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BERNARDO ALBERTO HOUSSEY
1887–1971
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By Sir Frank Young, F.R.S. and V. G. Foglia

During his lifetime Bernardo Alberto Houssay not only achieved outstanding distinction by his prolific and original investigations which in 1947 brought him the award of the Nobel Prize, but late in life he became a cultural leader against dictatorship and an inspiration, in the struggle for freedom, which went far beyond the boundaries of his homeland. The statement has been made that during the period of nearly a quarter of a century after his Nobel award the contributions he made to learning and human welfare through his courageous example and wise advice were at least on a par in importance with those that he had made during the earlier years of immensely fruitful research in the laboratory.

ANCESTRY

Bernardo Alberto Houssay was born in Buenos Aires, Argentina on 10 April 1887, the child of Alberto Houssay and his wife Clara, née Laffont. His parents had been born in the south of France, his father in Bayonne and his mother in Aussan-es-Angles (Haut Pyrenées). The Laffont family had earlier settled in Argentina, a country to which Albert Houssay subsequently moved and where he married Clara Laffont. But later Alberto and Clara Houssay returned to France because Alberto's Baccalaureate, which had been obtained in that country, was not recognized in Argentina. Subsequently, in Bordeaux, Alberto Houssay became a Doctor in Law.

In 1886 the President of Argentina invited Alberto Houssay to return to Argentina, where he was appointed a teacher in the High School ‘Colegio Nacional Central’ in Buenos Aires. In the following year Bernardo Alberto was born, the fourth child of eight.

SCHOOL AND UNIVERSITY EDUCATION

Very early in his life Bernardo Alberto Houssay was seen to possess unusual mental abilities, allied to a love of hard work and an astonishing memory; these qualities continued to serve him till the end. From the earliest years he spoke French as well as Spanish, and later was from time to time mistaken
for a native of France when travelling on the continent of Europe. He went to private schools from the age of five to eight years, and then to the State elementary school, where he finished the course at the age of nine. His two older brothers and his sister had gone to France to finish their education; but the cost was high and his parents decided that Bernardo should complete his education in Argentina. At the age of thirteen years he took his Baccalaureate with the highest honours. Evidently he was a precocious child and through his father became conversant with the classical writers, whose works he committed to memory and from whom later in life he could quote at length. He early showed a passion for reading, especially history, literature and natural sciences.

In 1901, at the age of fourteen, he started to study pharmacy, graduating as a pharmacist at the top of the class in 1904 when he was seventeen years old. This period provided a foundation in chemistry which was of great value in his later career.

In 1904 he began medical studies and, as in pharmacy, proved to be an outstanding student, being congratulated by the examiners on his performance at every stage. Before he had completed the course he was appointed by competitive selection to be the Assistant for practical work to the Professor of Physiology, Horacio G. Pinero and this early close contact with physiology had a lasting effect on his career. Houssay observed that at the time the teaching in physiology was fundamentally theoretical, with little practical work or research. He decided that he himself would investigate the function of the hypophysis or pituitary gland, about which little was known at that time. As a result he was able to prepare for his doctorate a thesis entitled (in translation) ‘Studies on the physiological action of pituitary extracts’ for which he received not only the M.D. degree but the Science Prize of the Faculty of Medical Science. This thesis was published in 1911 and was acclaimed for its erudition, for its experimental basis, for the originality of the subject and for the special methods employed, which Houssay himself had devised.

From the age of thirteen onwards Bernardo was determined to pay his way, and for his education. He obtained an appointment to a technical post in the French Hospital, and in 1907 he became an Assistant Pharmacist by competitive selection in the Hospital de Clinicas. He used to save money by walking from his home to work, and later showed himself to be a champion runner in the 800 metres flat race.

In 1909, when Houssay was twenty-two and before he had completed his medical course, he was appointed Acting Professor of Physiology in the Faculty of Veterinary Science in Buenos Aires. He thus first became a university professor when he was of an age similar to that of many of those he taught. To begin with, some of the veterinary students boycotted his lectures, partly on the grounds of his age but also because he was not a graduate in veterinary medicine. Nevertheless his theoretical and practical teaching, associated with his enthusiasm and evident great capacity, won the day. Later, in 1912 at the age of twenty-five, he was promoted to be full Professor.
When he had completed his medical qualification Houssay began to treat private patients, and for a time served as a house physician in the hospital. His outstanding merit soon led to his appointment as Chief of the Unit of Clinical Medicine of the Alvear Hospital where patients suffering from endocrine disorders were of special interest to him. But as his research became more absorbing he gave up both consulting room and hospital work.

**EARLY RESEARCHES**

The Laboratory of Physiology in the Faculty of Veterinary Science in Buenos Aires possessed scientific material of French origin which had been acquired by the previous Head of the Department, and although there were many experimental animals available there was little room in which experiments could be carried out. There was no artificial light, and experiments could be performed only in daylight or by the use of candles after dark. In winter the floors were so cold that overshoes and wooden boards were resorted to. There was no library.

Although there were comparatively few students some of them were outstanding and later themselves became professors. Among these may be mentioned Leopoldo Giusti, who later succeeded Houssay in the Chair of Physiology in the Faculty of Veterinary Science, and Enrique Hug who became Professor of Pharmacology in the Faculty of Medicine in Rosario, Argentina.

In 1910 Houssay devised a method for the removal of the pituitary gland from the frog (3) which proved to be of fruitful importance in the later development of his investigations. He also succeeded in removing the pituitary gland from dogs, and studied both in frogs and in dogs the action of extracts of the pituitary gland on the circulation, and also on the contraction of the uterus and of the intestines and of other organs which contained plain muscle. In cats and cows he investigated the action of posterior pituitary extract on the secretion of milk, and he removed the thyroid gland from horses, cows, goats and sheep. He explored the action of different anaesthetics on the horse, and the control of salivary secretion, as well as haematopoiesis and the function of the vagus, in this animal. In research on the action on cattle of toxic plants he studied the effects of extracts of mushrooms, foxgloves and emetine.

One of his special interests was the venous pulse and arrhythmias in man, which was the subject of an extensive publication in 1915 (10).

In 1915 Houssay accepted an invitation to become the Chief of the Section of Experimental Pathology in the Institute of Bacteriology, an official department concerned with the preparation of serums and vaccines of which the Director was Professor Rudolph Krauss, a distinguished scientist of German origin. Houssay held this appointment until 1919 and his relevant publications are concerned with the action of venoms from snakes, spiders and scorpions on the coagulation of the blood and on precipitins and haemolysins. Studies on the action of curare, and on specific serum therapies, added to his international reputation.
In all these investigations he was aided by a woman doctor in chemistry, María Angélica Catán, and their professional cooperation resulted in marriage in 1920. Their three sons, Alberto, Héctor and Raúl, all became doctors of medicine and contributed to research. María Angélica was a great support to Bernardo until her death in 1962. She was the understanding wife who encouraged and supported her husband through the financially difficult time when he was set on being a full-time physiologist. She assisted Bernardo in many different ways throughout her life, and her death after a long and distressing illness left a deep mark upon him which was never eradicated.

The Institute of Physiology, the University of Buenos Aires

In 1919, at the age of thirty-two, Bernardo Houssay was appointed Professor of Physiology in the Faculty of Medicine of the University of Buenos Aires. Despite his remarkable qualifications his appointment was the subject of some controversy. There was a tie in the voting by the appointing body, which was settled in Houssay’s favour by the casting vote of the Dean of the Faculty of Medicine, Professor Alfredo Lanari.

With this appointment Houssay completely gave up his medical practice and other commitments, becoming full-time Professor of Physiology and Director of the Institute of Physiology, with its teaching and research laboratories. Although this change meant a significant diminution in his emoluments Houssay had no doubt about his wish for a full-time university appointment. As time passed his collaborators followed his example and began to work full-time at the Institute, and ultimately this pattern became widely accepted in other Latin American countries where previously it had been unknown. Long before the political problems of the 1940s had made themselves felt Houssay had become an example for international consideration.

His ideas on medical teaching in general, and on that of physiology in particular, were expressed in many lectures and articles, some of which were published in 1942 (130). He believed that teaching should be objective and practical, and should develop in the learner the capacity for thought, personal judgement and initiative. He asserted that there should be much teaching and few examinations, an idea that was far from popular with some of his colleagues. He maintained that the number of students admitted should be related to the teaching capacity of the school and that if there were too many good applicants new schools must be created. He insisted on the selection of those who were admitted to the Faculty of Medicine on the basis of strict tests. He maintained that with properly selected students and good teaching, failures in examinations should be minimal or non-existent. He maintained with great vigour the importance of having full-time teachers.

Opposition to many of these points brought the hostility of students and of some professors. A campaign accused him of holding anti-democratic views. But his integrity, his pertinacity, and his intellectual dominance, helped to carry him safely through what could have been a daunting experience for one who was less certain of what he was about.
As soon as he had been appointed Professor of Physiology and Head of the Institute of Physiology in the University of Buenos Aires, in 1919 Bernardo Houssay began to build up a remarkable group. Early in this period he attracted collaborators from within Argentina, but slowly and surely his fame spread and many came from without Latin America. The total number of those engaged in research and teaching with him became such that a collective photograph of them gave the impression of a small international congress rather than those who were working in one institute in one university.

Houssay was almost indefatigable and his interests were immensely wide. Endocrinology and metabolism came first, but neurophysiology, renal function, blood and immunity, respiration and digestion, each claimed their part among his manifold interests. Under endocrinology and metabolism his interests were anything but narrow, including studies on sexual and reproductive functions and the adrenal glands, as well as the pancreas and the pituitary gland in relation to diabetes mellitus. He studied the metabolism of fat and ketogenesis, the influence of sex hormones on diabetes mellitus and the action of the thyroid gland. He also continued his pharmacological studies on curare, the action of snake venom and the venom of spiders and scorpions. Moreover, he showed increasingly wide interest in the teaching of medicine, of physiology and of science in general. And many of his objectively critical articles on these subjects, which pointed out how improvements could be achieved, had constructive importance.

But in 1943 came a break. Argentina was going through a crisis. The country was ruled by a constitutional government which was both weak and unpopular. The Second World War was moving to its climax and public opinion, submitted to intense propaganda, was sharply divided in its support of one side or another. Under these conditions a military revolution occurred and a new government came to power, against which the universities provided strong resistance. All over the country rectors, deans, professors and students offered opposition, and this led to violence and a paralysis of the universities. The Government had to act.

One of its first measures was to take action against Professor Houssay and other university colleagues who had joined in signing a manifesto with over 150 other well known public people, which asserted that the country should return to ‘constitutional normality, effective democracy and American solidarity’. Very quickly, in October 1943, all the university professors who had signed this statement were dismissed from their posts. This was indeed surprising in view both of Houssay’s stature within his own country and of his international reputation. But the rest of the world was much distracted.

Within the Institute of Physiology in Buenos Aires, Houssay’s collaborators were divided into those who resigned as a protest at the dismissal of their leader, and those who decided to remain in order to preserve the Institute for later restoration. Similar reactions took place in other universities throughout
the country and so almost overnight the Chairs of Physiology in Buenos Aires (B. A. Houssay), in Rosario (J. T. Lewis) and in Córdoba (Oscar Orias) became vacant, and not only these but many other posts were vacated by the actions of those who followed their professors. Some who were dismissed or resigned turned to private medical practice or went abroad but among those who resigned but remained in Argentina to support Houssay were Dr Virgilio G. Foglia and Dr Luis F. Leloir.

The dismissal or departure of so many distinguished professors exacerbated the political situation. University faculties were taken over by the students, skirmishes occurred between antagonistic armed groups and a large number of students were gaoled as political prisoners. Ultimately the authorities were obliged to close all places devoted to higher education.

In such circumstances Bernardo Houssay was the leader among those in Argentina who strove for intellectual freedom. Undoubtedly he could have departed and been appointed to a senior post in another country. But he decided that he must remain in his own country as the standard bearer for freedom and for science.

In 1945 there was a general amnesty for those who had been expelled from universities in 1943 and many, including Houssay, returned to their posts. Their dismissal had been declared illegal, but legal changes were now enacted under which the age of retirement for university professors could be decided by a special delegate appointed by the Government to advise the university. On 6 September 1946 Professor Houssay, then 59 years of age, was informed by such a delegate that he had been relieved of his post. With him again departed as before many who were his followers and supporters. Among those who resigned was Dr Eduardo Braun Menéndez, who was a Deputy Professor in the Faculty of Medical Science and who, in tendering his resignation said that he did so because 'he wishes with his resignation to reaffirm his solidarity with Professor Houssay, recently relieved of his post, an exemplary master who with his talent, his work and research and his self-denying dedication to his work, has brought honour to the Chair of Physiology of the Faculty of Medical Sciences of Buenos Aires and to the country, deserving without any doubt the respect of posterity'. Again Professor Houssay was invited to make his home abroad, particularly in the United States where research facilities were put at his disposal. But once again he preferred to stay as the obvious leader of those who fought against the forces of reaction.

**The Institute of Biology and Experimental Medicine**

The creation of the Institute of Biology and Experimental Medicine was the direct outcome of Houssay's first dismissal from the Faculty of Medicine in 1943, and of his determination to remain in his own country. A group of Argentinian business men and university graduates, who were seriously worried by the dark future in prospect for science in Argentina under the conditions which then reigned, offered Bernardo Houssay funds to set up an institute in
which he could continue his work. The spokesman for this group was a distinguished lawyer, Dr Miguel Laphitzondo, who was President of the Sauberán Foundation which had been established to aid scientific research in memory of Juan Bautista Sauberán. And the new Institute also attracted international support.

In March 1944 this Institute began work, and it has continued to flourish to this day. In it Houssay was joined by Juan T. Lewis (Rosario), Oscar Orias (Córdoba), Eduardo Braun Menéndez and Virgilio G. Foglia (Buenos Aires). Later Luis F. Leloir came back to join them after a period of research abroad, and soon came others, some full-time and some part-time. The house in a suburb of Buenos Aires (Palermo) at Costa Rica 4185, in which the Institute was first established, consisted only of two floors, a cellar and a garage; but soon it was working, though working with meagre facilities since so much of the relevant material in the University Faculty had been destroyed during the disturbances. When, in 1955, as the result of the ‘Revolución Libertadora’, Houssay was reinstated in his Chair as Director of his old University Institute of Physiology, he maintained his Institute of Biology and Experimental Medicine. But in 1956, at the age of 69, he resigned from the University Chair and devoted his full attention to the independent Institute.

In 1959 the Institute of Biology and Experimental Medicine moved from Costa Rica 4185 to a much larger house, in the suburb of Belgrano, at Obligado 2490. The increase in space available meant that new equipment could be properly accommodated and the number of investigators increased.

Bernardo Houssay remained the Director of the Institute until his death in 1971, continuing to stimulate the output of many research publications. Furthermore, he was responsible with collaborators for the publication of a most important text book of human physiology, that has run into many editions.

HONOURS AND DISTINCTIONS

The award in 1947 of the Nobel Prize for Physiology and Medicine jointly to Bernardo Houssay, and to Carl and Gerty Cori of the United States, was of special importance to Argentina. Not long before Houssay had suffered his second dismissal from his University post and although his independent Institute was well established the future could not be regarded as certain. But before this period many public acknowledgements had been paid to him in Argentina. In 1934, on the 25th anniversary of his appointment to be Acting Professor of Physiology in the Faculty of Veterinary Science, a jubilee meeting was held, attended by many distinguished people in the scientific world both from within Argentina and from abroad, together with national authorities, including the then President of Argentina, General Agustin P. Justo. A special book was published to celebrate this event. Then again in 1967 the Academy of Medicine in Buenos Aires celebrated his 80th birthday and another special commemorative volume was published.

Houssay was honoured by many public, scientific, medical and university bodies throughout the world. But the award to him jointly of the Nobel Prize
at the time it came was an event of the greatest importance, arriving as it did soon after he had been dismissed from his University post and when the future indeed seemed dark. In his own country there were official efforts to minimize the importance of this distinction, and public meetings to celebrate the event were prohibited. Houssay himself said that he considered that the Prize had been won by his collaborators and all who had shared in his work over the years. He thought that the Prize obliged him to work even harder and better along the same lines, and he considered that the intellectual acknowledgement which attached to the award of the Prize was a stimulus of benefit to his country. In this he was undoubtedly right.

The National Council for Scientific and Technical Research 1958

The revolution of 1955 found Argentina backward in scientific matters, with a deficiency of university teachers, of research workers and of up to date equipment. Bernardo Houssay proposed that a government organization should be established to aid the rapid rehabilitation of Argentinian science, and as a result the National Council for Scientific and Technical Research was inaugurated on 5 February 1958, its object being to 'further, coordinate and assist research in the fields of pure and applied science'. Houssay was its first President and directed its activities until his death.

The activities of the Council were many. It instituted Fellowships both inside and outside the country, and helped the repatriation of scientists who had gone abroad during the troubles. It assisted in the creation of a career structure for scientific research workers and technicians which made possible full-time dedication to scientific work, with the certainty of an adequate salary which would rise with increasing responsibility. It provided grants to help research, to pay the expenses of those attending congresses, to aid publications and it assisted in the upkeep of research institutes. In some ways the Institute for Biology and Experimental Medicine was the precursor, and almost a microcosm, of the structure that Houssay reared in the last years of his life in the form of the National Council for Scientific and Technical Research.

Research

The hypophysis and carbohydrate metabolism

Houssay's name will always be linked with the hypophysis, the pancreas and diabetes mellitus. In 1907 he examined a patient with acromegaly who greatly interested him. Houssay knew that the hypophysis or pituitary gland was affected but since so little was known about the function of this small appendage to the brain he decided to study it. In 1910 he published his first work on this subject, and in 1911 his thesis for his doctorate of medicine on the same topic received the Faculty Prize. From then he never ceased to pursue investigations on this small gland.

When insulin became available in the 1920s, as the result of the important discovery in Canada by Banting and Best, Houssay initiated a systematic study
of the effect on the sensitivity to injected insulin of the removal from animals of various endocrine glands. As a result he discovered the most extraordinary increase in sensitivity to the hypoglycaemic action of insulin which is induced by the removal of the pituitary gland in numerous species of animal. For the first stages of these investigations Houssay had to prepare his own insulin, and for the investigations he was undertaking a biologically standardized product was of paramount importance. So at first, not surprisingly, progress was slow. Although, as early as 1924, he and Magenta (52) had established the astonishingly high sensitivity of hypophysectomized animals to the blood-sugar lowering action of injected insulin there was some confusion for a time about which part of the complex pituitary gland was involved, and the possibility was envisaged that the posterior lobe, the neurohypophysis, was concerned. But here Houssay's early experience with the toad was of great value since in that animal the anterior lobe of the pituitary gland can be removed quite readily without damage to its other parts, and as a result in 1929 Houssay and D. Potick were able to demonstrate clearly that it was removal of the glandular part alone—the adenohypophysis—that induced the great rise in sensitivity to the action of insulin. Moreover, the implantation of tissue from the glandular part of the pituitary into a hypophysectomized toad greatly diminished its sensitivity to the hypoglycaemia action of injected insulin.

These observations led to the view that after hypophysectomy, or the removal of the anterior pituitary lobe alone, the tissues of the operated animal were oxidizing glucose at an unusually high rate and that the production of something in the anterior pituitary gland could diminish this excessive utilization of the sugar.

The next step was crucial. Would the removal of the pituitary gland increase the utilization of glucose in an animal which had been made diabetic by the removal of the pancreas? In 1930 Houssay & Biasotti described the diminution in the severity of the diabetic condition of the depancreatized dog which occurred when the pituitary gland was removed (77). The animal survived the double operation for many months, while animals from which the pancreas alone was removed lasted only a week or two. Houssay & Biasotti then went on to emphasize the importance of the anterior pituitary gland in experimental diabetes by showing that in partially depancreatized dogs the administration of a simple extract of the anterior pituitary lobe could induce the symptoms of diabetes. The evidence was now complete that the anterior pituitary lobe played a fundamentally important role in the control of the metabolism of glucose in the body. These phenomena had been first demonstrated in the toad and then in the dog, but were found to apply to a wide range of species, in which man can now be included.

This unexpected discovery was of great importance. Until that time the view was widely held that the presence of insulin in the body was essential for the oxidation of glucose by tissues such as muscle and that when the source of insulin—the pancreas—was removed diabetes supervened because no glucose could be utilized. But now there was clear evidence that glucose could be
oxidized when the pancreas and the pituitary gland were both absent, and that
the anterior lobe of the pituitary gland secreted something that inhibited the
utilization of glucose.

Subsequently, F. G. Young showed that the administration of a simple
extract of ox pituitary gland to a normal dog, in which the pancreas was intact,
could induce an intensely diabetic condition which continued indefinitely after
the cessation of the treatment (metahypophysial diabetes). The observation in
1937 by Richardson & Young that the beta cells of the islets of Langerhans
of the pancreas were severely damaged in dogs with metahypophysial diabetes
emphasized one possible corollary of the original observation, namely that
the anterior pituitary gland could be involved in the aetiology of human diabetes
mellitus.

The fundamental observations of Houssay and his colleagues were so revolu­
tionary that some time elapsed before they were widely accepted. Moreover
the results were not easy to reproduce unless one employed precisely the condi­
tions which Houssay and his colleagues had described. Because other investi­
gators failed to follow exactly what had been done they obtained negative
results and cast doubts on the validity of the earlier observations. Nevertheless
the discoveries of Houssay and his colleagues ultimately were accepted, and
later extended by numerous other investigators in relation to the adrenal
glands, the thyroid gland and the gonads.

In Houssay's own laboratory, and in other laboratories throughout the
world, research on the control of secretion of insulin by the pancreas, the
hormonal control of fat metabolism and other related aspects of the hormonal
control of metabolism, received a tremendous stimulus from all these funda­
mental observations.

Houssay’s interest in comparative problems, and his emphasis on the value
of the toad for experimental investigation (104), led to a widespread rise of
interest in comparative studies of endocrinology. The demonstration in Argen­
tina that in the male toad the injection of urine from a pregnant woman induced
liberation of spermatozoa, provided a cheap diagnostic test for pregnancy in
women which was widely adopted there and elsewhere.

**Experimental arterial hypertension**

The control of arterial blood pressure was a subject of special interest to
Houssay and his colleagues, and in particular to Eduardo Braun Menéndez,
who sadly met his death in an aeroplane accident in Argentina while he was
still relatively young. The discovery in the United States in 1934 by H. Gold­
blatt and his colleagues that partial ligation of the renal artery induces arterial
hypertension in the dog, led Houssay to suggest to his colleagues that light
might be thrown on the mechanism of the induced rise of blood pressure by
ascertaining if the transfer by grafting of such a treated kidney would induce
hypertension in the animal receiving the graft. The positive results of such
experiments confirmed the view that the treated kidney produced a hyper­
tensive substance which passed into the circulation. Subsequently Braun
Menéndez and his colleagues obtained renin from the treated kidney. Later evidence indicated that renin acted on circulating globulin to give rise to angiotensin, and that angiotensin evoked the secretion of aldosterone by the adrenal glands. The contributions by Houssay’s laboratory to these fascinating developments directly related to the experience available there of the experimental grafting of organs.

Research in general

Although Bernardo Houssay’s ancestors came from France there was something almost Germanic in his thoroughness, his systematic attention to detail and his determination to explore every facet of the subject under study. This aspect of his character was one of the reasons why he early decided that, contrary to the custom prevailing in Argentina last century and well on into the present century, a university post must involve full-time employment. As he is recorded as saying: ‘The blow-pipe when directed on to the same spot for some time melts and perforates; if the heat is spread over a surface that surface may hardly be warmed.’

Because of his thoroughness in detail he and his pupils performed dozens and dozens of experiments that might have been regarded by less exacting investigators as unnecessary. The total number of the publications which bear his name, either alone or in collaboration with others, is over 2000. There were in fact very few aspects of physiology in which he did not carry out research, and so much was this the case that the late Professor E. B. Verney, F.R.S., once said ‘Never worry about priorities. Houssay has always done it first’.

The man

Houssay not only was endowed with great and varied mental abilities but he also was one of the very few who possess the character and good health to use such outstanding abilities to the full. He gave the impression of being almost indefatigable. The daily routine at his Institute began at 8 a.m., when he met the leaders of the various sections to discuss what had been done and what should be attempted next. He would then inspect the rooms where practical classes took place, and then the research laboratories. He usually lectured at 11 a.m. and started research work at 2 in the afternoon, finishing around 5 o’clock, at which time he would receive visitors. After that he had appointments with various research workers or attended lectures or scientific meetings, and brought his reading up to date. When he was nearly 80 he met a foreign visitor at the airport at 9.30 one evening, and by 10 the next morning had already performed two operations in the laboratory.

In 1970 the Eighth Congress of the International Diabetes Federation was held in Buenos Aires with Houssay as its President of Honour. Investigators came from all over the world to pay tribute to the grand old man and he clearly enjoyed in an almost boyish way the adulation that he received. But still he remained unassuming, gentle and likeable though one in possession of an iron
determination which had carried him through most troubled times in his country. His courage was great and his influence in the world of science and medicine, and in the larger world outside, will last long.

When he died in Buenos Aires on 21 September 1971 at the age of 84 his pupils occupied many important positions in Argentina and indeed throughout the world. Luis F. Leloir, one of his early colleagues, had been awarded the Nobel Prize for chemistry in 1970, this being the second Nobel Prize to go to Argentina.

He received many honours and obtained the highest distinctions to which a scientist can aspire. He was a doctor honoris causa of no less than 28 universities, including Oxford and Cambridge, and was an honorary member of 114 medical and scientific bodies. He became a Foreign Member of the Royal Society in 1943, but could not formally be admitted until after the war. In the United States of America Dr A. J. Carlson, in a memorable phrase, said 'Houssay has put Argentina on the physiological map of the world'.

When he received an honorary degree from the university of Cambridge in 1960 the public orator of the University, in presenting him for the conferment of it, said (in translation from the Latin), 'This Argentinian has benefited the world not only by his medical prowess: when his country was troubled by revolution “the face of the oppressor did not shake his sturdy spirit” (Horace). For when, after being ejected from his Chair, he received invitations from all sides to go abroad and enjoy opportunities of pursuing his studies with becoming status and position, he preferred to remain at home and be a bulwark to those who were defending academic freedom, a role he was soon able to play with double effectiveness by the timely award of a Nobel Prize’. And in the eleven years of life that remained to him after that event he was to benefit his country and the world by his example as a great scientist and an outstanding administrative leader. His combination of abilities was indeed unique.

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Bernardo Alberto Houssay


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