



Iconographic approaches to the study of musculoskeletal stress markers

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Introduction

Paleopathologists examine both primary evidence (bones, calcified tissues, preserved bodies, and coprolites) and secondary sources such as contemporary documents and iconographic representations such as artifacts and works of art^{1,2}.

In the last decades, paleopathological studies have revealed important data about past human lifestyles. These interpretations are based on the principle that bone react to biomechanical stress, developing pathological conditions like OA, enthesopathies, trauma, and/or non-pathological, such as accessory facets or hypertrophy of muscle-skeletal insertions^{3,4,5,6}.

Musculoskeletal Stress Markers: biocultural approach

Musculoskeletal markers (MSM) are distinct skeletal lesions that occur where a muscle, tendon or ligament inserts/origins into the bone surface^{7,8}. Nevertheless, a profound gap remains between the type of bone lesion observed and the biomechanical forces produced by human gestures. The limitations identified are:

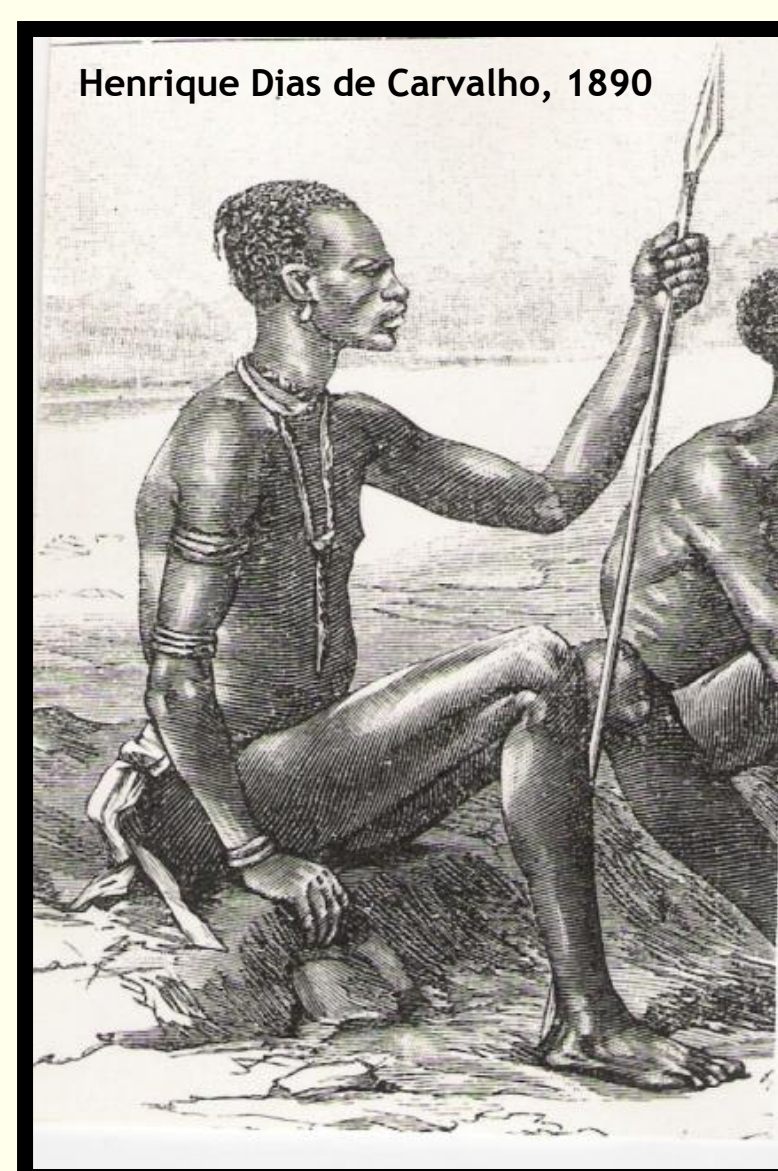
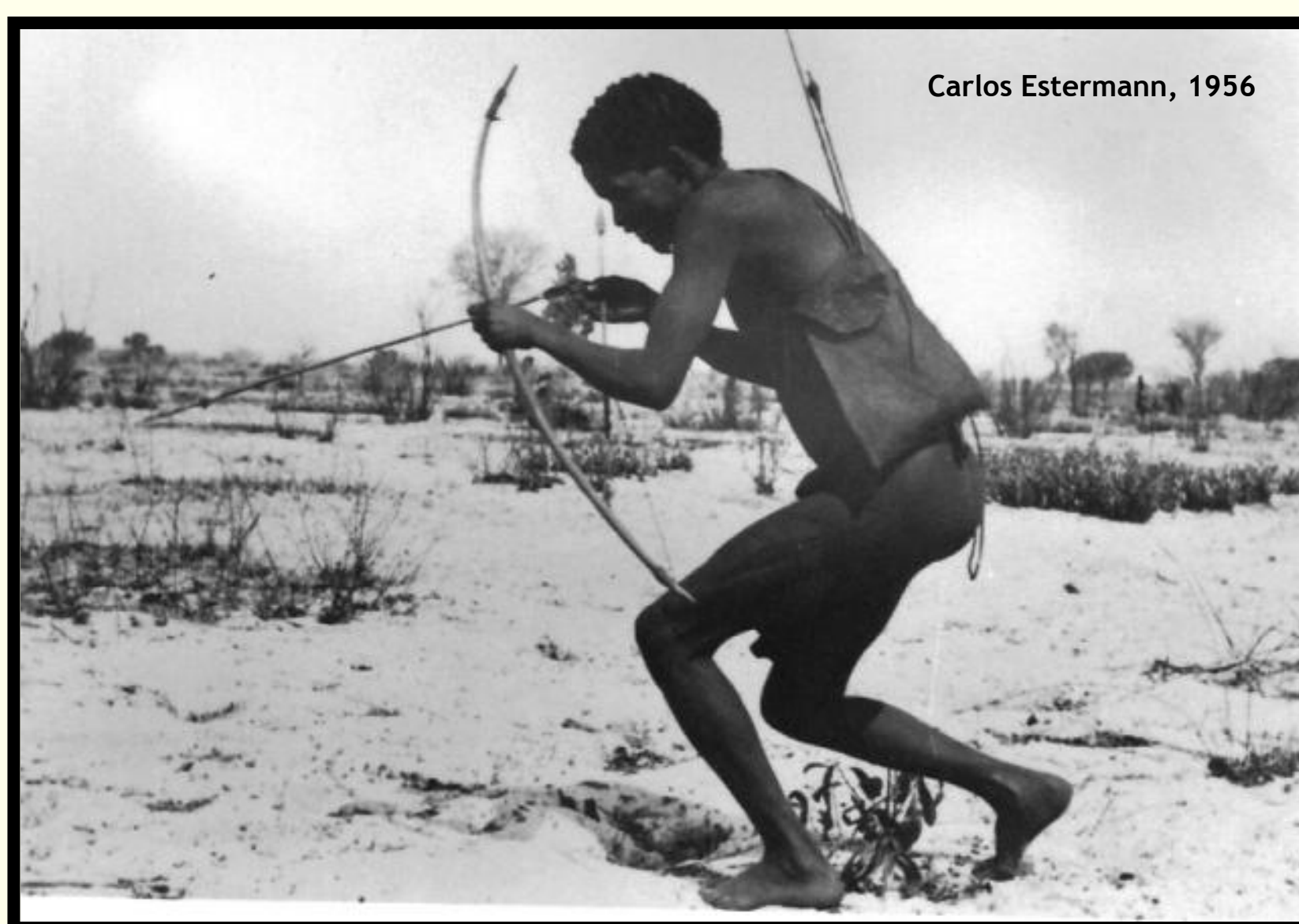
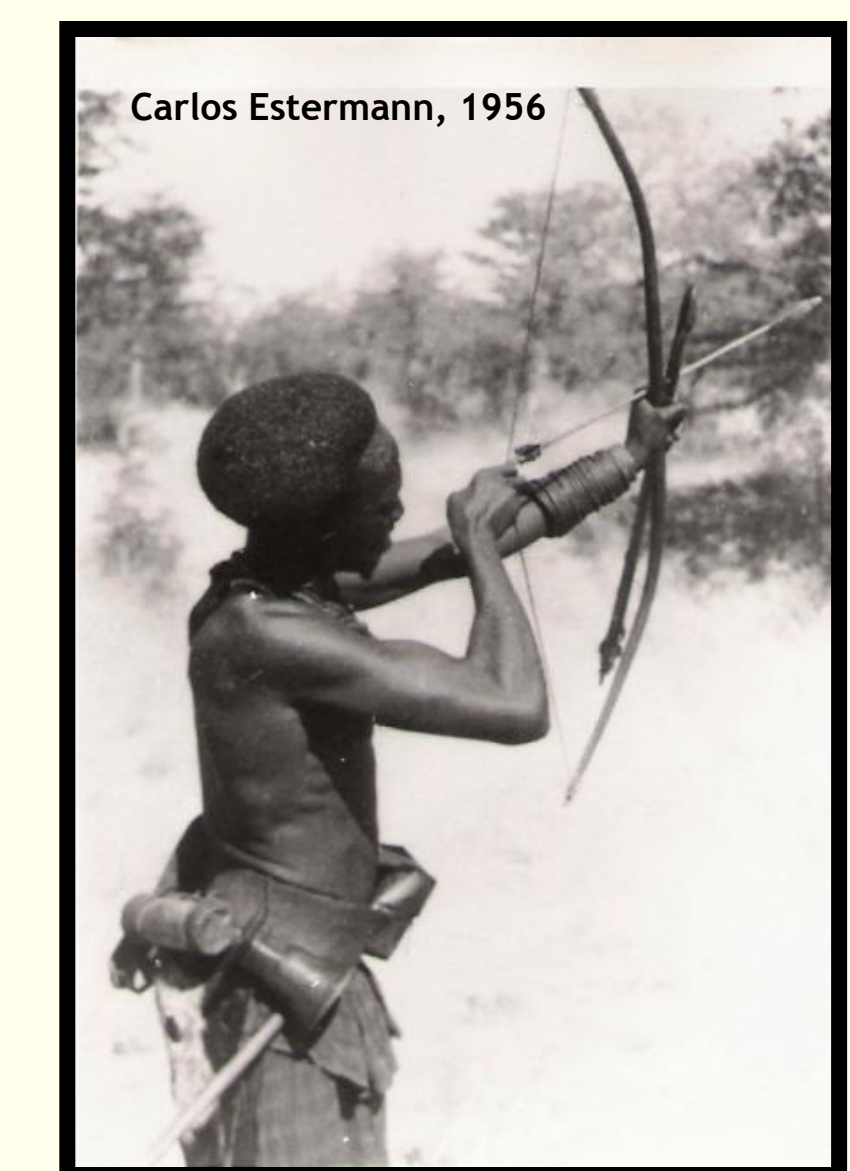
- Muscle insertion sites are morphologically complex⁹
- Lack of knowledge about the severity, duration and intensity of biomechanical forces
- Muscle groups respond to a complex mosaic of biomechanical stress^{9,10}
- Multifactorial aetiology⁹

As a result, a biocultural approach has been proposed bridging the biological information with historical and ethnographical data¹¹. In this unifying perspective, the comparison with traditional living groups, the ethnographic study of material culture, iconographic portrayals or writing documents comprises a significant source of meaning in everyday activities interpretation.

Goals

To consider the usefulness of iconographic collections in the difficult task of understanding the musculoskeletal effects of occupation in past populations. For pursuit this propose will be described a corpus of artefacts from Africa representing fishing and hunting activities and stored at the Museum of Anthropology at the University of Coimbra.

Hunting



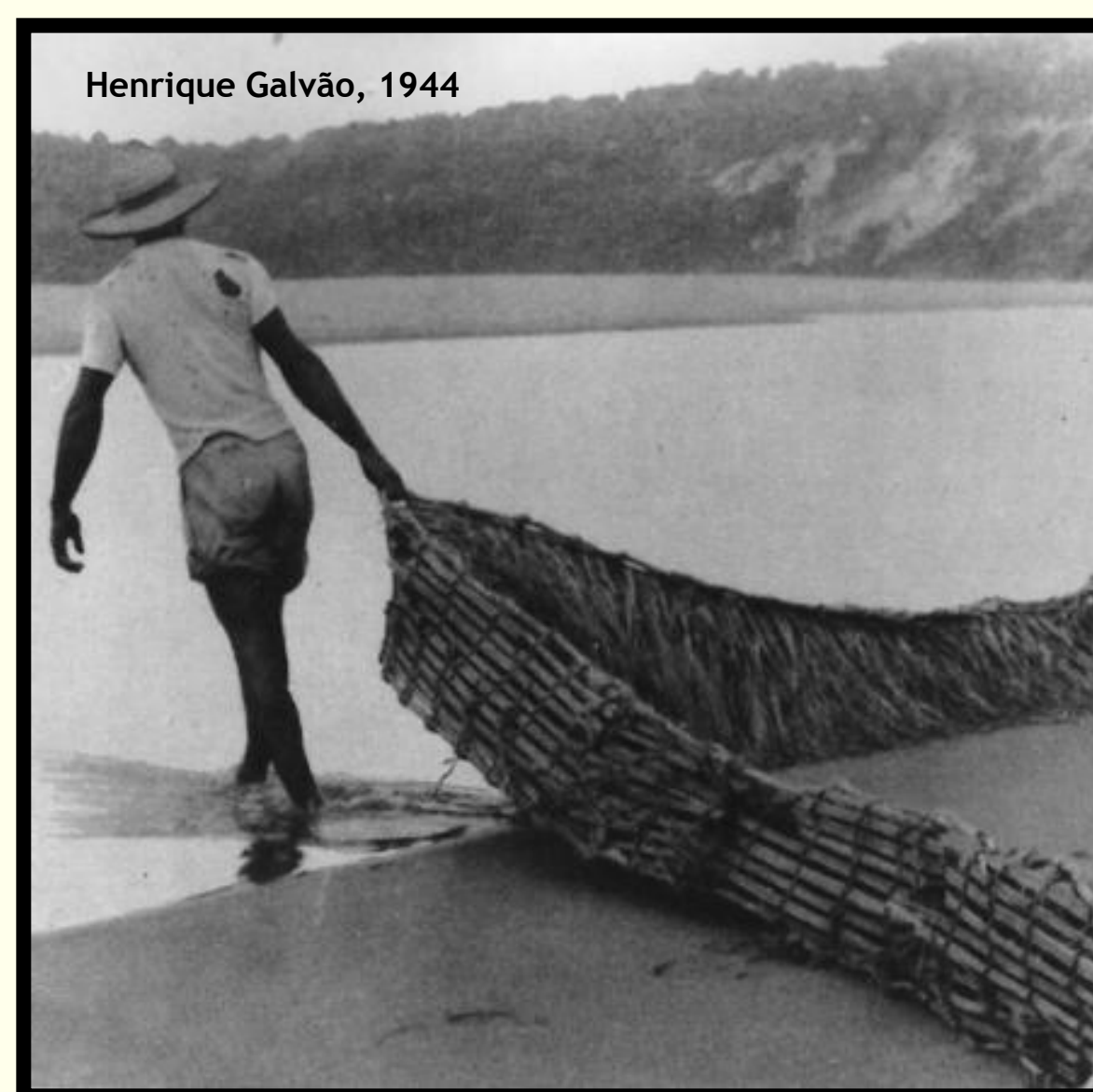
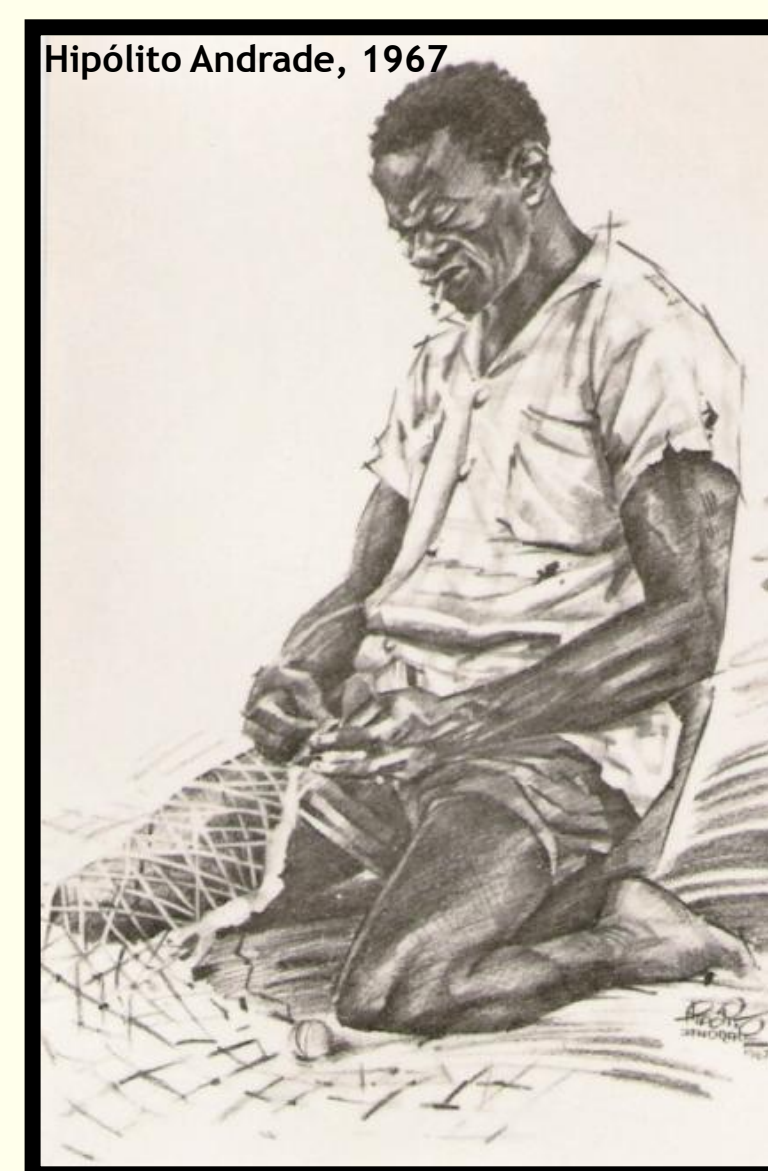
Angola Bochimanes or “Bushman”: nomadic groups that live in deserted areas from Low Cunene (Namibia desert). The costal populations gather fish, mollusks and plant roots. The inland groups are active hunters, using bows and arrows as hunting technologies.

Hunter with a lance, Lunda, Angola.

Ovimbundu, Angola, 19th c. (?)
 • Wood bow with leather extensors.
 • Iron blade with two pointed edges and a narrow depression to bow insertion.

Makonde hunter, Mozambique.
 Black wood sculpture

Fishing



Angola fishermen in a two paddle boat, transporting fish harpoons. Sculpture representation.

Fisherman from Kwanza river, Angola, repairing nets

Fishermen from Zaire, Angola, pulling a heavy fibre net

Men's from Mozambique Island manufacturing nets with toes help

Women's fishing in the river N'gangelá, Angola

Discussion

Archery movements are well known and include three-phases: the stance, the drawing and the sighting¹². In the considered cases, these behaviours are characterized by a similar body posture that involves extension/flexion of the upper limb. In addition, an asymmetrical use of the forearm and shoulder girdle is also noted. Biomechanically, these movements can produce extensor muscle fatigue and lateral epicondylitis at the elbow¹³. According to iconographic record, hunting is only performed by men.

Fishing is a complex activity that involves multiple tasks. Some of them are amply described (e.g. use of double paddle boat and its bilateral effect in the upper limb). However, for the remaining activities, it is difficult to trace the accurate movement pattern. Nevertheless, sexual labour division is noted in these African groups, with males fishing in the sea, manufacturing, repairing and pulling nets and women fishing in rivers and lakes and carrying fish baskets. Besides the interpretative limitations of the iconographic record, it can be useful as a comparative tool, in conjunction with biological and other ethnohistorical sources.

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