

perspectives in biology

DEDICATED TO BERNARDO A. HOUSSAY

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editors

PERSPECTIVES IN BIOLOGY

A COLLECTION OF PAPERS DEDICATED TO
BERNARDO A. HOUSSAY
ON THE OCCASION OF HIS 75TH BIRTHDAY

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PREFACE

A life of complete, selfless dedication to the high ideals of science and humanity has endeared BERNARDO ALBERTO HOUSSAY to the many who are proud to call themselves his pupils and friends and he has won their unreserved admiration of his personality and accomplishments. Professor HOUSSAY has been the recipient of many honors. The dedication of a volume of collected papers and essays would seem superfluous if it were prompted merely by a wish to honor him further. Rather we felt that publication of such a volume on the occasion of his 75th birthday would afford some of his pupils and colleagues the opportunity of expressing their admiration and conveying their affection and good wishes. In the course of his long career Professor HOUSSAY has made a large number of friends in many parts of the world and it was, unfortunately, only possible to have a few of them, physiologists in their majority, contribute to this volume. Many of the contributions, often based on new experimental findings, are of a forward-looking speculative nature. The volume offers a number of *perspectives* in various fields of biology and medicine that are currently the subject of considerable interest and intensive investigation. They include topics in endocrinology, neurophysiology and neurochemistry, cardiovascular and muscle physiology, metabolism, and some other fields. Nearly half of the papers are appropriately in the field of endocrinology to which HOUSSAY made some of his most notable contributions.

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BERNARDO ALBERTO HOUSSAY

BERNARDO ALBERTO HOUSSAY was born in the city of Buenos Aires on April 10, 1887. His parents, Alberto Houssay and Clara Laffont, had come to Argentina from France in 1870 and were married in 1879. He was one of eight children, four boys and four girls. Alberto Houssay was a lawyer who practiced his profession and taught literature in the National College of Buenos Aires. He had the finished intellectual training characteristic of French higher education at its best. Wide reading and a remarkable memory had made him familiar with the classics, and the scholarship of the father has left indelible traces in the son.

Bernardo Houssay was a precocious child. He had completed his secondary school education when he was 13, and in 1901 entered the School of Pharmacy of the University of Buenos Aires. In 1904 he obtained the diploma of Pharmaceutical Chemist, with the highest ranking of the year. He then studied medicine and at the age of 23 was awarded the degree of Doctor of Medicine, a Diploma of Honor for his scholastic achievements and the prize given to the best doctoral thesis of the year for his *Studies on the physiological action of hypophyseal extracts*. This precociousness was not merely an early development which ceased once it had reached maturity, but the first stage of an intense intellectual process which has continued without interruption or decrease throughout his life.

Circumstances have made Dr. Houssay in a great measure self taught; he did not have the advantage of working under a great scientist, but had to discover science and the scientific method, which is the instrument for acquiring scientific knowledge, by himself. To a certain extent it can be said that he is a pupil of Claude Bernard, because the reading of the *Introduction à l'Étude de la Médecine expérimentale* caused a great impression on him and revealed to him his vocation.

It is possible, however, that even if he had had the opportunity of doing his apprenticeship in science guided by an expert teacher, he would have preferred to do it on his own, because at an early age an outstanding feature of his personality became evident, his independence of thought and action.

When he was 13 years old, in order to establish his independence, he told his father that he would in future pay all his expenses. This was not just the empty boast of an adolescent. He obtained a small post as assistant in the dispensary of the French Hospital, and from then on he satisfied all his needs with his earnings. The meagerness of his income obliged him to acquire austere habits if he was to keep his word. Thus at an early age he began to practice that way of life, distinguished by concentration of purpose, hard work and the avoiding of loss of time and energy in frivolous pursuits, which seems to be suitable for a scientist. The dignity of poverty is as propitious for the development of intellectual powers as it is for spiritual perfection. The delicate

mental mechanism which acts in the search for knowledge and truth is destroyed in a mind disturbed by inner conflict and the urge to possess many things. The habit of getting along and being satisfied with little served him well when later he had to accept straitened circumstances as a condition for giving all his time to scientific work. He has never admitted this was a sacrifice and in 1934, on the occasion of the twenty-fifth anniversary of his appointment to a university professorship, he said: "In order to work exclusively in science I had to choose between a possibly prosperous situation and scientific work. I chose the better part, that which is worth more than money, and I have not been the loser". He was able to lead this way of life because his wife, Dr. María Angélica Catan, a graduate in chemistry, also found it satisfactory, and to use his own words, "was always an efficient and unostentatious helpmate in all his work". Her life was one of quiet virtue, dedicated to her husband and their three sons, all of them medical doctors, until she died on March 12th, 1962.

Another outstanding feature of his personality is the vigour of his intellect. He has a strong critical attitude of mind which makes him refuse to accept any statement not supported by sufficient evidence, however attractive its appearance. Moreover, a statement to be acceptable must be made with utmost accuracy. He does not have much confidence in intuition, that direct and immediate apprehension which grasps truth without the need of laborious reasoning, but which, sometimes, is the high sounding name given to that intellectual vice known as jumping to conclusions. He prefers to advance step by step, consolidating the ground which had been gained so as to feel it firm under his feet. Yet he does not lack a kind of intuition. His innate scientific talent has been developed by being in constant use; he will return time and again to consider a problem in all its aspects; he has achieved mastery in the handling of the scientific method; he has a vast fund of knowledge, always available thanks to a memory no less remarkable than his father's. All this has given him familiarity with the matter and ways of science so that he can go straight to the significant fact or the weak point in a demonstration, and rapidly find the path that leads to further discoveries.

Professor Houssay is, as are all scientists, devoted to truth. This absolute loyalty to what is true makes him intolerant, not only of gross falsehood, but also of anything that is not authentic, specially if it is disguised under superficial brilliance. His love of truth has made him equally devoted to freedom. In 1946, when his country was passing through a troubled time, he maintained that the "highest forms of thought can only live and flourish in an atmosphere of freedom . . . Science needs freedom and independence and languishes under oppression". He would not compromise with "dictatorships which suppress intellectual activity by restricting freedom of speech and by the regimentation of thought".

Justice is a third object of his devotion. He cannot conceive that anybody should be deprived of his just due, but he also does not admit that anybody can ask and obtain what is not his due. He once said that he had „never exerted undue influence nor been susceptible to it in matters of appointments, examinations or the rulings of committees. This firmness in not tolerating what is unjust and in not granting favors has made

me the object of much criticism and unpopularity, but this has not disturbed me because I not only kept my self-respect but also gained the respect of honest men". He has always been severe and exacting with himself and the experience of many years has been necessary to make him understand that the same demands cannot be made, nor the same rule of austerity applied to all, because few men are endowed with his strength of character.

Strength of character was needed to carry out work of wide scope and great importance in frequently unfavourable circumstances. Houssay is mostly known as a student of natural phenomena, a scientist who has made valuable discoveries, but he is also a man of action. He has the spirit of enterprise and capacity for achievement characteristic of the pioneer and leader in any field of human endeavour. His intellectual energy and physical resistance are such that at one time he was able to direct nearly one hundred research associates working on different problems, without neglecting his duties as a university professor or his work for the advancement of science.

The young Doctor Houssay was attracted to internal medicine. On obtaining his medical degree in 1911, he started to attend the medical department of the Alvear Hospital. In 1913 he was appointed Chief Physician in charge of a ward. He became interested in clinical problems and published several papers on subjects in this field. Four years later he arrived at the conclusion that fruitful work requires concentration of purpose and effort in a definite field. He, therefore, resigned his post at the hospital in order to work exclusively in physiology. Later he stated his motives for this decision in these words: "I believed that I could thus be more useful to my country and at the same time satisfy my vocation for research in natural science". He had been working in physiology for several years. In 1909, while still a medical student he had been put in charge of the biochemical laboratory in the Department of Physiology of the Medical School. He had acquired a certain reputation as a chemist, having continued to work in chemistry after he had completed his studies at the School of Pharmacy.

The following year, Professor Pedro N. Arata, then Dean of the Faculty of Agricultural and Veterinary Sciences, on the recommendation of Doctor Horacio Piñero, Professor of Physiology at the Medical School, asked him to take on the duties of Professor of Physiology at the School of Veterinary Science and appointed him provisionally to the chair of physiology. In 1912 he was appointed full professor, having been chosen amongst 33 candidates who applied for the post. The most important part of his apprenticeship in Physiology and Experimental Medicine was done in this school. He gathered around him a group of young men and trained them in the scientific method, amongst them Leopoldo Giusti, who was to succeed him when he left for the Medical School and Enrique Hug who later became professor of Pharmacology at the Medical School at Rosario.

In 1913, Professor Rudolf Kraus, who had been called from Vienna to organize the National Public Health Laboratories, asked him to direct the laboratory for Pathological Physiology. Biedl, the famous Viennese endocrinologist, knew about the young Argentine scientist's work and had drawn Kraus' attention to him.

In the meantime Houssay had not severed his connections with the Medical School

and in 1915 he was appointed Substitute Professor of Physiology. The chair of physiology became vacant in 1919 and Doctor Houssay was appointed Professor Piñero's successor. At a farewell dinner given in his honor by the staff of the Public Health Laboratories, Professor Kraus pointed out that this appointment was not just the routine filling of a vacancy but "a memorable event in the development of Argentine medicine . . . The purpose of a University, besides teaching, is research. This must be recognized as a basic principle if there is to be autonomous scientific development. Doctor Houssay has always been faithful to this principle, he is not only a teacher but also an untiring and disinterested researcher".

Professor Houssay organized the Institute of Physiology at the Medical School, and made it a scientific center with an international reputation, attracting many Argentine and foreign young men who wished to learn the way of science from such an eminent teacher and scientist. He gave his time and effort generously to the Institute. He resigned all his other appointments to become the first full time professor in the Medical School. Early every morning, including holidays, he would arrive at the Institute and often late at night he could still be found there. On returning home he would pick up his books or scientific periodicals, or study the protocols of his experiments, or write a paper reporting the results of his work. The practice of full time in the University meant for him not just the filling of so many hours a day or a week with formal teaching and laboratory work, for a salary which would cover his personal needs, but giving the best of his mind with unflagging effort to his task, a complete dedication to the service of science or scholarship which finds its reward in the work itself. He was open-handed in other ways besides in the giving of time and thought and work; with funds taken from his own by no means princely salary he collected and kept up to date the magnificent library in physiology and related sciences which was a valuable asset of the Institute.

His austere and dedicated life had the virtue of attracting many young men who felt proud to be his pupils. Severe and exacting, he was not an easy master, but he demanded more from himself than from others, thus setting an example which called up emulation.

His teaching at the Institute of Physiology began a new era in Argentine medicine. He was active in introducing accurate, up-to-date techniques for clinical observations and in the application of the scientific method to clinical studies. His influence was not limited to his students and to his subject, members of other Departments of the Medical School would come to him for advice and help in their work. Soon his reputation spread to wider spheres and men interested in scientific research came from the universities of his own and other countries seeking for his guidance. Some fifteen Honorary Professorships in Latin American universities bear witness of the depth and importance of his influence in the development of Science throughout the Continent.

There are many facets in Doctor Houssay's work, but a fundamental purpose gives it unity and harmony. The scientist who searches for new knowledge, the teacher who guides his students in the path of science, the university professor who speaks and writes with authority on problems of university education, the enthusiastic and perse-

vering advocate of the advancement of science, the citizen active in the defence of civil liberties is always in these varied activities the faithful servant of truth and learning.

The most valuable part of all this work is, possibly, his scientific research. He began studying the hypophysis, "a small organ placed by God where it cannot be easily approached", as Harvey Cushing once said, "so that only the most able could reach it and discover its great importance". His first scientific paper, published in 1910 in the *Revista de la Universidad de Buenos Aires*, was on the hypophysis of the frog. His first important research work, a study on the activity of hypophyseal extracts, was the subject of his doctoral thesis, presented in 1911. He continued this work and in 1922 published a book on *The Physiological Effects of Hypophyseal Extracts*, which obtained the first Prize for Scientific Work awarded by the Argentine National Government to the most outstanding work in science published in the course of the year. His interest in the hypophysis has never ceased, and today, more than half a century after his first publication, he is still studying the functions of this gland.

All the endocrine glands have been the object of his interest. A long series of papers on the adrenal glands and the secretion of adrenaline have established definite knowledge on the functions of both parts of these glands. The thyroid and parathyroid glands, the endocrine and other aspects of sexual functions, the internal secretion of the pancreas and the activity of insulin have been the subject of numerous papers published by Houssay and his associates. He was specially interested in the part played by the endocrine system in the mechanisms which regulate different bodily functions, therefore in the inter-relations between the endocrine glands. He thus came to make the most important discovery of the many he has to his credit, the role of the anterior lobe of the hypophysis in the regulation of carbohydrate metabolism and in the pathogenesis of diabetes. In the understanding of diabetes the following discoveries can be considered as the main steps: (1) the discovery made by PAVY and by WILLIS in the 17th century that the blood and urine of diabetics have a sweet taste and that this is due to sugar, as was demonstrated by DOBSON in 1776; (2) the discovery of the glycogenic function of the liver made by Claude BERNARD just over a century ago; (3) the demonstration, made by VON MERRING AND MINKOWSKI in 1889, that removal of the pancreas causes diabetes in the dog; (4) the extraction of insulin from pancreatic tissue by BANTING AND BEST in 1922; and (5) the discovery by HOUSSAY, in 1930, that removal of the anterior lobe of the hypophysis diminishes the severity of diabetes due to removal of the pancreas. Further work by Houssay and his associates showed that the anterior lobe of the hypophysis plays an important part in the regulation of carbohydrate metabolism and that diabetes is not merely due to insufficiency of the islet cells of the pancreas, but is a disturbance in the endocrine equilibrium of the organism. For this discovery he was awarded, in 1947, the Nobel Prize for Medicine and Physiology.

Houssay and his associates have done much work in other aspects of physiology, biochemistry and pharmacology. The physiology of circulation and respiration, of the blood and the processes of immunity, of the nervous system, of digestion and bile secretion and of many aspects of metabolism have been the subjects of several hundred

papers. His interest in pharmacology, which began when he was a student in the School of Pharmacy, led him to become an authority in this science and many advances in pharmacology in the Argentine are due to his initiative. In 1934 he was appointed Vice-President of the Permanent Committee for the Study and Revision of the Argentine Pharmacopea.

When Doctor Houssay was a member of the National Public Health Laboratories he was in charge of the preparation of serum against snake venoms. He became greatly interested in the venoms of snakes, spiders and scorpions and published some fifty papers on the subject. These studies give proof, not only of the versatility of his interests, but also of the fact that when an opportunity for research has been offered him he has made the best possible use of it. This work earned him one of the first international distinctions which acknowledged the value of his scientific work; in 1919 he was appointed a member of the Société de Pathologie Exotique of Paris.

Today, well over 500 scientific papers and several books contain the results of his discoveries and have given such a solid base to his reputation as a scientist that he has been made Doctor Honoris Causa by the Universities of Paris and Harvard, Oxford and Cambridge, and 18 other universities all over the World. He entered the Argentine National Academy of Medicine in 1927 and was its President in 1936-37. He was made member of the Argentine National Academy of Letters in 1935, of the Argentine National Academy of Sciences in 1946, of the Academy of Science of Cordoba in 1946 and of the Argentine National Academy of Moral and Politic Science in 1948. More than one hundred Academies and Learned Societies in many countries have honored him with membership, amongst them the Academies of Medicine and of Science at Paris, the Royal Society of London, the Academia Nazionale dei Lincei and the Pontifical Academy of Science of Rome, the National Academy of Science of the United States of America, the Deutsche Akademie für Naturforscher, the Academies of Medicine of Rome and of Madrid. The Government of several countries have honored him with decorations, such as the French Légion d'Honneur, the Order of Merit of Italy, the Order of the Crown of Belgium, the Order of Oranje-Nassau of Holland, the Order of Merit of Chile, the Order of Merit of the German Federal Republic, the Cross of Merit of the Sovereign Order of Malta, and Pope Pius XII made him a Commander of the Order of St. Gregory the Great.

At the beginning of his career Doctor Houssay became aware of the need of ways and means for the discussion and publication of the results of the work of Argentine scientists. In 1920 he founded the Argentine Society of Biology, which was soon affiliated to the Société de Biologie of Paris. The Society has met regularly, without interruption, according to the rules laid down by its Statutes during more than forty years. Doctor Houssay has also been a member of the Editorial board of many scientific periodicals. He has taken great interest in teaching his pupils how to speak and write in scientific language. Scientific thought must be expressed in an austere and sober style, whose beauty lies in the clearness and accuracy with which ideas are put forward, because scientific truth does not need to be embellished by useless verbiage, however well sounding it may be.

Houssay has preached by means of the spoken and written word, but mainly by examples, the need of a fundamental reform in Argentine university education. A first object to be achieved is to make the universities institutions active in the search for new knowledge; a second is to convert teaching from the mere transmission of information, which soon becomes outdated, into the training of the intellect in the methods of original thinking, so that university graduates will think on their own and not become the slaves of current opinions and slogans manufactured by propaganda; a third is to make available to Society the knowledge acquired and the benefits of independence of thought. University teachers should be fully dedicated to the search for truth and the guiding of their pupils along the path of their vocations. University students should be able to make the training of their minds the main business of their lives, and they should receive personal attention to their intellectual needs, because University graduates are not mass-produced commodities. Argentine universities are far from having achieved these ends, but some progress has been made, in spite of the interruption which occurred from 1945 to 1955. Certain principles are now well understood and in part have been put into practice. Houssay's papers on this subject published up to 1934 were collected in a volume under the title of *Escritos y Discursos*.

The advancement of Science has been another of Houssay's main interests. He has affirmed and often repeated that a nation which has no scientific activity lives a parasitic life, because it does not contribute to the common fund of knowledge without which man cannot live in security and free from want. It cannot therefore hold its place with dignity amongst other nations. He has been untiring in his efforts to make the public and the authorities understand the importance of science for general well-being. For this purpose he was one of the founders of the Argentine Association for the Advancement of Science, of which he was president from 1934-1957. The Association also awards fellowships and grants for research projects with funds obtained by voluntary contributions.

The Association can be considered the cradle of the National Council for Scientific and Technological Research created in 1957. That year the Government asked the National Academy of Science its advice on the question of the formation of a National Research Council. The Academy appointed a Committee made up of four of its members, Dr. Houssay, Sanchez Díaz, Deulofeu and Braun Menéndez. All of them members of the Association, who for several years had taken an active part in promoting the organization of a Research Council. Their report was the basis that served to organize the Council and Doctor Houssay was appointed its President. It has become a powerful and efficient instrument for the advancement of science and technology in Argentina.

Difficulties and troubles test the courage and resourcefulness of men and nations. If there is an adequate response to the challenge and the obstacles are overcome, these difficulties stimulate the achievement of greatness which otherwise would have remained latent, not having had the occasion to become manifest. In 1943, in a moment of national emergency, Houssay together with other outstanding men in different walks of life, expressed his opinion that there should be effective democracy and that the

country should fulfil its duty of solidarity with other American nations. The *de facto* Government then in power immediately dismissed him from the University. This barbarous act of depriving an eminent scientist of the means for continuing work of great value for his country and for humanity, provoked a world-wide reaction. Positions were offered him by institutions in several countries, which would have considered themselves fortunate if they could have acquired a so valuable member for their staffs. Doctor Houssay refused them all, he did not wish to leave his country in the hour of its need. He continued his work with a small group of his associates in a laboratory equipped and kept up with funds contributed by men who understood the importance of assuring that his work should not be interrupted. The "Instituto de Biología y Medicina Experimental" thus came into being, the first institution in Argentina dedicated to disinterested scientific research financed with private funds. It has also served to set an example and soon afterwards several others were founded.

In 1955 the Revolutionary Government re-instated Doctor Houssay in the University. In 1958 he was appointed to a research professorship and he continues to work in the Instituto de Biología y Medicina Experimental.

Once, on a memorable occasion, Doctor Houssay summarized his code of belief and behaviour in a few brief sentences. The First is "love of my country". His patriotism does not consist in empty rhetoric or hatred of all that exists beyond certain geographical frontiers. It is fundamentally "to do one's duty"; to maintain "personal dignity"; to serve one's country and humanity by "devotion to science and work"; to "love freedom" and to know how to defend it when it is attacked; to have "respect for justice and men" and to "love one's family, pupils and friends". This statement has the directness and simplicity of authentic belief, an authenticity which has been proved by firm adherence to it during a long and fruitful life.

Happy is the country which has a son of such great-worth.

JUAN T. LEWIS

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“SCIRE” AND “SCIENTIA”: ARISTOTLE AND FRANCIS BACON

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INTRODUCTION

One of the most spectacular trends in the scientific thought of our days is undoubtedly the great interest scientists have taken in certain problems of epistemology*: what is meant by knowledge; how knowledge originates; what makes the difference between “ordinary” and “scientific” thought; what kind of spiritual tools science has to make use of; what makes the difference between the various sciences; how the latter are to be related with one another?

To demonstrate the fundamental importance of all these epistemological problems it would be sufficient to refer to the painful difficulties biologists of my age group (a very significant *terminus technicus* in social anthropology) had in finding out that biology is very far from being nothing else but chemistry and physics; psychologists in finding out that psychology is very far from being nothing else but neurophysiology; and sociologists in finding out that sociology is very far from being nothing else but biology of human races**.

Thus I thought that the scientist, and so also the biologist, will be interested to discuss various details referring to two phases of the evolution of epistemology related to the names of ARISTOTLE and FRANCIS BACON, separated by almost two thousand years. These were phases in epistemology of crucial significance, and essential for the understanding of the core of science***.

* To avoid any misunderstanding with professional philosophers I may add that epistemology is here used only in the immediate sense of the word as derived from ἐπιστήμη (epistémē), science, without allusion to those special problems which might be of the incumbency of the philosopher.

** “Nothing else but...” is from chapter *Brain and Soul* of the then famous book of LUDWIG BÜCHNER’s *Kraft und Stoff*, 1855: “The word “soul” is nothing else but a notion which summarizes... all the activities of the brain and its different parts... including the whole nervous system”. This concept is certainly true in so far as it concerns the problems and methods of neurophysiology; but it does not comprehend the problems and methods of psychology. Old and wise PAVLOV suggested a “happy union” between physiology and psychology (*Selected Works*, Moscow, 1955, p. 569).

*** The significance of BACON in the history of European science has been discussed more recently in a masterly manner in the writings of BENJAMIN FARRINGTON. Of considerable interest is also the book of the Italian ROSSI. For some relevant aspects of ARISTOTLE and BACON see also my book.

THE RISING STEPS: SCIRE AND SCIENTIA

A true understanding of the complex phenomenon of science as we know it to day presupposes taking contact with its beginning, *i.e.* its *dawn* in palaeolithic times, and its *primitive evolution* in neolithic times. Indeed, archaeology procures us direct information only about the material culture of *homo sapiens*; our information about his intellectual status is derived from the observation of the rests of his material culture and of his artistic achievements. Since *homo sapiens* is from the very beginning also *homo opifex*, the remains of his material culture are abundant; and the same is true for his artistic achievements. One is rather overwhelmed by the technical skill, by the sculpture and painting of *homo sapiens* in palaeolithic times. The same is true for "primitives" of our time as testified by a host of observers.

Knowledge as acquired through Work, *Opere*, is the heritage of all the members of the tribe. Reflexion, Reasoning, intimately related to Work, shows rather early the tendency to become, in certain individuals, *autonomous*, *i.e.* to become to a certain degree independent from their own Opus, but relying on the Opus of the members of the tribe. The chief, and especially the medicine-man, the magician, is the representative of this autonomistic tendency in human intellectual evolution. The medicine-man, the magician, is the first sage, or scientist, *homo sapientissimus, seu doctus*.

The very humble origin of science and of its professional representatives, or scientists, is mirrored also in the multifarious significances of the verb *scio*, *scire*, from which *scientia*, or science, derives. There is, in the significance of *scientia*, a real evolutionary ascent from humble practice to sublime theory (Lat. Dict.):*

scire: to know, in the widest significance of the word; to understand, perceive; to have knowledge of or skill in any thing.

sciri potest: can be learned.

scire licet: it is easy to see that.

scito (imper.): be assured; remember (p. 1643).

sciens: knowingly, wittingly, purposely, intentionally. . . understanding, acquainted with, skilled, versed, or expert in any thing.

scienter: wisely, skillfully, expertly (p. 1644).

scientia: a knowing or being skilled in any thing, knowledge, science, skill, expertness, = cognitio, eruditio. . . theory (p. 1642).

When going through these significances of *scientia* at different periods of Roman culture one cannot avoid assuming that *scientia* is in its beginning by no means codified science but nothing but acquaintance with things, awareness of things, and, consequently, skill; *scientia* is, as mentioned, intimately related to practice before becoming theory. Thus skill and expertness are steps of the ascending ladder of primitive science.

* For every one who is not a linguist it is frankly amazing how much one can learn from a good dictionary. I should like to pay sincere homage also to Valbuena Reformado, *Diccionario Latino-Español*, my permanent companion in former years before I became acquainted with the Oxford dictionaries. The services rendered by Valbuena were also brilliant.