

**Project of an instrument for the identification of persons : for use in military establishments, police offices, &c.; and for physiological and artistic research / by Joseph Bonomi.**

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# PROJECT OF AN INSTRUMENT

FOR THE

# IDENTIFICATION OF PERSONS

FOR USE IN

MILITARY ESTABLISHMENTS, POLICE OFFICES, &c.

AND FOR

PHYSIOLOGICAL AND ARTISTIC RESEARCH.



BY

JOSEPH BONOMI.

PRESENTED  
by the  
AUTHOR.

Property in ideas is not so well respected and protected as goods and chattels, and therefore is as much exposed to the depredations of the powerful and unscrupulous as material property was of old time.

*The Builder*, 1872, p. 321.

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LONGMANS, GREEN, AND CO.  
1872.

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AND PARLIAMENT STREET

NORMAL PROPORTION  
OF  
THE HUMAN FIGURE.

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‘ Nature, in the construction of the human frame, has so ordained, that the measure of the distance from the extremity of one hand to the extremity of the other, when the arms are extended, should be the same as the measure from the top of the head to the sole of the foot.’ This proportional measure of the human figure, like all the others given by Vitruvius,<sup>1,2</sup> is to be regarded as the normal proportion which the extended arms should bear to the entire height; for, in some individuals the measure of the extended arms exceeds that of the height, while, in others, it falls short, and in others again, it exactly equals the height. From this fact it follows, that every individual of the human family must belong to one or other of three classes: for, either they must belong to that class in which the measure of the extended arms exceeds the height; or, to the class in which the height exceeds the measure of the arms; or, thirdly, to that class in which the measure of the extended arms is exactly equal to that of the height.

This law, then, of natural growth, which enables us to divide the human family into three distinct classes, is not only of great physiological interest, but is also of great social importance, because, as it will be shown, it may be made, by a very simple apparatus, to furnish the means for the identification of any adult person with a certainty that could not be obtained except by a careful scrutiny<sup>(3)</sup> of the naked body.

*Description of Diagram (I).*

With a view to illustrate the application of the instrument for measuring in the clearest and most comprehensive manner, two persons, as remarkable samples of growth, have been chosen and drawn in outline, in what an architect would call 'geometrical elevation;' that is to say, without perspective, and to scale, and in a way that permits of comparing by actual measurement one figure with the other. The smaller figure, as may be seen by the scale, represents a dwarf,<sup>(4)</sup> 3 feet 3 inches in height; the larger figure, a giant,<sup>(5)</sup> 8 feet in height. Both figures are represented in the position in which the person to be measured by the instrument is required to stand.

The two remarkable samples of growth here quoted are represented naked, in order that the comparison, in a scientific point of view, should be more exact than it could have been had the figures been clothed or represented in perspective. It is not, however, in the least necessary that persons to be measured by the instrument should be at all undressed, allowance being made for the depth of the heels of the boots.

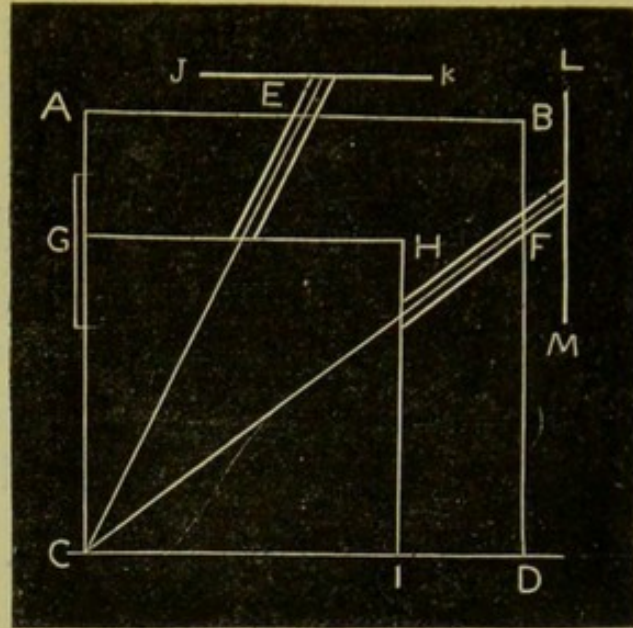
In the space to the right is drawn to scale the indicators for ascertaining the height and extent of the arms. They slide down, and are maintained in the right position by means of the tongue of wood, which exactly fits the groove. The projecting flat part of the indicator, to measure the height, should not be less than five inches in width and nine inches in length. The indicator which is to measure the extent of the arms need not be so long, but it must be of the same width as that for the head.

#### *Description of the Instrument.*

The main part of the instrument consists of two laths of deal, fixed at certain angles against a wall. Down the centre of each lath is a groove in which slides an indicator. The indicator which is to measure the height is brought down to touch the top of the head, and that which is to measure the extent of the arms is made to touch the extremity of the middle finger of one hand, while the extremity of the middle finger of the other touches an upright strip of wood, or an angle of the room in which the instrument is fixed.

Thus, by the simple movement of the indicators, both the height and extent of the arms are almost simultaneously ascertained, the two inclined laths being divided into feet, inches, and eighths of an inch, in order to secure the greatest possible accuracy.

The next point to be explained is the mode of obtaining the proper inclination of the two laths. This will be readily understood by means of the Diagram No. II.



On the wall of the room in which the instrument is to be fixed, draw the horizontal line  $A B$  six feet above the floor. From the point  $A$ , which is six feet from the point  $B$ , draw the perpendicular line  $A C$ , and from the point  $B$  the perpendicular line  $B D$ . Bisect the horizontal line  $A B$ , and from the point of bisection  $E$  draw the diagonal  $E C$ ; measure off on the line  $B D$  the point  $F$ , 4 feet 11 inches from the floor (or 1 foot 1 inch from the point  $B$ ), and from the point  $F$  draw the diagonal  $F C$ . The two diagonal lines thus obtained are at the angles required, and represent the centre of the grooves down which the indicators are to move. Now it will be evident that, if a well-proportioned six-foot man were to stand with his arms extended in the centre of the square  $A B C D$ , his head would touch the point  $E$ , and the extremity of the middle finger of his left hand would touch the point  $F$ , while the extremity of the middle finger of his right hand would touch

the perpendicular A C at the same distance from the floor as the point F. If, however, the extremity of his left hand were to exceed the perpendicular B D, the indicator would have to be moved back to the extent of the excess, and thereby the excess would be known. So likewise, if the dimensions of the extended arms were less than six feet, the indicator would have to be pushed forward, and thereby the quantity less than six feet would be known. In either of these two cases the highest part of his head would not come precisely under the point E, unless, indeed, one arm were longer than the other (which circumstance would have to be noted), but as the indicator for the head is five inches wide, sufficient space for even an extraordinary dissimilarity in the length of the two arms would be provided for. In like manner, the indicator that is to measure the extent of the arms is five inches wide, that width being considered sufficient space for any even extraordinary deviation from the normal proportion of the length of the neck, which requires that the pit of the neck in a six-foot man should be 1 foot 1 inch from the crown of the head, the pit of the neck being on a level with the middle finger when the arms are extended horizontally. Another provision is to be made in the indicator for the sake of detecting more easily any deviation from the normal proportion in the length of the neck, and that is by painting a black line on the centre of the vertical surface of the indicator. The same provision is recommended to be adopted for the horizontal surface of the indicator that measures the



height, as well as a slit in the centre, from which may be suspended a plumb-line, for the more easy detection of any deviation from the perpendicular in the form or in the position of the person under measurement.

*Method of dividing the strips of deal into feet,  
inches, and eighths.*

Next in importance to the placing of the strips of deal on the wall, at the exact angle or inclination, is the accurate division of the scale into feet, inches, and eighths of an inch.

The method adopted by the Author was to procure a sheet of Alderman Sir Sydney Waterlow's inch-ruled paper, divided into eighths. Strips of this paper, about one inch and a quarter in width, are cut at the proper angle for each lath. The strips are then pasted on that margin of the lath which will be lowest when the instrument is in position. On the margin on the opposite side of the groove is to be pasted a strip of cartridge paper of the same width as that of the scale, and this is to be divided into feet and quarters of a foot, by drawing a line at every three inches, using the indicator as a ruler. The scale for measuring the height will, of course, be divided by horizontal lines, while the scale for measuring the extent of the arms will have vertical divisions. The whole is then varnished and, when dry, fit for use.

The advantage of adapting the accurately divided paper of Alderman Waterlow is, that every instru-

ment will be alike; and therefore, if this mode of identification should be approved, and every police and military station in the United Kingdom furnished with one of these instruments, the identification of a person previously measured could be effected at any place, and a mass of information respecting the laws of growth and the influence of trade or occupation on those laws brought out and defined, as well as other physiological particulars not yet contemplated.

*The Method of recording the Measurements.*

Respecting the ledger, it may be useful to say a few words, as, by an inconvenient division of its pages, a great deal of important information may be lost. For whatever purpose, whether scientific or political, of course the first column will be for the date, the next for the name, the third for the age, the fourth for the sex, which is signified by the letters M and F. The next space should be divided into two columns, over which will be written the word 'height.' In the first column will be set down the number of inches, in the next the number of sixteenths of an inch; or, if it should be more convenient, the space might be divided into three columns, the first for feet, the second for inches, and the third for eighths. The next space should likewise be divided into three columns, and over this space should be written the word 'width,' and in that the extent of the arms should be recorded in feet, inches, and eighths, as in the case of the height. Then should be ruled off a narrow space, which should

contain the letter L, or the letter S, or the letter E, to signify that the person whose measures have been recorded is either long-armed or short-armed, or equal-armed—that is to say, the extent of whose arms is equal to the height. Then should follow a considerable space for observations, such as the colour of the eyes, and which arm, if either, were the longer, and whether the space from the top of the head to the pit of the neck was longer or shorter than the normal proportion. There should also be a space in which to record the occupation or trade of the person measured, for this will be found to affect considerably the laws of growth and normal proportions of the human frame.

It will be abundantly evident, by reference to the diagram, that for police purposes the strips of deal bearing the scale need not extend below 4 feet 6 inches from the floor, nor extend upwards above 6 feet 6 inches, because all adult persons less than 4 feet 6 inches or above 6 feet 6 inches are sufficiently identified by the circumstance of their extraordinary growth. This is signified by the inner square G H C I, down to which the scale from the horizontal J K, and that from the vertical L M, extend. (See Diagram II.) For artistic purposes and physiological inquiry however, the laths should extend to within a foot from the ground to the height of 6 feet 6 inches, because, with such a scale, the horizontal which crosses the figure below the patella and the other two horizontal lines could be measured even in young persons, by which it would be discovered whether the

four equal divisions given by Vitruvius maintain the same relative proportion throughout all the periods of growth. Both these and the other measurements given by Vitruvius could be accurately taken by simply reversing the indicator for the head, by which means its horizontal surface would be turned upwards, and a ruler or straight-edge placed upon it, to reach the part to be measured.

In making these measurements, the indicator should be moved upwards.

*Statement of the analysis of the measurements of the height and extension of the arms of 84 persons taken with the instrument by the Author.*

In the 84 persons, male and female, there were—

54 long armed,

24 short armed, and

6 whose extended arms were exactly equal

— to their height.

84

54, 24, 6, being in the ratio of the squares of 3, 2, and 1.

The greatest excess of length of arms was in the case of a carpenter, whose arms exceeded his height by five inches. The greatest excess of height over extended arms was four inches, and that was in the case of an architect.

In the 84 persons there were not two in whom the measures of height and extent of arms were alike; that is to say, that though there were six persons of

whom the length of the extended arms was the same as the height, yet, of those six, not two were of the same height.

JOSEPH BONOMI.

Sir John Soane's Museum,  
13 Lincoln's Inn Fields:  
*October 1872.*

## NOTES.

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*Note (1).*—It will be seen, by reference to the diagram, that the extended arms are equal to the height, since the figures are inclosed in squares; and also, that the entire height is divided into four equal parts, indicated by the three horizontal lines which cross the larger figure: namely, the first, at the nipples; the second, at the pubis; the third, just below the patella.

The cubitus, or forearm, is likewise a fourth of the entire height. From the top of the head to the horizontal line which touches the highest point of the clavicals is a sixth of the entire height. (See 'Proportions of the Human Figure,' Charles Roberson & Co., 99 Long Acre, London, W.C. 1872.)

*Note (2).*—Vitruvius, 'Treatise on Architecture,' Book III. cap. 1.

*Note (3).*—'By a careful scrutiny of the naked body' is to be understood the usual practice followed in prisons and reformatories at the present time. In order to secure the identification of a prisoner, it is first of all necessary to put the person into a warm bath, in order to remove any artificial stains or marks. The person is then stripped to the waist, and two skilled scrutineers—one with a tape measure, the other with a book, kept for the purpose—carefully notify every natural or permanent mark, mole, or cicatrix on the body and arms, measuring their distances as to latitude and longitude from adjacent well-defined fixed points. This done, the lower extremities are subjected to a like scrutiny, and the whole operation cannot be adequately performed in less than two hours. When the person has to be identified the like operation must be performed, occupying scarcely less time than did the first, whereas five or ten minutes will be sufficient to perform both operations with the proposed instrument.

*Note (4).*—Count Joseph Borouwlaski, a native of Poland, was precisely the height given by the scale to the smaller figure in Diagram No. I. He lived for many years in the city of Durham, much respected for his probity and urbanity. He died in that city in

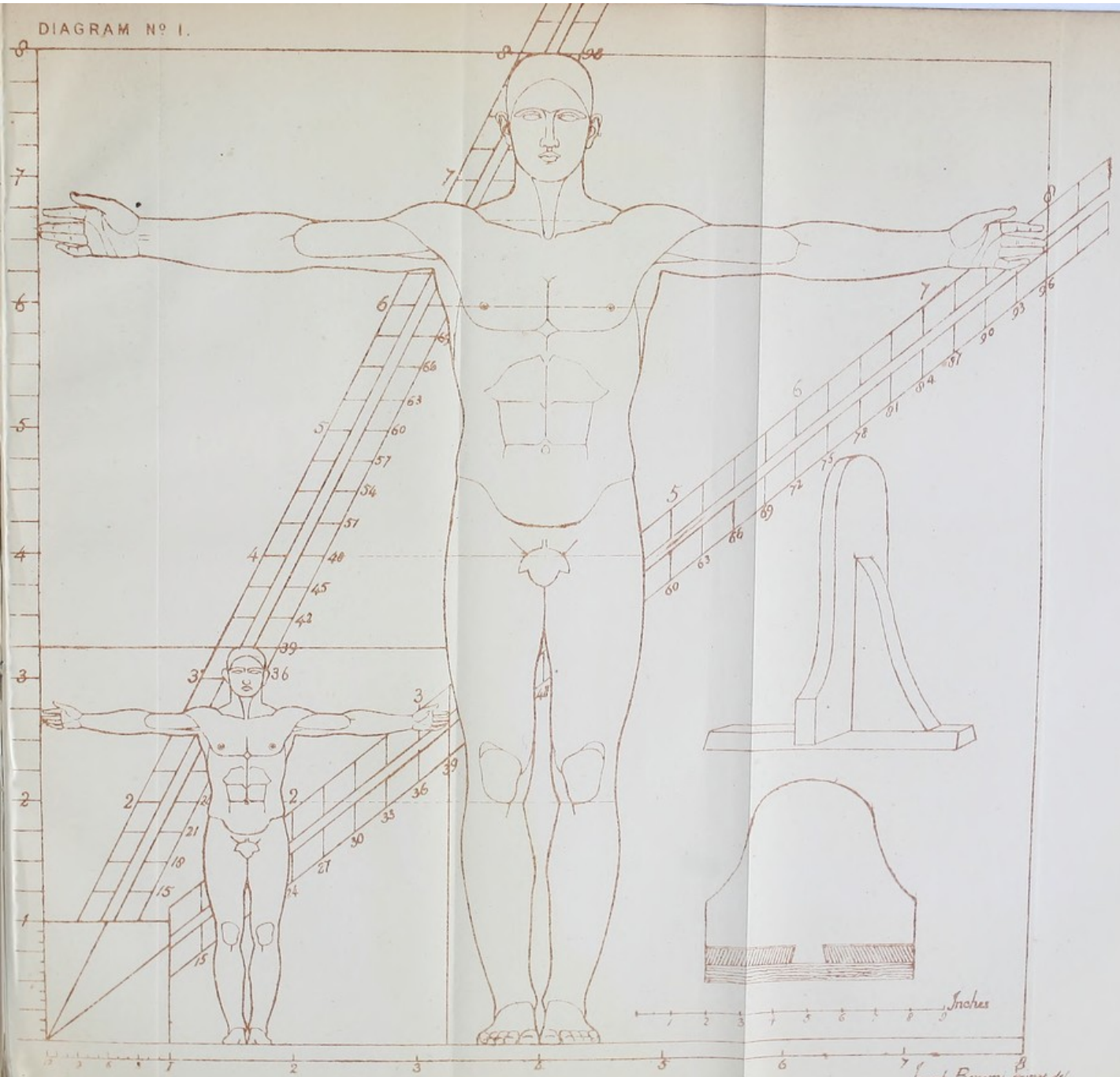
September 1837, aged 98 years, and was buried in Durham Cathedral.

See 'Giants and Dwarfs,' by E. J. Wood. Bentley, London. 1868.

*Note (5).*—Charles Byrne, afterwards called O'Brien, died June 1783, aged 22 years. He was a native of Ireland, and was exhibited in London as the Irish giant. His skeleton is in the College of Surgeons, Lincoln's Inn Fields. It measures eight feet in height.

It is stated in his biography that he was unfortunately given to indulgence in alcoholic beverages, which statement is indirectly confirmed by his premature death, and more directly by the condition of his skeleton, from the quantity of oily matter retained in the cellular structure of the extremities of the cylindrical bones.

DIAGRAM N° 1.



Joseph Bonomi architect del  
1871 del



