THE PATHOLOGICAL LESIONS OBSERVED ON THE OSTEOLOGICAL REMAINS FROM THE SITE OF SANJAN,VALSAD DISTRICT, GUJARAT STATE, INDIA

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INTRODUCTION

The site of Sanjan located in state of Gujarat in India has yielded osteological remains dating to the 15th century A.D. This site represents a large city that existed between the 8th and 15th centuries A.D. and is probably one of the earliest locations on the Indian subcontinent where the Zoroastrian population settled after fleeing from Persia (Iran) due to Islamic persecution. In 2004, 40% of the mortuary site of Sanjan was excavated revealing around 140 skeletal remains. The osteological material recovered from this excavation is disarticulated and commingled and as such the analyses of the cranial, dental and post-cranial remains were carried out independently by Dutt, Bhattacharya and Pitale respectively to ascertain the type as well as the frequency of the pathologies present in this population.

MATERIALS AND METHODS

- Cranial, post-cranial and dental remains from the site of Sanjan – rough estimation of 140 individuals calculated in the field.
- Condition – fragmented, disarticulated and commingled
- Includes newborn, sub-adult, adult and elderly individuals
- Curated at Deccan College, Pune, India
- Craniometric measurements and cranial sex determination [Martin and Saller 1957]
- Age estimation based on suture closures [Meindl and Lovejoy 1985]
- Teeth attrition classification [Smith and Scot]

Map of India with the region of Sanjan circled in black. Courtesy: www.nationalgeography.com

Location of the site of Sanjan Courtesy: www.nationalgeographic.com

The north-east section of the bhandar Courtesy: Dr. Kurush F. Dalal

Tower of Silence, Mumbai :engraving from 'True Stories of the Reign of Queen Victoria' (1886) by Cornelius Brown

RESULTS

MNI count:
Cranial: 41 (left petrous portion).
Mandible: 67
Long Bones: 36 (left femur)
Teeth – approx 470 (in isolation)

Sex Ratio (from cranial collection):
Male – 31%, Female – 28.5%, Undetermined - 40.5%

Age Ratio:
Sub Adult: 11% Adult: 48%
Old Adult: 11.5%
Undetermined: 29.5%

Overall Health:

- Overall, healthy and well nourished – cranial and long bones
- Teeth ridden with pathology
- Substantial number of old adult (+55 yrs)
- Low sub-adult mortality rate – perhaps due to underrepresentation since Sanjan bones were hand-recovered.

PATHOLOGIES FOUND

- Anemia (n=1)
- Osteomyelitis (n=3)
- Periostitis (n=2)
- Exostosis or Cancellous Osteoma (n=1)
- Osteoid Osteoma (n=1)
- Osteopenia (probable Osteoporosis) (n=1)
- Tartar = 106/358
- Hypoplasia = 148/358
- Caries = 21/358
- Enamel Hypoplasia = 148/358

Others

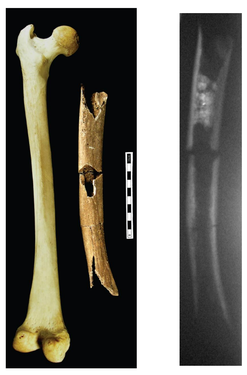
- Wormian Bones (n=2)

Lateral view of the diploë of skull fragment 93A & superior view of porous surface, probably due to iron deficiency

Tibia R2: Osteomyelitis

Fibiula U11: Periostitis

Femur L17 : Osteoid Osteoma



Femur L5: Osteopenia (probable Osteoporosis)

Femur L2 : Exostosis or Cancellous Osteoma

Slight Tartar Accumulation

Beginning of caries

Enamel Hypoplasia

Wormian bones on Skull No. 4

PRESENT POPULATIONS AND SIGNIFICANCE

- Parsis since C18th – economically, politically and socially influential.
- Strictly endogamous with few instances of "mixed breeding" and changing opinion of *who is a Parsi/ Zoroastrian?*
- Four major illnesses rampant among present day Parsis; cardiac problems, cancer, diabetes and stress (Parzor Report 2008).
- Zoroastrians today are a protected community. Parsi community has an opposite demographic pattern than rest of the Indian community. Rapid population and fertility decline (Unisa et al. 2009: 2).
- The UNESCO Parsi Zoroastrian Project – Parsis "medical paradox"
- Possible microevolution among the Paris since their migration to the Indian subcontinent resulting in a high frequency of Mediterranean G56PD alleles among extant Parsis.

Pavi: Parabolic floor upon which dead bodies are placed (Modern Parsi *Dakhma*) Courtesy: http://www.ronlaytner.com/towerofsilence.html

Bhandar: Central Well (Modern Parsi *Dakhma*) Courtesy: http://www.ronlaytner.com/towerofsilence.html

LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

Commingled remains; Pathological lesions: lack of context; Sex estimation: exceedingly probable; Age estimation: not attempted to a large degree; No other contemporary *dakhmas* excavated.

Further excavation of the rest of the Sanjan *dakhma* would provide a more holistic picture of the Sanjan population. Other contemporary or later sites would help explain the adaptation of this endogamous group to Indian climate and the present day health issues prevalent among the Parsis. This could facilitate in finding corrective measures that can be taken for future Parsis.

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BIBLIOGRAPHY

- Dutt 2006 Anthropological Studies on the cranial collection from Sanjan (M.A. Thesis, Deccan College, India)
- Pitale 2006 Post-Cranial Skeletal Collection from Sanjan: A Bioanthropological and Taphonomic Approach (M.A. Thesis, Deccan College, India)
- Bhattacharya 2006 Investigation in Dental Anthropology: A Case Study For The Medieval Sanjan (M.A. Thesis, Deccan College, India)
- Nanji and Dandekar 2005 Excavations at Sanjan Dhakhma, Journal of Indian Ocean Archaeology
- Martin and Saller 1957 Lehrbuch der Anthropologie. Bd 1. Fischer G, Verlag, Stuttgart.

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