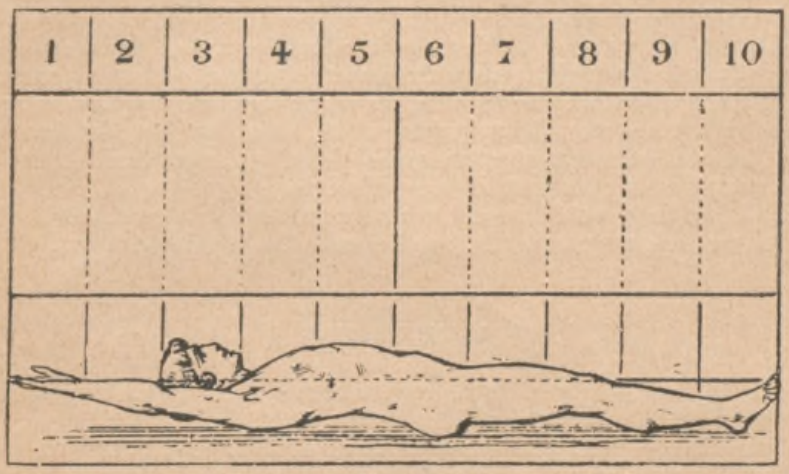

Fig. 15.

This is man extended on the ground, and all the parts are in play, as in the two preceding figures.

What should be especially noticed in this position, is that the arms as well as the legs are upon the median line, and that the hands occupy exactly the same position as the feet.

This is the real position to give to the human being for a study of his measurement, because it is thoroughly geometric throughout. He is also entirely passive, does not make any act of volition, exhibits himself well governed by nature, and in such a manner that he might be comprehended by the Creative Director of being. So no person will dream, seeing him thus, of making the legs end otherwise than at the end of the feet.

In this condition he measures ten heads, and the displaced centre is fixed at the navel.

Remark.—If we measure any one in this position, it is necessary that the two arms should be elongated in such a manner, that if an arm is extended crookedly, it will appear too long, and the measurements will be disarranged.

OTHER DIVISIONAL MEASURES OF THE HUMAN BODY.

We have now arrived at the term of the human size, and at the end of the measures of extent, inasmuch as the three last plates, representing man in a square, spread out, and lying down, give the complete form. It might be imagined from this that we had finished.

There are, nevertheless, other subjects to explain, and even other figures to give, but this appears to us superfluous for an elementary work like the present.

For example, we might show the man *sitting down* or *on horseback*, which gives four measurements, as it reposes on the part which makes the end of the trunk.

We may thus also show the man *kneeling down*, who, when he holds himself perfectly straight, gives six measures, as he stops at the terminal part of the thigh, and beside this, we may place the *upright man*, who gives eight measures, the man *lying down*, who gives ten ; we have by this, an excellent term of comparison, showing that at each section or flexion, our being presents regular divisions.

But drawings would be of no use to render that more intelligible which we already know. It is sufficient to have pointed it out.

RECAPITULATION.

For the rest, we are able to give a résumé of all the measurements. Thus we see the whole of all these rules.

The Head.—Principle of unity. Base of all the measures.

The Trunk.—Three heights of the head, with distinct centres.

The Thighs (including the knees).—Two heights of the head.

The Legs (including the feet).—Also two heights of the head.

The Arms.—They are exhibited under three conditions :

1. Reversed over the head, and giving two measures at most.
2. Stretched out transversely, and giving with the part of the body to which they are affixed four lengths of the head.
3. And finally, when they are hanging along the thigh, where they stop at the fifth division of the upright man. (See further on page 31.)

The Upright Man (the heels elevated and without the arms).—Eight heights of the head.

The Man in a Square.—Eight measures of the head, lengthwise and breadthwise.

The Man spread out.—Ten lengths of the head.

The Man lying down.—Also ten lengths of the head.

The Man sitting.—Four lengths of the head.

The Man kneeling.—Six heights of the head.

These are all the measurements which are common to the two beings which make our species.

It only remains for us to solve a few questions, or offer a few subsidiary remarks, which will be the object of the fourth chapter.

We shall then investigate the special study of the prototype, common to man, or the male being, and that of the Prototype common to woman, or the female being, marking the separation of the sexes.

CHAPTER IV.

SUBSIDIARY QUESTIONS.

15*th Law.—Section on the Median line.*
16*th Law.—The line of level.*
17*th Law.—The Arm and the Shoulder.*
18*th Law.—The Leg and the Foot.*

Fifteenth Law.

SECTION, OR INTERNAL VIEW ON THE MEDIAN LINE.

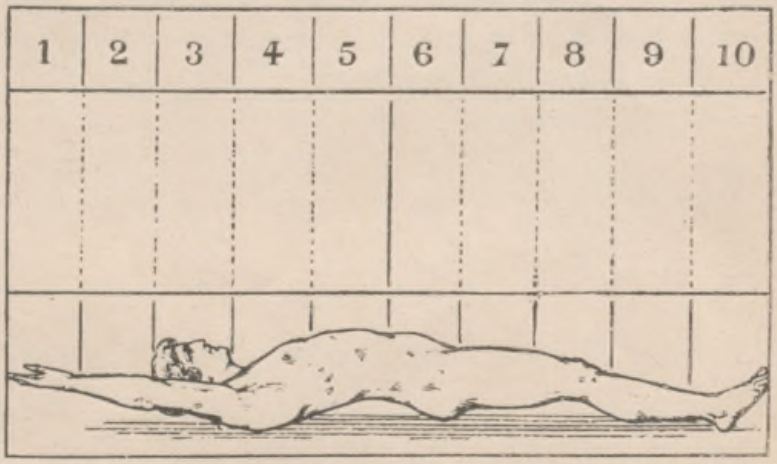

Fig. 16.

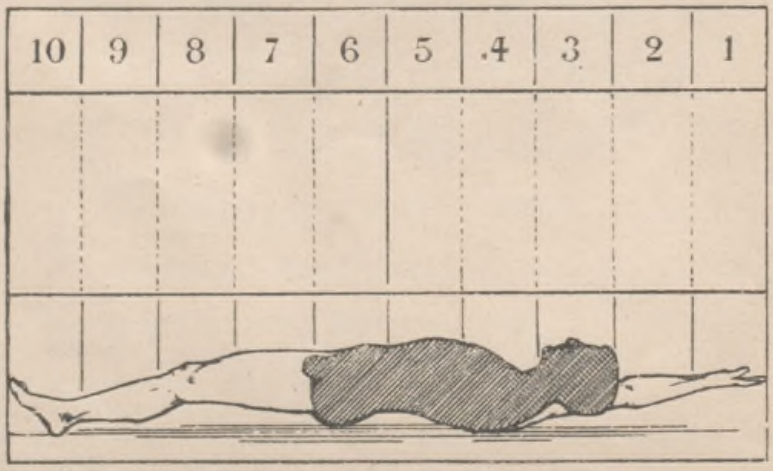

Fig. 17.

This plate (No. 17) which presents the same figure as the preceding, twice repeated, has an entirely different object. It is here to show that the median line is in reality a fictitious, internal, and straight line, and that it is not displaced by the elevations or depressions that are given by the form.

These two figures show in some degree the two halves of the same person; Fig. 16 lets a very small portion of the median line be observed, which is internal, and presents itself in all its extent.

The shaded portion indicates the section made at the middle of the head and the body, at the spot where the median line passes. It passes thus into the empty space between the legs and the arms, and the spots where it touches might have been indicated. These are the thighs, the two knees, the two calves, the two ankles, etc.

Sixteenth Law.

THE LINE OF LEVEL OF EQUILIBRIUM.

Fig. 18.

This line, which may be termed axial line, or line of support, is the line in the man who holds himself upright, which reposes on one leg. It is the sculptor's line especially, because a statue is never seen in repose on the two legs; it is the line, as we have said, of the *carrier*.

This position of man bearing on the leg is a natural fact, and one of the practical laws that has permitted man to accomplish his first act, that of keeping his body in repose although holding himself upright.

This line is an anatomical one: the whole human frame is disposed for its use; the bones alone support the weight of the body, and the muscles undergo no fatigue.

Furthermore, what is important to note is, that during this act, the principle of the median line is respected, as may be seen in the figure, on the base of the head, and the foot which supports it in perfect equilibrium. If this does not take place the whole body will fall down.

In all times, in art, this line has been known, and it is for this reason that we have not to give its history.

Seventeenth Law.

THE ARM AND THE SHOULDER.

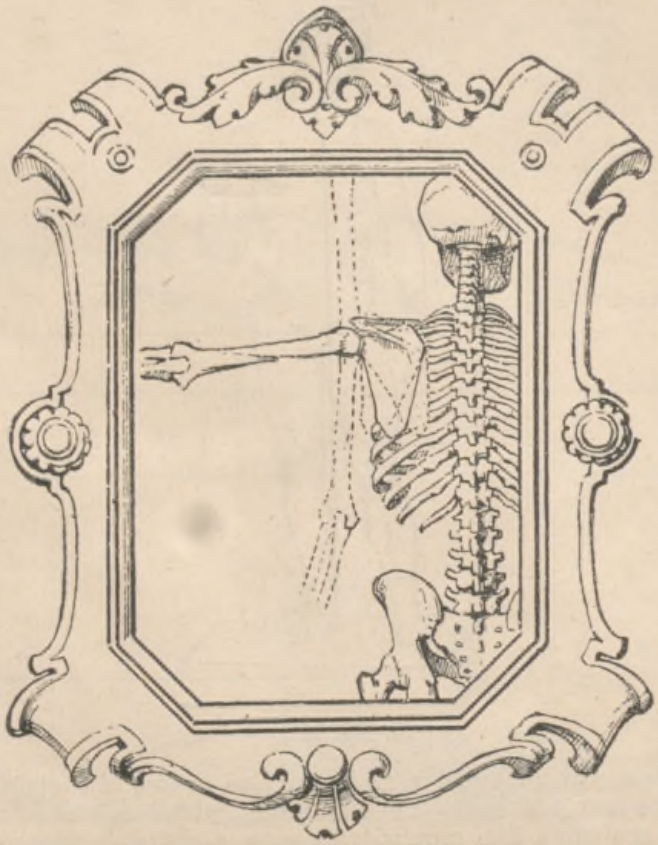

Fig. 19.

One of the most complex questions in nature, and complicated for students, is that of the arm and the shoulder, for the reason that the arm is not, as the foot, a simple organ of support and of locomotion; it is more than this, it is an instrument, an implement of work for man, and placed in proximity to his head, in order that it may be disposed of with entire liberty. Thus, this member is capable of motion in all directions, and turns as a wheel around the body. The axis of rotation of this wheel is the shoulder.

It is this which causes difficulty in the measurement of the arm; and also, it permits its measurement in every direction.

Of so many positions, we shall only adopt three; those which are attached to the median line, or which permit a rectilinear position.

It is this which is indicated in the plate, wherein may be seen on the skeleton the arm-home (*humerus*), moving in the cavity of the scapula and representing the three positions, upwards, across, and downwards.

Upwards.—This is the position described in the man lying down (page 25).

Across.—It is that described in the man in a square (page 23).

Downwards.—It is that of the arm hanging in the ordinary position from the shoulders, and placed, as is said, along the seam of the trousers.

This last position has not been described, as it is not in reality a geometrical one. Nevertheless, we may admit in principle that the arm, hanging in this way, ought to descend as far as the fifth line of man standing upright with eight heads.

This is the most general rule. although in some people differences are observable. Thus, in the Negro we find most often a length of arm which surpasses this measure, while in the Chinese the contrary is the case.

The arm can be placed in many other positions which are interesting to study, but we have said enough on this point for an elementary treatise.

Eighteenth Law.

THE LEG AND THE FOOT.

There also now arises a question which has an entirely different character, and has not less importance, that of the Foot, its position, its place in the measurement of the leg, and that of the whole man.

We are obliged to refer to it, in spite of all that has been written on this point, because it affects our whole system, and makes the real base of all the symmetry of the human body.

The division by eight heads has been always that proposed by artists, and it is by measuring the statues of Greek gods that we are forced to discover the entirety of the laws that we here explain.

The Greek artists, by adopting the measure of eight heads, have

committed a grave error. This led me to make a communication to the Anthropological Society of Paris.*

And I also read another memoir to the Institute (Academy of Fine Arts),† from which I extract the following passage :—

'The Greeks started from a true principle, but they have made of it a false application, or at least an application defective in one point, and on this point I shall explain myself.

'They have erroneously estimated the total height of man, by stopping or arresting the man whom they selected as the type *at the heels*, for the reason that the leg does not end in a heel, any more than the arm can

Fig. 20.

be said to end in a wrist. Never, in the measurement of animals, do we finish a limb otherwise than at the extremities of the limb itself. The anthropoid ape is measured from the extremities of his four hands ; the dog and the horse, at the end of the paws or the hoofs, etc.

'It is thus at the end of the feet that it is necessary to seek for the limit of the real height of man. This they have not done, and this has rendered their scale of measurements a little wrong. It is actually a very small thing. Six centimetres for the average for a man, five for a woman, a quarter head alone, a thirty-second part of the whole height

* 'Some Considerations on the Geometry of Form of the Human Body.' Memoir read at the sessions of the 18th February and the 4th March, 1875.

† 'On the Law of Proportions of the Human Body, and the use of it by the Ancient Greeks.' Read at the session of the 27th November, 1875.

of the human body ; but this is sufficient to destroy the whole harmony of a law.'

It is on this that the error of the Greeks has been founded. It is in reality very trifling, but this destroys all the harmony of things, and all entirety in their relations.

In re-establishing the foot as we have done it, we give to the leg its real length of two heads ; to the thigh a similar length ; to the arm its relations with the leg ; to the entire trunk, its three head-measures and three natural centres. Finally, we put everything in its place.

Here is the benefit of this discovery.

As for the plate that is shown, it is made exactly to comprehend how it is possible to measure a leg (see the principal figure). The other figures illustrate that we ought no more to measure the walking foot than the dancing foot, which makes a pirouette.

SECOND PART.

MAN AND WOMAN; OR, THE HUMAN SPECIES DIVIDED INTO TWO SEXES.

'The Absolute which exists in the law of Proportions, does not exist in height.'

CHAPTER V.

THE TWO SEXES.

The Man and Woman contrasted with the Prototype.
The English and French stocks.
The Head in either Sex.
19th Law.—The Typical Man.
20th Law.—The Typical Woman.
Symmetric divisions.

MAN AND WOMAN BEFORE THE PROTOTYPE OF THE HUMAN SPECIES.

A part of real application and utility.

HERE we are arrived at the end of the exposition of the laws of proportion common to the human species in its entirety, which consequently is applicable to both sexes at one time.

We now enter upon an entirely different kind of labour. We shall make a separation of sexes, and place on one side what is proper to man (male), and on the other what relates to the woman (or female).

And we shall do this with the sole object of being useful to our kind, and appropriating this work to the great race termed white or European, that is to say, the one which dominates and directs, and is capable of profiting by the labours of science.

OF THE ENGLISH AND FRENCH STOCKS.

We are satisfied with having formed our stock and prototype of sexes; and have disclosed the reason why we establish two instead of one.*

We have remarked on the peoples of Europe (and it is a fact admitted up to the present day in ethnography), that the men of the north are generally greater, and have stronger heads than those of the south.

The cause of this is, that the first, especially the light-haired, arrive at the age of puberty one or two years later, and that for this reason they attain a larger size: whilst the others, the brown, formed earlier, remain at a slightly lower scale.

This purely climatological fact leads us to establish

TWO TYPES OF SIZE.

Eternal relations never change: the invariable law is the same, but the height of the model alone is modified. One of these types is that of the northern peoples, the other that of the southerners.†

And as we do not wish to exaggerate, we have in the English and in the French what is sufficient for a demonstration for the present.

The English type may be said to represent the Anglo-Saxon and Anglo-American races, as well as many other peoples of the North of Europe.

The French type may answer sufficiently to the Neo-Latin race, and to the other peoples of Central Europe.

Let us add that we have to agree, not merely with human nature, but also with the modes of measurement, another and greater difficulty.

We must put ourselves in accord with the instruments for measurement in use in both countries, and make our *exposé* clear and easy, without complications of numbers, and without fractions which would confuse everyone.

We have taken the English foot for the English, and the metre for the French.

Finally, we shall repeat, this will not change anything of the law of proportions, which is invariable even between the sexes, and makes us here insist on our axiom. The absolute exists in the law of proportions of our species, it does not exist in the height of individuals.

This is equivalent to saying that two individuals may be of different size, and nevertheless may be both perfectly well built up in their several proportions.

* My friend the late Dr. Pruner Bey recognised in the Egyptian races a 'Type fin,' and 'Type grossier,' which seem nearly equivalent to those illustrated by the Author.

† The researches of Beddoe and Pike have, however, tended to abrogate the theory that the English are typically 'Anglo-Saxon.' The stature of the Celt has been carefully estimated: and the difference between a tall flaxen-haired Yorkshireman and a London city-dweller has shown that it is impossible to predicate all in both the characters usually in the South of Europe associated with the Anglo-Saxon race.

English { 72 in 6 ft. male
68 in 5'8" female

FIXTURE OF THE HEIGHT OF THE HEAD IN EACH SEX.

The head being the base, and the criterion of all the measures of the human body, it is necessary firstly to determine what ought to be its typical height, and this in each sex, as the head has not one equal height in man as in woman.

On this point, we have not to make a selection among various heads, wherein one superior and exceptionally developed head is separated from our consideration. We have only to take an average, and this average we have been able to find at once amongst ourselves, as also in other nations; and finally, in the entire human species.

It was only after a long series of researches and measurements repeated a thousand times, followed by an examination that we have been able to make of the documents left by the learned men of all countries, that we arrived at a head of nine inches for man in the English, and twenty-two and a half centimetres in the French head.

And for the woman, at a head of eight inches and a half in the Englishwoman, and 21½ centimetres in the Frenchwoman.

This gives, eight times repeated, the total height of what may be especially called the typical man, like the typical woman, of whom the categorical description is given hereafter.

Nineteenth Law.

THE TYPICAL MAN.

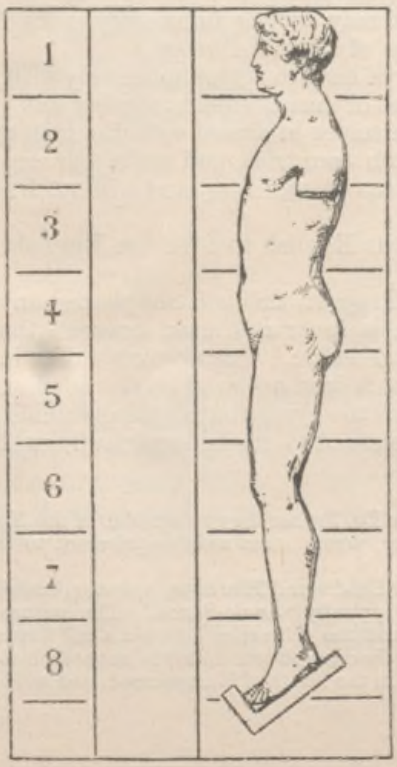

Fig. 21.

This is the most elaborate and the most complete of human perfection. Man best defines the type of species: man, as he is, has the right to suppose that he has been created.

He has been taken for us in the adult state, that is to say, when he has attained his highest limit of growth. He is constituted according to the law of equilibrium and harmony that we have above defined.

We give him a height of six feet, English measure, from the head to the extremities of the feet, measured by the head of nine inches, eight times repeated, which gives him a length to the heads of five feet nine inches six lines.

Twentieth Law.

THE TYPICAL WOMAN.

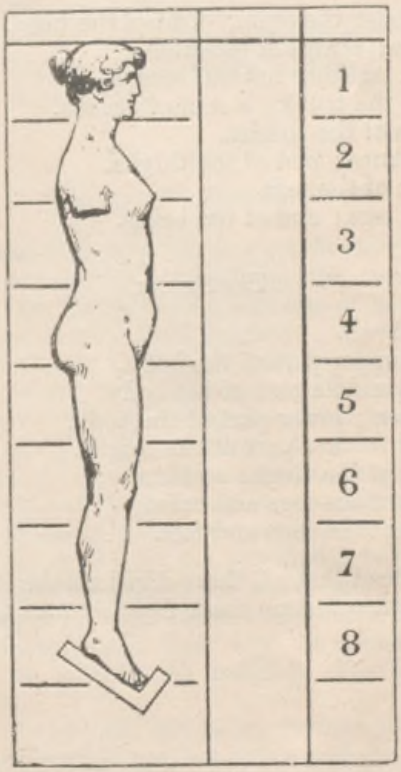

Fig. 22.

The woman, as we know, has been made by nature according to the same laws of equilibrium and harmony as man, but the Creator has built her upon a more perfect model, which will be recognised in every race.

It is necessary, therefore, to give her a separate canon for the rest of her body, as we have already done for the head.

Her total height is that of five feet eight inches, English measure, from the head to the extremities of the feet, measured by a head of eight inches and a half, eight times repeated, which gives her to the heels five feet eight inches.

THE SYMMETRICAL DIVISIONS OF THE MALE AND OF THE FEMALE TYPES.

The following is a summarised table of the divisions of the eight parts applicable to men and women. These divisions are explained in sections as well as in spaces.

The Sections.

1. The line under the chin. End of the head.
2. The nipples; centre of lactation.
3. The navel; another natural centre.
4. The end of the trunk; a seat of organs.
5. The middle of the thighs.
6. Under the knee; end of the thighs.
7. The middle of the legs.
8. End of the legs; end of the being.

The Spaces.

1. The entire head.
2. The bust; upper part of the body.
3. The torso; middle part of the body.
4. The abdomen; lower part of the body.
5. Higher and thicker part of the thighs.
6. Lower part of the thighs and knees.
7. Upper part of the legs and calves.
8. Lower part of the legs and feet.

It is well understood that all these divisions are of equal height. It is for this reason that we name them *Equi-sections* and *Equi-distances*.

CHAPTER VI.

FINAL REMARKS.

Regrets for Typical Unity.
The Stunting of Growth.
Manner of Measuring a Head.
Manner of Measuring a Person.
Advice given.

REGRETS FOR TYPICAL UNITY.

It is with deep regret that, after having established a double source for man and woman, we have been forced by circumstances to create two types of each sex, one of the north, and one of the south of Europe, one of the French, and one of the English.

That of the French, let us say at once, is a little below that of the English. It is 1·80 for man, 1·70 for woman, measuring each by a head half a centimetre below, which gives four centimetres less than the English type, or one and a half inches.

This will be seen to be very little. And we should remark that this is not the only ethnic difference which we might establish between these two types. Above all things we would have preferred, a hundred times, if we had not a respect for principles, but to give to each sex one prototype. It would have been much more rational. But how could it have been done with nations who have different systems of measurement? How can the idea 'foot' be expressed to French, and that of 'metre' to the English people? The endeavour would be impossible.

In reality this is our sole difficulty; it changes nothing, so far as regards the essentials of things, but it is a complication that we would have liked to avoid, because it is not the height which is of importance in man scientifically examined, but only the symmetry of relation between the parts of his body, and a small human being may be as well proportioned as a big one, if every part is found in the geometrical relationship which the rule demands.

What we say here is the truth, and so easy to comprehend, that the woman, although smaller in size than the man, is not less handsome, and is as well made, according to the harmonic law, in all her forms.

STUNTING OF GROWTH, OR ARREST OF DEVELOPMENT.

All human beings are made to attain the height of the normal scale of proportions, if we only speak theoretically, because we indicate the law of harmony established between men and the terrestrial surroundings which he is made to inhabit. If a number of individuals do not perfectly reach the symmetric height, it is because they are arrested, not by a force, but by a cause of weakness which keeps them back when the force of growth pushes them forwards.

We give to this cause of arrest the name of Stunting of Growth.

Stunted growth does not attack the head, and very little the body, but it strikes at the limbs.*

The Head.—The head being the seat of the most essential organs, which make man to be man, cannot be attacked by the arrest of growth without making the individual smaller, or at least deformed, as in the idiot, where the head acquires always, and especially, its perfect development. The little humpback, the legless cripple, the maimed in every manner, natural or artificial, generally possess good heads.† We know a thousand cases, since the time of Æsop, of little humpbacks acknowledged to have been men of superiority and very intelligent.

The Trunk.—The trunk is also the seat of organs essential and indispensable to life, which suffers very little (except in cases of illness) by stunting or arrest of development in strength. But in height, it may be remarked, in the persons of small size, that most frequently the relations of the three divisions are well marked.

The Limbs.—It is here that this condition operates in all the individuals who have remained small and show a stunted growth, and this is how it acts.

The limbs are very short in the child that is newly born. Everything in it is head and trunk, and in a few years this head and trunk take an enormous development.

For the limbs, the growth is made in the manner that we see in the vegetable. The members issue from the trunk of man, as the branches issue from the trunk of a tree, or by a better comparison, as the rings go out of an opera-glass when it is opened. The parts nearest to the stock are best nourished and developed. The thighs, the upper part of the arms, first afterwards the legs, and the forearms, last the feet and the hands. There is amongst stunted nations, as there is even amongst us an unhappy admiration for small feet and small hands.

Then, if the growth is not complete at its appointed time, when the period arrives that the boy attains manhood, and the girl womanhood, as nature will not wait, the individual, short and stunted in his limbs at this time, remains such as he is, and is likely to transmit to his children the evidence of an alteration which has become constitutional in him.

This is the origin of slender races, and nations physically degraded.

* The author has unconsciously repeated the idea of Horace Walpole:

'Fortune, who scatters her gifts out of season,
Though unkind to my limbs, has yet left me my reason.'

† Mrs. Gamp, in 'Martin Chuzzlewit,' has described such a child with the words, 'Thrive he did, though bandy.'

MANNER OF MEASURING A HEAD.

Let us now say that, as the plate indicates, there are two manners of measuring the height of the human head.

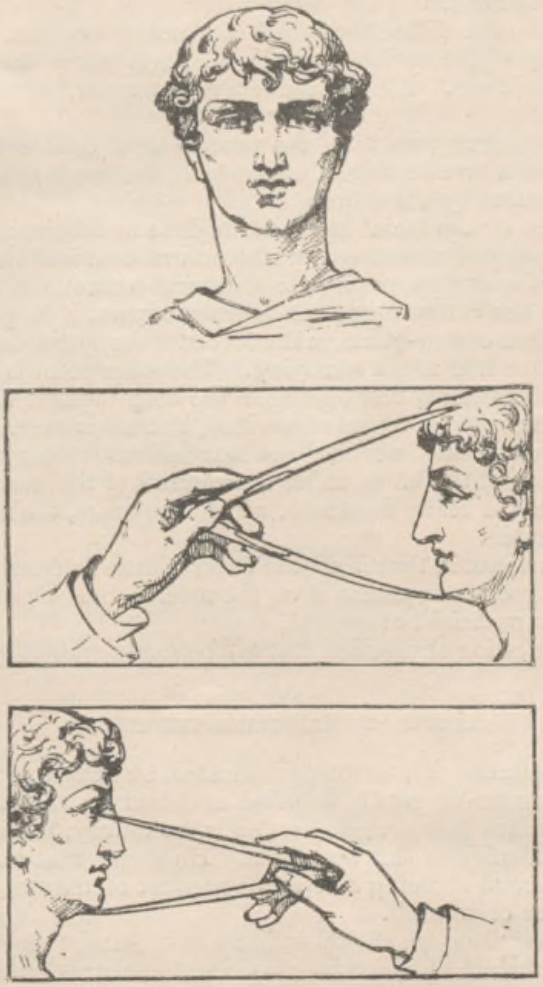

Fig. 23.

The one, which consists in taking it in its entirety, from the summit to the chin.

The other, which is that of only taking half of the face and doubling it.

This second manner, which appears to be comprised under the other, is nevertheless the best ; it is more easy, and gives more precision.

It may be believed nothing is so unequal, irregular, anomalous, or without measure, as the formation of the skull. It is nevertheless the

envelope of the brain, and this brain is the principle which commands all the forms of our being. This bony box presents all sorts of inequalities and irregularities, which entirely overthrow science, to such an extent, that we often scarcely know how to discover the summit of the head.

Add to this the difficulties which are not so obvious, the hair and that which is added to it (especially amongst our women) under the name of 'headdress.' All this renders measurement of an entire head most uncertain.

If, on the contrary, we take the process of a double half-head, we are assured of a precise height, so much so, that we may always rectify one measurement by the other.

To measure by the facial half-head is done as follows :

The true point of measurement, the natural centre of the head, is the eye and over the eye, the pupil (also a natural centre), but as we are not able to place the compass over so delicate a part, it is placed on the internal canthus or tear-gland, in the corner of the eye, which approaches the median line and is not annoying. The other point is put lower, at the base of the chin, without going in too deep towards the neck.

The measurement is repeated, verified, and all is over.

For the entire head, we need not fear inserting the compass points a little in front of the hairs, to let the summit of the head be reached, and if the head is really deformed, which is not rare, the facial measure is easily repeated.

We have suggested that it should enter a little in front of the hairs, because it is good to approach it on the median line, which, as we have said, is not superficial but central.

This is a question of practice that will be soon acquired by experience.

MANNER OF MEASURING THE FIGURE.

The only manner of measuring indicated by nature is that wherein the child or grown-up person is naked and laid on the back. But as man is an active being, and essentially voluntary, he lends himself with great difficulty to this operation. He knows that he is a created being, he is proud of being a separate product of nature, but he must remain master of himself.

It is necessary that we should indicate the means, to a certain extent artificial, by the aid of which we may counteract this unwillingness.

In the first place, the upright position should be taken, as it is usually practised, although it has the disadvantage of making the man stop at his heels. This can be remedied by adding for the male six centimetres,* and for the female five centimetres, in order to restore what is lost in not going further towards the ends of the feet.

People in cold regions being always dressed, the clothing is most inconvenient; therefore, when the body has to be examined, as we cannot go closely enough to the points which mark the divisions, it is

* Two and a half inches (man), two inches (woman).

necessary to supply them by collective measurements, especially in the case of a female model.

This is how we should proceed:

1. To learn if the person is really of eight heads to the end of the feet.

2. If the individual is square, taking the breadth after having taken the height.

3. Also to assure ourselves if the height of the trunk, compared with the head, gives exactly the three measures wanted. If there is doubt of this, especially in a woman, and it cannot be precisely indicated, we may be content with the sitting position, and the measurement by the back.

4. Furthermore, the person may be placed on one or both knees, or may support herself upright. We obtain by this the length of the trunk and thighs.

In the last place, we may elongate the leg, as the shoemaker does when he fits on boots, and by a measure going in a direct line from the lower part of the knee to the top of the great toe, with the foot at liberty, and without any muscular flexion, we have the exact length of the leg.

Collecting all these measurements, and comparing their numbers, we obtain general control over the relations of parts, and we may thus render an account, to a certain extent correct, as to whether any individual is regular or defective in his proportions.

ADVICE GIVEN.

We see, by what has been said, how easy it is for each person to know how he is constituted. The custom of measurement is one that should enter into the habits of civilized persons. In families they commence by children. There exist rules of growth, which we shall indicate, as we shall show by the laws and principles of the beauty of the face; because nature has foreseen everything and calculated everything. This sort of examination is practised as a game, a pleasure which will soon take the place of a serious thing, and one of the wants of modern education is to adequately regard the intellectual and moral proportions amongst children, their aptitudes, their temperament, their organic constitution, their hereditary dispositions, etc.

The physical constitution of individuals is too much neglected by us. It is nevertheless the basis of all the human edifice. With our habits of over-clothed people, we attach too much importance to costume, and not enough to that which is beneath it; but what lies underneath is our whole being, and that which makes us live.

The industry of clothing is pushed to such an extent, especially for our women, that it leads them to all sorts of frauds. It is time to remedy this.

The human species may be improved in a large number of points that are now ignored. The race amongst ourselves may arrive at perfection greater than that which exists in the races amongst animals. Man, in this point of view, will go much further than his horse. Why

do we say that the physical constitution of man has made so little progress? It is because the attention of man has never been given to this subject, and anthropology is a science of too recent a date.

Γνωθι σεαυτον was said, perhaps twenty-five centuries ago, by the philosopher Thales to his fellow-citizens. Let us use the words of the wise man, and say to entire humanity, Γνωθι σεαυτον—Man, know thyself.

THE END.

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PLATE

I. MALE FIGURE. Front View.
II. MALE FIGURE. Back View.
III. FEMALE FIGURE. Front View.
IV. FEMALE FIGURE. Back View.
V. DRAGGING AT A ROPE. Front View.
VI. DRAGGING AT A ROPE. Back View.
VII. HURLING A JAVELIN. Front View.

PLATE

VIII. HURLING A JAVELIN. Back View.
IX. DESCENDING A LADDER.
X. (*a*) KNEELING. Back View.
(*b*) KNEELING AND DRAGGING AT A ROPE. Front View.
XI. (*a*) RECLINING. Front View.
(*b*) RECLINING. Back View.
XII. (*a*) ROWING. 'Getting Forward.'
(*b*) ROWING. 'Recovery.'

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