Ignacio Olagüe

THE STUDY

OF COMPARATIVE CIVILIZATIONS

Scientific thought today is dominated by the spirit of synthesis, in contrast with eighteenth and nineteenth century works which were characterized by their analytical impulse. However, this movement is still lurking in the collective unconscious, and not having achieved as yet its complete flowering, it remains ignored by most of the intellectual élite. Not only because it is impossible to see the forest for the trees, but especially because, influenced by an academic tradition inherited from the great masters of past centuries, the élite today is loathe to open its eyes to the reality of our own times. Official science, most universities and specialists have been trained to feel a horror for general ideas. It would, therefore, seem that this intellectual tendency is not likely to favor the creation of vast conceptions, were it not for the fact, as we shall see later, that despite themselves, scholars and researchers are carried along by the same movement of ideas. For,

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in order to advance into the most varied domains of scientific thought in our time, it is sometimes necessary to establish such intimate relationships among special fields, widely separated from each other in terms of their subject matter, that actually the sketching out of veritable syntheses is taking place to some degree everywhere. It is really very simple; in the absence of such generalizations, one would be pawing the ground.

Reaction against general ideas in the course of the past two centuries have had a legitimate cause: to disengage scientific method from the interference of certain anthropocentric conceptions which had often been put, by propaganda, at the disposal of a religious idea.

Galileo's trial, the hue and cry unleashed by clerical militants against the theory of evolution, could not easily be forgotten. The consequences of this reaction were all the more important insofar as the physical and biological sciences which were the direct targets of such attacks, lay, by reason of their discoveries and practical applications, at the very forefront of events and gave them their tone. Unconsciously, their methods were taken as the model. And thus, a more or less unanimous animosity against general ideas crystallized. In a sense, this discipline was very prudent, for at that time the physical and biological sciences were merely in their adolescence. It was much more important to gather facts, whether by observation or by experience. The interpretation of these facts would come later.

However, the abuses which were committed must not be exaggerated to the point of prejudicially judging the work-methods of the most developed sciences. Wide-flung hypotheses were necessary for the progress of knowledge and the evolution of thought in general. Together with the accident of discoveries or the appearance of new techniques, there came the resuscitation of themes and theories long rejected or forgotten. But in their newest metamorphosis they re-emerged purified as more precise instrumentalities. Thus, it would appear that alongside of the evolution of scientific thought the critical spirit had to separate bit by bit correct ideas from those which seemed furthest from reality, distinguishing useful from encumbering concepts. Henri Poincairé had already observed this torturous march of scientific thought; thus he was enabled to write those clairvoyant pages

which were confirmed by the history of science, together with the new perspectives which had just been opened up.[1] But the ideas of the great scholar could not change the atmosphere which prevailed at the end of the last century; and, on the other hand, recent lessons in the history of science could not be assimilated by the reading public at large for the simple reason that of all the sciences, the history of science was the youngest and had not yet succeeded in establishing a recognizable body of doctrine.

Setting aside some stuttering efforts in the course of the nineteenth century, the history of science was established on a solid base only forty years ago. However, despite this short existence, it is possible to derive two lessons from these attempts which help us to understand the present situation. These are the relationships which obtain in any given epoch between already-acquired knowledge, and the sometimes uncertain principles which may be deduced from recent research, as well as from the comprehension of the discontinuous movement of scientific thought in its historic development.

From the historical point of view, that is to say, in terms of the evolution of scientific thought, there has always existed a misunderstanding, a more or less emphasized lack of harmony, between the level of knowledge already acquired by previous generations and the mental attitude which is our contemporary patrimony; in a word, between learning and inquiry.

For the purpose of this article we are now concerned only with a certain confusion growing out of this difficulty which must take more or less time to be resolved. In our time, as has happened in the past, together with the parsimony inherent in any effort of too long duration, or with the fever which produces sensational discoveries—especially if they serve to modify customs of contemporary life—there exist sciences which are very much in fashion because they seem to plunge suddenly ahead in an extraordinary way. And their bursting luminosity tends to dazzle minds to the point where other sciences are left rejected in the shadow, a situation especially marked if their labors are obscure, or if they are not succeeding in issuing forth from the impasse in which they find themselves wedged.

[1] See especially the introduction to his book: *La science et l'hypothèse.*

Thus, from the fifteenth to the eighteenth century, navigational science enjoyed an enormous publicity; the same as nuclear or astronautic science today. The former made possible in those days the discovery of America and the dispersion of the white peoples all over the earth; the latter make possible the exploration of space. As a result of the fuss produced by technological exploits, a state of mind spreads among intellectuals who tend to believe that the striving of thought toward new horizons is limited exclusively to those sciences which, at a given moment, are rich with creative ebullience, whether real or apparent. For there is a tendency to confound the benefits which certain practical applications may produce with real contributions toward human knowledge.

Furthermore, it is possible to fall into the error of appreciating values of our own time while one lacks perspectives with regard to the past. Let us give an example. From a historical point of view, Galileo's work has generally been presented to the public at large in a tendentious manner. If one were to believe most of the texts and commentaries it would seem as if Galileo's work had enjoyed great popularity in its time and exercised an important influence on creative thinkers. But this is really a distortion due to faulty perspective, resulting from applying to the past a prestige subsequently acquired as a result of the extraordinary exuberance of nineteenth century physical science. In Galileo's day no one had acclaimed a miracle. The great laws, then set forth, had been more or less known in outline since antiquity, and the master's contemporaries did not suspect the importance which the newly introduced mathematical subtleties represented.[2] Archimedes had not been able to establish these laws in a precise manner for the simple reason that neither multiplication nor division was available to him, nor the possibility of employing the zero or decimals.

[2] Even Descartes manifests this state of mind, which seems surprising since he, more than any other, contributed by his mathematics and philosophy to the development of the physical sciences. His testimony, therefore, assumes an authority difficult to find among other seventeenth century authors: "As for classical mathematics and modern algebra, aside from the fact that they deal only with the most abstract, seemingly useless, materials... they have been made into an obscure art, encumbering the mind, rather than into a science cultivating it." Descartes, *Discours de la méthode*. Second Part.

He possessed only the abacus to assist him in operational calculation. But Galileo took up again the same studies making use of the new means of calculation which represented a continuous effort of fifteen hundred years.

That is why Galileo's work in his time interested only a limited minority of learned men. The real efforts of the seventeenth century were yoked to another need—the problem of discovering a method by which it would be possible to compute longitudes. Such was the problem which preoccupied governments, official science, the academy, stirring up the curiosity of the newspapers and the public, as today research for discovering the causes of cancer or the secrets of the atom. The solution of this problem which cost enormous sums of money and work lasting three hundred years dates from the eighteenth century. Sea voyages were made possible by it and modern time computing applied to it.

In the selection of this field of work Galileo, therefore, offers us no proof of originality. His genius consisted in applying new mathematical methods where they had previously not been applied. In other words, he realized a synthesis between modern mathematics and the beginnings of physics; just as in the thirteenth century the astrologers of Alfonso X, the Wise, had achieved at Toledo a synthesis among trigonometry, algebra, and the new decimal forms of arithmetic in order to study the curves of the movements of the planets.

We, therefore, find ourselves with two opposing points of view which have been the cause of serious misconceptions, resulting from a fault of perspective. In Galileo's time the great preoccupation and obsession of most thinkers was concerned with navigational science because it brought an immediate yield to the collectivity. The first conceptions of the new physics interested only a very small minority; but if the wide public of letters had understood the importance of Galileo's work his trial would not have taken place, or, at any rate, not in the manner which later provoked such scandal. On the other hand, from the point of view of modern thought, the fact is ignored that Galileo's work was the fruit of a synthesis. But presenting his work, as we do today, as if it were the scientific thought of his epoch, we overlook

the fact that it was navigational science which made the development of the contemporary world possible.

This faulty perspective has exercised such an influence on thought that the history of science has been derailed by it up to our own day. Thus was formed that naive conception (put forward in innumerable texts) according to which science had not really begun until the end of the eighteenth century. Everything that had been achieved before were only sketches, stammering efforts. We were informed, black on white, that atomic science counted only fifty years of existence when the fundamental hypothesis dates from Democritus and the methods of work which made possible the current measurements without which nuclear science would not exist, that is to say, mathematics, had demanded of humanity a continuous effort of five thousand years!

Furthermore, we had to face the fact that in human knowledge there existed sciences which were no longer engaging in research because they had exhausted their objectives. Others found themselves in an impasse. But the one as much as the other might serve for future syntheses. In the seventeenth and eighteenth centuries numismatics were considered a leading field of research. But once all the coins had been collected and described, there was almost nothing more to discover. However, numismatics could serve as a precious source for the historian; it could help him out of difficulty. Taxinomy, which had aroused the enthusiasm of nineteenth century biologists, is at the point of completing its inventories and classifications. But the fact that it no longer occupies the place today that it had previously does not mean that it has ceased to exist. Thanks to it other scaffoldings could be constructed. The description of invertebrates or insects and the study of their biology made experimentation possible in genetics. Without the application of zero in mathematics and the discovery of the decimal (notions which were investigated in Spain in the thirteenth and fourteenth centuries) the microns and angstroems employed by biochemists and physicists would not exist. Nor are these exclusively contemporary. Apollonius of Perga who lived in the third century B.C. had discovered the unusual curves which might be obtained by sectioning a cone. It was only one thousand six hundred years later that it was ob-

served that these geometric figures existed in nature and were traced in the sky by the rotation of the stars.

In other words, sciences which had been at the very forefront of research, those which pawed the ground without going ahead, those which had achieved their goals a long time ago—all these play their part in the heaping up of human knowledge transmitted from generation to generation. Nuclear or biochemical sciences might enjoy the publicity and illusions which their discoveries and practical applications create, but science is the knowledge of all branches of learning. These observations now permit us to understand the discontinuous development of scientific thought. And furthermore, the history of science teaches us today that this discontinuity exists not only in time but also in space; a fact which has been overlooked until recently. Let us give an example which has now become classic.

"Humanity," wrote Schopenhauer, "lost (because of Aristotles' geocentric theory) a truth (the heliocentric system) and it took two thousand years to rediscover it." Now, this phrase which has become a cliché cooked in all kinds of sauces during the past century was simply the result of an ignorance of extra-occidental civilizations. According to a nationalistic assumption one would have believed that the West after a long tunnel called the Iron Age had finally succeeded in continuing the scientific work of the Greeks. But this was not so. The heritor of the School of Alexandria which synthesized the knowledge of antiquity, was Arab civilization and scientific development continued within its radius of action, where nations of high intellectual standard existed: Persia, Mesopotamia, Andalusia. During these two thousand years in which it was believed that nothing had happened, human knowledge had actually made a gigantic leap ahead. Scholars had brought to bear an extraordinary instrument, mathematics. Humanity had learned to calculate with numbers rather than letters. And in this impressive effervescence, Aristotle's geocentric theories had very little attraction. Indeed, those of Aristarchus of Samos had had at least as many partisans, and the astrologers of the Wise King of Toledo were more or less heliocentrists in the thirteenth century long before Copernicus and Kepler.

It is now easy to deduce from these historical perspectives the principles which interest scientific thought. In order for a science

to achieve a broad structure of ideas, a long period of analysis is needed, sometimes lasting millenia. In order to arrive at geographic syntheses which are today taught in school, a continuous effort was necessary beginning with Hecataeus of Miletus in the sixth century B.C. and ending only toward the end of the last century. How much more time will geologists need in order to classify the ancient folds in the strata existing all over the surface of the globe? This would make it possible to understand techtonic phenomena, their genesis, and why and how mountains came into being. How many centuries will yet be needed for the nuclear sciences to pass from the state of equations—which are relations between different measurements—to that of definitions?

But at *any* given moment a particular science finds itself sufficiently mature to undertake the task of synthesizing its data. It may happen that this propitious moment coincides with parallel developments in other fields. The synthesis, therefore, will be concerned not only with a single branch of knowledge but a large complex of them. Society will be shaken by a burst of genius. New horizons will leap to view. The epoch will be stamped by this coin.

These new perspectives, therefore, reveal to us the discontinuous evolution of scientific thought. In the history of science there exist long periods of analysis and rapid movements of synthesis in which human genius achieves the highest degree of its power. Thus we have the epoch of the School of Alexandria, of that of Andalusia in the Middle Ages, of the seventeenth century in the West. And thus also the twentieth century offers itself more sharply to our comprehension by reason of this new light. After the long period of analysis which dominated a great number of sciences from the eighteenth century on, a wide movement of synthesis reveals itself today with such force of acceleration that our epoch can already be characterized by this tendency.

It was possible to perceive the beginnings of this process toward the end of the century. Biology, represented by paleontology, the natural sciences by geology, and physics by crystalography,—all these sciences, although very remote from each other in terms of fields of study—had begun to establish such intimate relationships as to permit a gigantic synthesis: the history of the earth and living things. Chemophysics and biology were joined

in order to explain the functioning of the human machine; as a result of which, new perspectives in physiology have been opened up, and in our day even new horizons in the field of psychology. At the present time, molecular chemistry, the nuclear sciences, genetics and others are intermingling to create another extraordinary synthesis: biochemistry which, perhaps, in the very near future, will succeed in explaining the mysteries of life and its evolution. What was the direction of Einstein's life-work if it was not an effort to achieve an equation that might synthesize all known laws of physics? This trend is obvious today. The ultra-specialization in all branches of knowledge today, resulting from the activity of scientific thought over the course of preceding millenia, must not influence us to underestimate the significance of this counter-trend.

History could not avoid this grandiose trend toward synthesis which characterizes our epoch. From the sixteenth century until today, history had carried on a long work of analysis. For, beginning in the sixteenth century, the critical spirit, thanks to the humanists, intervened in order to separate fact from fiction, from inaccuracies and lies, to verify or reconstitute facts on the basis of primary evidence. Previously, history had been the patrimony of personal interpretation necessarily circumscribed within the chronicler's vision. The narration of events could not possess any authority other than that resulting from the honesty, intellectual formation and idiosyncracy of the chronicler. Although he might have talent, even genius, he was subject to errors of interpretation resulting from a limited knowledge of the contemporary facts which he was relating. Too often he was inscribing his parchment only to satisfy the vanity of a prince or his own family; sometimes he was even subsidized to present "the official truth" in his writing. If he enjoyed independence, he made no effort to describe events objectively. Not possessing any perspective on the past, hardly knowing about the generations which had immediately preceded him, he made no attempt to raise himself above the struggle. Such an idea never even entered his head. Consciously or unconsciously, he allowed himself to be borne along by his own religion or political convictions. History was simply a literary genre, an art.

From the sixteenth century on, a gigantic work of scrutiny

was effectuated. Little by little, the chronology of the most important events experienced by humanity, have been set down in an orderly manner. The origin of humanity's past has been pushed further back into the night of time. It took three centuries of critical studies to free the historian from the tyranny of Genesis. The antiquity of man seems ever more remote, going back to epochs so distant as to startle the mind. In the seventeenth century, it was still believed that Adam dated from four thousand years ago. In our time, fragments of primitive beings are found in strata belonging to the most remote quaternary periods. Sinanthropes and Australothropes are dated from between six hundred thousand and eight hundred thousand years ago. But in that case, an enormous perspective—at first startling us, and then filling us with a sense of wonder—emerges out of the dawn mist and imposes itself on modern thought. Since the paleolithic age, numerous civilizations had succeeded each other, concealed or forgotten in the inexorable course of centuries. More and more evidence heaped up in museum collections and it was possible to begin to understand humanity's slow march ahead. And again a grandiose conception struck the spirit. Entire cycles of civilizations had developed in complete isolation of each other. Formerly, natural obstacles had been so imposing that civilizations had emerged, grown and attained their complete flowering independently within determined geographic limits. Regions privileged by nature were distinguished from the sterility of other parts of the globe in which great cultures had not been able to perfect themselves; the Mediterranean *oikouméne*, the high plateaus of Asia, the valleys of the great Chinese rivers, of the Indus and the Ganges, certain sections of America... After four centuries of analysis history eventually had become a science. It had accumulated an enormous amount of material. It was time to put it all in order and establish relationships. The hour of synthesis had arrived.

History, therefore, was following the same rhythm of evolution as that of contemporary thought. Lacking new forms it could only remain motionless. Of course, it was always possible to continue the inventory undertaken since the sixteenth century. Indeed, this is the task which most researchers are engaged in even today. Archives and centers containing archaeological riches

possess enormous reserves still to be catalogued and analysed. New discoveries occur which make it necessary to restudy themes which had been considered exhausted, such as the manuscripts of Upper Egypt which present under a new light—and I need not say how much more exact—the problem of Gnosticism. But also it seemed ever more evident that as soon as one departed from the early years of the sixteenth century in order to go back to more remote times, one entered a slippery terrain in which cunning ambushes lay in wait at every step.

It was very simple. The documents which had come down to us were less numerous—and how much less!—than those which had been preserved in modern times. And then there was a more serious problem: periods for which no documentation remained. At the same time, the critical spirit was being applied to those epochs which had left richer source materials. Yet, even in those cases, it was difficult to resuscitate the authentic atmosphere. For example, the great century of the Roman Empire. Suspicion crept into the mind. Agreed, one possessed an accurate chronology; various data which had seemed sufficient. But did that lend a believable interpretation to events? Today it is possible to doubt it. At the end of the nineteenth century the historians had gathered together their findings on modern times. The sixteenth century had particularly interested them. In the course of these years, the West had finally split up into separate restless nationalities; and there was no doubt that the wars of religion constituted a turntable on which the West of the Middle Ages had become transformed into Europe such as it subsequently existed. Because of its inherently great interest, this epoch was conscientiously studied. However, one need merely read the works written then by the great scholars to realize that they were more or less unintelligible. Like every old scientific text, it will be said, superseded by more recent work. Agreed, and in this sense it was easy to point out the lacunae concerning Latin countries, Italy and especially Spain. But it was not the lack of information which disheartened the reader. Rather, what irritated one beyond measure was a question of fundamental error with regard to the interpretation of events. The facts were exact, the episodes recounted were seriously documented, but one knew that the spirit of the epoch was altogether different than that which was being described.

In our days the greatest works of history have gone beyond the analytical method. Short syntheses have been outlined. Twentieth century historians have made a very great effort to understand the extraordinary sense of life which was bubbling in the West in the sixteenth century. But they realized that an accurate chronology of battles, of peace treaties, of tournaments and other anecdotes, together with descriptions and commentaries were not sufficient. They understood that the society of that time had been agitated by profound currents of ideas whose sources went back to previous centuries, but whose explosion had been favored by a complex of economic, social and intellectual phenomena which had set people and things topsyturvy. The reappearance and knowledge of texts from antiquity, unknown until that time, the diffusion of printed books, the discovery of America and contact with civilizations whose existence had not even been suspected, the new Humanist conceptions put forward by Erasmus, the arrival of precious metals from the East Indies causing a rise in prices composed an entity important in an altogether different sense than the squabbles between Charles V and Francis I. A vast synthesis had thus been sketched out. Undoubtedly, it will be perfected by new findings. Nevertheless, it is permissible today to believe that the main lines for the understanding of that epoch were solidly drawn. That is why the reader felt that nineteenth century works, although so close to our own time, seemed to have aged so terribly.

And so the suspicion grew in the mind of the student of universal history. If this new synthesis concerning a period so short and a geographical frame so limited as that of the West during the sixteenth century had resulted in such a transformation of knowledge during the last few years, what was one to think of previous epochs about which only a meager documentation was available and sometimes only a simple chronological scaffolding! As one went back toward the past, led astray by chronicles possessing literary value but no objectivity, had not only the history of victories been set down? That is to say, the history of those ideas which had succeeded in dominating the minds of an epoch and eliminating all rivals: those soldiers clinging to the ground? In a word, as one went back beyond the sixteenth century, had

not a history of myths been conceived of rather than a history of facts?

The problem was clearer when it became a question of understanding events which unexpectedly happened in epochs about which no documentation remained. Then myth shamelessly imposed itself. For example, all the text books assure us that the Arabs invaded Spain. Now, there does not exist any evidence from the eighth century concerning this extraordinary action. The earliest Latin chronicles which have come down to us, dating only from the ninth century, do not explain this invasion. They ignore Mohammed and the expansion of Islam. The enemies of the Christians are the heretics. One must refer to the earliest Arab chronicles known, belonging to the end of the tenth and beginning of the eleventh century, in order to find an account of this startling conquest. That is to say, this history agreed upon by everyone is based on documents drawn up several centuries after the events! The myth was so anchored in the mind of historians that it had never crossed their imaginations to find out how armies from the Nile were able to reach Tunisia after having crossed some three thousand chilometers of desert, nor to explain how North Africa could have been conquered in less time than one says an Ave Maria, that is in ten years! For, in order to invade Andalusia it was necessary to control Morocco...and to cross the Strait of Gibraltar. How had this formidable stretch of sea been cleared? Very easily. According to the evidence of the oldest Arab chronicles, with four boats...!

But since that seemed insufficient, even if those barques were as big as Noah's ark, the basis of the account was approved of, while the mechanism which might explain the action was rejected —the fleet (?) of Count Julian, Governor of Ceuta, who, seeking to avenge his daughter's honor, soiled by the king of Toledo, had lent the four barques to the troops of Taris the invader.

Certain historians, especially among contemporaries, clearly recognized the weakness of the documents on which classical history rests. But what was there to do? Except realize with Georges Marçais the impotence of current science in explaining the Islamisation of Ifriqiyah, the land of Saint Augustine, Origen,

Tertullian![3] A Spanish author of the past century who studied the Arab invasion of Spain in great detail exclaims in an outburst of frankness: "If for such reasons (fables, contradictions, exaggerations and anachronisms in the chronicles) one were to reject what the ancients tell us, many of the most important pages of universal history would remain blank."[4]

Thus one found oneself faced with an unsurmontable obstacle which, upon further consideration, proved to be only the result of analytic methods followed up to our own day. In simple terms, it is only a question of growth. To go ahead, to issue from the impasse, and advance toward the future it is necessary to change methods and take a bird's eye view. Just as in the torturous march of scientific thought, at a certain stage there was an imperative need for syntheses. It became absolutely necessary to establish the lines of force which at a given time and in a given geographical framework had structured the society. The historian found himself in possession of certain precise and accurate data like those points which the mathematician fixes upon his coordinates, but he had not dared establish their curve, that is to say, the evolution of this human grouping.

A similar difficulty had presented itself to the biologists who were studying those creatures who had formerly peopled the earth. Two bits of evidence were discovered, two fossils representing the growth of a *phylum*, that of the hooved mammals, for example. Now, the paleontologist enjoyed an advantage over the historian. He possessed a general idea, a working hypothesis, permitting him to establish relations between the two fossils which he would compare in his laboratory. This was the theory of evolution. He did not know how this evolution had come about, but, as a hypothesis existing over a long term, it served him as a connecting feature, whereby he could recognize the relationship existing between two species which at first seemed markedly different in terms of their

[3] "The Islamization of the Berbers raises an historical problem which we have no hope of resolving." Georges Marçais, *La Berbérie musulmane et L'Orient au Moyen Age*, Paris, Aubier, 1946, p. 35.

[4] Eduardo Saavedra, *Estudio sobre la invasión de los Árabes en España*, Madrid 1892, p. 2.

anatomy and yet belonged to the same family. It was impossible for him to reconstruct the missing link but all the same, he could deduce the development of the living creature. Thus, on a very fine thread, paleontologists succeeded in describing the evolution of the hooved mammals. The method employed proved most adequate since subsequent discoveries confirmed their generalization.

The historian found himself in a position of flagrant inferiority. It was difficult for him, employing analytical methods, to reconstitute the sense of events which, besides, he knew about only in a sporadic manner. That is why myths have maintained themselves up until our day. The understanding of universal history was only a snare.

And so we have the problem of the Arab invasion of Spain or that of the Islamization of Ifriqiyah. Lacking contemporary documents and considering the poverty of those belonging to later epochs, the historian did not dare set himself above the mediocre and contradictory texts to confront the insurmountable problems posed by geography. How explain the conquest of regions so far from bases in Arabia, which at that time, given the then existing means of communication, were situated at the end of the world? Did one not have the right to wonder how and by what miracle, those gigantic armies needed to reach the Clain or the Indus and conquer the terrain, had been able to rise out of a desert, an uninhabited place by definition? Historians had not compared these obscure events with subsequent events better known; for Islam consequently was well propagated in regions where no one in the memory of man had spoken about the Moslem invasion, since that episode had taken place in periods when the political power of the Arab nations was already well on the decline: Black Africa, the high Asian plateaus, certain Chinese provinces, Indonesia which had been Islamized in the fourteenth and fifteenth century and has now become the most important Moslem state in the world.

If one applied simple but vast syntheses to these questions, it was then easy to understand that Islam had been propagated among the masses by virtue of a leading idea which possessed an extraordinary dynamism: monotheism. As a result of this principle one could demonstrate that the Mediterranean world since the second century A.D., and perhaps even before, up to the six-

teenth century, the battle of Lepanto, had been the theatre of a gigantic competition between two religious ideas: monotheism and a trinitarian conception of the divinity. The events of the seventh and eighth century to which we have made reference signalized a grave and determining crisis in the evolution of this rivalry. For these regions had been the seat of elements which were precursors of this crystalization; that which had permitted the rapidity of the phenomenon. These were Christian heresies of the monotheistic type: Gnosticism in its Priscillian version in Spain, Aryanism which had so great an importance in the peninsula and in Tunisia, etc.

But then one could deduce a concrete idea from this synthesis. These regions had not been subjected to the invasions of the eighth century; they had been overturned by veritable wars of religion.

Now, if one compares Visigothic civilization in Spain, a section of life which animated Hispanic society with its own manifestations from the fourth to the eighth centuries and about which sufficient archeological and literary information is known, with the subsequent period which lasts until the eleventh century, when the Moslem counterreformation was fixed into a characteristic dogmatism, one would perceive that the great culture of the caliphate of Cordoba (tenth century) is in harmony with the earlier civilization on an analogous line of evolution. In both civilizations, scientific, philosophical, literary thought, as well as the art of which abundant documentation remains, are located on the same curve.

The crisis of the eighth century must not, therefore, be interpreted as a violent hiatus as a result of which Hispanic society, like the changing of the set in the theatre, had been transformed from Christian to Moslem, from Latin to Arab, from monogamous to polygamous. It was rather a question of a process of acceleration of a sharp crisis in a long evolution over several centuries. As a result of a vast religious competition it so happened that during those obscure times society had undergone not an invasion but a revolution; just as today the Chinese were not invaded by the Russians in order to become communists. In other words, perhaps we will never know what happened in the Iberian penisula during

the first fifty years of the eighth century, but we can now know the sense of these events.

To achieve a better conception allowing us to interpret more exactly than in the past this obscure period of history, the question must be determined whether we are not dealing with a comparative study between two civilizations, the Visigothic and the Andalusian-Moslem? This example, taken from studies which we have undertaken for a long time and are still pursuing[5] as well as other instances which one might select out of the pages of universal history, makes clear to us how much importance the study of comparative civilizations has in our time.

So as to put some order in the enormous classification of facts being gathered and analysed today by research it was necessary to achieve syntheses. But, in the state of current knowledge, a comprehension of universal history could only be acquired by syntheses obtained from the comparison of different civilizations. Not only in order to pierce the mystery of obscure epochs, understand the meaning of certain events which we view with false perspective (generally due to our present conceptions about man and about society which otherwise would have been inconceivable), but also to attain to superior precepts concerning the evolution of thought and the sciences of man.

In our opinion this effort must rest on three points:

I. *On the lines of forces which structure each civilization.* Before proceeding to a synthesis it would be necessary to make sure that the data to be integrated were exact. Otherwise, one would be engaging in useless work which could only multiply confusion. Given the enormous mass of registered facts, an inventory increasing from day to day in accordance with new discoveries and work undertaken everywhere to some degree, it is urgent to establish clear and precise schemes concerning the geographical frames, the limits and evolution of each civilization. Therefore, the basic task is posed: to isolate in a positive manner the lines of force which have structured these civilizations.

[5] Readers desiring more complete details may read in French the chapters concerning this epoch in our *Histoire d'Espagne*, Paris 1958, or, in Spanish, Chap. XIV, entitled "La révolution islamique," in the second volume of our work *La decadencia española*, Madrid, Mayfe, 1950.

Now, to establish these bases it is sometimes necessary to have recourse to the study of civilizations which have followed a parallel development. For example, writers have affirmed that the spirit of demonstration was an attribute of Greek civilization. Is this entirely true? Although perhaps insufficiently realized in our day, had not mathematics at Babylon, and in Egypt, achieved such a form of expression long before? In order to construct the pyramids with the calculations that such an enterprise involved, was it not necessary to make use of simple but demonstrable theories? When Mohammed Ibn-Kothair who lived under the seventh Abasside Caliph, Al-Mamun, (786-833) measured with two teams of astrologers the terrestrial degree in the plain of Sindjar in Mesopotamia, was he not accomplishing this collective task for the purpose of a demonstration? Was he, therefore, following foreign teaching or did this rationalism of his grow out of his own cultural conceptions? The Hellenistic style underwent an analogous evolution in Byzantium and in Andalusia. A comparative study of the monuments of these two civilizations would permit us to separate out the autochtonous elements of Ibero-Andalusian art in its Visigothic and Moslem expressions. Since the third century after Christ vast regions, the high plateaus of Asia, have been the theatre of an important competition of religious ideas which penetrated up to China, first of all Nestorianism, then Islam. The history of these regions could be known only if one has recourse to a study of these comparative movements.

II. *On zones of metamorphosis.* Civilizations have not always evolved within geographic frames completely isolated from each other, like the Chinese, the Mayans or the Incas. Families of civilizations have existed, which, over the millenia, succeeded each other in regions sufficiently near, so that reciprocal contacts permitted exchanges of every kind. Thus, civilizations belonging to Indo-European and Semitic types confronted each other, first in Asia and later on the shores of the Mediterranean. In this way, a sort of zone of friction between these two poles of attraction was formed, and the societies of these regions possessed, as a result of these mutual influences, greater sensibility. Spengler, although utterly ignoring the geographic problems which enframe

and determine history, was nevertheless aware of certain facts resulting from this state of things. He had discovered the phenomenon which he called: Pseudo-morphosis.

To express his thought, he had recourse to the technique and terminology employed by geologists. Mineralogists denote by the word pseudo-morphosis, the following phenomenon: A substance crystallizes within the strata. Crystals in the form of polyhedrons, proper to their molecular constitution, will appear. Let us suppose that as a result of subsequent chemical action, this substance is dissolved, it will produce in the rock a cavity which will possess the form, quadratic, octagonal or any other shape of the crystals which have disappeared.

Then it might happen that another substance is introduced into this cavity. It apparently takes the form of the primitive crystal but in its internal constitution it will crystallize according to its own nature. The inexpert student may be mistaken if he considers only its external form; but it will be sufficient for him to break it to recognize another crystalographic disposition.

Spengler had observed that there existed within civilizations similar phenomena of a cultural type. Greek civilization, for example, possessed a particular genius proper to it. This was a conception of life which, following Nietzsche, he called "Apollonian." The Semitic peoples on their part possessed a genius which he called "Magian." Now, it so happened that as a result of historic events certain literary monuments had taken the apparent form of the Hellenic genius, while conserving, at the same time, in their inwardness the Magian spirit of the Semitic author. St. Paul wrote his Epistles in the Greek tongue, but these texts could not be ranked among Greek literature, insofar as the spirit which had set them down was altogether different. A veritable pseudo-morphosis had taken place.

Averroes wrote his philosophical works in the Arabic language but they were not essentially part of the "Magian" spirit. Rather, they should be situated on the trajectory of Greek philosophy, and this Cordovan has always been considered as one of the great Aristotelian commentators. From this fact alone one could deduce a much broader conception. By reason of its geographic position, Spain at the heart of history, was located in a middle ground between Semitic and Indo-European civilizations. The woman of

Elche, a symbiosis of Greek and Carthaginian art and indigenous workmanship was a remarkable bit of evidence in this regard. Now, this region and this nation were not alone in carrying out this function of mediation. The same thing happened in Ifriqiyah, in Syria, and in the other Byzantine provinces of Asia. These regions, therefore, constituted zones of metamorphosis. A term by which geologists refer to terrain generally sedementary which have been metamorphosed, by reason of their primitive formation, by subsequent developments. A study of comparative civilizations, therefore, would permit us to uncover these interractions produced in zones of metamorphosis. And perhaps we shall discover there, other than pseudo-morphosis, phenomena which we know nothing about today. New horizons would appear which would shed more brilliant light on events of which we possess only the vaguest ideas as a result of the lack of sufficient documentation.

III. *On the evolution of thought and society.* When it concerned itself with political events or episodes, the knowledge of humanity's past had very little influence on the evolution of scientific thought. For it was only a question of a superficial description of life. But this situation changed when history began to study societies not only in terms of their striving toward material and intellectual advancement but also in their evolution toward the biological type of contemporary man. The study of comparative civilizations will facilitate not only a more exact focusing on the history of science, for example, but would also furnish interesting precepts of research which, at first, do not seem to have any direct relationship with history.

If one establishes in a positive manner the evolution of the human being in relation with the geographical settings in which he lived and with the civilizations which shaped him, these lessons would make possible a deeper understanding of phenomena which interest today the laboratory and biological researcher: for example, the average lifespan over the course of time. According to the epoch, this varied as a function of the geographical and social milieu. If we possessed a precise understanding of such questions which only a study of comparative civilizations can deepen, could one not deduce therefrom knowledge concerning future physical and mental preventative measures for the health

of society? Would not the history of disease be of infinite assistance to the biologists? The equilibrium and disequilibrium produced by the individual's adaptation or lack of adaptation to his environment, studied from a historical point of view, would constitute, needless to say, useful data to aid the psychologist and alienist in their research.

Economic problems are discussed today within the complex of the modern world. Nevertheless, social and economic phenomena were much simpler in the past than in our day. It is possible to study them. It is indeed probable that analysing them in terms of comparative civilizations would permit the understanding of contemporary problems by locating them in a perspective which would explain the trajectory of their evolution. The history of economics and sociology, still at the sketching-out stage, deserves sustained attention if society wishes to issue from the morass in which it now finds itself buried. Under the Roman Empire and in the sixteenth century did the precious metals of the West drain away toward India?

Especially in the social sciences does the study of comparative civilizations play its most important role. Some day perhaps it will be possible to learn about the genesis and evolution of thought. At what epoch of history, for example, did abstraction appear in man and society? What are the conditions which permitted its development? Why are most men still incapable today of forming abstractions and following chains of reasoning?

The study of comparative civilizations could isolate the laws which have governed human destiny in the past; it would enable us to understand the causes of growth, flowering and decline of society. For a civilization is not an abstract entity. It is the living and characteristic image of a society.

Spengler, Toynbee, and others have been the pioneers of these grandiose new conceptions. For this reason they have upset many fixed ideas and stirred up a lively effervescence among thinkers. Since in their speculation they could not make use of a scientific method established by generations of preceding experience, they were forced to commit errors, to ignore certain panoramas, to fall into some exaggerations. All of this, of course, sometimes arouses unjust criticism. These authors, like all in advance of their contemporaries in the perception of new horizons,

paid the price which must be paid by all those who make discoveries. It is unreasonable to reject these great schema under the pretext that some conclusions have been put forward on the basis of insufficient evidence. Flaws in the marble do not make ugly a statue which has been sculpted by the hands of a great master. Discussions about subordinate motifs cannot break the thrust of their thought.

Specifically, the history of science teaches us the importance of those swift moments in the existence of humanity when new ideas surge forth and launch toward a fecund and prodigious future. We find ourselves today in an epoch analogous to other moments in the past when great syntheses were put forward. Current generations must put to order in this crowded world all the knowledge acquired during two centuries of analysis. The alert has already been sounded for a long time and by the most distinguished individuals.

Modern man needs clarification to understand his existence. He must have an ideal in life in order to forge his destiny. Without a program to be achieved, without a guiding ray amidst the incoherence of the modern world, there is a danger that our societies are sliding towards a fruitless nihilism.

If the study of comparative civilizations is carried out with method, then some clear and precise conceptions may surely be established.

Would it not then be possible to deduce the exact situation of humanity today in terms of its immense evolution in the past? Norms for present action and future objectives can someday be fixed. At last! Will not man be in a position to guide his destiny? A precise instrument will be at his command. He will possess the archives, scientifically classified and studied, of the story of man.