

THE  
**SCIENCE OF GYNAMETRY**

BY

MRS. M. V. COLEMAN.

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ATLANTA, GA.

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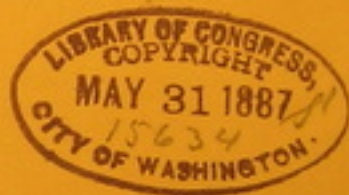
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*THIS BOOK*  
*Is Sympathetically Dedicated*  
*to*  
*THE WORKING WOMEN OF AMERICA.*

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## PREFACE.

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In almost every periodical, from time immemorial, do we find dissertations on the "Influence of Woman."

In every speech, heralded, in clarion notes, from rostrums, to graduating girls, do we hear that to our influence alone, all the future glories of a spotless name is due. From her triple kingdom, "The Kitchen, Parlor and Home," she is expected to send out representatives to wield the power with which she so cunningly imperviates the souls of the human beings, which have been mercifully given to her charge.

If woman faithfully discharges the duties and the requirements which man has placed upon her, she may feel assured that the Lord will say, "Well done, thou good and faithful servant;" thou hast sent out, from thy inexhaustible kingdom, those who are capacitated to tempt the appetite of man with delicately cooked viands. Thou hast given to thy daughters accomplishments by which their parlors are made fitting resorts of refinement and intelligence; and occasionally thou hast benefited mankind by giving to them "Leaders" who can fearlessly charge an opposing foe on the battlefield; and legislators who guide and direct their affairs in times of peace.

Oh, woman! surely much is expected of thee! Let us then shoulder our responsibilities, and discharge faithfully our duties. Let us teach the children how to make home pleasant, and while doing this, impress their minds with their chief duty, *that of dressing well.*

Nature has provided richly for her inferior children, while God has endowed woman with reason, imagination, taste and ingenuity, to provide for herself clothing that will make her appear as fitting queen of every season.

This is a question that troubles many intelligent and conscientious people. The Christian is perplexed, men especially are doubtful, about the usefulness of changes in costume, and the effects of ornaments in feminine attire.

The importance of dress in a moral point of view is seldom considered. Some sensible people often talk of the art of clothing as though it were of no importance; and yet, the art of dress was the precursor of all arts; it was the first invention of human ingenuity and skill, it was the first symbol of Divine mercy to our fallen race.

The Bible, as we well know, is the standard of authority by which we test the right or the wrong of ideas and usages; let us see therefore what we can draw from Biblical records, to sanction the importance we attach to this wondrous feature of the human, above the animal life.

"Clothing has nine distinct phases of teaching the philosophy of its usefulness. It gives covering, comfort, comeliness; it marks custom, condition, character and civilization; it symbolizes redemption through Christ, and the holiness of the saints in heaven."

The first three phases need no comment. As to the manner in which clothing expresses character and condition, read the 24th chapter of Genesis.

When the servant of Abraham gave ear-rings and bracelets to Rebekah, her character as a pure and lovely maiden was indicated; the jewels of gold and raiment showed her condition as the betrothed of a great lord, son and heir of the Hebrew patriarch; and the "veil" that this Syrian bride threw over herself when she saw Isaac, was type of her feminine modesty and faith in his love, which crowned this young "damsel" with the delicacy and dignity of womanhood.

We might fill a volume with these evidences of the importance and significance of dress and ornament, from the testimony of inspired writers, but we will refer only to the "Kings daughter, all glorious within, her clothing of wrought gold. She shall be brought unto the king in a raiment of needlework." And also the "virtuous woman," whose "clothing is silk and purple," and "all her household are clothed with scarlet."

These examples show that not only character and condition are represented by dress, but also the spiritual graces of godliness, and the virtues of home life, may be pictured forth in the perfectness and richness of personal apparel.

Nor do these examples encourage useless extravagance. We give them only as guides to a more thoughtful study of this—in our country—important subject.

It is only when the dress is appropriate to the wearer and becomes the time, the occasion and the office, that magnifi-

cence in clothing is an honor to the wearer. Nor can we comprehend the full import of clothing, or its advantages, unless we look at the evil results that follow neglect of or disobedience to this law of necessity for the human race ever since the "Lord God clothed" the first man and woman before sending them out of Eden. From that day to this, dress has been the sign of hope and comfort to the individual, and the sure mark of progress in the arts of life, and in intellectual and social improvement.

Thus we reach the moral of dress. A clothing of rags symbolizes wretchedness, wickedness, imposture or imbecility; nakedness is savagery, shameless sin, or extreme misery.

Heathenism has no darker shadow on its God-forsaken horizon, than the half-nude millions on millions of its worshippers. Wherever Christian civilization prevails, as in Europe and America, dirt and disorder in a household or in dress are proofs of ill-conditioned or ill-trained people; the dress must be decent before we can have confidence in the character of any person.

We feel and judge thus intuitively, because the instincts of humanity tell us that without decent clothing, there cannot be real delicacy of feeling, or true dignity of mind, unless the "miserable" suffers from the sins of others. And this does not weaken the force of our moral of dress, that there is and has been wrong doing, whenever we see people badly or indecently clothed.

Three requisites, palpable to common observation, should distinguish every Christian family—good clothing, household cleanliness, and ready courtesy.

We have only written to impress the importance of raiment.

Fashion is one of the powers of the world, subject to the same moral treatment as all other influences. It is more potent than rank. Kings and queens do not rule it; rather like sorrow, it makes kings bow to it.

French artistes, who may be accounted the priestesses of fashion, do not, we believe, do anything deliberately, but unconsciously follow its laws.

To assist its votaries to the requirements of the "fickle goddess," I have carefully devised and arranged certain rules of measurement, by which garments can be easily and gracefully fitted to the body, which I propose to make known in the following pages.

## GYNAMETRY

Is a science which relates to the outside measurement of the human body, on geometrical principles.

We have been taught that man was created for a purpose, our Creator placing the muscles on the limbs, in just the position necessary for strength and action. So all the other organs of the body are designed and arranged to best suit the purpose for which He created us.

The rules of proportion applied to the human body, clearly demonstrate the fact that one part of the human body is in proportion to another.

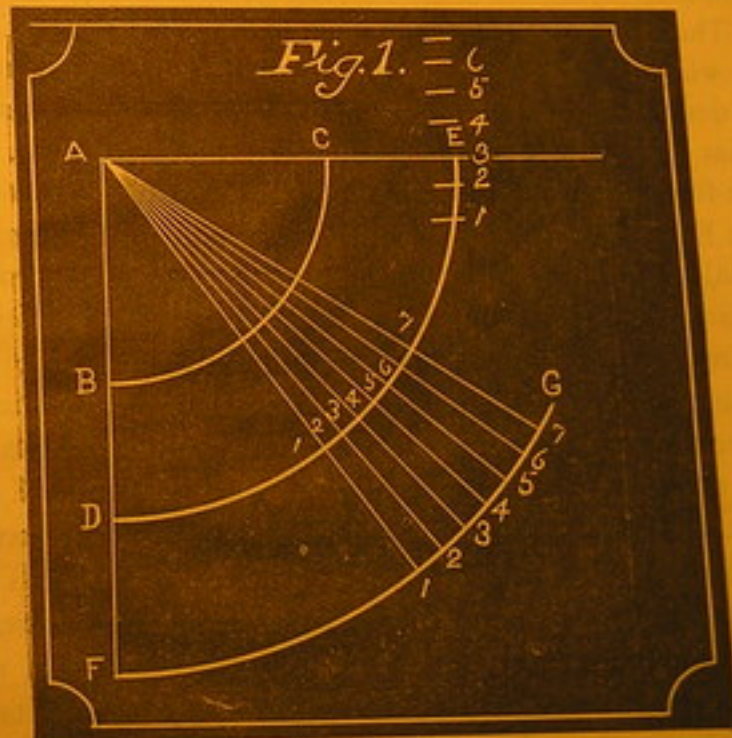
I have ascertained by careful attention, that one part of the body is in proportion to the other throughout the entire structure; that every muscle is a curve, and every joint is a circle; and that for these reasons it is necessary only to use one measure to obtain a circle, and that another, or but one measure is required to obtain the size of the various parts, and consequently of the entire body.

With this measure, a geometrical figure can be drawn by which all the different measures of the human body can be obtained with great accuracy. By becoming familiar with this problem, illustrated and described, it will be easy to cut a dress, or any other garment desired, which will fit perfectly, without the necessity of trying on, which is sometimes annoying to those being fitted for garments.

To reduce this method to practice, I have devised the diagram represented in Figure 1, which is explained as follows, and can be easily understood by the letters of reference marked thereon.

### DIRECTIONS.

Take the measure of wrist between the wrist joint and hand.



With one point of the compass at A, draw a quadrant A B C, to the size of wrist measure, next with the arc B C, increase the figure to D E, that being the line, or circle on which the length of back and size of waist both, are described.

The length of back is determined by adding 12 and 3, parts of the measure,—by part is meant one-sixth—of wrist measure—to the arc D E, or taking 1 and 2 parts from said arc.

These different lengths of back make the different classes to which bodies may belong, there being six in number, as designated by the numbers written thereon, nearest the point E. After getting the correct length of back, with one-fourth of it increase the circle a third time, making the line F A. The size of waist is determined by adding fractional parts of the wrist to the arc B C, or elbow measure, the smallest size having one part added, the second in size having two parts added, and so on, until the whole wrist measure is added for the largest size; that makes one-half of the waist. After the correct waist measure is ascertained, with one-fourth of waist proper, measure on line D E from point D to its terminus, then dot, draw the intersecting line from A to said dot, letting it continue to line E G.

The numbers written on line D E nearest its centre denote the different waist measures of any given wrist, while the figures on line F G denote the bust measure of its corresponding waist. I do not mean the actual measure of the bust around the figure, but it is a dividing distance between the bust and hips. The waist measures, which are seven

in number, denote the different orders to which a body may belong. I will here state that bodies belonging to the 6th class, as well as the first order, are extreme cases, and are rarely seen. Hence the measures for a body belonging to the 2nd order and 3d class, they being the most common, are as follows:

From D to Q is  $\frac{1}{4}$  of waist, which, in drafting, I will simply call waist measure.

From F to G is  $\frac{1}{4}$  of bust measure, which will be called bust measure in drafting.

B C is the size of arm at elbow.

A B is size of wrist.

A B—two parts is the size of hand over the thumb.

D to E is the length of back.

D F is the length from waist to pelvis bone, or what is more commonly known as hip joint.

The length of back, plus two parts, is the length of inner arm.

Twice the length of inner arm, plus A B—the wrist measure—is the length of skirt.

It will be found that a body perfectly proportioned in every other respect may sometimes have its length, from waist down, increased two and three parts, and sometimes as much as the entire wrist is added; and again, it will be decreased in length as much as two parts.

Let it be here remarked that whenever such deformities occur, the body has certain peculiarities, the study of which will prove interesting to many. The difference does not exist in the limbs proper, but from the waist to the lowest point of pelvis bone.

Human bodies are divided into two classes, irrespective of sex, the square shoulder and the droop, or sloping shoulder, the difference of which is barely distinguishable in some instances. An infallible rule for determining, is to notice the relation the arm sustains to the length of the waist. Fold the arm to the body if the bend of the arm—not the elbow,—be above the waist line, then the body is square shouldered; if it comes on a level, or below the waist line, then it has sloping shoulders. Another way to determine the difference is to notice the toes on the foot. If the first, or great toe is the longest, it denotes square shoulders; if the second toe is the longest, the body has drooped shoulders. I don't mean stooped shoulders, for they can be either square or sloping.

It is necessary to know to which class a body belongs before it can be fitted, for this difference effecting the length under the arm, makes a difference in the shoulder and width of the body between the shoulders.

It will be found that the length under the arm in drooped shoulders is just one-half the length of back, while in square shoulders it is one-half the back, plus one part. Again, there are different positions which bodies occupy: erect, moderately erect, and stooped. It may be noticed that whenever the length of back is short the body will be very

erect, with prominent bust and little stomach, while a body with a long back is just the reverse, consequently, bodies belonging to the first class are the most erect while those of the sixth are necessarily stooped. Opinions differ as to the cause of stooping, but I maintain that bodies are born so, for these positions are observable in infants as well as in children of larger growth. It may, also, be noticed that people with long backs are less strong than those with shorter ones; these differences are observable in the carriage of a body, people who are very erect take short, elastic steps, while those who are stooped take slow, long strides.

The human body is an exceedingly interesting study, and when a knowledge of its measurements be acquired, its beauties will be considerably enhanced.

There is no doubt but the outside formation of the body indicates the capacity and strength of its inner organs. The cavity containing the brain will vary in width and length in the same proportion which govern the other parts of the body.

Much could be written, and many ideas suggested, but as it is my intention to give only primary instructions in this little work, I will proceed to diagram 2nd.

FIGURE 2

Is a diagram which represents the method of arranging the measures on paper to facilitate the drawings. Those represented in the Figure are for a body belonging to the 3rd class and 2d order, with square shoulders, and occupying the 1st position.

A B is a strip of paper, cut five or six inches longer than is required for length of back, double it, then point one end, as at A. Measure from the pointed end the size of wrist, indicate it by a notch, as at C; after the first quadrant is drawn measure from pointed end the length of arc, notch as at D, and so measure the arcs as they are drawn. Notice, the three whole arcs of the quadrants are indicated by the three notches as C D F.

The fraction  $\frac{1}{4}$ , worked nearest the pointed end, represents literally, one-sixteenth of the waist measure, which I will call simply  $\frac{1}{4}$  of waist, as it is really  $\frac{1}{4}$  of the sectional part of waist, used in drafting,  $\frac{1}{4}$  of the body.

The character marked bust, is  $\frac{1}{4}$  of the bust, proper, which, in the drawings, I will call bust measure.

Remember that the 2nd order denotes 2nd waist measure, which is found by adding two parts, or  $\frac{1}{3}$  of wrist to the arc B C, or elbow measure, to get  $\frac{1}{2}$  of waist proper; 3d class denotes that the length of back is the length of arc for back. First position is two parts added to the back for length of front.

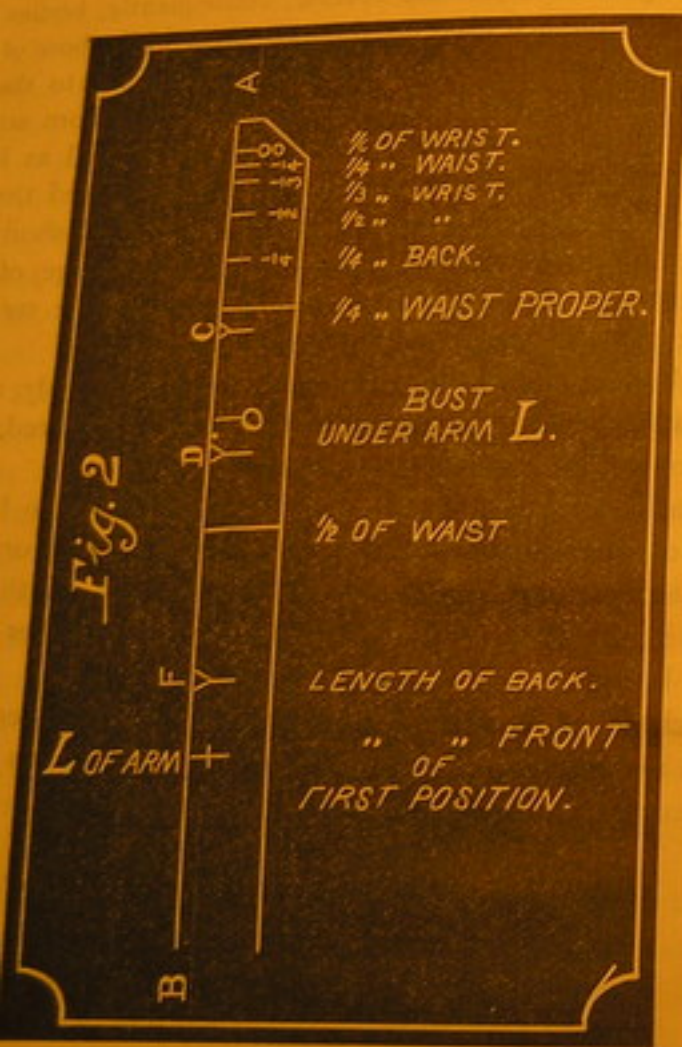


Fig. 3 is a Diagram for drafting back of waist for a body belonging to the 3rd class and 2nd order, having square shoulders and occupying the 1st position.

The difference in bodies with square and droop shoulders relate principally to the measure under the arm; in droop shoulders the under arm measure is one part shorter than in square shoulders, hence the shoulder lowers one part, as represented by dotted lines at shoulder and arm's eye.

#### DIRECTIONS FOR DRAFTING FIG. 3.

Draw the square A B C D to the length of back and width of  $\frac{1}{2}$  of entire waist measure.

Incline the line D C to E C by using 2 parts of measure; hence

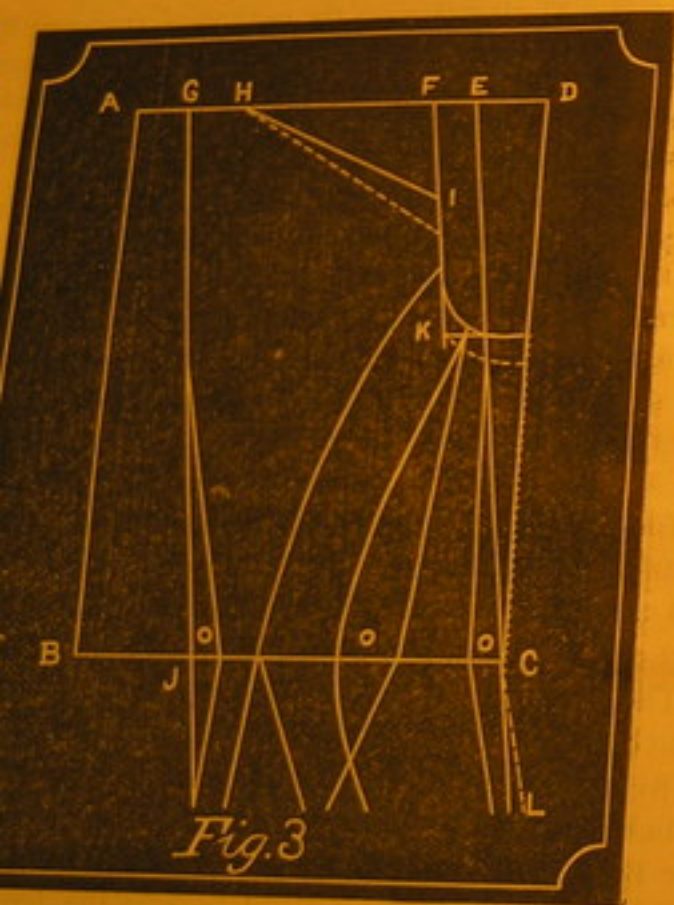
From D to E is 2 parts of measure.

From E to F is  $\frac{1}{4}$  of waist; draw the line parallel with incline line E C.

From F to G is the width of back between the shoulders, which is the wrist measure plus  $\frac{1}{2}$  a part.

From G to H is  $\frac{1}{4}$  of width of back.

From C to J is the bust measure—not really the bust proper, but a dividing distance, which is used to get a sufficient space for the waist and the necessary darts—a measure which it is very essential to have correct, in order to obtain a graceful fitting garment below the waist as well as above the waist line.



From E to I is  $\frac{1}{4}$  of length of back; for droop shoulders and for square shoulders it is  $\frac{1}{4}$  of length of back, minus one part.

From I to K is  $\frac{1}{4}$  of the length of backs, curve the arm's eye out to incline line.

From K measure down the length under arm dot, as at little c; curve the waist line from that point to J.

To ascertain the darts represented by O. On waist line, measure  $\frac{1}{4}$  of entire waist then dot; the remainder of waist line will be the quantity required for the darts; divide it into four equal parts. One part must be taken out at the centre of back, one at the under arm line, and the two remaining parts or one-half between the two side bodies; divide the arm's eye into three equal parts, then draw the intersections of the waist as represented by the lines, from arm's eye to waist line.

For skirt of basque:

From C to L is  $\frac{1}{4}$  the length of back, at the centre of back and under the arm. Curve the lines for skirt of basque out to their respective limits; the other lines for side bodies must be drawn parallel to their respective parts; in other words, all the sides which go towards the back are drawn parallel with the back seam.

In order to have the waist more symmetrical, one part is taken from the front under the arm, and added to the back, as the dotted line under the arm shows.

To show the philosophy in drafting garments upon said principles, a diagram is drawn, which is represented in Fig. 5, showing the largest waist of the same wrist, which governs Fig. 3. By observing the difference one can more easily understand where and how a body fattens.

The arm just below the shoulder joint in bodies of ordinary proportions and positions will be found to be one-half the size of waist; but as this measure varies according to position, it will be better for the student to take the measure of the arm until she becomes familiar with the different forms; for instance, in a very erect form or one with a very short back, if the waist be 24 inches, the arm may measure only 10 inches. Then the bust measure in drafting the back must be reduced twice, as there is a difference of two inches in the arm measure. If the arm measures 11 inches then the bust is reduced once.

If the arm increases in size, which possibly may be the case in bodies belonging to the 6th class, increase the bust measure correspondingly. These differences relate only to the back; the bust measure in drafting the front remaining always in its natural proportions.



for an extended length of front. The same must be added at S to increase the size of bust, for one determines the other.

To draw the shoulder. Place the shoulder of the back, which must be previously cut out, in an inverted position, the neck at I, letting the arm's eye reach to the line K at its nearest point, then draw the shoulder by back.

From K to L is  $\frac{1}{4}$  of extended bust, if there be one, which, of course, there is, if the length of front reaches a point above the line J. If there is no extension of the length of front, then  $\frac{1}{4}$  of the natural bust size must be used for the width of neck on front.

From L to M draw the line for front.

From L to P is  $\frac{1}{4}$  of the length of back, minus one part.

Q is the half way point between neck and waist line.

From Q to R is one part of the measure.

Draw the line S R, for height of darts, parallel with waist line.

All forms require a curve of  $\frac{1}{2}$  a part on the front as from R to S, hence, whatever is added for an extended bust must be measured from S.

Draw the arm's eye as diagram shows.

Ascertain the necessary quantity for darts as on back, divide it into as many parts as darts are required, place them

where fashion requires, these are represented by the letter O. Dotted line under the arm shows the part which has been previously taken off and added to the back.

From C to T is  $\frac{1}{4}$  of back.

From T to U is two parts of the measure.



Is a diagram arranged to show how and where the body fattens. It is drawn in the same class and position as Fig. 3, but being in the 7th, or largest order, makes the difference, which is apparent in the drawings. The space A B is increased with the waist which makes the natural increase for arm's eye, but the width of back from B to C remains the same throughout the seven different orders of any given wrist.

FIGURE 6

Is a diagram for drafting sleeve.

Remember the length of inner arm is the length of back, plus two parts of the measure, in adults.

In children the length of the inner arm and back are equal. When children begin to develop, the arms lengthen as the waists grow smaller.

#### DIRECTIONS FOR DRAFTING FIG. 6.

From A to B draw a straight line as a basis of operation.

From A to C D E is  $\frac{1}{4}$  the length of back.

From C to E is the waist measure, more or less, plus  $\frac{1}{2}$  of the wrist, a space sufficiently great for the increased upper part of sleeve.

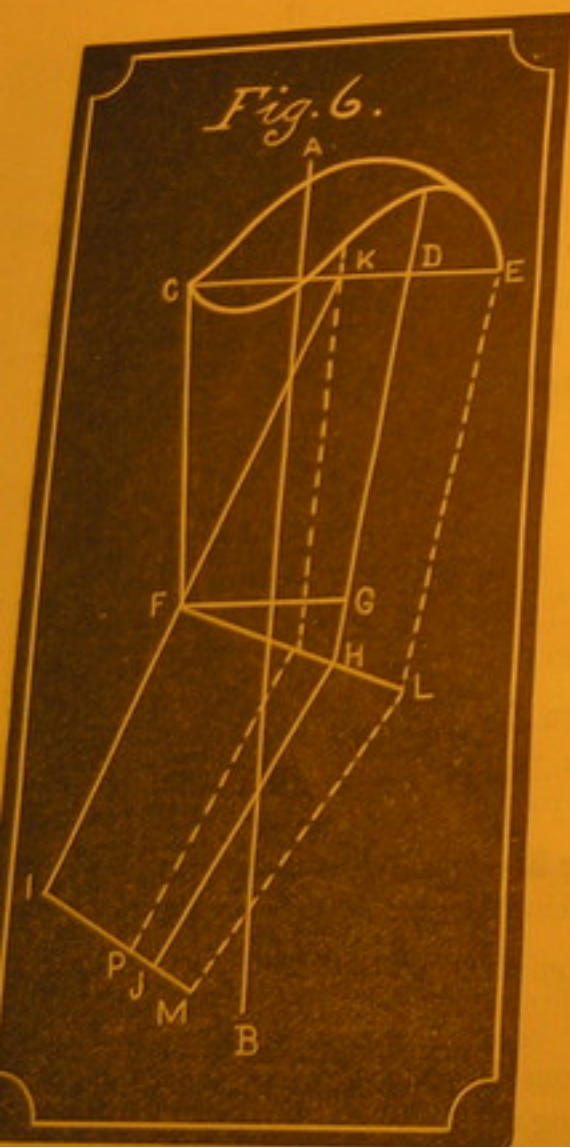
The line C D is divided into two equal parts, the line A B making the division.

¶ From the line C D to the line E C is  $\frac{1}{2}$  the length of arm.

From F to G is  $\frac{1}{2}$  of elbow measure, the line A B making an equal division of it.

Draw the line C F, also the line D C, letting it continue one part below to H for elbow.

Fig. 6.



From K, which is  $\frac{1}{2}$  the line C D E, draw the line K I, letting it intersect the elbow line at point F, to the length of arm measure.

Remark: If the body belonged to a larger order, the line C D E would be greater,—the elbow always remaining the same—the line K I would necessarily incline more, hence, the sleeve proper would materially shorten, although the same arm length would be used in drafting both.

From I to J is the hand measure, which is the measure of wrist plus two parts of measure.

From H to L is  $1\frac{1}{2}$  parts of measure.

From J to M is one part of measure.

#### FOR UNDER PART OF SLEEVE.

From C to K is  $\frac{1}{2}$  of wrist.

From H to O is  $1\frac{1}{2}$  parts of measure.

From J to P is one part of the measure.

Curve the top of sleeve, both upper and under, as diagram shows.

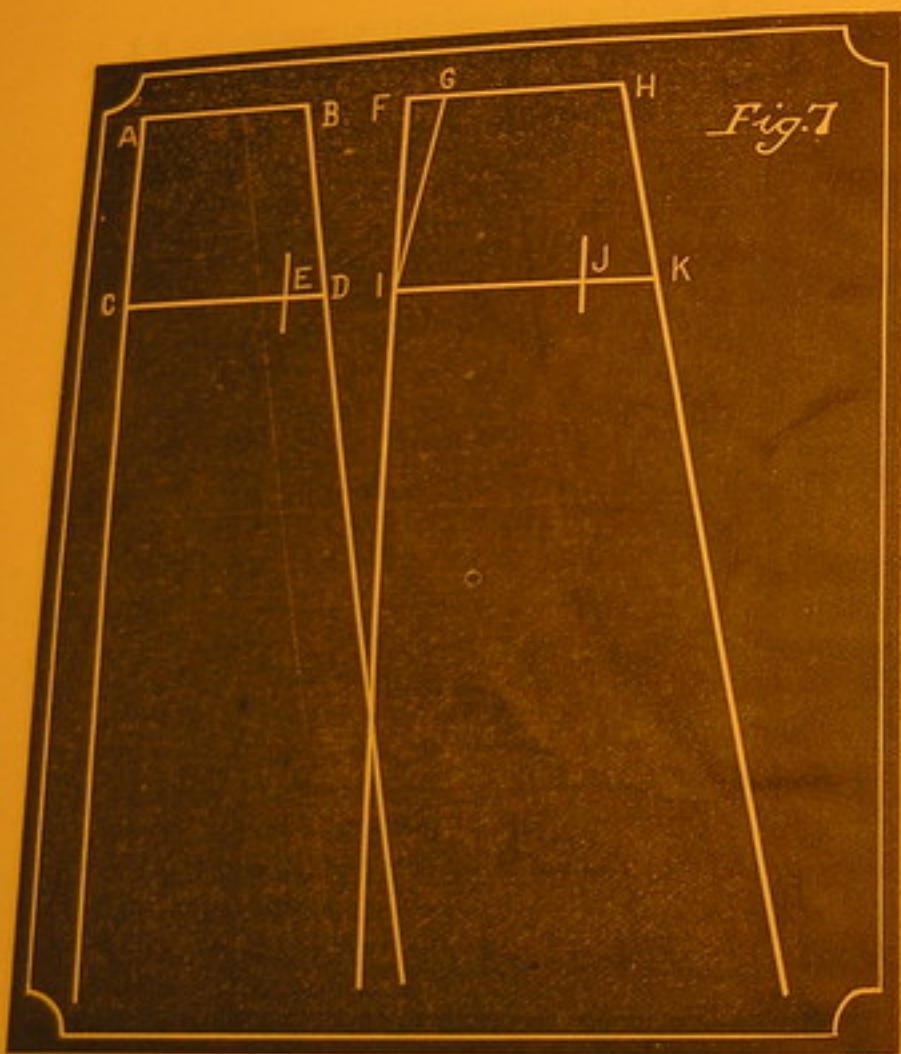


FIGURE 7

Is a diagram for drafting skirt, front and side gore.

From A to B is  $\frac{1}{4}$  of waist proper.

From A to C is the wrist measure.

From C to E is  $\frac{1}{4}$  of waist.

From E to D is one part of measure.

Draw the line B D the length of skirt.

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From F to G is one part of the measure.

From G to H is  $\frac{1}{4}$  of waist measure.

From F to I is the wrist measure.

From I to J is  $\frac{1}{4}$  of waist measure.

From J to K is 2 parts of the measure.

Draw the line H K one inch longer than length of skirt-front.

#### CONCLUDING REMARKS.

To ascertain the measures for gentlemen, and little girls under the developing age, proceed as for ladies until the bust measure is found; then from the fractional part of it, which is ascertained, take one part of the measure; the remainder will be the correct bust, or literally speaking, one-fourth of the bust proper.

For little boys, the waist and bust are equal. All the other measures are ascertained in the same manner as for ladies, and the drafting of the different Figures executed as fashion requires, embracing, however, the same principles throughout the structure.