

**COMPARATIVE STRATIGRAPHY  
AND CHRONOLOGY OF WESTERN ASIA**

(3RD AND 2<sup>ND</sup> MILLENNIA BC)

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To THE PRESIDENT AND FELLOWS

Of

ST. JOHN BAPTIST COLLEGE

in the UNIVERSITY OF OXFORD

in token of affection and esteem

THE AUTHOR

Formerly fellow of St. John's College

# FOREWORD

The present work is the result of archaeological research pursued between 1929 and 1939 in Western Asia. My excavations at Ras Shamra-Ugarit, at Tell-el-Arab and in other places in Northern Syria, as well as on the island of Cyprus, have provided me with the main material. I have supplemented them with the analysis of discoveries and observations made on the other great archaeological sites of Western Asia, most of which I have been able to visit myself during my travels.

I had conceived my work-plan, and gathered the principal materials, when the war came to interrupt my research. Still, I was able to write part of the book during these troubled years. It is true that it often had to be done under difficult conditions. They explain the limits imposed on this work and might excuse, to some extent, its imperfections. I think it necessary therefore to make them known.

At the beginning of the war, I first had to entirely give up my personal work in order to dedicate myself, from 1939 to 1941, to cryptographic research. Having succeeded in deciphering the radio-telegrams of the German War Navy ordering the invasion of Denmark and Norway, I was commanded by the [French] National Navy to go to England along with a few other cryptographers in order to join our efforts to those of the British Navy. In full mutual trust, we were able, together, to extract many secrets from the German coded messages. I refused to desist of this eminently fruitful and harmonious French-English cooperation when, after my country's capitulation, the General Staff ordered me to leave England. With some other French officers, I joined the British Navy in order to continue the fight.

The appeal of General de Gaulle reached us at our war-posts "somewhere" in England. In London, I met my friend and colleague of the Musées Nationaux, Joseph Hackin, again, who had arrived from Afghanistan. I decided to join the Free French Navy, where I served successively under the orders of admirals Muselier, Auboyneau and d'Argenlieu.

The organizational work of this small combatant French Navy to which I was able to contribute held me back in London most of the time. And this is when the long repressed desire to take up my archaeological work again became more and more pressing. I shared many a night with Sir John Forsdyke in the basement of his house at the British Museum, where he weathered all the German attacks and from which he emerged to direct rescue operations under the hail of bombs. I remember that he was telling me about the chronology of pre-Homeric Greece while, having joined the fire-watchers posted on the roof of the British Museum, we observed the approach of bombers caught in the cones of the searchlights.

Among other archaeologists whom I met again in London and who contributed to direct my thoughts back to my studies, I would like to cite Mortimer Wheeler, the director of the London Museum, then a lieutenant colonel in the anti-aircraft artillery, Max E.L. Mallowan, the excavator of Chagar Bazar and of Tell Brak, a volunteer officer in the Royal Air Force, Sidney Smith, curator at the British Museum, and Christopher Hawkes, who cooperated with the Air

Ministry. Soon, every minute of freedom which my service in the Navy afforded me, as well as part of my nights, were devoted to the analysis of books and archaeological reports which the library of the British Museum, never closed despite the bombings, provided me with liberally.

It's in the library of the Athenaeum Club, the hospitality of which was for me a big comfort for the duration of the war, that I was able to write down many paragraphs of this work. I must admit that there were moments when the din of bombs and of anti-aircraft cannons became insufferable.

At this point, events gave a new orientation to my activities and led my interests away from archaeology for a while. It became urgent to prepare the liberation and the independence of Syria and of Lebanon which were subjected to the directives of the Vichy government and to stop the German infiltration. I wrote memoirs for the Allied armies in the expectation of the liberation of the country.

In order to gather information and to serve as a liaison, I was authorized to go frequently to Oxford. This is where I met H.A.R. Gibb, professor of Arab, the sanscritist H.W. Bailey of Cambridge, Sir Alfred Zimmern, specialist in International Relations, H. Beeley, A.H. Hourani and other orientalists. Their profound conviction of the necessity of a swift liberation of the Near East countries enthused me and lent inspiration to my own work. In London, friendship tied me to Cheik Hafiz Whaba, the ambassador of King Ibn Saoud to the Court of St. James, to Colonel Newcombe, an ardent survivor of Lawrence's crew, to Nevill Barbour, who directed the radio broadcastings to the Arab-speaking countries. I myself spoke at the BBC to remind General Huntziger, who was then the Minister of War at Vichy, of his duty to oppose German plans in Syria and Irak.

How painful and distressing it was for me, after the generous promises made by General Catroux to the Lebanese and Syrians at the eve of operations, to hear Free France, once victory achieved, proclaiming in Beyrouth that the Mandate was being reconducted. In the archives of Combatant France can be found my reports, of which I have a copy, in which I sounded the alarm, well foreseeing where such a stance would lead our relations with the Levant and what effect it would have on our traditional friendship and bonds with these countries.

I found myself at this point in an interior state of revolt. I confessed to admiral Muselier and begged him to allow me to take up my archaeological work again. He retained me, putting me in charge of organizing the history service of the French Free Navy and allowed me to go work in Oxford every week-end.

This is where I picked up my work on this book again. Oxford became for me the quiet haven where, encouraged by my English friends, I could throw myself back into my archaeological studies. As early as 1942, the University received me as a doctor *honoris causa*, and St John College elected me as a fellow. I owe a great debt of gratitude to Oxford for having welcomed me during this time of my life, and to have afforded me again the means and the quiet necessary to carry on my research. Returning from service in London, I was thus able to pursue, at the library of the Ashmolean Museum, and thanks to a grant of the Griffith Institute, the analysis of archaeological publications and the writing of the present work.

In 1944, when the preparations for the invasion of Europe monopolized the attention of all of us, bringing about a new interruption in my work, a large part of it had been written. A serious worry plagued me then: what would happen to our historic monuments and sites, to our museums, cathedrals, castles and ancient abodes situated in the zones chosen for the invasion by the liberating armies? Sir Leonard Woolley, the excavator of Ur, was at that time in charge at the War Office of organizing a service for the protection and salvaging of the artistic riches of France and Italy. Professor Webb of Cambridge was attached, with the same mission, to the general staff of Eisenhower where a crew of English and American fine-arts officers were being prepared. I reckoned that Combatant France and North Africa, by then liberated, had to concur in the saving of our monuments. Pierre Vénit and after him M. Massigli approved with the idea and helped it along.

Put in charge of a mission by General de Gaulle, I flew to Algiers in order to choose architects who would be ready to accompany the Allied armies in order to bandage the monuments which would have to suffer during the offensive or from the retreating enemy. I found the man for the task, Mr. Christofle, an architect of historical monuments, to whom Combatant France entrusted the protection service.

A new mission made me continue on the way to Morocco, then to Egypt and the Near East where I found myself studying the situation of our archaeological institutes and services, as well as the possibilities of resuming the activities of our missions after the long interruption caused by the war. Flying aboard military aircrafts from call to call, I took advantage of my stops to get acquainted with the work published between 1940 and 1944 and with the discoveries which had been made during that period. M. Thouvenot, director of Antiquities at Rabat, Cannon Drioton, director general of Antiquities in Egypt, and Mr Kuentz, director of the French Institute in Cairo, Mr Hamilton, director of Antiquities, and Mr Nelson Glueck, director of the American School of Archaeology in Jerusalem, M. Laoust, director of the Damas Institute, emir Maurice Chebab, director of the National Museum of Lebanon in Beyrouth and Mr Dunand, then director of the service of Antiquities of Syria, Hamit Bey Kosay, director general of Antiquities, and Remzi Bey Arik, curator of the museum at Ankara, liberally opened to me their libraries and their collections. I was able also to make a quick trip to Cyprus where Mr Megaw, director of the service of Antiquities, and Mr Dikaios, curator of the museum of Nicosia, welcomed me and facilitated for me the visit of some of the island's archaeological deposits.

I returned to England in July 1944, when the first Allied victories on French soil were preparing the liberation of Europe. Before returning to France, in June 1945 and immediately afterwards, I had the leisure of adding to my work several extra notes. Then in 1946, I was able to write down the résumé and the conclusions. The synoptic tables were finished at sea, on my way to resuming my digging at Enkomi on the island of Cyprus and at Arslan Tépé-Malatya in Turkey.

Yet I decided to change nothing at the text which I had written during the war. The difficulties which I had met at the time to avail myself of documentation forced me to set tighter limits to my inquiry than I would have wished. But now that research is again possible, I hope that

the future will permit me to supplement and ameliorate this first volume of my *Comparative Stratigraphy*.

During this exposé, I have frequently alluded to earthquakes which, during the 3<sup>rd</sup> and 2<sup>nd</sup> millennia, have destroyed or damaged numerous urban centres in Western Asia. In our own countries, which are situated outside the great epicentral zones and which are spared such catastrophes, the reader might hesitate to accept a seismological explanation or at least object to the usage I have made of them. Maybe that his doubts will be encouraged by the experience of modern earthquakes, which only rarely happen to devastate far-reaching areas. It is proper to address these objections.

True, it is necessary to warn against a generalisation of the seismological explanation. It is fit to resort to it only in the cases where archaeological and geological clues point indubitably in its favour. This being the way I myself was brought to conceive of it, for it did in no way come to my mind spontaneously. In fact, at the beginning of this inquest, I harboured some misgivings about it. I first needed to familiarize myself with tectonic geology, and particularly, with studies of the Mediterranean geosyncline as it has been scientifically observed for about a century, in order to convince myself that the frequency of earthquakes constituted for the countries of Western Asia a very real threat, particularly for its urban civilizations.

Let us not forget, regarding the frequency and gravity of seismic catastrophes observed in diverse parts of the globe, that Asia Minor comes right after China and Japan.<sup>1</sup>

When I discovered that the very sudden development of the industry of bronze and the prodigious diffusion of mining knowledge in the Near East and in protohistoric Europe, at the beginning of the second millennium, were a consequence of the immigration into these countries of miners and bronze-workers chased out of Anatolia and Armenia by a series of seismic catastrophes, I felt at first some kind of irritation at the simplicity of the explanation, alike to the egg of Columbus, which hadn't so much as grazed my mind at the time, fifteen years ago, when I attempted to explain the propagation across Europe, beginning in about 2000, of industrial types originating in the Eastern Mediterranean.

It is the study of a solidly established fact, and not a theoretical idea which introduced me to the domain which one may call Seismic Stratigraphy. My point of departure was the discovery, in the first level at Ras Shamra, of the vestiges of the city of Ugarit which, situated at the centre of an epicentral zone, fig.2, was ravaged by a violent earthquake at the time of Amenophis IV. Abimilki of Tyre alludes to it in his report to the pharaoh redacted between 1370 and 1360, let's say, around 1365 BC. According to my observations made at Ras Shamra, this earthquake

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<sup>1</sup> A. Holmes, *Principles of Physical Geology*, London, p.367. – The earthquake of December 26, 1939, one of the most violent in Anatolia about which precise reports are available, affected an area of 15,000 square miles, in other words, no less than one twentieth of the total area of the country. A more than 400km long zone along the Southern coast of the Black Sea and reaching 100km inland was ravaged in one night. Hitting at two o'clock in the morning, the first shocks were so violent and sudden that the inhabitants did not have time of get out of harm's way. Over 23,000 (the lowest figure) perished under the ruins of their homes. Three cities (Erzincan already shaken up in November, Sivas and Tokat at a distance of 300km from each other) lost up to 80% of their inhabitants (21,600 dead, 7,000 injured) and were almost entirely destroyed (11,000 dwellings entirely, over 1,000 partially collapsed). Four days later, the same area was ravaged by inundations and the seismic shocks perdured until January 1<sup>st</sup>, 1940.

must have attained a force 8 on the Mercalli scale and force 9 or 10 on the international scale. It could not but have caused damage in the other cities situated on the same geosyncline. This is indeed what one observes when analysing the observations of Mr Garstang and Mr Macalister, relating to the earthquakes at Jericho and Gezer, and others reported from other Syro-Palestinian sites, where the true nature of the destruction however has not always been recognized by the diggers.

As to knowing how far the quake zone of the 1365 seism extended, the question is a hard one to solve with the knowledge presently available. However, from the point of view of modern seismological experience, nothing keeps us from admitting that it encompassed the Syro-Palestinian coast to a considerable depth inland and that it may have reached the gulf of Alexandretta to the North. Observations made at Tarsus are in accord with this conclusion. So that we obtain, for the study of the sites inside that zone, a stratigraphic and chronological landmark of a precision heretofore unknown.

During my visit at Hissarlik in 1936, I was struck by the analogy between the damages observed at Ugarit and those noted by Mr Blegen among the subsisting dwellings of Troy VI, which was also destroyed by an earthquake. The character of objects retrieved from among the ruins cleared on both sites, and the appearance of the Mycenaean ceramics, are identical to the point that it is impossible to accept a large amount of time separating the two catastrophes. Our American colleague himself has reached the same conclusion and fixed to around the middle of the 14<sup>th</sup> century the date of the Troy VI earthquake. If I have given up the idea of considering the two catastrophes as having been provoked by the same earthquake in view of the distance (about 950km in a straight line) which separates the two sites, I want to bring back to mind nevertheless that earthquakes of a tectonic nature have a tendency to propagate themselves along fault lines, or coastlines, over sometimes considerable distances. It has been observed also that such earthquakes trigger other upheavals in their path, which in turn propagate destructions farther afield.

There is another consideration which, in my opinion, should not be left out of sight. Correcting the unstable equilibrium of terrestrial masses, tectonic seismic shocks tend by nature to diminish in intensity as the equilibrium is reaching ever greater stability. So that it may be possible to admit that earthquakes of the Mediterranean geosyncline may have been more violent in former time than today.

One reaches the same conclusion when one studies the traces left by ancient earthquakes in the archaeological sites and in some regions of Central Asia which are particularly suitable for such investigations: the banks of the Caspian Sea and the area of the Dead Sea, for example. At the same time, we notice that some of the most important transformations, accompanied by earthquakes, to which the Earth surface has been subjected, occurred in the middle of the 3<sup>rd</sup> and 2<sup>nd</sup> millennia, that is, precisely during the Bronze Age.

Generally speaking, it would be imprudent to infer from the present-day observation of natural phenomena what might have been the situation existing several millennia before our era. For instance, if one were to compare the relatively benign climate variations observed during modern times to the changes which occurred during the Palaeolithic or else in the post-

glacial periods, one would make a serious error. Let us not reason along these lines when it comes to the earthquakes of high antiquity.

Finally, I want to point out that the question of the origins of the great crises which the civilizations of Western Asia had to go through during the 3<sup>rd</sup> and 2<sup>nd</sup> millennia presents only an accessory interest for my investigation. Its study doesn't enter into the framework of my archaeological research itself and I will have to dedicate a special work to it later. What is important to me here, is to clarify and put in order this mass of stratigraphic and chronological observations accumulated for some fifty years by the explorers of the ancient sites of Western Asia and to extricate out of it some learning for future research.

I am left with the agreeable duty of thanking all those who have lent me their help during my research.

In the field, notably at Ras Shamra, I owe much to my faithful digging companion Georges Chenet and to my architects and topographers de Jaegher, Paul Pironin and the regretted Jacques Fagard. Madame Schaeffer has participated in all my expeditions and in all the numerous trips in the countries bordering Syria where I have searched for the elements of comparison of which the present work has benefitted.

I have told already what a debt of gratitude I owe to the University of Oxford, to St John's College and the Griffith Institute at the Ashmolean Museum. It is at the expense of this Institute and with the advice of its secretaries Mr E.T. Leeds (until 1945) and since then of Mr D.B. Harden, that this work has been printed by Oxford University Press. Sir John L. Myres has steadfastly encouraged my work. My friends H.A.R. Gibb, Henri Seyrig and my collaborator of the French Archaeological Mission, Mr E. Coche de la Ferté, were so good to reread my proofs and to communicate to me their many observations. To another friend, Mr L. Brun, director of the Navy Foundries and Steelworks, I owe the precious metallurgical analyses published in Appendice II. Miss Vaughan and my daughter Odile, then a liaison officer with the American Army, have patiently deciphered and typed my manuscript in their off hours. To the directors of Oxford University Press, as well as to their staff, I address here my thanks for the care they took in the printing of this book.

As for the numerous drawings, they were executed for the most part by Mr. Pironin or by myself, as faithfully as possible. However, they should not dispense the reader from examining the original reproductions, the sources of which he will find indicated in the references in the table of figures.

ST. GERMAIN-EN-LAYE

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*September 1947*

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