

Art and Science in the anatomical waxes of Susini-Boi of the University of Cagliari

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ABSTRACT

The models of Cagliari were made in 1803-1805, when the great collections of La Specola in Florence and that of the Josephinum in Vienna, completed since more than a decade, were famous all over Europe under the name of Fontana's waxes. The waxes of Susini-Boi are a work of the maturity of Susini and the result of his cooperation with the Sardinian Anatomist F. A. Boi, and were commissioned when Susini was eventually free from the influence of Fontana. Among the collections from Florentine origin, that of Cagliari is the only one whose cases bear a tag with Susini's signature and date. The preparations have been selected to give to medical students information relevant to their professional formation, rather than to render anatomy as attractive as possible to lay people. Besides representing an example of how anatomy can be transfigured into art, the models of Susini-Boi still maintain, two centuries after their completion, an extraordinary scientific and teaching value.

Key words:

Clemente Susini, Francesco Boi, Felice Fontana, wax modelling, anatomy.

RIASSUNTO

Arte e scienza nelle cere anatomiche di Susini-Boi dell'Università di Cagliari.

Le cere di Cagliari sono state realizzate nel 1803-1805, quando le grandi collezioni di La Specola (Firenze) e dello Josephinum (Vienna), già complete da oltre un decennio, erano famose in tutta Europa col nome di Cere del Fontana. Esse sono opera della maturità di Susini ed il frutto della Sua collaborazione con l'anatomista sardo F. A. Boi, vennero commissionate quando Susini si era finalmente liberato dell'influenza di Fontana. Tra le collezioni di cere di origine fiorentina, quella di Cagliari è l'unica in cui tutte le vetrine sono datate e firmate da Susini. I preparati sono stati scelti per istruire gli studenti di medicina e non anche per rendere l'anatomia il più possibile attraente per i comuni cittadini. Oltre che costituire un esempio di come l'anatomia possa diventare arte, le cere di Susini-Boi mantengono, a 200 anni dalla realizzazione, uno straordinario valore scientifico e didattico.

Parole chiave:

Clemente Susini, Francesco Boi, Felice Fontana, ceroplastica, anatomia.

THE COLLECTION OF CAGLIARI: HISTORY AND PECULIARITIES

The collection consists of only 23 showcases for a total of 78 pieces and, therefore, from a quantitative point of view, cannot be compared with the other collections of Florentine origin and, particularly, with those of La Specola and of the Josephinum, each housing hundreds of cases with over a thousand of specimens. Its peculiarity resides in the fact that the waxes of Cagliari represent the artistic maturity of Clemente Susini and the result of his cooperation with the Sardinian anatomist Francesco Antonio Boi (Cattaneo, 1970; Ballestriero, 2007). Moreover, some preparations which look complementary to those of

La Specola, illustrate a few anatomical details missing or less accurate in that collection (Brizzi et al., 2008). The models were manufactured in the workshop of La Specola Museum in Florence in the years 1803-1805 when Felice Fontana (1730-1805), who had started in 1771 the workshop in Florence, had lost interest in supervising wax modelling being involved in the realization, in his private laboratory, of the wooden, demountable, anatomical models ordered by Napoleon (Castaldi, 1947; Knoefel, 1984). The waxes for Cagliari were commissioned by Carlo Felice of Savoy, Viceroy of Sardinia, through Boi who was spending a sabbatical in the laboratory of anatomy of the general hospital (Arcispedale) of Santa Maria Nuova. Boi was born in 1767 from Salvatore and

Grazia Pirisi in the village of Olzai in the Barbagia di Ollolai, Central Sardinia. Owing to his achievements in the primary school, he continued his studies at the Seminary of Oristano. At the age of 18, he abandoned the clerical life and moved to Cagliari to enrol in the local Medical School. Even if, during his years as a student, he had to work as preceptor in the house of Signor Rossi, the Chief Officer of Cagliari Customs, he got his medical degree at the age of 20. He soon acquired a good fame and, four years later, was appointed to the chair of Human Anatomy which, since its institution in 1764, had been given alternatively to the Professor of *Materia Medica* (the old name for Pharmacology) and to that of Practical and Theoretical Medicine (Castaldi, 1947; Lai & Riva, 1996). Since in 1801 no students enrolled for the anatomy course, Boi, under his request, was granted financial support to take a sabbatical in the Italian peninsula to improve his expertise of Anatomy. He first visited Pavia, whose chair of Anatomy was then held by Antonio Scarpa, the most illustrious Italian anatomist of the time. He then went to Pisa and on, to the Arcispedale di Santa Maria Nuova of Florence, the great teaching hospital housing more than 1000 patients that was a model for all Europe (Keel, 2005). The hospital was endowed with eight Chairs including Anatomy that was under the direction of Paolo Mascagni (1755-1816), famous for his studies on lymphatics and a friend and supporter of Fontana (Maerker, 2011). Boi received an order from Carlo Felice asking him to commission to Susini a number of anatomical wax models that the Vice King wanted for the Museum he was planning to institute in Cagliari. Castaldi reports that it was Boi himself who performed the dissections and that the waxes cost 14,800 lire, a substantial sum for the time. (Castaldi, 1947). The high price may be related to the cost of the wax mixture which must have been devised in order to resist the high summer temperatures of Sardinia. At variance with those of the other collections. (Lemire, 1990; Maerker, 2011), the Cagliari models have survived more than 200 years without the need for restoration (Riva, 2007). This may be due to Sardinia mild climate that very seldom, even in winter, goes below zero, preventing freezing which renders the models brittle and susceptible to cracks caused by environmental vibrations. (Riva et al., 2010). Over the three years that he worked with Boi, Susini was no longer under Fontana's tutorship and free, at last, to fully express himself. As a matter of fact, Cagliari's waxes are more realistic than those of *la Specola* (Lemire, 1990; Ballestriero, 2010), there are no gesturing figures and the models do not exhibit the "rosy skin" of those of *la Specola* and Vienna (Maerker, 2011). As modern Anatomy atlases do, there it is not stressing of the cadaveric features. Each of the 23 cases bears the date and Susini's signature; an assessment of authorship absent in the other

collections of Florentine waxes, even in those, as the ones in Bologna, that were bought from Susini's studio in 1810 (Riva et al., 2010).

It was just in the early years of the 19th century that the status of modellers gradually changed from that of artisans to that of artists. At the start of the workshop (Mazzolini, 2004), Fontana regarded the young modellers as instruments and was only later, mainly thanks to Giovanni Fabbroni (1752-1822), a former assistant of Fontana who became his main rival and critic, that the modellers, and Susini in particular, started to receive recognition as the true authors of *La Specola* waxes, generally reported as Fontana's opus (Maerker, 2011). However, Fontana continued to be regarded as the author of *La Specola* models even when, in the late XIX and in the first half of the XX century, the anatomical waxes lost their fame, being known only to scientific circles. The first study that reports in its title Susini as the author of the Florentine waxes, was the one by Luigi Castaldi (1890-1945), Anatomist of the University of Cagliari, written during the thirties and posthumously published in 1947, that it is still largely cited and highly regarded: "this work has never been superseded" (Knoefel, 1984). An early appraisal of the artistic value of Clemente Susini and of his role in the production of *La Specola* models (Tumiati, 1941, 1942), came also from the well known physician and writer Corrado Tumiati (1885-1967).

The models arrived in Cagliari in 1806, when the King Vittorio Emanuele had eventually taken possession of his throne and Carlo Felice had retired from public offices. The same year Boi, who was a man of broad European cultural background, resumed his teaching (Castaldi, 1947). Boi died in Cagliari in 1855, after a long and successful career not only as Professor of Anatomy and physician, but as Archiater (Protomedico) of the kingdom as well. He had several academic pupils, among whom two became full professors: Giovanni Falconi (1817-1900) Professor of Anatomy in Cagliari from 1856 to 1889 and Francesco Randacio (also known as Randaccio, 1821-1903) who held the same chair in the universities of Sassari and Palermo and is credited for the discovery of the five upper branches to pterygopalatine ganglion which are known as Randaccio's nerves (Dobson, 1962). Despite his fame, Boi, whose official portrait is exhibited in the Museum of Cagliari, did not leave any published works, but 2 handwritten manuscripts, one in Latin, the other in Italian, called "trattati" (tracts) kept in the Biblioteca Universitaria of Cagliari that contain some of his anatomy lessons (Castaldi, 1947).

THE MODELS

Susini's models were placed in the Museum of Antiquities and Natural History, founded by Carlo

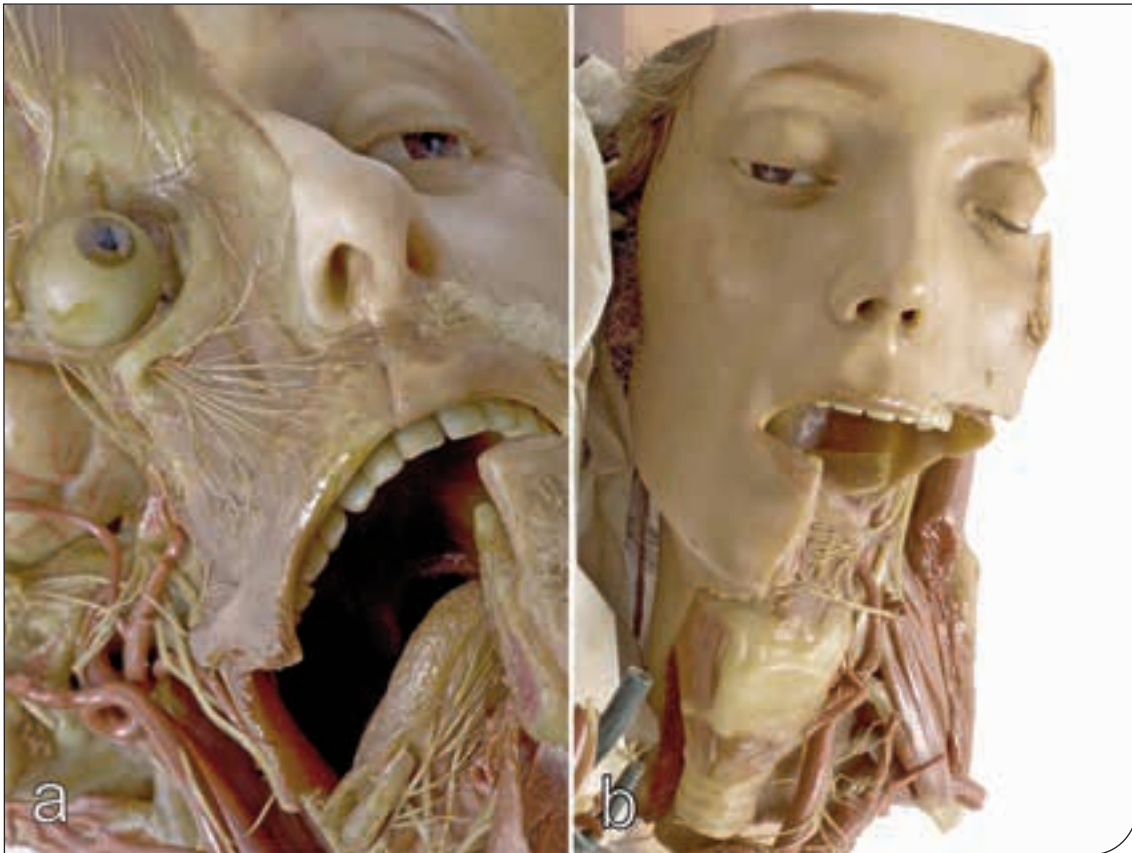


Fig. 1. a, b) Details from the striking faces of models of cases XIII and XVI, with vessels (arteries) and nerves.

Felice, later called "Museo d'antichità della Regia Università degli studj di Cagliari", which was on the ground floor of palazzo Belgrano, the University seat. In 1857, the wax models were granted to the University and placed under the charge of the Professor of Anatomy to be used for teaching purposes. In 1991, under request of Alessandro Riva the Collection was transferred to the Museum located in the Cagliari Citadel of Museums, where it is still on public exhibition. These are the preparations exhibited in the 23 showcases, which are numbered with Roman numerals according to a sequence suggested on the basis of anatomy (Cattaneo, 1970):

- I - Preparations of general and microscopic anatomy (21 pieces).
- II - Deep dorsal muscles from sacrum to occiput.
- III - Head and body of a girl with muscles, vessels (mostly arteries), left pectoral lymphnodes and preparation of the right mammary gland and the perineum.
- IV - Diaphragm muscle.
- V - Muscles of the hip as seen from the front.
- VI - Hip muscles as seen from the back.
- VII - 1) Plantar aponeurosis of the foot; 2) Interosseous muscles of the foot as seen from the sole.
- VIII - 1) Deep layer of the plantar muscles of the

foot; 2) Middle layer of the plantar muscles of the foot.

- IX - 1) Muscles of the pharynx as seen from the back; 2) Palate and nasopharynx as seen from the bottom.

- X - 1) Open pharynx as seen from the back; 2) Larynx seen from the front; 3) Hyoid bone seen from the top.

- XI - 1) Pharynx cavity; 2) Laryngeal and pharyngeal branches of the vagus nerve, and ansa hypoglossi; 3) Laryngeal nerves.

- XII - Head, with preparation of the encephalic trunk, neck, thorax, abdomen pelvis and relevant viscera, male genital organs and left upper limb with preparation of the shoulder joint. Vessels and nerves, the visceral ones in particular, are reproduced with utmost detail.

- XIII - Man's head and neck showing the surface of the encephalon with the meninges, the convolutions and the superficial vessels of the brain, the carotid artery and its branches and some cranial nerves with their ramifications.

- XIV - Organ of touch (4 pieces). Two models of left hand sectioned at the wrist and seen from their palmar aspect: one is covered by skin, the other is dissected to show its muscles and nerves. The two other models



Fig. 2. a) From case XVI. Masterly model of the left hand severed at the wrist with demonstration of muscles, bones, vessels and nerves. b) From case XXII. Proximal part of a frontal section of the left thigh of a pregnant woman from the subcutaneous tissue to the femur, showing the muscles, encircled by their fasciae, the vessels and the nerves. The arrow indicates the opened lacuna vasorum. Note the realistic rendering of the sectioned flesh.

are enlargements of the two distal phalanges of a longitudinally sectioned finger, and of the last phalanx of the thumb with the nail removed and its epidermis raised to show the dermal ridges.

- XV - Organ of smell (2 pieces): parasagittal sections of the nasal cavity, one with the nasal septum and the other with the nasal conchae, with preparation of their relevant nerves.

- XVI - Organ of taste (3 pieces): 1) dissected head and neck, with preparation of the encephalic trunk, arteries and nerves of orbit, face, tongue and neck; 2) boiled veal tongue, with its covering removed on the right side to demonstrate its lamination; 3) human tongue with its vascular supply; the epithelium is raised in order to show the chorion of the mucosa with its papillae.

- XVII - Organ of hearing (12 pieces): 12 enlarged parts of the external, middle and internal ear with muscles and nerves.

- XVIII - Organ of sight (10 pieces). 1) Head with the lateral wall removed and the skull opened to show the encephalic trunk and the nerves of the orbit; 2) orbit with the ocular globe muscles and vessels; 3) Lacrimal apparatus; 4) enlarged fragment of the superior eyelid seen from its conjunctival surface; 5) eight variously dissected eyeballs.

- XIX - Liver; stomach, duodenum, pancreas, and spleen, with their vessels.

- XX - Male uro-genital system with arteries and veins.

- XXI - Female uro-genital system with arteries and veins; as in the following models the thighs are frontally sectioned close to groin in order to show the muscles with their fasciae, nerves and vessels.

- XXII - Female uro-genital system with opened uterus during pregnancy and relevant vessels.

- XXIII - Opened female abdomen with the uterus at the end of pregnancy and vessels.

The above numeration is at variance with that reported by Castaldi (1947) from the register of the University of Cagliari dated Dec 31, 1870. Here is the correspondence between the two classifications: I-1st, II-4th, III-3rd, IV-16th, V-19th, VI-20th, VII-23rd, VIII-22nd, XIX-11th, X-12th, XI-13th, XXII-2nd, XXIII-13th, XIV-21st, XV-10th, XVI-15th, XVII-9th, XVIII-8th, XIX-17th, XX-18th, XXI-7th, XXII-6th, XXII-5th.

All the models are unique and different from those produced in La Specola both earlier and later and are not present in other collections, and seem to be directed to instruct medical students in some selected fields of anatomy with particular reference to its role as basis for the function of organs and on details relevant to regional and clinical anatomy (figs 1-4) and not to have the secondary aim of "popularizing"

anatomy ascribed to Fontana's waxes (De Renzi, 1848; Castaldi, 1947). The preparation are all from human dissections, with the exception of the boiled bovine tongue of showcase XVI, prepared according to Malpighi in order to show the lamination of its external layers (Zanobio, 2007). No "Venuses" nor whole human figures are represented. The most complete preparations are those of cases II, III and XII which demonstrate the deep muscles of the back, the head and trunk of a young female and that of a male cadaver with the left superior arm, respectively. It must also be noted that at variance with their parts of the body, the anatomical structures of the inferior limb, apart from the four models on the muscles of the foot, are represented solely by the extremely accurate cross sections of the proximal thighs demonstrated in the obstetric models of cases XXI-XXIII (fig. 2b).

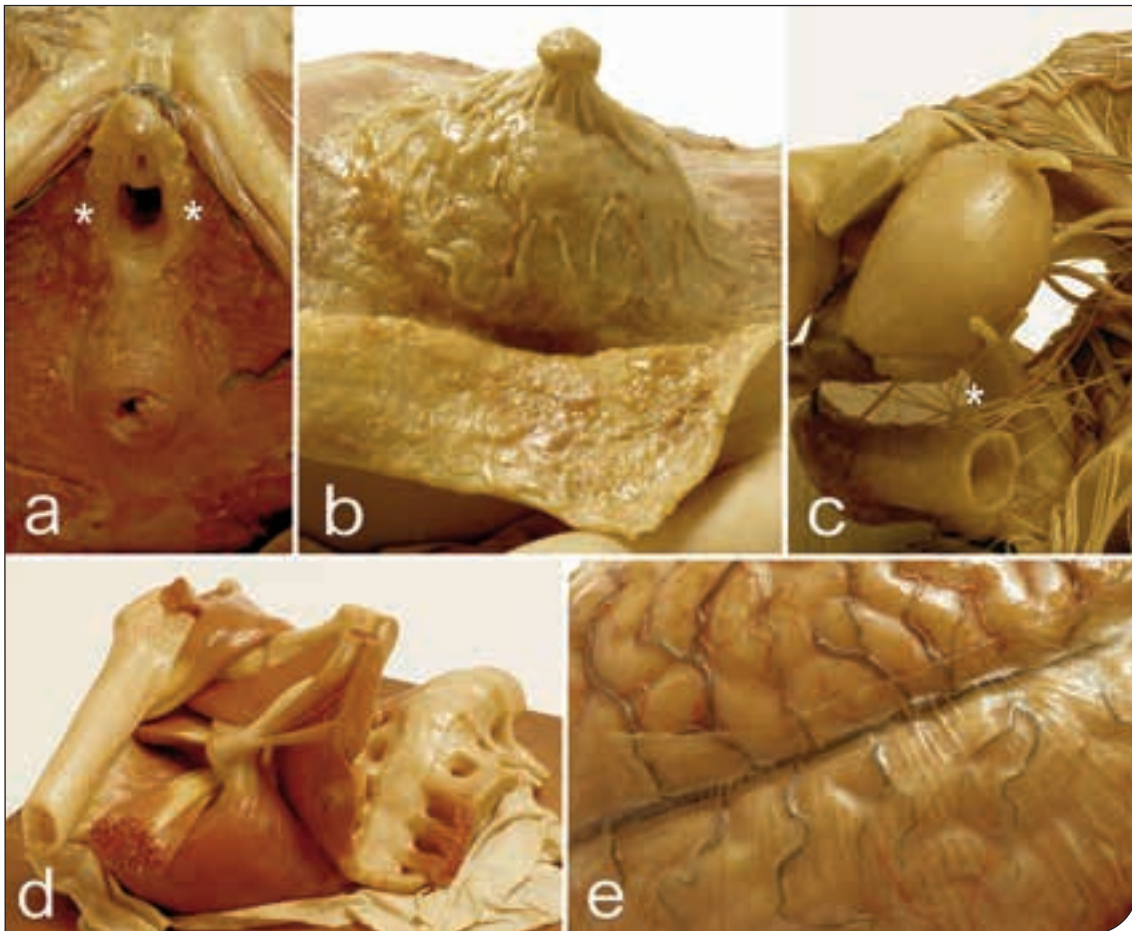


Fig. 3. a) From case III. Detail of the female perineum after removal of the skin and of some components

of the superficial and deep perineal pouches, From the bottom to the top, along the median line, are aligned: the anal orifice, the vaginal orifice encircled by the corpora spongiosa clitoridis (formerly bulbs of vestibule, asterisks), external urinary orifice, and glans of the clitoris. b) From case III. female mammary gland after removal of the skin and demonstration of subcutaneous fatty tissue, lactiferous ducts, and nipple. c) From case XII. Pelvic ganglion (asterisk) with visceral nerves directed toward the pelvic organs. d) From case V. Pelvic diaphragm and muscles of the superficial perineal pouch seen from the bottom in a male subject. e) From case XIII. Portion of the dorsal surface of the brain that, in the lower side (right hemisphere) shows, under the dura, the superior cerebral veins affluent to the median superior sagittal sinus. On the left hemisphere, among the cerebral convolutions, there are the cortical vessels. Note the absence of lymphatics.



Fig. 4. From case XXII. Opened uterus of a pregnant woman in the early 5th month of pregnancy. Note the artistic representation of the foetus and of the flower-like abdominal ostium of the uterine tubes (asterisks).

Other structures such as the lungs, the pleura, the peritoneum, the intestines and the lymphatics, extensively demonstrated in La Specola, are only marginally represented here. A peculiar feature is the importance given to both visceral and somatic nerves (fig. 1) accurately demonstrated in more than one third of the models. The representation of visceral nerves in table XII, particularly those of the cardiac, celiac and pelvic (fig. 3c) plexuses, compete with - or even surpass in accuracy - the most celebrated textbooks of the first half of the 19th century. As reported previously (Riva et al., 2010) a model that demonstrates the exceptional skill of Boi as a dissector is the preparation of the female perineum of case III, that demonstrates the structure of the female external genital organs with details not revealed until recently. As seen in the detail illustrated in figure 3a, the preparation demonstrates also the bulbs of the vestibule (now renamed corpora spongiosa clitoridis) which are reported to be absent from the La Specola preparations (Brizzi et al., 2008). In the same model (fig. 3b) there is an accurate demonstration of the subcutaneous and fatty tissue of the mammary gland. A further anatomical structure which, according to the latter authors, is missing in the Florentine waxes, viz the urogenital diaphragm, is absent even here. There is, however, a beautiful preparation illustrating the pelvic diaphragm, the ischioanal fossa and the muscles of the superficial perineal pouch in the male (fig. 3d). A feature that make the waxes of Cagliari apart from those, also produced in La Specola and exhibited in Florence and in Vienna, and even from those of Bologna, dated 1810, is the absence of lymphatics in the brain (fig. 3e, detail of Table XIII) which are, instead, abundantly seen in brain preparations of the other collection (Riva et al., 2010). This seems to be originated from an erroneous injection made by Mascagni, who erroneously depicted them in his textbooks (Lukic et al., 2003). It

appears, therefore, that Boi became aware of this mistake well before it was eventually confuted by Key and Retzius in 1875-1876. Cerebral convolutions, at variance with most of La Specola brain models (Brizzi et al., 2008) are here correctly represented. Figure 3e also shows the masterful demonstration of the meninges and of the superficial cerebral veins. Figure 4 reproduces a foetus in the uterus at the beginning of the 5th month, a stage not present among the many obstetrical preparations of Florence. All the models fit with the requirements that Scarpa, though denying that waxes could substitute cadaveric dissections, furthermore, Scarpa, in a letter dated 1786, attested that no model was produced in La Specola in the absence of the cadaver (Zanobio, 2007). This is confirmed by the presence of such anatomical variations as the double hepatic artery seen in case XII and the accessory hepatic artery derived from the gastric left artery of case XIX. The fact that variations are represented in these models is of great relevance for the teaching of clinical anatomy because, as a rule, they are not illustrated in modern anatomy textbooks.

CONCLUSIONS

As reported above, the limited numbers of the preparations represented in the Collection of Cagliari, the fact that Susini and Boi worked more than two decades after the completion of the models supervised by Fontana, and even the partially different purposes of the two collections, makes a comparison between the two collections rather questionable. However, from our preliminary investigation on the anatomical features of the La Specola Models, based both on the photographic documentation reported in textbooks (Lanza et al., 1979; Düring et al., 1999) and on the analytical study on their didactic value performed by professional anatomists (Brizzi et al., 2008), it emerges that, in a few instances, the models of Cagliari may be regarded as refinements or evolutions of those on similar subject exhibited in Florence.

In the last decades the collection of Cagliari, that was almost unknown till the posthumous publication of the seminal essay by Castaldi (Castaldi, 1947), has gained increasing consideration both in Italy and abroad, having been greatly admired in important exhibitions on art and anatomy held in museums such as the Villette of Paris, the National Science Museum of Tokyo, the Hayward Gallery of London, the Marciana Library of Venice, the Triennale of Milan, et cetera (Riva, 2007). Moreover, its artistic and scientific qualities have been repeatedly praised in many publications (Lanza et al., 1979; Lemire, 1990; Kemp and Wallace, 2000; Mazzolini, 2004; Musajo Somma, 2007; Ballestriero, 2010). In 2010, the head of model XII has been reproduced in the cover of the special issue edited by Gillian Morris-Kay and John

Fraher and entitled: *The Art of Anatomy*, published by the official organ of the Anatomical Society of Great Britain and Ireland. Finally, an important acknowledgement of the present-day value of the Cagliari Models as teaching aids, came recently from Russia, more than 200 years after their accomplishment. As a matter of fact, 42 photographs of details of Cagliari models, relevant to clinical and functional anatomy, have been published, aside with images obtained with the most modern imaging techniques, in a recent Russian Atlas of Anatomy (Kryzhanovsky & Bilich, 2008-2010).

REFERENCES

- BALLESTRIERO R., 2007. *The Art of Ceroplastics. Clemente Susini and the Collection of the Anatomical Wax Models of the University of Cagliari*. In: Riva A. (ed.), *Flesh & Wax. The Clemente Susini's Anatomical Models in the University of Cagliari*. Ilisso, Nuoro, pp. 35-45.
- BALLESTRIERO R., 2010. Anatomical models and wax Venuses: art masterpieces or scientific craft works? Symp. issue: *The Art of Anatomy. Journal of Anatomy*, 216(2): 223-234.
- BRIZZI E., SGAMBATI E., POGGESI M., BAMBI S., 2008. *Il significato didattico dell'Anatomia Umana attraverso le Cere del Museo "La Specola di Firenze"*. In: Cilli C., Malerba G., Giacobini G., (eds.), *Atti del XIV Congresso ANMS, Il patrimonio della Scienza. Le collezioni di interesse storico*. Torino 10-12 novembre 2004. *Museologia Scientifica Memorie*, 2: 221-227.
- CASTALDI L., 1947. *Francesco Boi (1767-1860), primo cattedratico di Anatomia Umana a Cagliari e le Cere Anatomiche fiorentine di Clemente Susini*. Leo S. Olschki, Firenze, 76 pp.
- CATTANEO L., 1970. *Le Cere Anatomiche di Clemente Susini dell'Università di Cagliari*. Università di Cagliari, Cagliari, 67 pp.
- DE RENZI S., 1848. *Storia della Medicina in Italia. Tomo V. Tip. Filiate-Sebezio, Napoli*, 1015 pp.
- DOBSON J. 1962. *Anatomical eponyms*. E & S Livingstone Ltd, Edinburgh and London, 235 pp.
- DÜRING M.V., DIDI-HUBERMAN G., POGGESI M., 1999. *Encyclopaedia Anatomica: Museo La Specola Florence*. Benedikt Taschen Verlag, 704 pp.
- KEEL O., 2005. *La scuola di Santa Maria Nuova modello per l'Europa nella Francia della Rivoluzione*. In: Ghidetti E., Diana E. (eds.), *La bellezza come terapia, arte e assistenza nell'Ospedale di Santa Maria Nuova a Firenze*. Edizioni Polistampa, Firenze, pp. 313-375.
- KEMP M., WALLACE M., 2000. *Spectacular Bodies*. University of California Press, Berkeley, 232 pp.
- KEY A., RETZIUS G., 1875-1876. *Studien in der Anatomie des Nervensystems und des Bindegewebes*. Samson & Wallin, Stockholm, 334 pp.
- KNOEFEL P.E., 1984. *Felice Fontana life and works*. Società di Studi Trentini di Scienze Storiche, Trento, 422 pp.
- KRYZHANOVSKY V.A.; BILICH G.L., 2008-2010. *Atlas of Human Anatomy. Voll. I-II-III*. Geotar-Media, Moscow, 2292 pp.
- LANZA B., AZZAROLI PUCCEI M.L., POGGESI M., MARTELLI A., 1979. *Le Cere Anatomiche della Specola*. Edizioni Arnaud, Firenze, 253 pp.
- LAI I., RIVA A., 1996. *Indirizzi nell'insegnamento dell'anatomia umana nell'Ateneo cagliaritano dalla dominazione sabauda alla fine del XIX secolo*. In: *Attualità in Storia della Medicina e Storia della Fisica*. La Goliardica Pavese, Pavia, pp. 11-138.
- LEMIRE M., 1990. *Artistes et mortels*. Chabaud, Paris, 446 pp.
- LUKI I.K., GLUNI V., IVKI G., HUBENSTORF M., MARUŠI A., 2003. Virtual dissection: a lesson from the 18th century. *Lancet*, 362: 2110-2113.
- MAERKER (MÄRKER) A., 2011. *Model Experts: Wax Anatomies and Enlightenment in Florence and Vienna, 1775-1815*. Manchester University Press, Manchester, 252 pp.
- MAZZOLINI R., 2004. *Plastic Anatomies and Artificial Dissections*. In: Chaderavian S., Hopwood N. (eds.), *Models: the Third Dimension of Science*. Stanford University Press, Stanford, pp. 43-70.
- MUSAJO SOMMA L., 2007. *In cera. Anatomia e Medicina nel XVIII secolo*. Progedit, Bari, 103 pp.
- RIVA A., 2007. *The collection of wax anatomical models by Clemente Susini at the University of Cagliari*. In: Riva A. (ed.), *Flesh & Wax. The Clemente Susini's Anatomical Models in the University of Cagliari*. Ilisso, Nuoro, pp. 9-13.
- RIVA A., CONTI G., SOLINAS P., LOY F., 2010. The evolution of anatomical illustration and wax modelling in Italy from the 16th to early 19th centuries. Symp issue: *The Art of Anatomy. Journal of Anatomy*, 216(2): 209-222.
- TUMIATI C., 1942. *Clemente Susini e le Cere Anatomiche della Specola. Illustrazione Toscana*, 4: 16-18.
- TUMIATI C., 1941. *Le Cere della Specola*. In: *Il miracolo di Santa Dymfna*. Vallecchi, Firenze, pp. 143-150.
- ZANOBIO B., 2007. *The anatomical wax models of the University of Cagliari as witnesses of a season of Italian science*. In: Riva A. (ed.), *Flesh & Wax. The Clemente Susini's Anatomical Models in the University of Cagliari*. Ilisso, Nuoro, pp. 47-50.