

Serge Cleuziou & Maurizio Tosi

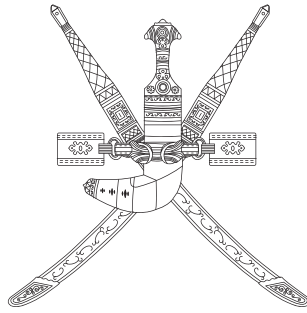
**IN THE SHADOW OF
THE ANCESTORS**

**THE PREHISTORIC FOUNDATIONS OF THE
EARLY ARABIAN CIVILIZATION IN OMAN**

second expanded edition

Edited by

Dennys Frenez & Roman Garba



Ministry of Heritage and Tourism
Sultanate of Oman
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Front cover: Alignment of Hafit type tombs at Al-Ayn © Roman Garba

Back cover: Hafit type tombs at Shihr Jaylah © Roman Garba

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Ministry of Heritage and Tourism

Sultanate of Oman

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Note: The maps in this book are historical and cannot be modified as they are specifically drawn for that period only and they do not reflect political, geographical and administrative boundaries. The Geographical Place Names (GPN) in these maps are not written by the Arabic Standardized Romanization System applied in the National Survey Authority of Oman (NSA).

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Preface to the International Release

To Build on Solid Ground

Muscat, December 2020.

Two years after the publication in Oman of the second expanded edition of «In the Shadow of the Ancestors: The Prehistoric Foundations of the Early Arabian Civilization in Oman» by Serge Cleuziou and Maurizio Tosi at the end of February 2019, in my capacity as Minister of Heritage and Tourism of the Sultanate of Oman, I have the honour of presenting to a broader audience the international release of this important volume, published by this Ministry in association with Archaeopress Publishing, Oxford, and distributed worldwide.

The continuation of this worldwide distribution policy, inaugurated at the beginning of 2019 with the international editions of the series «The Archaeological Heritage of Oman», highlights the pivotal role of the Sultanate in the region as an attractive destination for archaeological teams and scholars and as a member of the World Heritage Committee 2019–2023.

Overall, this publication can be seen as a symbol of the novel strategy that is being implemented by the Ministry of Heritage and Tourism to enrich our shared knowledge and legacy and to inform the international scientific community about the Sultanate.

Salim M. Almahruqi
Minister of Heritage and Tourism
Sultanate of Oman

Foreword to the Second Expanded Edition

Serge Cleuziou and Maurizio Tosi

Cornerstones of Archaeological Research in Oman

Muscat, January 2018.

Serge Cleuziou and Maurizio Tosi were actual cornerstones of the archaeological research in the Sultanate of Oman and important collaborators and advisers to this Ministry.

Their love for the history and people of the Sultanate made them lifelong friends and teachers of several generations of scholars still researching on the archaeology of Southeastern Arabia.

On many occasions, both private and public, they expressed their honor for being part in revealing the unique greatness of Oman's prehistory to the national and international academic communities. However, what touched me most was their sincere pride in having provided the people of Oman with information about their ancestors and how they created an original civilization based on those social bonds that still characterize our culture.

I was privileged to support the publication of their joint efforts in 2007. «In the Shadow of the Ancestors» was the first and only summary of decades of archaeological research in the Oman Peninsula. The book was widely distributed and it is now part of the most prestigious private and public libraries all over the world. This Ministry equally published the Arabic edition of that book, making it available for a greater and more diversified audience in Oman and in other countries of the Middle East.

Although both authors are no longer with us, their commitments and efforts deserve the highest respect and all the possible means to perpetuate their memory and the importance of their work. Therefore, this Ministry invested considerable resources for the publication of this new and significantly expanded edition. The new contributions by a younger generation of scholars, most of whom were students and collaborators of the authors, can be in fact regarded as the actual legacy they left and the highest homage to their memory.

Haitham bin Tariq Al-Said
Minister of Heritage and Culture

Editorial Note

A Posthumous Expanded Edition

Dennys Frenez & Roman Garba

This second expanded edition of «In the Shadow of the Ancestors. The Prehistoric Foundations of the Early Arabian Civilization in Oman» by Serge Cleuziou and Maurizio Tosi had a long and winding journey toward publication. The passing away of Serge Cleuziou not long after the release of the first edition left Maurizio Tosi alone in completing this challenging enterprise. For this reason, and out of respect for his lifelong friend and colleague, he decided to not intervene massively on the main contents, but to add instead to the original eleven chapters a number of new «Windows» written by other scholars, in order to include more recent research and interpretations .

Sadly, Maurizio suddenly passed away before he was able to complete the review of several parts of this second edition. Unfortunately, he did not leave an updated version of the official acknowledgments. He would have certainly thanked again and again the members of what he often called his «tribe», the Ministry of Heritage and Culture (now Heritage and Tourism), principally His Majesty Haitham bin Tariq Al-Said, who at the time was still the Minister of Heritage and Culture, continuing with His Excellency Sayyid Faisal bin Hamud Al-Busaidi, then Adviser to the Minister; His Excellency Salim bin Mohammed Almahruqi, then Undersecretary for Heritage Affairs and now Minister of Heritage and Tourism; His Excellency Hassan bin Mohammed Al-Lawati, Adviser to the Minister for Special Projects; Sultan bin Saif Al-Bakri, Director General of Archaeology; Rahma bint Qasem Al-Farsi, Director General of Museums; Biubwa bint Ali Al-Sabri, Special Adviser to the Minister; Khamis Al-Asmi, Director of the Department of Excavations and Archaeological Studies; and all the Ministry's employes who always treated him as a wise father and helped him to face the daily struggles of a complex life. Last but not least, his friend Khamis bin Nasser Al-Amri from Ras Al-Jinz. In the National Museum, Maurizio would certainly have thanked Jamal bin Hassan Al-Moosawi, the Director General, and Mouza bint Sulaiman Al-Wardi, Head of Studies and Research.

There are so many colleagues and friends to whom Maurizio was sincerely grateful. If we attempt to list them, we would no doubt make some serious omissions. However, Maurizio would never have forgiven us if we do not mention at least Maurizio Cattani, Vincent Charpentier and Paul Yule. Moreover, in addition to those already acknowledged with Serge in the first edition, (in alphabetical order by name) Elena Maini, Francesco Genchi, Gianluca Regoli, Lapo Gianni Marcucci, Luigi Lena, Maria Pia Maiorano, Philip Koch, Romolo Loreto, Sabatino Laurenza, Simone Mantellini, and all the students and collaborators who participated in the projects he organized and coordinated during decades of research in the Sultanate.

A special thanks to Roberto Raffi, Giò Morse and Clive Gracey for having been «loyal friends» during his last years in Muscat and Ravenna.

Sincere thanks also to the authors of the new «Windows» that enrich and update this second expanded edition, as well as to Ibtisam Abdullah Ali Al-Mamari and Salim Mohammed Salim Al-Hajri for the thorough review of the final manuscript.

We do hope Serge and Maurizio would have been proud.

This book is dedicated to every researcher and academic scholar who by their effort and time committed to recover the early civilization of Oman.

It is also dedicated to the Ras Al-Jinz community of fisherfolks who collaborated in revealing the glory of their distant ancestors. And finally, to the people of Oman who belong to this glory.

Acknowledgements *

This volume is the result of many years of work in Oman and the ideas and opinions expressed in this book are of course those of the authors themselves: we owe thanks to several people who have helped with this volume in one way or another. First of all, we are very thankful to His Royal Highness Sayyid Haitham bin Tarik Al-Said, Minister of Heritage and Culture (*His Majesty the Sultan of Oman since 11 January 2020*, Eds.), who has disclosed for us the unique possibility to direct our scientific commitment towards a fuller enhancement of Oman's great historical contributions to Mankind.

Thanks are due to His Excellency Eng. Sultan bin Hamdoon Al-Harthy, the Undersecretary for Heritage in the Ministry of Heritage and Culture, who shared with us the everyday problems in rediscovering the rich tapestry of Oman heritage. A cornerstone contribution in the architecture of our recent work in Oman is represented by Mr. Hassan Mohammed Ali Al-Lawati, Director General of Archaeology and Museums. When we started working in Oman, many years ago now, the Minister of Heritage and Culture was His Royal Highness Sayyid Faisal bin Ali Al-Said, a man of great generosity whose open attitude encouraged our work and gained a perpetual memory of great deference.

Since the very beginning, our work in Oman has been sponsored and assisted by the Department of Antiquities of the Ministry of Heritage and Culture (*now Department of Excavations and Archaeological Studies, Ministry of Heritage and Tourism*, Eds.): Doors were wide open as nowhere else in the world of our wide experience, including our home countries. To say «there was collaboration with the Authorities» would be a rather diminutive statement for the welcome, sympathy and assistance we always got, year after year, project after project. Our ideas once turned into proposals were met always with attention and support. In fact, this book is the result of a great mutual respect that over the years has turned into a solid friendship with all the people working in the Department. First of all we would like to thank the early Directors of Antiquities, Dr. Paolo Costa (1976-1979) and, in particular, Dr. Ali Ahmed Bakhit Al-Shanfari (1979-2004), who was for both of us a true companion for a quarter of a century. Furthermore, our gratitude goes to the present Director of Excavations and Archaeological Research, Ms. Byubwa Ali Al-Sabri, who has been the energy and will behind this book and other projects that are changing the face of Oman's archaeology. Aside we owe gratitude and respect to the other lady of the Department, Ms. Rahma Qassim Al-Farsi, Head of the Archaeological Studies Section (*now Director General of Museums*, Eds.), who greatly participated in the editing work and whose gentleness has most contributed to the sympathetic atmosphere we encounter in the Ministry. Without them this book never would have been realized. After many years of encounters and discussions, thanks are due to the gruff temper of Arch. Enrico D'Errico, Adviser to the Ministry of Heritage and Culture, who has brought in this furthestmost Arab land the Tuscanian genius for cultural conservation.

Our special thanks go to our friend Sheikh Nasser bin Ali Al-Amri, the gentle head of the small Ras Al-Jinz community of fishermen, who have so generously assisted us for twenty-five years of archaeological exploration to recover the glory his land and to his two elder sons, Khamis and Ali. Ras Al-Jinz, our main «home» in Oman for so many years, is not only an extraordinary archaeological site but also a beautiful and highly significant natural reserve, into which the collaboration between archaeologists, conservationists and rangers was always friendly and efficiently managed by Dr. Ali Al-Kiyumi, Director of Natural Reserves and a renown expert of those turtles, that for long time preceded humans in the appreciation of this easternmost corner of Arabia.

* *Acknowledgements were written in 2007 and unfortunately not updated before the authors' death.*

Many people – too many to mention – helped us to complete this volume: only a few can be explicitly acknowledged here. Eng. Mariangelo Lampertico ought to be mentioned first since he was the very first person who suggested and promoted this book that originally had to be published by a private company. In particular we are indebted with many among the friends and colleagues who have been working with us in the Joint Hadd Project since 1985. Archaeologists, geologists, anthropologists or natural scientists, they have all shared with us ideas and work, paving the way for the scientific advancements that are at the core of this book: Jean-Francois Berger, Paolo Biagi, Olivier Blin, Luca Bondioli, Alfredo Coppa, Maurizio Cattani, Fabio Cavulli, Vincent Charpentier, Lorenzo Costantini, Mauro Cremaschi, Silvio Durante, Jean-Jacques Glassner, Jessica Giraud, Herve Guy, Fidelity and William Lancaster, Curtis Larsen, Sabatino Laurenza, Anne-Marie Lezine, Roberto Macchiarelli, Sophie Méry, Cecile Monchablon, Olivia Munoz, Jean-Claude Plaziat, Stefano Pracchia, Marcello Ranieri, Jean-Francois Saliege, Sandro Salvatori, Geraldina Santini, Donatella Usai. Many of the thoughts on the relations between animal and men spread across the text were generated by working in close connection with two friends of great science and experience: the late Sándor Bökönyi and Hermannus Grobler. The support of many colleagues who have directed important projects in Oman and the UAE is evident throughout the text by their contributions included in this volume, where they share with us thoughts and data still largely unpublished. Their texts, framed within our chapters have greatly enriched the presentation. They are all named in the book and deserve our thanks not only for their work but also for the confidence in the use we made of it.

We sincerely thank Hélène David-Cuny for her very able assistance with the beautiful maps and drawing prepared for this volume. For specific help in gathering together the strands of scattered data we would like to thank Alessandra Lazzari and Victoria de Casteja. The imaginative vignettes that reproduce the first hunters of Arabia are the fine workmanship of Giorgio Albertini, widely recognized master artist in portrayals of past life.

However, we should stress that any faults or errors remains entirely our own responsibility. Such long-term work could hardly be carried out without the help of many people all over the country, and here again it would be impossible to name all of them. The very beginnings of the field project at Ras Al-Jinz, at that time a very remote part of the country, would have been almost impossible without the encompassing help and deep friendship of Maj. William Foxton. Along with him came a sequel of Omani and British officers of the Sultan Armed Forces: their skillful assistance and patience are acknowledged with gratitude. Particular thanks for help are also due to Mr. Jean-Paul Breton of BRGM Oman.

At the end we must acknowledge the skillful forbearance of our editor Professor Adrian Roscoe for the very high standards of his revision work. The English language is a misty countryside of towering cliffs and hidden pathways that we would have never crossed without his guidance. Well might we write with the same words of Dante's *incipit* of «The Divine Comedy», still the best representation for the condition of all lost travelers, real and virtual alike:

... mi ritrovai per una selva oscura ché la diritta via era smarrita. Ahi quanto a dir qual era è cosa dura esta selva selvaggia, aspra e forte che nel pensier rinnova la paura!

... I found myself within a forest dark, for the straightforward pathway had been lost. Ah me! How hard a thing it is to say what was this forest savage, rough, and stern, which in the very thought renews the fear!

Serge Cleuziou & Maurizio Tosi
Paris & Ravenna, June 1st, 2007

Chapter 1

A Land of Many Landscapes for Greater Opportunities



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Chapter 1

A Land of Many Landscapes for Greater Opportunities

Historians, and archaeologists among them, love to reduce complex issues to lapidary sentences. They hope to impress others by conveying an immediate message in very few words: «Egypt is the child of the Nile» is the best example of this kind of statement. Since the Egyptian priest Manetho wrote it 2300 years ago to explain his country to the new Greek rulers, this sentence has been quoted thousands of times, disguising the fact that Egypt as a country was in reality made not by the river floods, but by its own people. It was a land of swamps where hippos and crocodiles had a great life. To turn it into a land of plenty, one of the richest countries in history, its inhabitants did an immense work over millennia. So we could start this book by telling you that Oman is the child of the marriage of mountains and sea, only to cover the fact that also behind its early civilizations there is a lot of work done by men and women, who in the few years of their average lifetime, generation after generation, transformed a desert country of scarce and erratic resources into a milestone of human progress. This process of transformation through time is the story this book will try to tell you, piecing together the clues emerged from a few scattered ruins.

The modern concept of «civilization» was developed in the eighteenth century during the Age of Enlightenment, to explain the whole of values, institutions and traditions of greater achievement shared by the populations of a region in a given period of time. The word is taken from the Latin *Civitas*, identical to the Greek *Poleis*, by means of which the ancient Romans indicated the city as a complex of political institutions and social relations that created a superior form of life. Till fairly recently historians and common people alike were accustomed to identify civilizations with the urban societies, thus considering any social and political

system other than cities as primitive or, to say it with the Greeks, barbarian. In Aristotle's vision of the world, cities were the flywheel that created wealth and progress from social complexity. It was no coincidence that for the ancient Greeks, the greatest heroes were city founders.

Concurrent advancements of anthropology, sociology and archaeology during the twentieth century have deeply questioned this close association between urbanism and civilization as a form of superior social life. Cities were increasingly viewed as an effect and not a cause of the new order: the product of efficient political structures able to integrate in a single space different groups in spite of their diversity of interests, traditions and cultures. «States», the highest form of political structures, were then regarded as the key factor for the establishment of the earliest civilization. In an evolutionary perspective, this viewpoint made a lot of sense. The expansion of social and economic complexity would have required higher levels of political integration and more sophisticated forms of government, abandoning kinship and lineage relations as the basis for the legitimization of power. Although over the whole world the extended family remained the primary aggregation, authority over increasingly larger territories and population required specialized institutions for control and management: kingship took the place of kinship.

Once the focus of attention was shifted to the emergence of states, it became evident that cities were not the only possible outcome. Other forms of «civilization», equally based on complex relations and political structures, developed across the Old World. We may mention the hordes of the steppe nomads across Eurasia, the tribal federations of Arabia or the peer-alliances of elders that ruled most of Europe before the Roman conquest.

The equation between civilization and city has become too restrictive to cope with the diversity of political forms that expressed social complexity. It is then to be substituted with the equation between civilization and state, where the latter means *any* complex form of institutionalized government that allows the coexistence of different groups within a single political system. What we call «civilizations» are systems determined by diversity, in their formative process as well as in their highest achievements.

It is true that there are neither pyramids nor temples nor written clay tablets to witness the early civilizations of Oman in a way that speaks directly to the people. But science, knowledge and perseverance have made possible to disclose past greatness from hidden clues. The archaeology of Oman is very young: forty years, not even two generations of scholars. Also, the historical and geographical conditions of the country are somehow unique, to the point that very little use could be made of the experience gathered in neighbouring countries like Iran, India or the Mesopotamian heartland of civilization between Iraq and Syria. Alike in the rest of Arabia, the evolution of social complexity in Oman was very different. While countries along the Nile, the Euphrates and the Indus established their own civilizations on hierarchies, administration and royalty, the Arabians took another way. The common foundations of traditional Arabian society were built on the family: lineage, kinship, group feelings and the belief in common ancestry, regardless whether real or fictitious, tied the bonds among individuals.

This diversity did not prevent Arabia from developing her own civilization, in spite of the open and continuous exchanges with the other countries of the Middle East. To appreciate her particular contribution, we need to begin by disputing any reductive definition of civilization. The words of Ibn Khaldun explain very soundly that the quality of civilization is measured by the degree of social cohesion:

The existence and persistence of the human species can materialise only through the cooperation of all men in behalf of what is good for them. It has been established that a single human being could not fully exist by himself [...] Consequently, social organization is necessary to the human species [...] God's desire to settle the world with human beings and to leave them as His representatives on earth would not materialise. This is the meaning of civilization.

Al-Muqaddimah, ch. 1,1.

A civilization is not a pile of stones or a gallery filled with wonderful paintings and statues, the way any tourist in Egypt or Italy is made to believe. «Civilization» is the name we give to the most complex systems created by humans to enrich and rediscover themselves. It may have no material heritage, disappearing without traces for future archaeologists. Not one but many «Atlantis» have sunken in the Ocean of oblivion before us. As students of the past, our goal is to rediscover these lost continents of human achievements from the most dispersed and obscure clues.

It may sound too romantic, but it is out of question that archaeology is a discipline that works to recover from sherds and ruins memory of men and women since long extinguished. This resemblance is not accidental: archaeology as a discipline came into being in Europe exactly during the age of Romanticism, between the end of the Eighteenth and the beginning of the Nineteenth centuries. As the French Revolution and the turmoil brought across Europe and beyond by the armies of Napoleon ended the power of kings and aristocrats, the life and expectations of individuals became the centre of political and philosophical thought. The new nations and their elites turned to a different vision of the past, outside the bonds of religion and dynastic order, looking for new sources of their legitimization. People and no kings would make the law.

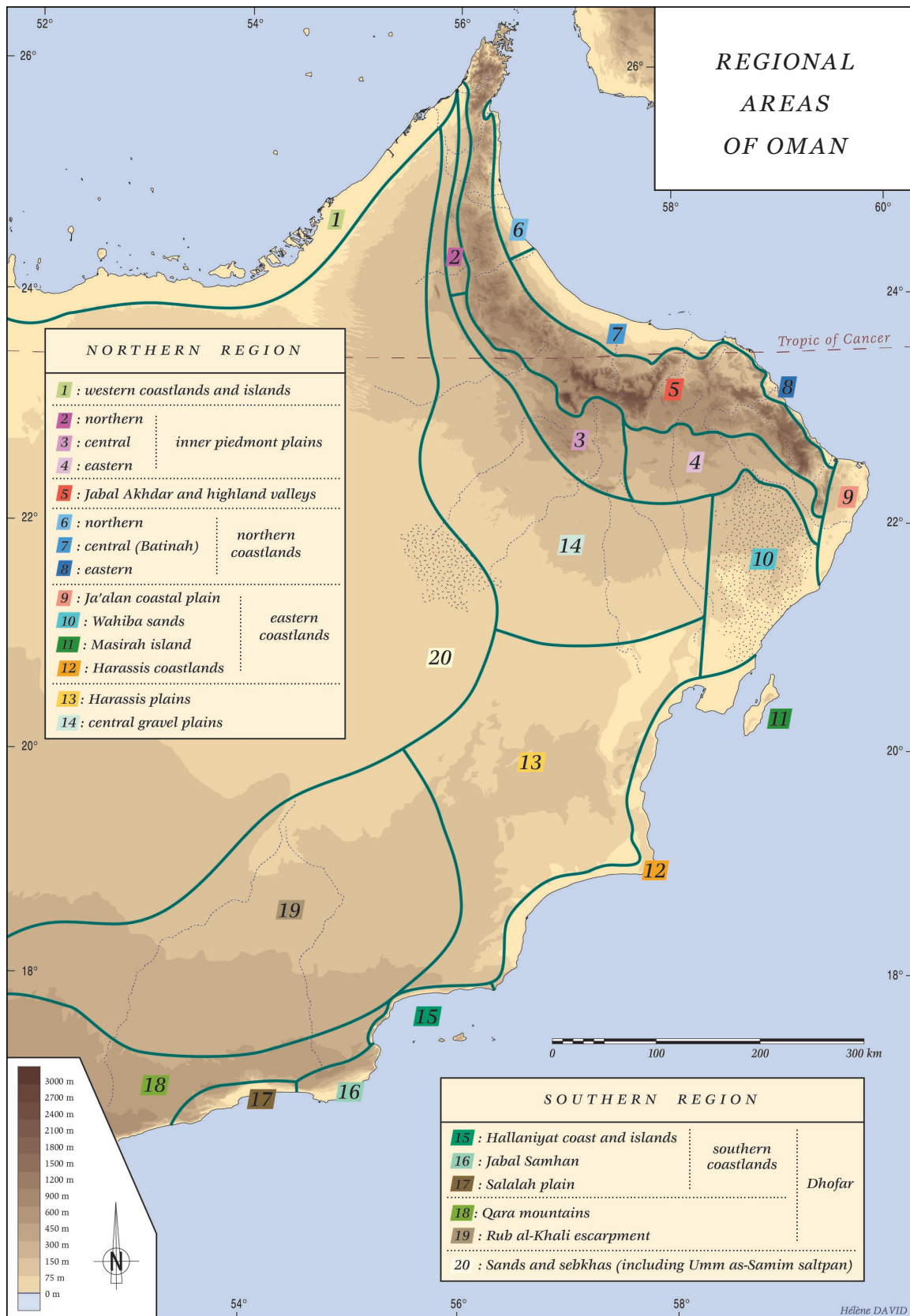


FIGURE 1. Main regional divisions at Oman according to the ecological zones and the distribution of natural resources, both determinant for the economical bases for human groups in Prehistoric times. Coasts, mountains, deserts and plains determine the different compartments of the early human populations (map by Hélène David-Cuny © 2006).

Since poets know how to say things, there is no better witness for that new vision than the verses of one of the most remarkable voices of that time, Percy Bysshe Shelley (1792-1822) in his *Ozymandias*:

*I met a traveller from an antique land,
Who said: Two vast and trunkless legs of stone
Stand in the desert. Near them, on the sand,
Half sunk, a shattered visage lies, whose frown
And wrinkled lip and sneer of cold command,
Tell that its sculptor well those passions read,
Which yet survive, stamped on these lifeless things,
The hand that mocked them and the heart that fed.
And on the pedestal these words appear:
«My name is Ozymandias, King of Kings:
Look on my works, ye Mighty and despair!
Nothing besides remains. Round the decay
Of that colossal wreck, boundless and bare
The lone and level sands stretch far away.*

An Island between desert and sea

To trace backwards the earliest history of Oman and attempt to explain its unique pathway to civilization, we need to begin from its geography. This is not because landscapes rule people. Since fire was brought under its control some half a million years ago, our species has been perfectly equipped to master his environment and to transform plants and animals into resources. Humans brought under control their environment at every latitude, but the form of this control has changed accordingly. As a consequence, the culture and eventually the civilizations they produced through time were different. For many of us, this diversity is the most remarkable character of Mankind and to retain it is essential to our future. If understanding the past means to explain the essence of our diversity, then the study of the past becomes important for the future.

As we stated in the opening paragraph, mountains and ocean have combined to direct the history of Oman. A sea of water marks its northern and eastern rim while a sea of sand encloses the country to the south. We may describe Oman at

best as an «island within an island», because the mountains that have arisen to divide the sea from the desert at the edge of the Ocean, in front of India, emerge within another «island», the *Jazirat Al-Arab*, as it was called by its own inhabitants. The Arabian Peninsula itself is closed on three sides by the sea waters and on the fourth one by rivers and lakes: the Euphrates, the Jordan, the Dead Sea. It is like a game of Chinese boxes: one world is locked inside the other.

The six hundred kilometers long Hajjar mountains wind their way across the whole of Oman, from the Musandam headlands to the Ja'alan, with a face on the Indian Ocean and another on the Great Desert. There is no point in Oman where you see no mountains, unless you moved a long distance across the desert or the sea, but at that point you are outside of it.



FIGURE 2. Holy and precious headwaters: a natural pool from a fresh water spring in the Omani mountains, here at Wadi Al-Arbayn (photograph Joint Hadd Project).

The mountains have made the identity of Oman, and were the source for most of its wealth. The maximum altitudes reach around 3000 metres at Jabal Sharm in the Jebel Akhdar massif, roughly at the centre of the long ridges. It is almost a continuous wall, thirty to fifty kilometers wide, broken by few river courses flowing along tectonic fault lines. There are four main corridors to cross the mountains: to the north the Dhayd – Fujairah corridor and the Wadi Jizzi, between Buraimi and Sohar; in the centre the Sumayl Gap, the widest highway, connecting Nizwa to the eastern Batinah and the Capital Area; to the east the Wadi Fulayj linking the Wadi Al-Batha to the port of Sur.

Access to the sea from the interior is also possible without passing through the mountains, by moving along the inner piedmont plains, to the north at Ras Al-Khaimah or crossing short desert distances till Dubai and Abu Dhabi, while to the south the Wadi Al-Batha corridor ends in a series of lagoons stretching between As-Suwayh and Ras Al-Jibsh, against the Sharqiya (Wahiba) Sands. It is a very compact country and at the same time a very open one.

Although the mountains are so ubiquitous, no part of the country has been denied access to the sea waters. This has meant that since prehistoric times no group was really separated from either of the two main sources of wealth, the sea and the mountains. For this reason, it is meaningless to say that Oman has been made of two distinctive countries, with two parallel histories. On the contrary, its essence has been in the early unity of these two geographical elements: the archaeological remains indicate that to a larger extent the integration between the coast and the interior may be traced back to at least 6500 years ago.

Cut across by the Tropic of Cancer, the Omani mountains are situated between 22° and 24°30' of northern latitude. In the classifications by geographers, the whole country is included in the subtropical zone of arid climates. With the exception of the highest parts of the Jebel Akhdar, temperatures remain high all the year round, while average rainfall remains very low, ranging throughout from an annual 101 mm at Nizwa to 77 mm at Sohar, well below the 250 mm conventionally accepted as the boundary of aridity.

FIGURE 3.

No man's land: sand dunes in the desert, towering over the road to Salalah. But the alliance of humans and camels overcame the empty broad expanses, turning Arabia into the only desert land on earth where humans could live and prosper (photograph Joint Hadd Project).



Although far too scarce for the dry farming of any crop, these rains have been sufficient to create the conditions to establish a very successful agriculture by supplying a widespread constellation of aquifers and springs all around the mountains. The geological structure of permeable limestone over impermeable metamorphic rocks is such that water is rapidly stored under the ground for long periods of time, feeding a large number of upstream ponds. These abundant water supplies have acted as natural storage facilities and to make Oman a country by itself within the Arabian desert. Of course, to channel these water reserves into the necessary irrigation for growing crops and trees has required a lot of ingenuity and skills piled by millennia of hard labour, in an investment millennia long. The *falaj* system as we see it nowadays is the ultimate result of a long history, but to a large extent it was accomplished some 5000 years ago. The techniques to capture, transport and stock water were already developed around 3000 BC, when the first oases came into being along the Omani mountains.

The water factor

Under natural conditions, not all the rains will end in filling ponds and underground aquifers. On the contrary, most of the water flows along the slopes cutting crevasses and gorges to feed an intricate lattice of streams, rarely reaching the sea. Most of it is dispersed in vast imbricated deltas along the border between desert and mountains, building alluvial plains and evaporating in the air. The rocks are broken by the water, limestones before the harder metamorphics, but all through time end up along the riverbeds, crushed into boulders, gravel and silt. Many different plant communities crowd along the banks and the bottom of the winding streams. If one looks from the air these arid mountains appear grooved by stripes of green, marking the passages of water. When waters are not drained for farming, bushes may crowd into thickets, growing downstream into riparian forests, known across the Middle East with the Persian word *jangal*.



FIGURE 4. Man-made environment created by an artificially concentrated biomass: Bahla, a lowland oasis, and an historic town at the heart of the Oman interior, developed after the Bronze Age along the water-rich piedmont plains. As elsewhere in all arid lands worldwide continuity of wealth and settlement are directly related to a constant water supply (photograph Joint Hadd Project).

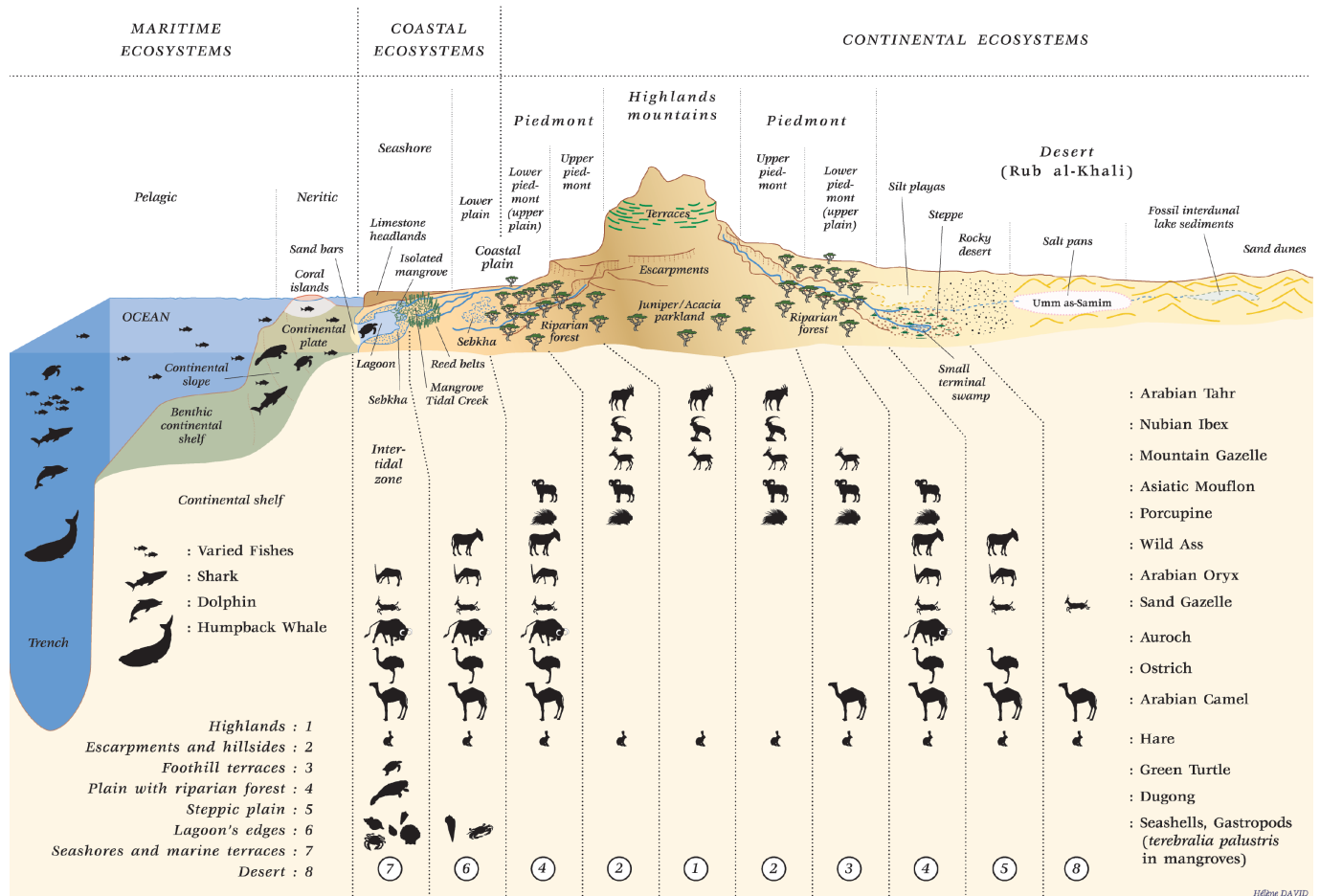


FIGURE 5. Ecological zones across Oman’s tectonic crest and the wild animal populations that lived in them. This schematic section groups the main ecosystems of Oman, from pelagic waters of ocean depth to the highlands of Jebel Akhdar and beyond to the salt marshes in the Rub Al-Khali. It indicates the main sources of food that were available to the prehistoric population segments. Specialization, seasonal scheduling and patterns of alliance fostered regular exchanges expanding the subsistence base of each group. As part of subsistence strategies, trade became embedded in the Arabian society at the dawn of history (image by H el ene David-Cuny   2006).

Further down, the flow of water opening into the plains, winds its way across the earlier sediments, broken into smaller and smaller channels, to form alluvial fans of fertile soil. At the end, sand or sea will claim the last water. In the north, watercourses merge into the sea, where the freshwater meets with the marine environments forming creeks and lagoons, the richest biotopes in the country. In the south, the desert swallows the waters coming from the mountains, in a mosaic of different situations, each endowed by different plant communities. This was the original home for herds of many different animal species adapted to the most arid conditions, and will be transformed into the grazing land of the Bedouins, the truest of the Arabs in Ibn Khaldun’s vision:

The desert is a place of hardship and starvation, but to them it has become familiar and accustomed. Generations of Bedouins grew up in the desert ... their defence and protection are successful ... [because] they are a closely knit group of common descent ... Clearly the Bedouins are closer to be good than sedentary people.

Al-Muqaddimah, chapter 2, 4-7.

Beyond the last of waters begins the realm of sand. The ancient sediments are blanketed by moving dunes at times a hundred metres high. White patches of silt broken by the wind indicate the remains of lakes as last witnesses of past climates,



FIGURE 6. Taming the slope with pockets of soil: terrace cultivation at Bilad Sayt, in the highlands of Jebel Akhdar. Here at Wadi Bani Awf dew complements the underground waters: the «other wadi» (photograph Joint Hadd Project).

when Arabia was already arid but still colored by hundreds of small and large water bodies surviving among the dunes or along the dry escarpments. Some lake sediments are still covered by vast deposits of salt, another remnant of the dead waters like the Umm as-Samîn. The dry courses of the largest riverbeds of inner Oman, like Wadi Andam, are still converging into these vast depression, making us dreaming of green valleys and blue lakes that probably were never there for more than few days. There is no lost paradise to be found among the wastelands of the Empty Quarter, but a much more interesting history of endurance, bonding animals and humans alike, in their capacity to survive through adaptation to the vagaries and hardness of climate. Radiocarbon has confirmed that these water bodies were active mostly sixty to fifty thousand years ago, surrounded by a lush tropical vegetation, as proven also by the bones of hippos and buffaloes. They dried several times and the last lakes in the Rub Al-Khali have been dated between the eighth and the 5th millennium BC.

The relations of humans with these erratic environments between water and desert are recorded through the millennia by thousands of flint scatters, the remains of campsites pinpointing all kinds of situations, from the terraces at the edge of present oases to the innermost sand dunes, in the middle of nowhere. These scatters, indicate that, from very early times, small groups of hunter-gatherers would have taken advantage of all water sources and the many different plants and animals that lived from them, between the vast *jangals* and the smallest thickets around water holes. It is evident that the history of Oman begins long before agriculture became practised towards the end of the 4th millennium BC.

The richest biotopes were related to the most permanent water sources: the aquifers within and around the mountains and the coastal lagoons. Here settlements might have been possible even before agriculture, allowing human groups to live at the same place with enough for the whole year round. Springs and streams are not the only water available.

Dew is the other one: suspended in the air with billions of tiny drops, it provides a significantly large amount of water, spreading also far away from the river beds. Many plants and animals are adapted to live by taking water directly from the humidity of the air. Gazelles and other animals feed almost exclusively on these drops, and often they can go weeks without drinking. Provided there are the conditions to keep this suspended moisture for a few hours during the early part of day, before wind and heat disperse it, even dates and other fruits can be made growing in the sands of the most scorched desert. From Morocco to Arabia, the *Bedu* know this very well and with a beautiful expression call it «the other wadi». Because dew was abundant and resistant in the narrow valleys across the Omani mountains, human life was not limited to the water corridors but could spread all across the hills and piedmonts with a wealth of food available.

Farming is more suitable where the sediments are the finest and cultivation has developed mostly on these alluvial fans. But, as everywhere in the arid lands all over the World, the easiest water and the most fertile land are at quite a distance from each other. Intensive cultivation required that they would be brought together and, since water is easier

to move than soil, the history of agriculture in those countries has been mostly paced by that of irrigation. It is the force of gravity that transports downstream the water and the skill is to direct this natural flow with minimal costs in terms of efforts and dispersal. By cutting small fields along the upper terraces and removing the stones embedded in the ground, more farmland has been rescued after centuries and greater fatigue in the upper sections of the rivers, closer to springs and ponds of natural storage. The agriculture of oases has been a continuous process and over the millennia labour has turned Oman into a garden land, an Eden of fruits and crops where humans not only could live but extend their wealth and knowledge alike through travel and trade. The taming of the desert and that of the ocean have been two sides of the same coin minted by Omani endurance and ingenuity.

The mountains as a source of biodiversity

The mountains are the essence of Oman and from the earliest times the guideline to its history. Few regions in the World have been so directly conditioned by plate tectonics. If we can use an imaginary vision from our European archetypes,



FIGURE 7. The dense clustering of houses and cultivation in a village of Wadi Bani Awf, closely shaped by the aquifers as a glove around a high limestone outcrop (photograph Joint Hadd Project).



FIGURE 8. The work of many generations and the symbol of a lasting alliance at the edge of the Great Arabian Desert: the vast oasis cultivations of Sinaw (photograph Joint Hadd Project).

the Omani mountains look like an immense sleeping dragon lying with head and tail on the ground and the huge back raising in the centre. The head is in Musandam, the tail curls with the Wadi Al-Batha around the Wahhiba sands. Or the other way around, it makes no difference. The blood flowing from its vast belly gives life to the fertile lands around it: Nizwa, Bahla, Ibra, Rustaq, Nakhal and many more. The Sumayl gap cuts it across as one deep slot. Throughout Eurasia, from China to the misty Germanic dreams of hidden treasures and glorious fights, the dragon is the symbol of heavenly force and eternal life. It might not have had the same meaning for Sindbad and the oriental customary visions of sun and light, but we still feel it appropriate to mention here also for those European compatriots who by crossing those mountains as occasional visitors, may be deceived by their barren appearance, and not realize they were the main source of life for the Omani civilization.

Quite differently from the plateaux of Dhofar and Yemen to the south, or the Makran chains to the north, the Omani mountains are a single, compact, continuous and narrow ridge, not more

than sixty kilometers at its widest point. An ideal cross-section running NNE-SSW from Barka on the Batinah coast all the way south to the Umm as-Samim depression, for over three hundred kilometers, very clearly shows the wrinkling of the lofty Jebel Akhdar that plunges down abruptly on both sides to the sea and the great inner desert alike. In only sixty or so kilometers, the ground rises from zero to three thousand metres above sea level. At a distance of only ninety-five kilometers from the coast, we drop to five hundred metres near the water-fed oases of Bahla and Nizwa. Further south, the slope becomes more gentle and regular for some two hundred kilometers till the salty depressions at the edge of the Rub Al-Khali. Across the first hundred kilometers of the cross-section, the Jebel Akhdar represents a true «wall» between the coast and the interior.

From the flat surface of the mountain tops to the centre of the desert depressions or on the other direction across the seashore till the edge of the continental shelf and the pelagic sea, the environment of Oman is a true mosaic of intersecting ecosystems. This diversification is very critical to understand its prehistory and to explain

the special pathways taken by its civilization since earliest times. There are many different factors involved, but the mountains are certainly the most determinant. Here, the environment varies both vertically along the slopes, as a function of height above the sea level, and horizontally, as a function of distance from water courses. Apart from the hillside mosaic, more diversity results from climatic conditions, some regional like the tight interplay between desert depressions and ocean waters, others global like those determined by the fluctuations of the monsoon fronts. Moving among these compartments, early human groups of hunters and foragers would have been confronted with a rich biomass, provided they were able to negotiate its delicate balances by seasonally shifting from one resource to the other. In such extreme environmental variability, plants and animals are distributed in small patches of land densely packed in their ecological niches. The relationships among the different species within each of these niches become extremely close: each species relies on the others for its life and

reproduction. An ecological niche is essentially a community of interdependent relations. For this reason, modern ecology has established that it is meaningless to define adaptation and evolution by singling out a particular pathway for each species, because their interdependence is such that it can be better conceived as a co-evolution of their associations. Humans behave not different among themselves and in relation to their homelands. Their cultural evolution has to be understood within a web of interwoven connections.

The human communities which depending from these resources are compelled to follow a similar logic and to diversify their exploitation in complementary sectors. Not surprisingly, in traditional Oman, also the architecture of the buildings, the systems of production and the way of life vary in each area according to principles similar to those adopted by the flora and fauna, although they have not produced any segregation, thanks to the development of social mechanisms of integration. Before they developed the means to transform the environment around them,



FIGURE 9. Muddy mangrove swamps formed by the clustering of *Avicennia marina* along the brackish waters of a *khowr*, like this one at Quriyat, are biomass concentrations of the highest productivity. Hunter-gatherers across the entire Indo-Pacific region had here a unique environment with vast and diversified plant and animal resources available all year round (photograph Joint Hadd Project).

human communities were also complementary or symbiotic to others: the early hunters and gatherers depended in their subsistence from few main species of animals or plants, and all aspects of life had to be scheduled according to the vagaries of their food sources. While we have to eat once or more times every day, no food source will remain at the same place all the year in the same shape. Both on the earth and in the sea, plants and animals have their cycles: they move or they retreat, they die or they get very lean.

In regions of high biological diversity like Oman, where many ecological niches are packed in small areas, the main strategy of the prehistoric foragers centred in the control of «ecotones». Once occupied a safe position overlooking at short distances of a number of different environmental zones, a human group controlled an intersection point, an «ecotone», from where it could direct the exploitation of a very broad spectrum of animals and plants within a small territory, just few kilometers around their campsites. Since the biological cycles of the plants and animals involved were different, exploitation could be organized in a single long-term schedule over more

seasons without moving from the same place. Not surprisingly, these campsites, often identified only by a few scattered flints, were almost permanently occupied, and by growing year by year, they laid the foundations for the future settlements of the Early Bronze Age civilization.

The ocean

Surrounding the land from three sides with a blue belt not less ubiquitous and diversified than the mountains, the sea will spell for us the other half of Oman's prehistory. Every Omani knows since childhood that the sea is a mainstream part of his heritage. Ocean navigation has been for generations before memory a source of wealth and conquest that helped to shape the particular character of the people and their civilization. The origins of navigation are deeply rooted in prehistoric times, back to the first exploitation of the deep and shallow waters along the coast. There are three main types of coastal environments in Eastern Arabia: sand beaches, rocky cliffs and lagoons. Each of them is the home for very different populations of plants and animals.



FIGURE 10. The coastal lagoon of As-Suwayh in the Ja'alan region during the rainy season. The photograph was taken from SWY-2, a 4th millennium BC site resting on a sand bar next to the seashore. On the sand dune that climbs the rocky hill in the background, just a mile across, there is another Middle Holocene site, SWY-5, exploiting instead the inner side of the lagoon. No pocket of potential resources was forgotten (photograph Joint Hadd Project).

If we have been impressed by the biodiversity of the mountain slopes and across the wadi beds, far more astonishing is the degree of diversity that can be crowded in few hundreds square metres across any segment of the seashores. The variability is not only related to the morphology of the coast but combines with the kind of sea and land they separate. These tropical waters are home to a very large biomass, making it one of the richest fishing grounds of the World, in sharp contrast with the barren emptiness of the desert lands of the interior. Fish, turtles, molluscs, crustaceans and marine mammals crowd along the steep edges of the continental shelves, organized in many interwoven food chains, all stemming from the vast floating banks of plankton. Somehow this abundance of fish has been feeding mythical tales even more than people. Pedro Pexeira, one of the first Europeans to report about Oman at the very beginning of the sixteenth century has left us one of the most vivid description of this fish bonanza: *«it is so easy to catch fish that a hungry cat can come to the sea, put in its tail, and when fish comes to bite it, swish them ashore»*. Whether the tale of the fishing cat is legend or truth, the fact remains that food was always available from the sea to anybody with a minimum effort. The origin for this great productivity derives from upwelling, a seasonal phenomenon that occurs during summer, between May and October, in connection of the southwest monsoon, when the persistent action of the wind removes away from the coast the surface waters. Its a true blessing, that in the whole of the western Indian Ocean, occurs only on the coast of Oman between Ras Al-Hadd and Dhofar and in the Somali coast south of Cape Gardafui. The rise of colder deep sea water carries to the surface nitrates and phosphates from the ocean bottom. These are the nutrients of phytoplankton, the base of all marine food chains, that moving in waves along the coast of Oman, creates the conditions of life for zooplankton and from here the massive occupation of the area by fishes, birds and marine mammals. Now you will expect that we close this paragraph by stating that the humans came to the Ocean because of this great unique food resource,

and from here they learned to navigate the waves. In reality only the first part of this sentence is true: upwelling made fish and other species available in great quantity just off the coast and people settled to exploit it, but there was no need to develop long range sailing to catch fish once also a cat could get it. If we look at the other areas of the world where upwelling is even more permanent and on a much greater scale, like California, Peru or Western Australia, although we find thousands of shell middens with fish remains piled by prehistoric people over the millennia, there was no development of ocean navigation other than in Oman. Later in this book, we shall discuss the very special conditions that made the Omanis of five thousand years ago the earliest navigators and traders of the ocean: none of them originated from the quest for food.

It took a very long time before humans ventured even few steps into the sea to catch any of the many species available there for food. For thousands of years they have certainly eaten fishes and other animals stranded on land by the waves. Shell beds on the shorelines were collected and eaten in Eritrea more than a hundred thousand years ago. But to built up a culture and an economy that depended from the sea took many more millennia. The sea is an alien world as deadly as outer space, and certainly many men and women died just few metres from the shore. And yet fear was overtaken, maybe long before they got used to live on fish. We do not know when the first float of raft was put together to cross the water. We can only use the indirect evidence of human migration into islands. Australia was populated already during the Pleistocene, some 60,000 years ago, and the forefathers of the Aborigine had to come from Indonesia across not less than hundred miles of open sea. In general, we may confirm the earliest archaeological evidence for intensive marine exploitation by coastal foragers has been dated between 12,000 and 8,000 years ago in Denmark and in different areas of the Indo-Pacific ocean, from Japan to Eastern Arabia. The part of the Indian Ocean bordering eastern Arabia on both sides of the Oman Peninsula is a rich and complex

ecosystem of coral reefs, mangrove coastlines and deeper water communities. The coast is divided between areas of relative simplicity and very diversified ones, mainly where lagoons are formed between beaches and rock cliffs. The conditions of coast may change rather rapidly as an effect of any minimal variation of the land and the sea alike, thus the extreme biological diversity in space combines with the one over time. Two are the main factors of change independent from each other: tectonics and the sea level fluctuations. While tectonics the movement of the earth crust, have built the original morphology of the Omani landmass, the coast have been mainly designed by the sediments from the mountains and the action of the sea. Rainfalls cut narrow corridors to the seashore across the rock shelf, to form at the end gravel fans or lagoons of brackish waters. Beaches alternate with rocks, and both are interspersed by creeks and lagoons. Changes are mainly determined by extension and contraction of the polar ice caps. For the Late Pleistocene, over the past 130,000 years, variations in the Indian Ocean have been recorded up to 120 metres below the present sea level, and 40 metres above it. This means that the earliest shell middens we have so far identified in Oman, dating about 7500 years ago, might not be the earliest sites related to marine exploitation: those are probably under the sea. Around this time, the geomorphologists reckon that the sea in this part of the Indian Ocean reached for the first time the present levels, raising from a depth of 120 metres over a period of some 10,000 years. In this period of time, the Gulf, whose maximum depths are around 80 metres along the Iranian coast between Qatar and Musandam, was a dry plain cut by watercourses, almost a continuation of the Mesopotamian lowlands: a land for hunters with plenty of game.

At the end, the sea has buried under water and sediments the sites of the earliest fishermen of Oman, as much as the wind has blown away or buried under sand those of the earliest hunters in the interior. The full history will be written only when archaeologists will be able to recover their remains under the sea in the years to come. The successful enterprises of the Danish archaeologists, who after years of exploration have been able to discover the fully preserved settlements of the Mesolithic fishermen in the straits between the North Sea and the Baltic, below 10-12 metres of water, tell us that such a costly attempt will pay high returns. In the meantime, much alike our Scandinavian colleagues have done on a century of intensive research, we need to develop first a better understanding of the sites and cultures we have on the coast.

After 5000 BC, overall sea level fluctuations have been a matter of few metres, but in the diversified coastal morphology of Oman, even minimal variations can radically change the landscape and the natural habitat. Lagoons can form or dry up in few years, affecting the life and economy of a single generation: within his own lifetime, a fisherman may have witness his home flooded by the sea or reduced to a barren *sebkha*. For these reasons, shell middens and other archaeological sites originally built on the shore of the water are the best indicators for past lagoons. Their study with the support of geologists and other natural scientists will inform us in great detail on the natural history of the sea and coastlands of Oman.

This book is exactly about the long work of hundreds of generations of men and women in Oman to deal with these changing conditions and built up a civilization of their own, that settled the path for the historical times to come ■