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### THE ORIGIN OF THE WELLCOME ANATOMICAL WAXES ALBINUS AND THE FLORENTINE COLLECTION AT LA SPECOLA\*

RECENT research has indicated a possible link between the wax models in the Wellcome Museum in London and the exquisite life-sized figures at La Specola in Florence.<sup>1</sup> This study offers further evidence that the Wellcome figures are, indeed, initial sketch models for not one, but two, sets of models at La Specola: the life-sized series already mentioned, and a smaller set about 75 cms. high; and that the source for all three sets of models is the German anatomist, Bernard Siegfried Albinus (1697–1770), and his artist/engraver, Jan Wandelaar (1690–1759).

The seven standing male figures of the Wellcome Collection, hereinafter identified as the “W” models, measuring only 85 cms. high, depict the human body in various stages of dissection. This study concentrates only on the four “W” models which show bones, muscles, and tendons, and on the similar Florentine models (Table I). The other three “W” models, showing arteries and veins, are omitted from this study as the normal variability of these structures does not lend itself to a valid comparative study.

TABLE I

Group	Albinus Tables <sup>a</sup>	Wellcome Models	La Specola Models	
			Large <sup>b</sup>	Small
A	I	4557	444/000	956
B	II, VI	4551	442/557	000 <sup>c</sup>
C	III, VII	4555	443/558	959
D	IV	4556	441/000	957

<sup>a</sup> Albinus Tables I–IV show the frontal (ventral) view of the body; VI and VIII show the posterior (dorsal) view.

<sup>b</sup> The numbers on the left are from Lanza *et al.*, *op. cit.*, footnote 10. The numbers to the right for two of the models are actual numbers found on the bases of the models. The other two models had no numbers.

<sup>c</sup> This model is at present in Dr Azzaroli’s office at La Specola. It does not have a number in Lanza *et al.*, where it is shown on page 239 and listed in *Depositum* (storage).

In 1975, Linda Deer relied largely on historic, stylistic, and technical considerations in her attempt to determine the origin of the “W” models.<sup>2</sup> She supported Azzaroli’s conjecture that the “W” models “may have been preliminary small-scale patterns for

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<sup>1</sup> The Wellcome Museum of the History of Medicine, which was formerly in the Wellcome Institute, is now a department of the Science Museum, London. The Natural History Museum in Florence is popularly named “La Specola” because of the observatory at the top.

the life-sized models . . .<sup>3</sup> at La Specola. Although she gave some anatomical description of the individual “W” models, her account was not specific enough, as she readily admitted.<sup>4</sup> She gave hardly any comparable description of the Florentine models, and what there was was limited to the large models. The small Florentine models were mentioned only once, “. . . a small number are still with the collection in Florence”.<sup>5</sup>

Careful first-hand observation of the three sets of models and Albinus’ illustrations<sup>6</sup> reveals that, in general, the large models are closest to Albinus, while the “W” models, which tend towards simplification of details, show the most variation. The small models at La Specola are intermediary between the “W” and the large models, but are often mirror images of Albinus and the large models. A comparison of the stance (Fig. 1) will illustrate this point.

All of Albinus’ illustrations show the weight of the body supported by the right leg, while the left leg is slightly flexed at the knee and placed a little ahead of the right foot. The right arm is pendant with the palm facing forward. The left arm is raised at an angle halfway between pendant and shoulder height (about 45° to the body) with the palm turned towards the body.

The “W” models have the same stance as Albinus’ figures except that both arms are pendant. The left palm, however, still faces the body.

Generally, the stance of the large models is similar to that of both Albinus and the “W” models; however, the position of the left arm varies. It is elevated to shoulder level in model 444 (Group A) with the elbow and wrist joints flexed. The arm is gradually raised further in the succeeding groups, until it is held high over the head in model 441 (Group D). For the most part, each small model from La Specola is a mirror image of its counterpart among the large models; it is the left leg that bears the weight, the right leg that is flexed at the knee and placed slightly forward. Similarly, the left arm is pendant while the right arm is raised in various attitudes. In Fig. 2D, the arm is raised slightly above the shoulder joint, with the elbow and wrist flexed, the whole giving the effect of a “putting on a hat” motion.

#### ANATOMICAL OBSERVATIONS

To facilitate detailed comparison of anatomical features, the models are grouped on the basis of their stage of dissection – Group A being the most superficial, Group D being the deepest (Table I).

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<sup>2</sup>Linda A. Deer, ‘Italian anatomical waxes in the Wellcome Collection: the missing link’, in *La Ceroplastica nella Scienza e nell’Arte*, Atti del I Congresso Internazionale, *Biblioteca della Riv. Stor. Sci. med. nat.*, 1975, **20**: 281–296.

<sup>3</sup>*Ibid.*, p. 282. Wellcome Institute for the History of Medicine correspondence. Dr Maria Louisa Azzaroli to Linda Deer, 22 October 1974.

<sup>4</sup>Deer, *op. cit.*, note 2 above, p. 286.

<sup>5</sup>*Ibid.*, p. 295.

<sup>6</sup>The Albinus illustrations were studied primarily from: Bernard S. Albinus, *Tables of the skeleton and muscles of the human body*, London, John and Paul Knapton, 1749 (translated from the Latin ed., Leiden, 1747). Engravings of Tables I and V were missing from the copy consulted. These were studied in: Robert Hale and Terence Coyle, *Albinus on anatomy*, New York, Watson Guptill, 1979.

The models at La Specola were studied in detail and photographed. The Wellcome models were observed during a visit to the Museum, and most findings are based on colour transparencies and black-and-white photographs obtained from the library of the Wellcome Institute for the History of Medicine.

*Group A: Alb. I/4557/444/956*

The platysma muscle, located superficially at the side of the neck and over the clavicle, is more prominent than in life in all instances except the small model. The normal textbook description of the platysma muscle places the lowermost part at the level of the second rib.<sup>7</sup> In all instances here, the platysma muscle extends beyond this level and up to the third rib.

The rendering of the abdominal wall muscles is also unusual. The fibres of the external oblique abdominis muscle are seen only in the inguinal region. Above the pubic region there is only the aponeurosis of the internal oblique abdominis muscle, determined by the direction of the detailed rendition of the aponeurotic fibres.

*Group B: Alb. II, VI/4551/442/000 (Fig. 1)*

The superficial muscles of Group A have been removed to expose the next layer of muscles.

In all instances, the rectus abdominis muscle shows four tendinous intersections visible on each side of the linea alba (midline). They are identically portrayed; the lowermost intersection on the right side is more prominent than on the left. The tendinous intersections below the umbilicus are prominently seen throughout, although they are poorly developed or absent in life.

The linea alba in Alb. II and the large model shows an identical continuous double elliptical shape. It is not as prominent in the "W" and small models. The pyramidalis muscle and the testes are seen in all specimens except the "W" model. This omission is a good example of simplification in the initial sketch models.

The aponeurosis of the biceps brachii, continuing as the tendinous fascia to the forearm, is cut in Alb. II and in all the models.

In Alb. VI, the "W" and the large model, the latissimus dorsi muscle is cut at the level of thoracic vertebrae 10–11, and the upper part of the muscle is removed. The rhomboid major muscle is seen on the right side in Alb. VI and the "W" model; on the left side are the serratus posterior superior muscle and the extensor muscles of the back. In the large model, the rhomboids are on the left side. The right side of the back, and in the small model, the entire back is not visible.

*Group C: Alb. III, VII/4555/443/959*

In all the three models and Alb. III, there are no muscles in the head region except, around the mouth, the orbicularis oris, the buccinator, the mentalis, and the depressor part of the nasalis. The eyeballs seem to have been placed in the orbits without any muscular moorings. The inferior oblique muscle of the eye is clearly seen in the left orbit in all but the large model, where the vantage point precluded its viewing.

In the anterior neck region, the thyrohyoid muscle is present throughout, but the sternohyoid muscle is absent in the "W" model, again a simplification.

Except in the large model, the ventral wall of the rectus sheath and the rectus abdominis muscle have been removed, showing the dorsal aspect of the rectus sheath

<sup>7</sup> John V. Basmajian, *Grant's method of anatomy*, Baltimore, Md., and London, Williams & Wilkins, 1980, p. 458.

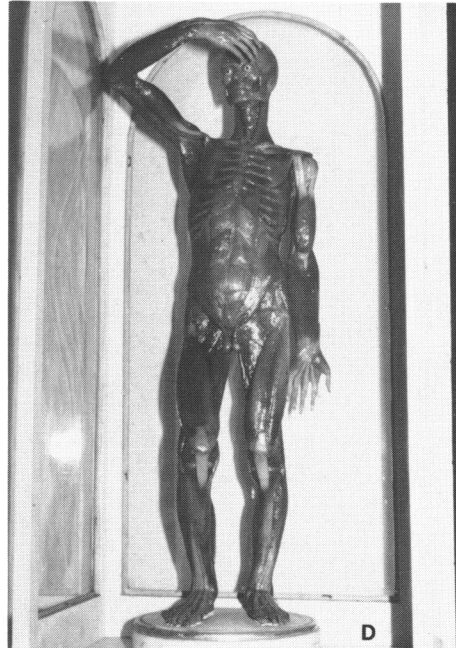
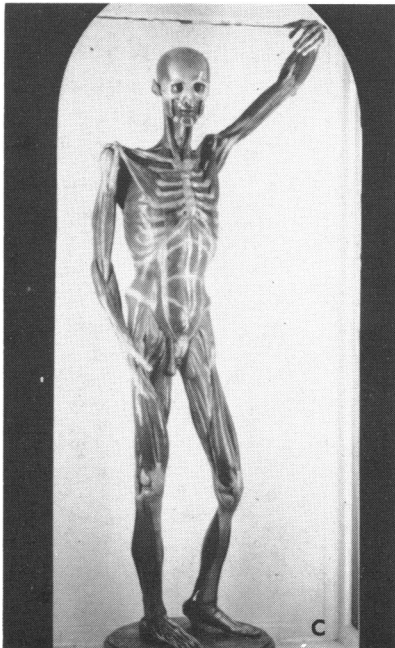
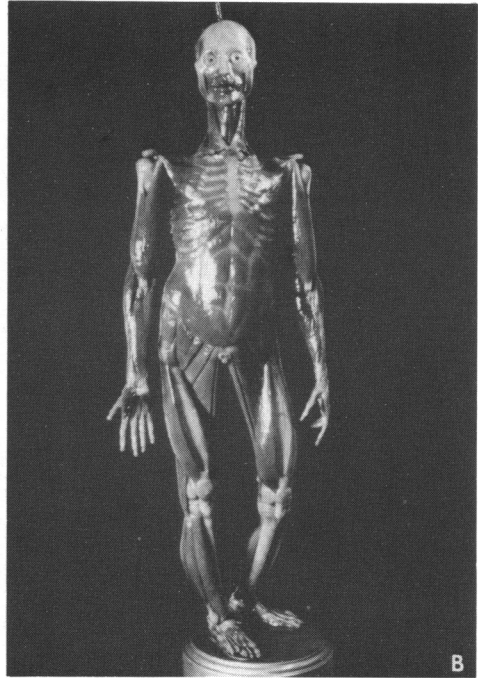
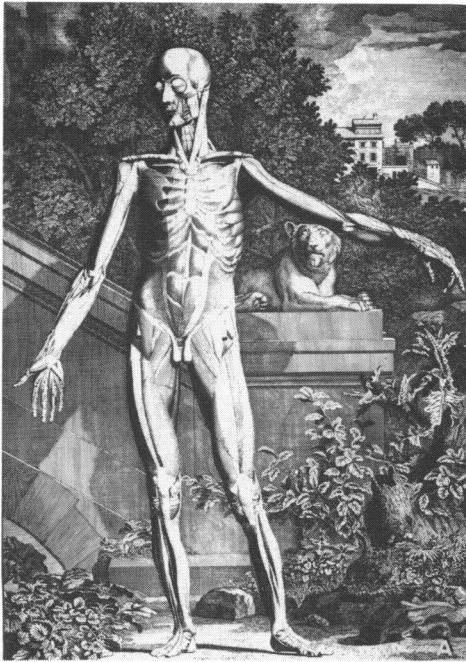


Figure 1. Comparable stance of figures in Group B. (A) Albinus Table II; (B) Wellcome model 4551; (C) La Specola large model 442; (D) La Specola small model. (Photograph of the Wellcome model from transparency 8276, by courtesy of the Wellcome Trustees.)

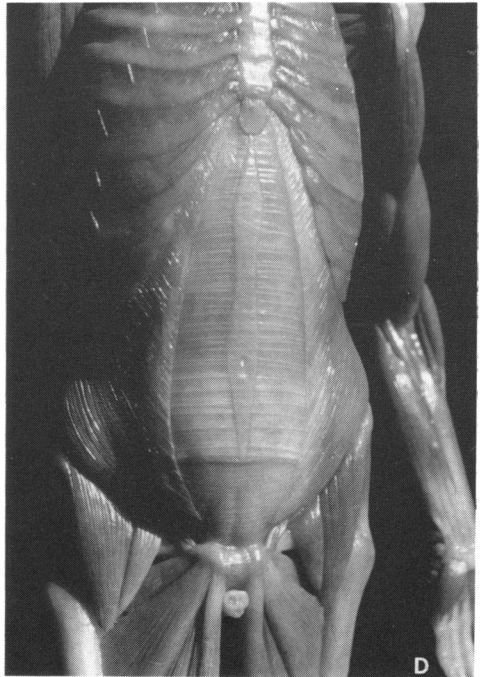
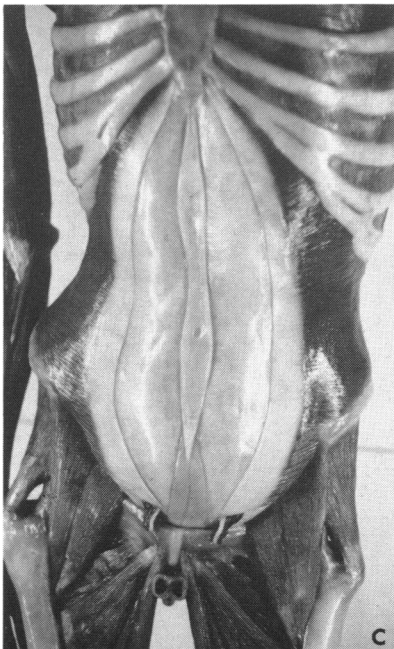
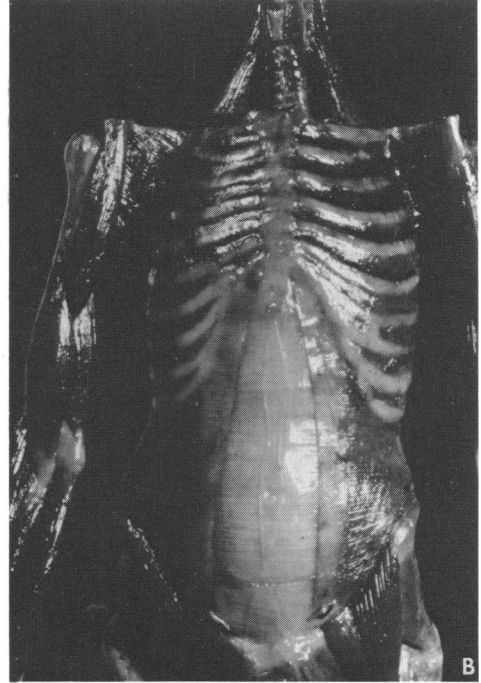
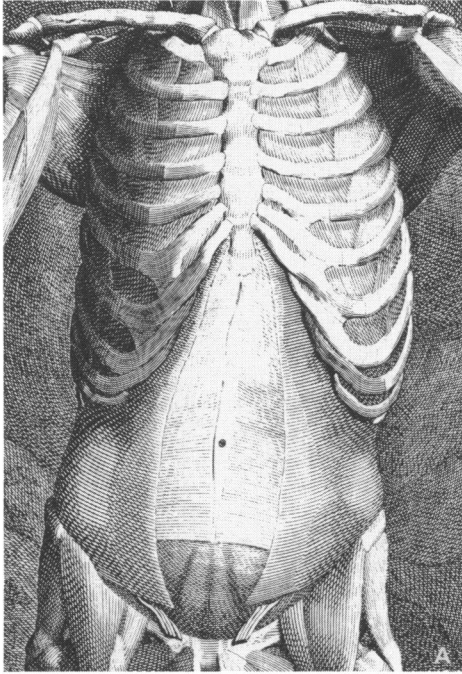


Figure 2. Comparative view of the deeper muscle layer of the abdominal wall in Group C. (A) Albinus Table III; (B) Wellcome model 4555; (C) La Specola large model 443; (D) La Specola small model 959. (Photograph of the Wellcome model from transparency 8298, by courtesy of the Wellcome Trustees.)

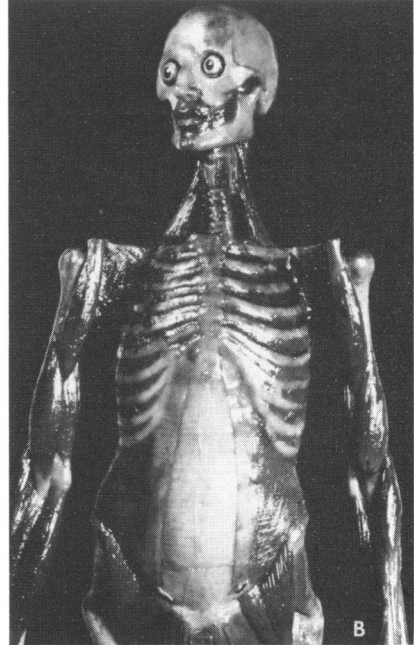
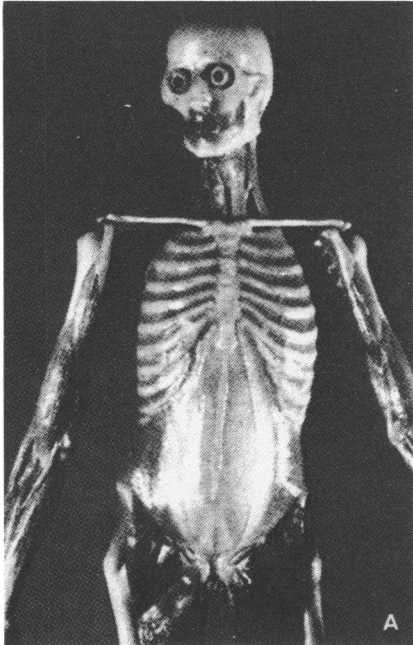


Figure 3. Marked similarity between: (A) La Specola model (unavailable for study, illustrated in Lanza *et al.*, op. cit., footnote 10, p. 239); (B) Wellcome model 4555. (Photograph of the Wellcome model from transparency 8298, by courtesy of the Wellcome Trustees.)

(Fig. 2A, B, D). That it is the dorsal layer of the rectus sheath is confirmed by the arcuate line halfway between the umbilicus and the pubic bone. Albinus described this line as “the bottom margin of the upper part of the aponeurosis which passes behind the rectus, and immediately adheres to the peritoneum”.<sup>8</sup> Inferior to this horizontal line can be seen the median and the medial umbilical ligament. Such minute details consistently shown in the two models and in Albinus cannot be coincidental.

The cut end of the short head of the biceps brachii muscle and the clavicles are always present except in the “W” model.

*Group D: Alb. IV/4556/441/957*

The only muscles seen in the head region are the recti and the oblique muscles in the orbit.

The rib cage is cut at the fourth costo-chondral junction and the diaphragm is almost entirely visible. In life, the dome of the diaphragm extends up to the fourth intercostal space on the right side and fifth intercostal space on the left. This is not evident in any of the models or in Albinus. The irregular, jagged inferior edge of the diaphragm has the same configuration in all four instances, with a prominent tongue-like sternal portion. In both the large and small models there is only one opening in the diaphragm, for the passage of the inferior vena cava, but this could not be verified in Alb. IV and the “W” model. The description of Alb. IV indicates the area of a passage of the oesophagus as “X the hole thro’ which the gulla passes out”,<sup>9</sup> but not the aorta. Passages for these two structures could not be seen in any of the models.

The only view of the pelvic viscera is in the large model, where the urinary bladder and the cut edge of the rectum are seen at the pelvic brim, a detail incorporated for the final version.

The psoas minor muscle in the abdomen and the thenar muscles in the hand are present in all but the more simplified “W” model, which shows only the adductor pollicis.

*A unique La Specola model*

Another model present at La Specola, but unfortunately not available for study, is the one illustrated and numbered 26 in Lanza *et al.*<sup>10</sup> (Fig. 3A). In stance and appearance, this model is closer to those in the Wellcome collection, especially to “W” 4555 in Group C (Fig. 3B), than to those at La Specola. There are, however, a couple of differences. The left arm is slightly adducted and, unlike “W” 4555 but like others in Group C (Alb. III/443/959), it has a clavicle as well as the cut end of the short head of the biceps. The presence of this model at La Specola gives a clue to the origin of the Wellcome figures.

Further evidence of their Florentine origin can be found in written records. An old catalogue entry in the Wellcome museum names the modellers of the seven figures as

<sup>8</sup> Albinus, *op. cit.*, note 6 above, Table III.

<sup>9</sup> *Ibid.*, Table IV.

<sup>10</sup> Benedetto Lanza, M. L. Azzaroli Puccetti, M. Poggesi, and A. Martelli, *La cere anatomiche della specola*, Florence, Arnaud, 1979, p. 239.

Clemente Susini and Francesco Calenzuoli or their workshop and gives a date of 1776–1780.<sup>11</sup> This can hardly be right, for although the young Susini joined La Specola on 15 November 1773,<sup>12</sup> Calenzuoli was not born until 1796.<sup>13</sup> Some wax models already existed before Susini's arrival. According to Azzaroli, "around 1772 Giuseppe Ferrini [who had become La Specola's first modeller in 1771, under the direction of Felice Fontana<sup>14</sup>], working perhaps in the Palazzo Pitti, had already filled about six rooms with anatomical wax models".<sup>15</sup> These early models were probably copied from published works such as anatomical atlases,<sup>16</sup> since there are no records of either dissectors or dissections before Antonio Mateucci joined the staff as dissector in 1772.<sup>17</sup> The first group, the Wellcome models, because of their close dependence on Albinus, were thus more than likely made in the early 1770s, during Ferrini's term.

The large models 443 and 444 have on their bases an identical inscription: "Made by Susini and his helpers under the direction of Tomasso Bonicoli between 1775 and 1791." We may be more precise. These models were in all probability made after August 1782, when Susini became the chief modeller;<sup>18</sup> otherwise, Ferrini's name would have appeared by virtue of his office, even if he had had no active part in the actual work. The period between 1775 and 1782 would thus be the more likely time for the origin of the intervening set, the small models at La Specola.

The evidence of the later series, as presented in this paper, also indicates that, in spite of the dissectors and dissections mentioned by Lanza, there must have been more reliance on published anatomical atlases. The histories of La Specola say very little about the availability of bodies for dissection, and mention in this context only one member of staff, Giacinto Guidette, "il Cinzio". Though listed as a "humble figure", he had some very important functions. It was his responsibility to visit local hospitals and pick up pieces of cadaver material, and, after they had been used, to carry them to the cemetery.<sup>19</sup> More likely, these were amputated parts of the extremities which were used for regional models. There is no mention of how often and how many bodies were available, where they came from, or where they were disposed of after dissection.

The "W" models were bought by the Wellcome Museum in 1925 in response to a letter dated 30 October 1925 from Professor Giulio Gambacorta of Ascoli Piceno to C. J. S. Thompson, the first Curator of the Wellcome Historical Medical Museum. He offered for sale "seven little policromate statues, hight above 4 feet, rappresenting the various progressive stages of a human body anatomically flayed" [original spellings],<sup>20</sup> but made no mention of any direct connexion with La Specola.<sup>21</sup>

<sup>11</sup> Records of the Science Museum obtained by courtesy of John Burnett, Wellcome Museum of the History of Medicine, Science Museum, London.

<sup>12</sup> Lanza *et al.*, *op. cit.*, note 10 above, p. 31.

<sup>13</sup> Maria L. Azzaroli, 'La Specola, the zoological museum of Florence University', in *op. cit.*, note 2 above, p. 16.

<sup>14</sup> Lanza *et al.*, *op. cit.*, note 10 above, p. 26.

<sup>15</sup> Azzaroli, *op. cit.*, note 13 above, p. 7.

<sup>16</sup> Lanza *et al.*, *op. cit.*, note 10 above, p. 43.

<sup>17</sup> *Ibid.*, p. 31.

<sup>18</sup> *Ibid.*, p. 34.

<sup>19</sup> *Ibid.*, p. 34.

<sup>20</sup> Deer, *op. cit.*, note 2 above, p. 284.

<sup>21</sup> Dr Vivian Nutton, Editor, *Medical History*, personal communication, 1983.



From the above detailed descriptions and comparison of the models and Albinus' Tables, it is safe to conclude that: (1) all the models studied here are based largely on the anatomical works of Albinus; (2) the Wellcome models were made at La Specola in Florence and were the first series of sketch models based on the works of Albinus; (3) the small model, No. 26 at La Specola, is a part of the first series; (4) the first series of sketch models was probably made by Giuseppe Ferrini in the early 1770s; (5) the present collection of small models at La Specola, with the exception of No. 26, comprises the second series of sketch models — they are more natural looking and more animated than the stiffer models of the first series, and can be dated between 1775 and 1782; (6) the large models at La Specola were made after 1782.

#### GLOSSARY OF ANATOMICAL TERMS

##### MUSCLES

###### *Head*

**Buccinator:** cheek muscle

**Inferior oblique of the eye:** within the orbit, moves the eyeball upward and outward

**Mentalis:** small triangular muscle of the chin

**Nasalis:** small muscle on the side of the nose

**Orbicularis oris:** circular muscle around the mouth

**Recti:** four muscles in the orbit to move the eyeball up, down and sideways

###### *Neck*

**Platysma:** superficial, flat muscle on the side of the neck

**Sternohyoid:** straplike muscle next to the midline

**Thyrohyoid:** small muscle to the side of the midline and deep to the sterno-hyoid muscle

###### *Back*

**Latissimus dorsi:** large triangular muscle arising from the lower half of the vertebral column and attached to the upper arm

**Rhomboid major:** rhombus-shaped muscle, from the upper thoracic vertebrae to the scapula

**Serratus posterior superior:** deep to the rhomboid major muscle and attached to the ribs

###### *Abdomen*

**External oblique abdominis:** most superficial muscle of the abdominal wall

**Internal oblique abdominis:** the intermediate layer of the wall

**Rectus abdominis:** vertically-running muscle next to the midline of the wall

**Pyramidalis:** triangular muscle above the pubic bone, superficial to the rectus abdominis muscle

**Psoas minor:** long, thin muscle on the top of a large muscle, psoas major, located on the side of the vertebral column

###### *Arm and Hand*

**Biceps brachii:** the prominent muscle in front of the upper arm

**Thenar muscles:** muscles responsible for the movement of the thumb

**Adductor pollicis:** one of the thenar muscles; moves the thumb towards the fingers.

**Inferior vena cava:** largest vein in the body, located in the abdomen

**Median umbilical ligament:** a fibrous remnant of the connexion between the bladder and the umbilicus in foetal life

**Medial umbilical ligament:** the remnant of the umbilical artery of the foetus.

#### ACKNOWLEDGEMENTS

I wish to acknowledge: the willing co-operation and assistance of Dr Marta Poggesi and the staff of La Specola, Florence; John Burnett, Wellcome Museum of the History of Medicine, Science Museum, London, for details of the Wellcome models. West Virginia University: Department of Anatomy for partial funding; Richard Toren, Associate Director of Communications Services, and his staff; Robert Murphy, Medical Center Library; and my wife, Julianne, for editorial help.