

*nisce o accoglie ragione alcuna intorno alle singole malattie di ciascuno, ma prescrive ciò che gli sembra opportuno in base all' esperienza che ha, come se fosse perfettamente competente con vanagloria come un tiranno, e quindi se ne va da un altro schiavo malato e allevia così al padrone la cura dei malati: il medico libero, invece, cura e studia nella maggior parte dei casi le malattie dei liberi, esaminandole sin dal principio e secondo la loro natura, e rende partecipe l'ammalato stesso e i suoi amici della sua indagine e lui stesso apprende qualcosa dai malati e nello stesso tempo, per quanto gli è possibile, insegna al malato; e non prescrive nulla prima di averlo convinto, e allora, rendendo docile e preparando il paziente mediante la persuasione tenta di rispostarlo perfettamente alla salute. E' migliore allora quel medico che procede nel primo modo o nel secondo?"*

41. RAMAZZINI B., *De morbis artificum diatriba*. Mutinae, Capponi, 1700.
42. MORGAGNI G.B., *Sugli scavi del Camposanto del Pio ospedale di San Francesco di Padova*. In: GAZZANIGA V., DE ANGELIS E. (eds.), *Giovan Battista Morgagni. Perizie medico legali*. Roma, Carocci, 2000, p. 157-161.
43. Regolamento dei Regi Ospedali di S. Maria Nuova e di Bonifazio, 1789. Cfr. DE RENZI S., *Storia della medicina in Italia*. V, Napoli 1848, pp. 335-733, 760, 932. MEDEA E., *V. Chiarugi e l'assistenza psichiatrica in Italia*. Rendiconti del R. Istituto Lombardo di Scienze e Lettere 1939-40; LXXIII: 492-496. GRANGE K. M., *Pinel or Chiarugi?* Med. Hist. 1963; VII: 371-380.
44. CIRILLO D., *Discorsi Accademici*. Napoli, 1787, Napoli, 1799. Si fa riferimento, in particolare, all'istituzione del progetto di Carità Nazionale. Cfr. Dizionario Biografico degli Italiani, Istituto della Enciclopedia Italiana, sub voce. Roma, 1980, pp. 789-795.

Correspondence should be addressed to:

Valentina Gazzaniga, Sezione di Storia della Medicina, Dip. di Medicina Sperimentale e Patologia, Università degli Studi di Roma "La Sapienza", Viale dell'Università 34/a - 00185 Roma, I. e-mail: valentina.gazzaniga@uniroma1.it

Articoli/Articles

POSSIBLE HUMAN SACRIFICE AT THE ORIGINS OF ROME:  
NOVEL SKELETAL EVIDENCES

LAURA OTTINI<sup>◇</sup>, LUCIANA RITA ANGELETTI<sup>◇</sup>, WALTER BENEDETTO PANTANO<sup>§</sup>, MARIO FALCHETTI<sup>◇</sup>, SIMONA MINOZZI<sup>°</sup>, PATRIZIA FORTINI<sup>§</sup>, PAOLA CATALANO<sup>§</sup>, RENATO MARIANI-COSTANTINI<sup>#</sup>

Departments of <sup>◇</sup>Experimental Medicine and Pathology, University "La Sapienza" Rome, Italy; <sup>°</sup>Department of Etology, Ecology and Evolution, Unit of Anthropology, University of Pisa; <sup>§</sup>Archaeological Superintendence of Rome; <sup>#</sup>Department of Oncology and Neurosciences, University "Gabriele D'Annunzio", Chieti, Italy.

SUMMARY

*Recent archaeological excavations at the Carcer/Tullianum, in the Roman Forum, allowed the unexpected recovery of human burials associated with the very early foundations of the monument, at the beginning of the iron age. The study of these burials resulted in interesting paleopathological discoveries, concerning the skeleton of a strongly-built male, radiocarbon-dated between 830 and 780 BC. The telltale posture of the skeleton and the presence of a massive perimortal blunt force trauma of the skull shed light on the mode and circumstances of the death of this subject, and are suggestive of ritual sacrifice. The archaeological, mythological and historical backgrounds, combined with the paleopathological evidence, help us to get a glimpse of life and death at the origins of Rome.*

*Discoveries at the Carcer/Tullianum in the Roman Forum.*

The novel findings which are the subject of the present article occurred during recent excavations, that explored the most ancient archaeological levels of the monument known since the Middle

*Key words:* Ancient Rome - Capitol hill, paleopathology - Human sacrifice - Cranial fracture.

Ages as *Carcer Mamertinum* (Mamertine prison), in the north-eastern sector of the Roman<sup>1</sup>. This very ancient monument, originally united to the fortification system of the Capitol, has been preserved almost intact through the centuries. It is composed of two superimposed structures and, because of its dual nature, is presently designated *Carcer Tullianum*. The upper structure, the *Carcer*, built as a maximum-security prison for the enemies of the Roman state, dates in its present form to the IV Century BC, while the extant lower structure, the *Tullianum* (from the latin *tullus*, i.e., pool of spring water), originally a vaulted circular reservoir for the water of a still existing spring, can be dated to the VII Century BC.

The area of the *Carcer Tullianum* that has been recently excavated corresponds to the north-eastern perimeter. These excavations permitted a better understanding of the most ancient construction phases of the monument and of its early relation with the Capitoline fortress<sup>1,2</sup>. In fact, stone walls predating the extant structures, probably connected with the defensive system of the eastern slope of the Capitol, were unearthed. In the spring of 2000, while excavating along the eastern foundations, facing the valley of the Roman Forum, archaeologists unexpectedly found the skeletal remains of three individuals, resting in an undisturbed articulated context, with no grave goods, in a layer of yellowish sandy silts. The burials were crowded in very limited space, one above the other. No stones or other heavy weights, which could have deformed or crushed the bones when still fresh, were associated with the skeletons.

Based on cranial and/or postcranial morphology<sup>3</sup>, the skeletal subjects were identified as a male, aged between 35 and 45 years at death, a female, aged between 30 and 35 years, and an adolescent, aged 14 to 16 years at death. Radiocarbon dating, by AMS-standard delivery, yielded calibrated C14 ages of 830 to 780 BC for the male, 820 to 770 BC for the female, and 850 to 780 BC for the adolescent. These dates fall within the early iron age and precede the traditional chronology of the legendary Romulean foundation of Rome<sup>4</sup>. The skeleton of the female, interred in supine position, and of the adolescent, limited to the elements of the lower limbs (the rest being

lost under the foundations of a medieval wall), did not show any relevant paleopathological changes. In contrast, the male skeleton (Figure 1 A-B) revealed interesting lesions, which, combined with postural evidence, shed light on the circumstances of his death.

#### Evidence of violent death

The male skeleton was lying on its left side with the skull and cervical spine flexed backward, the bones of the arms and forearms extended behind the thorax and the elements of the right hand rested over those of the left hand behind the pelvis (Figure 1 A-B). The *in situ* position of the skeleton strongly suggested that the neck had been forced backward, perhaps by ropes tied to the back or by some rigid support such as a stick placed under the chin, and that the hands were tightly tied on the back. No archaeological evidence of ligatures was found in the area of the wrists and arms. With the exception of the upper half of the right femur, the skeletal elements of the lower limbs could not be recovered, since they were lost under the above-mentioned medieval wall. Unfortunately, the frontal portion and the base of

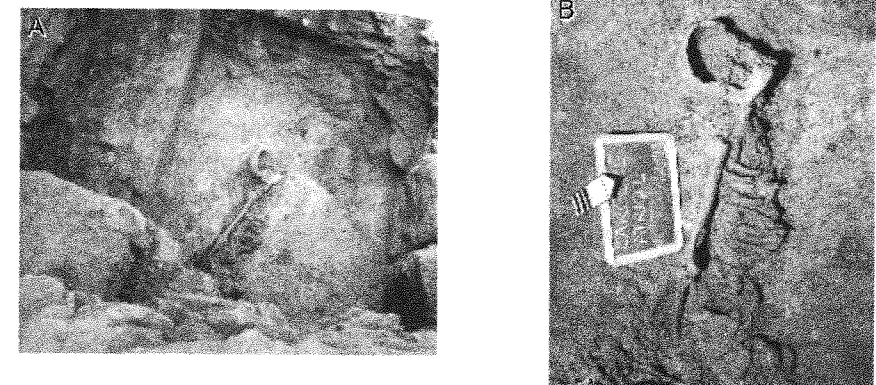


Figure 1 A-B – Views of the male skeleton in situ, showing backward flexion of the skull and the bones of the arms and forearms distended behind the thoracic cavity. The skeletal elements of the lower limbs are lost under the medieval stone wall at the bottom of A. As shown in B, the skull manifests evidence of the recent damage which occurred at discovery.

the skull, as well as the facial skeleton, were lost at discovery and were not available for reconstruction.

In spite of the recent damage to the basolateral aspect, the left parieto-occipito-temporal portion of the neurocranium retained evidence of a wide gap from an ancient cranial fracture (Figure 2A). This ramifying fracture, which separated the temporo-parietal region from the occipital, followed the temporo-occipital suture from the site of recent damage of the skull to the *asterion* landmark, and continued along the parieto-occipital suture, for at least 4.2 cm (Figure 2A-C). At the upper end, the fracture line, still ramified, ran just anterior to the parieto-occipital suture. Although the fracture passed through and dissociated suture lines, it is to be differentiated from *post mortem* bone separation because the occipital squama was pushed inward for about 0.7 cm. Such deformation could have taken place if the lesion had occurred when the cranial bones were still fresh and elastic. The lack of signs of reactive repair on the adjacent bone surfaces (e.g., formation of new woven bone) indicated that the lesion was perimortal, and possibly concomitant with death. The latter is consistent with the macroscopic appearance of a blunt force trauma.

The cranial injury could have been caused by a violent blow, inflicted with a blunt weapon such as a large stone or a club, that hit behind to the fracture line, as suggested by the inward dislocation of the occipital squama<sup>5</sup>. Assuming that the individual who inflicted the blow was right-handed, the left-sided localization of the fracture would imply a face-to face attack<sup>6</sup>. Unfortunately, the recent damage done to the left lower temporo-occipital region did not permit any assumption with respect to the supposed impact.

#### *Other paleopathological evidences*

The other relevant paleopathological lesion concerning the male skeleton regarded the upper lumbar part of the spine, where the body of L1 is anteriorly collapsed, and fused with L2 at the level of the end plates. Posteriorly, there is ankylosis of the apophysial joints and ossification of the supra- and inter-spinous ligaments between L1 and L2. Radiographs show that the antero-inferior portion of the

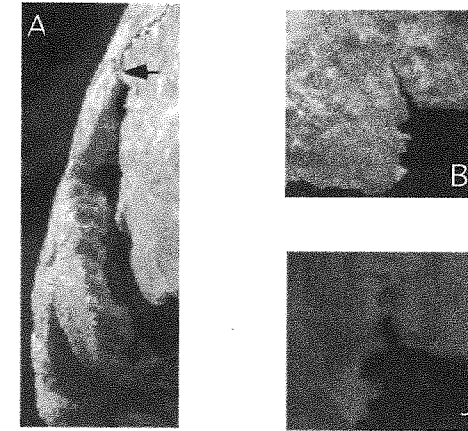


Figure 2 A-B-C – Panel A shows the wide line of ancient left cranial fracture separating the temporo-parietal region (to the left) from the occipital squama (to the right). A thin, ramifying fracture line continues into the parietal, above the arrow. The area pointed by the arrow is detailed in B, with the corresponding radiographic image shown in C.

body of L1 was crushed on the antero-superior portion of the body of L2, causing a concave deformation of the end plate of L2 (Figure 3B). In addition, there is hyperopacity of the bodies of L1 and L2, attributable to condensation and thickening of the bony trabeculae. Because of the collapse of L1, the thoracic spine is over-curved kyphotically. There is also evidence of scoliosis, with greater loading to the left, as indicated by the disproportion between the right and left apophysial articular facets. These spinal alterations might be linked with a thickening of the outer surface of the occipital due to subperiosteal bone apposition, probably secondary to chronic stress of the occipito-atlantal ligaments.

In spite of this, the tall stature, estimated at 175-177 cm, not taking into account the kyphotic deformation of the spine, the pronounced muscular insertions, and the overall robustness of the bones point to an individual of remarkable strength<sup>7</sup>.

Lesions of vertebral elements can be due to a variety of pathological causes, including trauma, tuberculosis, pyogenic osteomyelitis, brucellosis, fungal infections, Paget's disease, malignant tumors, and echinococcosis<sup>8</sup>. In the present case, we are

dealing with an old, healed lesion, which involves primarily the anterior part of the body of L1 and the upper surface the body of L2, with no evidence of bone resorption, fistulous canals or enhanced porosity. With the exception of focal osteophytosis, there is no evidence of periosteal new bone apposition on the anterior or lateral surfaces of the involved vertebral bodies. The overall pattern of the pathological changes rules out most of the possible causes of vertebral lesion, except compression fracture and tuberculous spondylitis or Pott's disease. These two pathological conditions tend to involve the anterior part of the body of one or few vertebra/e, generally sparing the neural arches (although ankylosis may occur in absence of medical intervention), are most common at the thoraco-lumbar junction, are associated with scarce new bone reaction from the outer periosteal surfaces, and result in characteristic angular kyphosis<sup>9</sup>. The presence of tuberculosis in early Rome would not be unexpected, since the disease is attested for Italy since the Neolithic period<sup>10</sup>. However, tuberculosis typically causes considerable bone loss intravertebrally, whereas in the present case there is no evidence of lytic lesions and of fistulous tracts. Furthermore, concave end plate deformation is not associated with tuberculous spondylitis<sup>11</sup>. The diagnosis of healed vertical compression fracture is consistent with the radiologic evidence (Figure 3B) and with the robustness of the skeleton, suggesting an overall healthy status and exposure to strong physical strains.

#### *The evidence of the Tullianum and human sacrifice in early Rome*

The site of Rome appears to have been more or less intermittently inhabited since the early Bronze Age (before 1700 BC), and the first stable occupation dates back to the Middle Bronze Age (1700-1350 BC), much earlier than the legendary Romulean foundation, traditionally said to have occurred on April 21st of the year 753 BC<sup>12</sup>. At the beginnings of the VIII Century BC, around the period of the deaths of the three skeletal subjects of the *Tullianum*, Rome was a proto-city formed by huts made of wood, mud, and hay, scattered among woods. The earliest stone fortifications defending the Capitol had been already erected<sup>13</sup> and

the burial areas of the then existing villages on the Capitol and on the Palatine were certainly not near the *Tullianum*<sup>14</sup>.

The hypothesis that the burials of the *Tullianum* might be related to human sacrifice and/or penal execution should be considered in relation to historically documented ancient traditions and beliefs. In the early history of Rome, there was no clear distinction between penal death and ritual killing<sup>15</sup>. According to the testimonial of the ancient authors, the early cults of Saturn, the divine founder of *Latium*, of *Vulcanus*, the god of fire (connected with the spirits of the ancestors), of *Dites*, the infernal god, and of the *Dii Manes*, the spirits of the ancestors, included the ritual killing of humans<sup>16</sup>. The cult of the *Dii Manes* was associated with structures marking the outer limits of the community, such as defensive walls<sup>17</sup>. Moreover, based on archaeological and topographical evidence, the site of the *Tullianum* may have been linked with the cult of Saturn<sup>18</sup>.

It is intriguing that the sacrifice of humans with hands tied to the back is reflected in one of the most ancient sacred festivities of Rome, the *Sacrificia Argeorum*, dating to the IX century BC<sup>19</sup>. According to the legend, the *Argei* were noble Achaeans, and, as such strangers, that could have threatened the customs of the community. Upon reaching the site of Rome, they were captured and sacrificed into the Tiber,

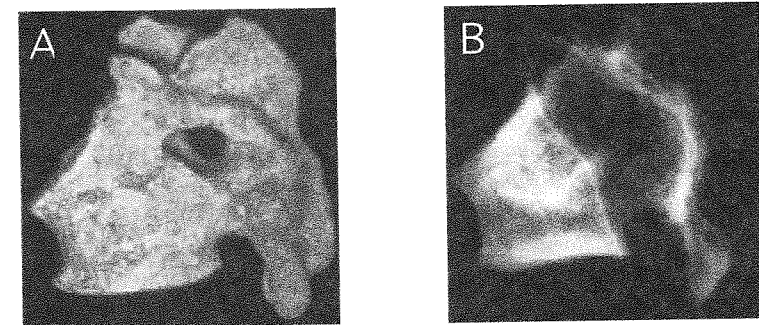


Figure 3. A-B. View of the first and second lumbar vertebrae (A), with corresponding radiographic image (B), documenting ankylosis, collapse of the anterior part of the body of L1, and concave deformation of the upper posterior part of the body of L2.

with hands and feet tied. This legendary event, which might have reflected early contacts with Greeks lost in the exploration of the west coast of Italy, was said to have occurred before the arrival of Hercules, the protector of merchants, symbolizing the Greek civilization, who changed the ritual substituting realistic effigies made of weeds to living human beings<sup>20</sup>. According to a variant of the myth, the *Argei* were buried at sacred sites, one for each district of Rome<sup>21</sup>. A sacred role of the sacrificed human body and of its tangible relics is also apparent in a variant of the legend concerning the death of *Romulus*, killed by the senators and butchered in pieces that were buried in each of the districts of Rome<sup>22</sup>.

At the *Tullianum* the paleopathological evidence and the archaeological data may support the ancient historical sources that suggest an important role of ritual human sacrifice at the origins of Rome.

#### BIBLIOGRAPHY AND NOTES

1. FORTINI P., *Carcer Tullianum. Il carcere mamertino al foro romano*. Milano, Electa, 1998; LUGLI G. *Il carcere Mamertino*. Capitulum 1932; 8: 232-244; COARELLI F., *Il Foro Romano. Periodo arcaico*. Roma, Quasar, 1992.
2. CATALANO P., FORTINI P., NANNI A., *Area del Carcer-Tullianum. Nuove scoperte*. In: *Archeologia e Giubileo. Gli interventi a Roma e nel Lazio nel Piano per il Grande Giubileo del 2000*. Napoli, Electa, 2000.
3. FEREMBACH D., SCHWIDETZKY I., STLOUKAL M., *Recommandations pour déterminer l'age et le sexe sur le squelette*. Bulletin et Mémoires de la Société d'Anthropologie de Paris 1979; 6: 7-45.
4. CARANDINI A., *La nascita di Roma*. Torino, Einaudi, 1997; CORNELL T. J., *The beginnings of Rome. Italy and Rome from the Bronze Age to the Punic wars (1000-264 BC)*. London-New York, 1995; OGILVIE R. M., DRUMMOND A., *The sources for early Roman history*. In: *The Cambridge Ancient History*. VII/2, Cambridge, Cambridge University Press, 1989, pp. 1-51; MOMIGLIANO A., *The origins of Rome*. In: *The Cambridge Ancient History*. VII/2. Cambridge, Cambridge University Press, 1989, p. 52.
5. MERBS C. F., *Trauma*. In: YSCAN MY, KENNEDY KAR., *Reconstruction of life from the skeleton*. New York, Wiley-Liss, 1989.
6. AUFDERHEIDE A. C., RODRIGUEZ-MARTIN C., *The Cambridge encyclopedia of human paleopathology*. Cambridge, Cambridge University Press, 1998.

7. SJØVOLD T., *Estimation of stature from long bones utilizing the line of organic correlation*. Human Evolution 1990; 5: 431-447; TROTTER M., GLESER G. C., *Estimation of stature from long bones of American Whites and Negroes*. American Journal of Physical Anthropology 1952; 10: 463-514.
8. STEINBOCK R. T., *Paleopathological diagnosis and interpretation*. Springfield, Thomas, 1976; KELLEY M.A., EL-NAJJAR M.Y., *Natural variation and differential diagnosis of skeletal changes in tuberculosis*. American Journal of Physical Anthropology 1980; 52: 153-167; BUIKSTRA J. E., *The Caribou Eskimo: general and specific disease*. American Journal of Physical Anthropology 1976; 45: 351-368; AUFDERHEIDE A. C., RODRIGUEZ-MARTIN C., *The Cambridge encyclopedia of human paleopathology*. See ref. 6.
9. BUIKSTRA J.E., *The Caribou Eskimo...*; STEINBOCK R. T., *Paleopathological diagnosis and interpretation...*; KELLEY M.A., EL-NAJJAR M.Y., *Natural variation and differential diagnosis of skeletal changes in tuberculosis...* See ref. 8; AUFDERHEIDE A. C., RODRIGUEZ-MARTIN C., *The Cambridge encyclopedia of human paleopathology*. See ref. 6.
10. FORMICOLA V., MILANESI Q., SCARSINI C. *Evidence of spinal tuberculosis at the beginning of the fourth millennium B.C. from Arene Candide (Liguria, Italy)*. American Journal of Physical Anthropology 1987; 72: 1-6; CANCI A., MINOZZI S., BORGOGNINI TARLI M. S., *New evidence of tuberculous spondylitis from neolithic Liguria (Italy)*. International Journal of Osteoarchaeology 1996; 6: 497-451.
11. See ref.9.
12. BLOCH R., *Origins of Rome*. London, Thames & Hudson, 1960; PALLOTTINO M., *Origini e storia primitiva di Roma*. Milano, 1993; MOMIGLIANO A., *The origins of Rome..* and CARANDINI A., *La nascita di Roma ...* See ref. 4
13. FORTINI P., *Carcer Tullianum...* See ref. 1; CATALANO P., FORTINI P., NANNI A., *Area del Carcer-Tullianum...* See ref. 2.
14. COARELLI F., *Il Foro Romano...* See ref.1; CATALANO P., FORTINI P., NANNI A., *Area del Carcer-Tullianum...* See ref. 2; GJERSTAD E., *Early Rome II. The tombs*. Rome, Acta Instituti Romani Regni Sueciae, 1956.
15. SANTALUCA B., *Osservazioni sulla repressione criminale in età regia*. In: *Le délit religieux dans la cité antique*. Rome, Ecole Française de Rome, 1981, pp. 39-49; TORELLI M., *Delitto religioso. Qualche indizio sulla situazione in Etruria*. In: *Le délit religieux dans la cité antique*. Rome, Ecole Française de Rome, 1981, pp. 1-7; GROTTANELLI C., *Ideologie del sacrificio umano*. In: (VERGER S. (Ed), *Rites et espaces en pays celtique et méditerranéen. Etude comparée à partir du sanctuaire d'Arcy-Romanche (Ardenne, France)*. Rome, Ecole Française de Rome, 2000, pp. 277-292.
16. OGILVIE A., *A commentary on Livy Books 1-5*. Oxford, Oxford University Press, 1965; DUBOURDIEU A., *Les origines et le développement du culte des Pénates à Rome*.

- Rome, Ecole Française de Rome, 1989; BREMMER J. N., *Horsfall N. M. Roman myth and mythography*. Bulletin of the Institute of Classical Studies of the University of London, 1987, suppl. 52; HUBAUX G., *Les grands mythes de Rome*. Paris, 1945; MUSTI D., *Varrone sull'insieme delle tradizioni su Roma quadrata*. *Studium Urbis* 1975; 49: 297-318; CARANDINI A., *La nascita di Roma...* See ref. 4.
17. DUBOURDIEU A., *Les origines et le développement du culte des Pénates à Rome...* See ref. 16; CARANDINI A., *La nascita di Roma...* See ref. 4.
  18. CARANDINI A., *La nascita di Roma...* See ref. 4; CATALANO P., FORTINI P., NANNI A., *Area del Carcer-Tullianum. Nuove scoperte...* See ref. 2.
  19. MADDOLI G., *Il rito degli Argei e l'origine del culto di Hera a Roma. La parola del passato*. *Rivista di studi antichi* 1971; 26: 153-166; WISSOWA G., *Argei*. In: WISSOWA G. (Hrsg), *Paulys Real-Encyclopädie der Classischen Altertumwissenschaft, Neue Bearbeitung*. Stuttgart-München, 1896, pp. 689; MUSTI D., *Varrone sull'insieme delle tradizioni su Roma quadrata...* See ref. 16.
  20. CARANDINI A., *La nascita di Roma...* See ref. 4.
  21. See ref. 19.
  22. CARANDINI A., *La nascita di Roma...* See ref. 4; AMPOLO C., *La vita di Romolo*. Introduzione, commento e traduzione di Plutarco. Milano, Mondadori, 1988; COARELLI F., *Argei, sacraria*. In: *Lexicon topographicum Urbis Romae*, I. Roma, 1993.

Acknowledgments. We wish to thank Prof. Adriano La Regina, who promoted the recent archaeological and anthropological investigations at the *Carcer/Tullianum* site. We acknowledge the support of the *Consiglio Nazionale delle Ricerche*, Finalised Project *Beni Culturali - Archivio Biologico*, contract #96.01152.PF36, and of "40%" funds from *Ministero dell'Università e della Ricerca Scientifica e Tecnologica (M.U.R.S.T.)* to L.R.A. and to R.M-C.

Correspondence should be addressed to:

Renato Mariani-Costantini, MD, Department of Oncology and Neuroscience, University "Gabriele D'Annunzio", *Nuovo Polo Didattico*, Building C, Campus "Madonna delle Piane", 66013 Chieti, Italy. Tel.: +39-0871-3554116; Fax: +39-0871-3554110  
e-mail: rmc@unich.it

Articoli/Articles

ALDO CASTELLANI (1874-1971).  
UN VIAGGIO SCIENTIFICO LUNGO UN SECOLO

ANTONIO SEBASTIANI\* e CARLA SERARCANGELI\*\*

\*Dipartimento Malattie Infettive e Tropicali, Università degli Studi di Roma "La Sapienza", I\*\* Sezione di Storia della Medicina, Dipartimento di Medicina Sperimentale e Patologia, Università degli Studi di Roma "La Sapienza", I.

SUMMARY

ALDO CASTELLANI (1874-1971)  
A CENTURY-LONG SCIENTIFIC TRAVEL

*Aldo Castellani is an international scientist, well known for his essential contribution to the aetiological researches on sleeping-sickness. During his career, that took him to many parts of the world, he studied a number of tropical diseases and he obtained important results, like the discovery of new therapies and some fundamental laboratory techniques. His academic career lasted about seventy years, during which he increased thanks to his works the scientific knowledge of Italian and foreign universities. Basic in his life is the period in which he headed the Institute of Tropical Medicine at the University of Rome, making important choices for Italian public health: for instance, during the Italian-Ethiopian War he proved to be an "additional weapon" for the Italian Army. He spent the last part of his life travelling, but he remained personal physician to the former Italian king Umberto II, exiled in Cascais and professor in the Tropical Medicine Institute of Lisboa. The aim of the authors, in homage to Aldo Castellani's memory, is to emend, as far as possible, the occasional errors in the papers dedicated to him.*

È molto probabile che i fiamminghi Professor Nicolas Tulp e Dottor Joan Deyman sarebbero oggi dei *carneade* qualsiasi se le rispettive lezioni di anatomia non fossero state immortalate dal pennello di Rembrandt. Lo stesso non può dirsi di Aldo Luigi

*Key words:* Castellani - Sleeping sickness - Tropical medicine teaching