

# Contemporaneous Anatomic Collections and Scientific Papers From the 19<sup>th</sup> Century School of Anatomy of Bologna: Preliminary Report

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Recently, a strict relationship was demonstrated between scientific pathology reports of the 19th century and a large number of specimens from the museum of pathology 'Cesare Taruffi' of Bologna. Such an experience suggested verifying whether a similar relationship exists between the 19th-century collections of the museum of anatomy and the contemporaneous anatomic scientific literature. The purpose of this preliminary report is to illustrate the first documented samples recovered in Bologna in order to promote such an inventory of old anatomic and pathologic specimens in other museums. *Clin. Anat.* 14:19–24, 2001.

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## INTRODUCTION

The anatomic museum of the medical school of Bologna consists of the very famous 18<sup>th</sup>-century preparations by Ercole Lelli (1702–1766), Anna Morandi (1714–1774), and Giovanni Manzolini (1700–1755). A less known collection of 100 wax preparations, 120 natural dried specimens with injected blood vessel, and 50 engravings belong to the 19th-century section of this museum. While the 18th-century preparations of that very famous museum have been described (Ruggeri, 1988, Ruggeri and Bertoli Barsotti, 1997), the 19th-century models have not yet been studied in detail.

Giuseppe Astorri (1785–1852) and Cesare Bettini (1801–1885), two wax modelers of the 19th century, created a number of natural specimens and copies in wax for the museum of anatomy and the museum of pathology. Moreover, Cesare Bettini was a famous illustrator of scientific papers from Bologna in the 19th century. Such a characteristic was fundamental in the re-classification of the museum of pathology because the similarities between scientific illustrations and pathological specimens was practically absolute (Scarani 1990, 1993; Scarani and Lacchini, 1999).

Systematic comparisons of the 19th century scientific papers, unpublished documents, illustrations and the pathologic specimens permitted a classification of the 300 preparations from the museum of pathology. Such a successful experience suggested adopting the same approach for the 19th century section of the anatomy museum in Bologna.

## MATERIALS AND METHODS

The modern inventory of the anatomy museum does not mention any relationship to the contemporaneous scientific literature. Such a feature is common to all recent inventories of the museums of the University of Bologna. Therefore, the comparison between specimen and scientific illustration requires a systematic review of the papers issued in the 19th century. The review was facilitated by the fact that most papers based on the museums of Bologna were published in the official journals of the Accademia

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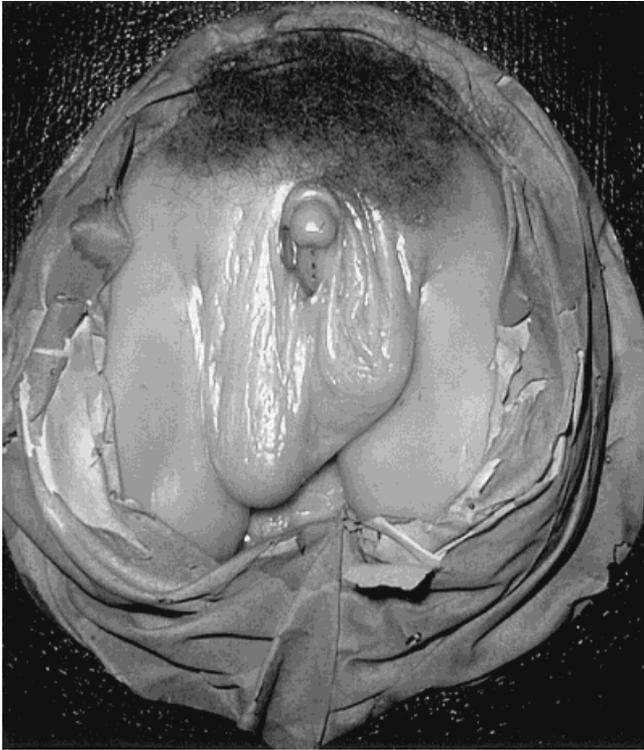


Fig. 1. Case 1. Wax model by Giuseppe Astorri.

delle scienze dell'istituto di Bologna and of the Società medica chirurgica di Bologna. Extremely precious advice and unique reports were also found in the *Rivista clinica di Bologna*.

The detailed correspondence between the illustrations and the specimens was revealing (Scarani and Lacchini, 1999). Therefore, the illustrations allowed us to distinguish anatomical specimens and wax models from those in the pathology museum.

## RESULTS

### Case 1

A wax model considered to be an example of hermaphroditic adult external genitalia (Fig. 1) had been previously attributed to the renowned wax modeler Giuseppe Astorri. Such a model corresponds to the illustration of a paper by Francesco Mondini (Fig. 2), written in 1834 (Mondini, 1844). The author attributed the illustrations to Cesare Bettini and confirmed that the wax modeler had been Astorri. Mondini (who died in 1844) was a professor of anatomy and described two malformations currently in the museum of pathology (Mondini, 1834, 1839). The genitals belonged to a 64-year-old male considered to be a female and admitted as such to the guard of Professor Francesco Rizzoli because of a brain hemorrhage.

That famous surgeon (the founder of the orthopedic Institute of Bologna) perceived the abnormal nature of the genitals during bladder catheterization. The patient died and the organs of the pelvis were removed and dissected. The illustrations attached to the paper show the accurate work by Mondini demonstrating a typical hypospadias (Fig. 3).

### Case 2

A wax model showing the external genitals of a 40-day-old neonate (Fig. 4) corresponds to the illustration (Fig. 5) of a second paper by Francesco Mondini, written in 1840 (Mondini, 1846, posthumous). The case illustrates an extremely small vaginal orifice simulating hypospadias. The anatomic dissection revealed a normal female genital tract (Fig. 6). Giuseppe Astorri was the wax modeler. To date, an inappropriate diagnosis of sex at birth still appears to be a problem in medical practice. In 1998, 106 autopsies of aborted or stillborn fetuses were performed, of which 28 reported an incorrect diagnosis of male sex at external inspection, despite the presence of a normal orifice of the vulva.

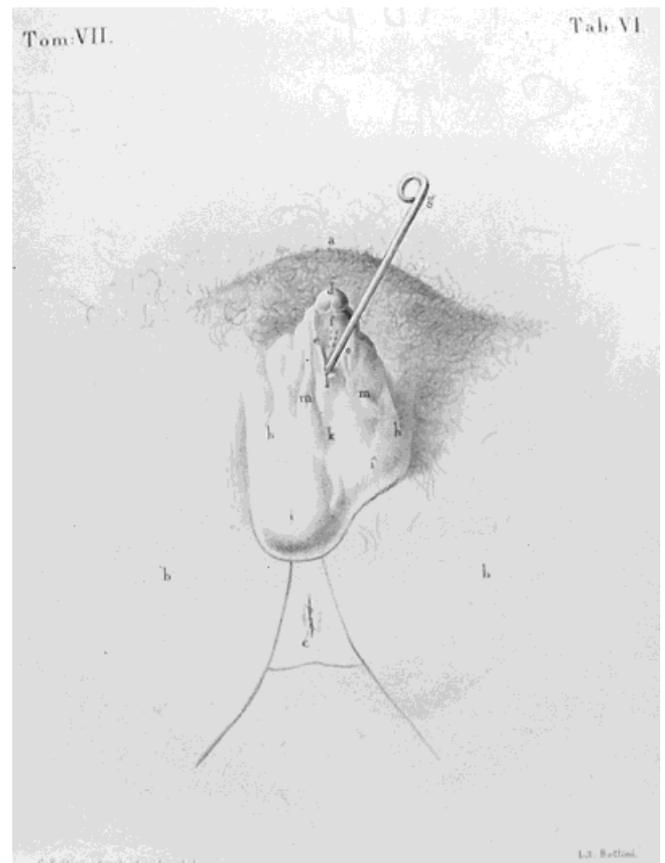


Fig. 2. Case 1. Illustration by Cesare Bettini.

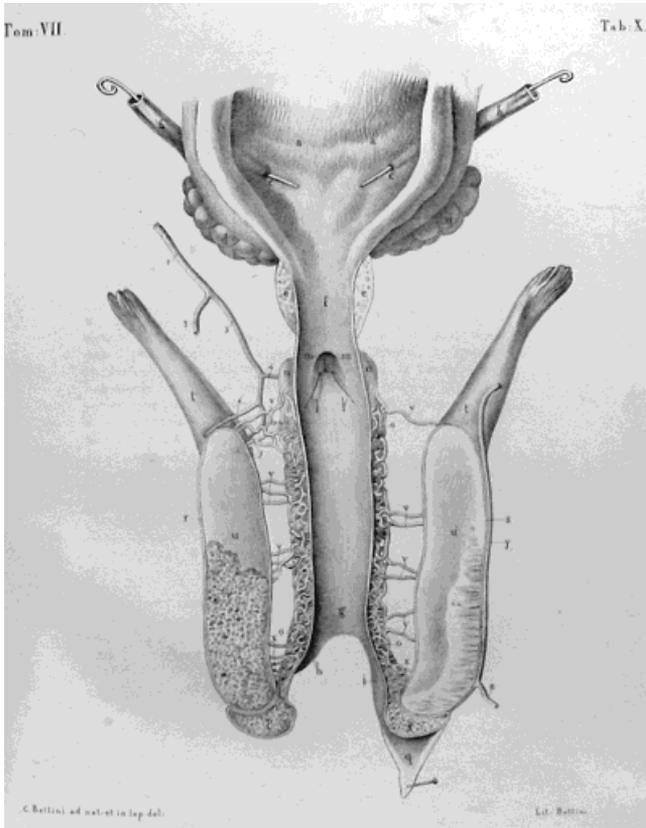


Fig. 3. Case 1. Illustration by Cesare Bettini.

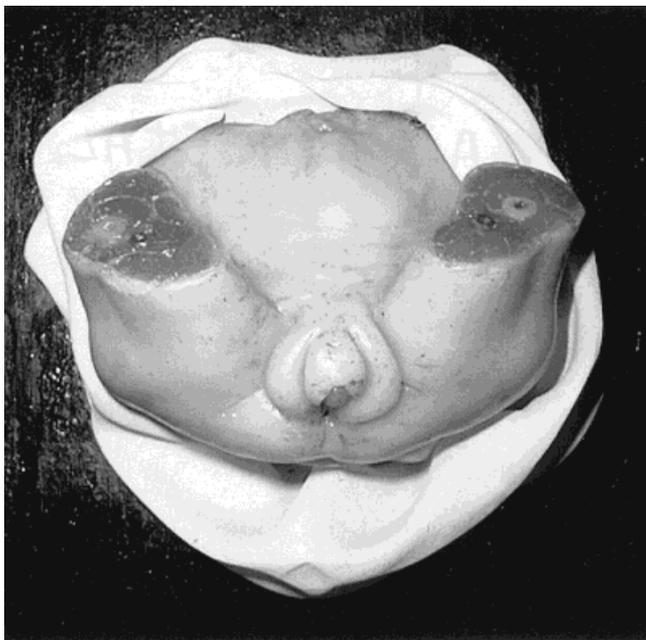


Fig. 4. Case 2. Wax model by Giuseppe Astorri.

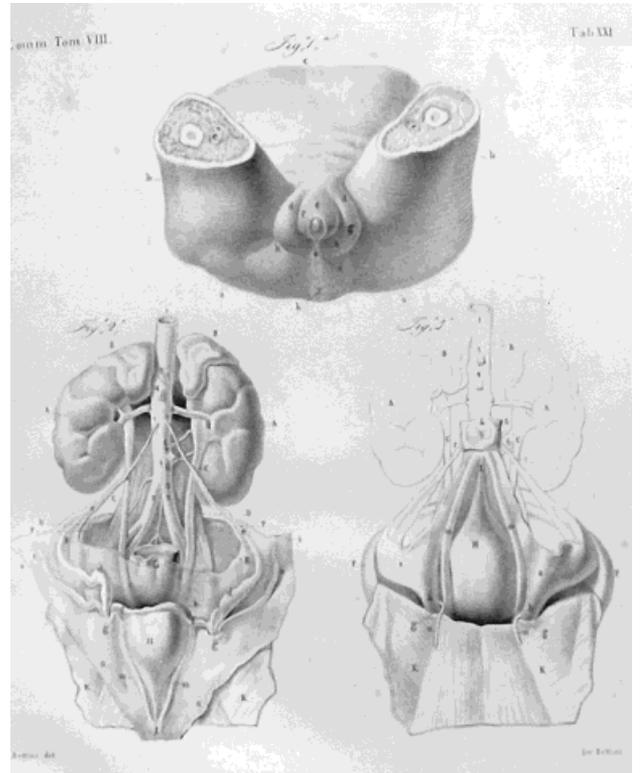


Fig. 5. Case 2. Illustration by Cesare Bettini.



Fig. 6. Case 2. Illustration by Cesare Bettini.



**Fig. 7.** Case 3. Chalk model by Leonida Berti.

### Case 3

A model in colored chalk (*scagliola*) represents the head of a black man with opened skull showing the structure of the brain (Fig. 7). It carries the signature of the modeler Leonida Berti (1850). Calori described the anatomy of the brain of a black man from Guinea in a paper with illustrations by Bettini (Calori, 1865). The purpose of the paper was to demonstrate no differences with respect to the average European brain. The model was not mentioned. One of the illustrations (Fig. 8) corresponds to the section of the right cerebral hemisphere of the model (Fig. 9). A series of anatomic drawings with no signature, recently discovered in the files of the museum, corresponds to the illustrations by Bettini for the paper mentioned above (Calori, 1865). Such a finding is similar to practices recently described in the archive of the pathology museum (Scarani, 1993).

### DISCUSSION

The school of anatomic wax modeling of Bologna was probably the most ancient in the world, with the only exception of the unique example of Gaetano

Zumbo (1656–1702)—Azzaroli Puccetti et al. (1995), active in Florence, Genoa, and Paris. Usually, the temporal sequence Zumbo—Lelli (1702–1766)—School of Florence (Lanza et al., 1979) is interpreted as consistent with a progressive evolution from Zumbo to the school of Florence via the School of Bologna. However, no documental confirmations exist. In Bologna and Florence, different techniques in wax modeling were used. Typical is the life-size model of Bologna, often enclosing natural bones, and use of the scale model in Florence. In Bologna, the cast was directly obtained from the natural specimen. In Florence, a preliminary copy in wax or chalk (life-size, smaller or magnified) was often preliminarily molded and the cast was obtained from it (Lanza et al., 1979). Such an approach is probably in accord with the massive serial production and trade of wax models characterizing the school of Florence. The climax of Florence corresponds to a profound crisis of the school of anatomy and wax modeling of Bologna (1797–1815). Between 1797 and 1803, the school was destroyed by Napoleon Bonaparte with the expulsion of Luigi Galvani (1737–1798) from the university (Scarani, 1998). Galvani was replaced by anatomy pro-

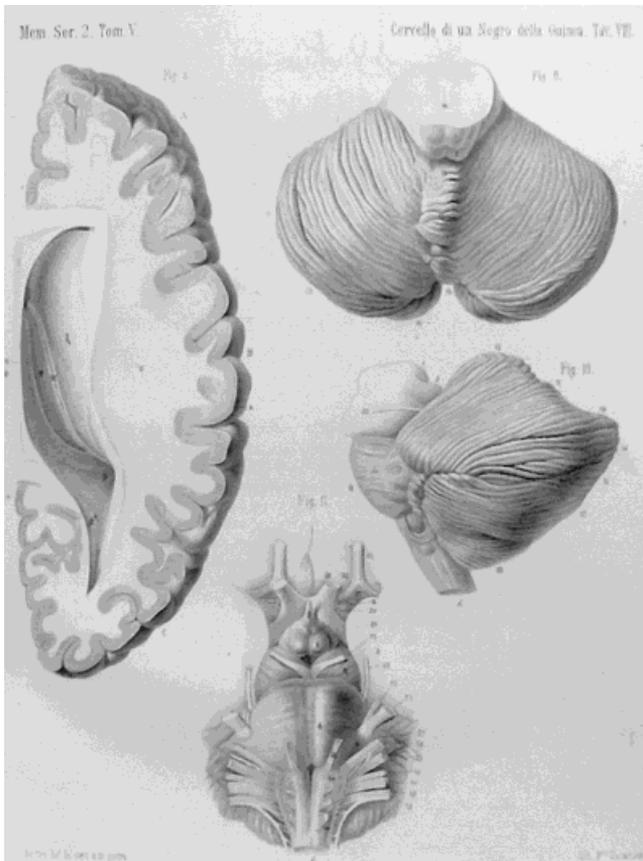


Fig. 8. Case 3. Illustration by Cesare Bettini.

fessors more compliant with the French rule. The school of wax modeling of Bologna was considered scientifically inconsistent by the new establishment and wax models were brought from Florence. The anatomy professor Francesco Mondini and the wax modeler Giuseppe Astorri, whose work is discussed in this paper, represent a sort of resurrection of the school of Bologna after Napoleon's fall.

The cases reported in this paper are not surprising because of the original unity in the scopes of the university museums of Bologna. Moreover, the modelers and the illustrators were the same for all university institutes and laboratories (Scarani, 1993, 1998) and similar features have been recently described in the geology museum (Scarani, 1999).

The cases by Francesco Mondini witness the fruitful collaboration between that anatomist and the famous wax modeler Giuseppe Astorri. Such a collaboration is a major reason for the resurrection of the school of anatomy after its demise during the rule of the French. The study by Calori of an old case from the anatomic collection is in accord with his classic anthropologic studies (Calori, 1866, 1870, 1872). A number of teratological studies by this author con-

cerning the specimens of the museum of pathology are known (Scarani, 1990). We are presently looking for an association between the late anatomic specimens and the numerous late papers by Calori concerning anatomic variations. A preliminary restoration of the time-worn specimens is in progress.

A consistent collaboration of anatomy, pathology and veterinary medicine in teaching and scientific research can be found in our 19th-century university. A number of specimens from the pathology museum are by Luigi Calori (anatomist), Giovanbattista Ercolani (veterinarian), and by Francesco Rizzoli (surgeon and orthopedist). Such an extensive contribution to the pathology museum is explained by its own history. The museum was founded by Napoleon in 1804 in order to preserve specimens with their relevant clinical history attached (Scarani, 1998). The main purpose of such an institution was to produce effective tools for continuing postgraduate medical education and systematic scientific exchanges. The museum was preserved by the government of the Popes after the Congress of Vienna (Scarani, 1998) and a fundamental duty of the Società medica chirurgica di Bologna (implemented in 1827) was to produce new cases for the museum. Therefore, it is not

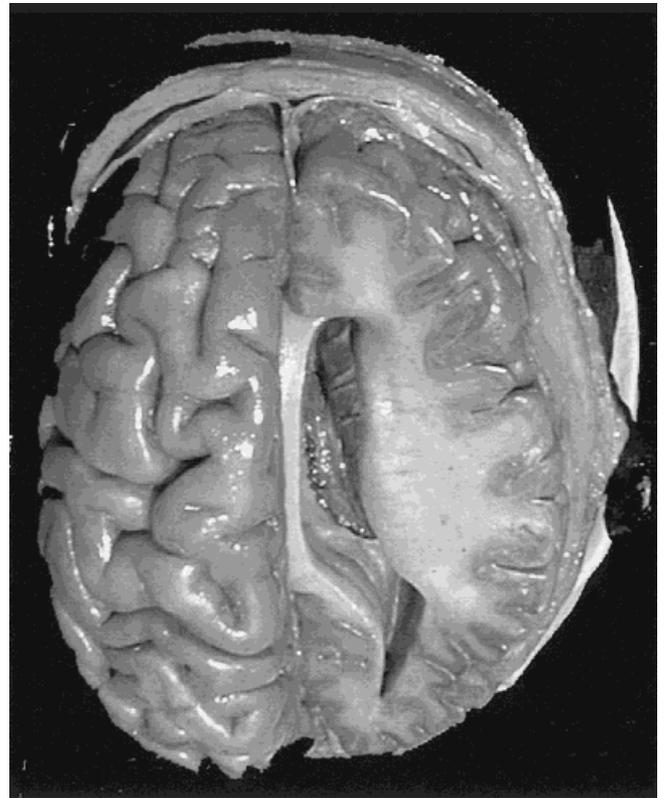


Fig. 9. Case 3. Chalk model by Leonida Berti.

surprising for us to find anatomic preparations accompanied by specific scientific papers.

The profound similarity between tables and wax models is due to the contemporary preparation of both. The authors of the tables and of the casts and wax models are usually reported in the papers. Nevertheless, the papers and the models appear to be independent entities. As usually, the paper is conceived as an independent scientific tool rather than a document explaining the specimens of the museum. All specimens were accurately described in a detailed manuscript archive with rich clinical histories. The importance of the scientific papers appears to be increased today because the old archives were almost completely lost.

When the first studies on the pathology museum were issued (Scarani, 1990, 1993) a number of people considered such features to be exclusive to that museum. On the contrary, we are convinced that such uniqueness is only apparent because of our inadequate understanding of the 19th century museums of Bologna. We suspect that the organizational features of the museums of Bologna were characteristic of all museums in the 19th century. Indeed, morphology was the most powerful innovative tool available in the life sciences at that time. In such a context, any museums organized with the criteria described above represented an incredibly powerful research tool for understanding the history of our discipline.

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