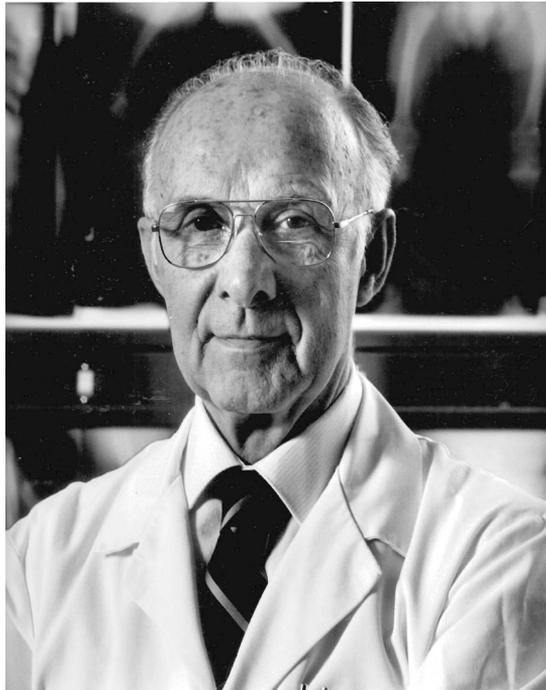


Homage to Iowa:

*The Inside Story of
Ignacio V. Ponseti*

HELENA PERCAS-PONSETI



The Department of Orthopaedic Surgery and Rehabilitation is proud to sponsor the biography of Dr. Ignacio V. Ponseti, written by his wife Helena Percas-Ponseti. The association of the department with Dr. Ponseti had its genesis in 1941 when Dr. Ponseti joined the University of Iowa. Dr. Ponseti played a major role in contributing to making the Department of Orthopaedic Surgery among the best in the world. He continues to transform the lives of babies inflicted with clubfeet until this very day. In honor of Dr. Ponseti, proceeds from the sale of this book will be committed to supporting the treatment of children with clubfeet.

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1 Background

In Ciutadella de Menorca, Ignasi Ponsetí Vives (thereafter Ignacio V. Ponseti) was born on June 3, 1914. Ciutadella, (the Citadel¹) was so named, I suspect, as the city-harbor of the most Eastern of the Balearic Islands in the Mediterranean off the east coast of Spain. Today it is an important center of modern footwear, design and tourism. Ignacio's father, Miquel Ponsetí Bibiloni, was a watchmaker who had a shop in the main street of the city. Miquel was from Palma de Mallorca, as well as his father, Ignasi Ponsetí i Picornell. Ignacio's paternal grandmother, Catalina Bibiloni i Figueres, was from Pollença in the northeastern part of Mallorca. The family had moved to Ciutadella to retire.



Map of Balearic Islands

Ignacio's mother, Margalida² Vives Fedelich, born in Ciutadella, was of land-owner ancestry. A genealogical search for the ancestry of Ignacio, who was named in 1985 *hijo predilecto* (favorite son) of Menorca for his achievements in medicine and biomedical research, revealed that Ignacio's family tree on his mother's side goes back to the middle of the 16th century, according to the Parish registry of the Church of San Nicolau in Ciutadella.

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In Margalida's home, water was supplied by a well that was periodically infected with typhoid bacteria and that caused the death of both Margalida's parents, her father before she was born and her mother when she was twelve. Margalida went to live with her cousin, Francisca Benejam, whose children she helped raise.

The Benejam and the Fedelich families disapproved of Miquel Ponseti's courtship of Margalida, and when she decided to marry Miquel both families disinherited her of a very large patrimony but leaving her three urban houses and her parents' Elizabethan hand-crafted mahogany furniture. This was in 1910 when she was 22.



Margalida, Ignacio's mother, at age 21

Catalina was their first born in 1911. Ignacio's father's jewelry business failed owing to the competition from two other jewelry stores. So in 1917 when Igna-

cio was three years old, his father decided to move the family to Felanitx in the southeast corner of Mallorca, where he would have no competition, to open a jewelry store. Ignacio's first clear recollections, now four years old, were of the panic caused by the devastating flu epidemic of 1918-19. To sanitize the atmosphere, small fires were built in the streets, which was a source of entertainment for the children, the most daring of whom jumped over the flames. Miquel's business was not thriving in Felanitx either so he forced Margalida to sell her houses in Ciutadella one after the other for the family to survive.

Ignacio remembers quite vividly the birth of his brother Miquel in January 1920. Upon being brought back home with his sister by their grandfather after what turned out to be a very painful delivery, he found his mother in tears. The five and a half year old Ignacio could not understand why. "Why are you crying?" he asked. "You have such a beautiful baby." When he was 6 years old he went to school. He was taught to read and write, not in the Mallorca-Catalan language spoken in the islands—but in Spanish, the official language of Spain that few people knew—a considerable obstacle in his education, for he was taught a language he could not speak and he spoke a language he could not write.

Spanish as the official language of the Peninsula and the islands had been imposed in the 18th century when the Bourbon dynasty succeeded the dynasty started by the Catholic Kings Isabel la Católica and Fernando de Aragón. These kings loosely united the various states of the Iberian Peninsula into a nation. They moved the court from state to state responding to the demands of the people. They curtailed the power of the aristocracy, substituting them with "letrados," educated and efficient civil servants. In Aragon, the aristocrats continued to be all-powerful. They possessed "fueros y privilegios" (laws and privileges).

Tradition has it that when a new king succeeded to the throne the Aragonese aristocrats declared: "Cada uno de nos, vale tanto como vos, y todos juntos más que vos, y si prometeis respetar nuestros fueros y privilegios vos hacemos rey y señor. Et si non, non" ("Each one of us is worth as much as you, and all together more than you, and so we declare you king and lord provided you respect our laws and privileges. And if not, not").

When in the 18th century after the War of Succession the Bourbon dynasty from France came to power in Spain, the Spanish language was imposed in Catalonia, Valencia and the Balearic Islands. The University of Barcelona was moved to Cervera, a small rural town in the northeast of Spain and run by the Jesuits. Catalan was forbidden in all official matters and in all publications, and, of course, in schools. An anecdotic detail exemplifies the degree of enforcement when dictator Franco took over. Ignacio's mother's telephone was taken away from her because she spoke in Catalan and refused to shift to Castilian.

Ignacio's linguistic confusion was overcome by the study of the universal language of mathematics and the folk art in the town of Felanitx. He would watch the performance of itinerant actors presenting their plays in the town square or he would go to the fair when it came to town to watch the wonderful puppet shows playing out the deeds of medieval knights. Those days he enjoyed going by train with his father to Palma, a great kingdom to him, and watch the almond

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trees in full bloom in late February. His aunt Maria Ignacia and her daughter Francisca lived in Palma and were not on speaking terms. They used Ignacio's innocence to deliver each other insulting oral messages.

In 1922 the family moved again, this time to Palma where Margalida's Isabelle mahogany furniture had to be sold, as well as her jewels, to keep the family afloat. Half a year later, another move took the family to Barcelona. After several more moves within the city the family ended up in an apartment on *Libretería* street ("Book Store Street") lined with shops—some of them bookstores, hence its name. Here, Miquel got a job working as a watchmaker in the best jewelry store of the thriving city. The apartment house was two doors from San Jaume square, where there are two palaces—one for the Generalitat (the government of Cataluña) and the other for the City Hall. Ignacio's home was 20 yards from the *Rovell de l'Ou* (The Egg Yoke) a reference to the center of the medieval city. School was near by. Ignacio's teacher, Taure, was the father of Manuel Taure Gómez, who would become years later Ignacio's anatomy professor in Medical School.

The son of the Archivist of the Crown of Aragón, Victor Hellín, was Ignacio's best friend. He lived in the palace where the Archives were housed, just behind the Cathedral. The two friends often played on the steps to the library and under its beautifully carved wooden ceiling. Through a secret door they would climb stairs leading to the monumental tower on Plaza del Rey (Kings Square), from which heights one could see the old city around and the terrace of the convent of the confined nuns who would vanish as soon as the children appeared.

Their convent cells had been built inside the Tinell, camouflaging the Great Hall of the ruling Counts, vanished from sight for two centuries till a bomb exploded nearby during the civil war of 1936 demolishing the partitions of the nun cells and uncovering the majestic Hall of the King's Palace. Here is where the Catholic Kings received Columbus upon his return from discovering America. Ignacio grew up, therefore, absorbing the medieval historic atmosphere of the *Barrio Gótico* (Gothic Quarters) where he lived. It left an indelible imprint in his makeup.

When he turned 11 he entered Catalunya College and then moved to the Instituto Balmes. Here his teachers were first rate and the students were the brightest in the city. One of his close friends was Ernesto Corominas, who was to become a professor of mathematics of international renown at the University of Lyon in France. With Ernesto's oldest brother, the later internationally known linguist Juan Corominas, he would hike in the Pyrenees and observe how Juan recorded the speech of people from various valleys. With these and other friends, he would classify rocks and fossils or collect and classify wildflowers with *Lineus'* book a pharmacist friend of the family had given him as a present. On hikes with his high school teachers the young boy learned the varied geology of the hills, mountains and plains surrounding Barcelona.

Ignacio's father Miquel was editor of the journal of watchmakers and president of the Watchmaker Society. Later on he was secretary and treasurer of the

Trade Union that provided insurance for the widows of the watchmakers. In the summers, while studying for his B.A., Ignacio worked part-time in his father's workshop. His father was a very gifted watchmaker who could make most watch components from scratch with great precision, so Ignacio became an expert at repairing watches and handling the file and the lathe.

As his brother Miquel was growing up, Ignacio became more and more his true father and teacher. He was entranced with the speed with which Miquel learned everything—math, reading, drawing. Ignacio took his brother to the sports club to play and swim. Miquel had a tremendous devotion for his older brother, and this relationship bore fruit. Miquel was first in school, grew up to win the championship in handball, and became a professor of architecture at the University of Barcelona.

Because of his very high grades in his finals, Ignacio was admitted to the University of Barcelona without having to pay tuition. He had the good fortune to study biology in a small group of bright students under an outstanding professor who instructed the class on how to dissect animal and vegetable tissues, make histological cuts of frog brains, dye them and analyze them under the microscope. These studies were the basis for his biological focus in medicine and his many contributions to the pathology of skeletal growth disorders that included the key to unravel the biomechanics of the clubfoot deformity, the correction of which brings him today little patients from all over the world.

At the end of his first year in the University, Ignacio received a scholarship from the city of Barcelona that came in quite handy to redress the precarious finances of the family. To get some spending money, he resorted to tutoring.

In 1931, during his first year in medical school, elections were held in Spain. When the monarchy lost, the king left for Italy and the Republic was established. Ignacio, his father and brother Miquel watched in San Jaume Square the raising of the Catalan flag on the balcony of La Generalitat (State House). The Catalan leader Francesc Macià thereby proclaimed the Catalan State. Two days later, a delegation of the newly proclaimed Spanish Republic from Madrid, including Fernando de los Ríos and two Catalans, Marcelino Domingo, and Nicolau d'Olwer, arrived in Barcelona to talk an enraged Macià into accepting a lesser degree of autonomy for Catalonia. In exchange for the deal, a Catalan statute was decreed liberating the University from any control by the central government of Madrid to become a free Autonomous University of Barcelona. This freedom was basic for the University to develop into one of the best in Europe and for the School of Medicine to reach its apogee during the deanship of Joaquín Trías. In 1933 the very well-trained students who had been sent abroad for postgraduate training in the best European and American medical centers, joined the faculty.

During the years of the Spanish Republic (1931-36) Barcelona was a city thriving with intellectual and artistic activities. Pablo Casals conducted the orchestra and played his violoncello in the Orfeo Catalán, the world-famous Barcelona concert hall. When Casals received the Gold Medal from the city in 1934, he played the Dvorak cello concert before a crowd overflowing the National Palace. At that time concerts were not for the elite; everybody attended from the aristoc-

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racy down to the working class. This cross section of the very nationalistic Catalan population was artistically and musically educated. In the Opera House (the Liceu), Chaliapine sang Boris Goudonof, and the great operas of Wagner were performed before an enthusiastic public. The Ballet of Montecarlo performed every spring in the Liceu.

On Sunday mornings the Municipal Band, conducted by La Mott de Grinyo in the Palau de l'Art (the Palace of the Arts), played the great symphonies of Beethoven and the moving symphonic poems of Respigui. In several galleries Dalí, Miró, Picasso and other great painters exhibited their works. Picasso often went to Barcelona to visit his mother who lived in la Pedrera, the striking avant-garde building by Gaudi. The famous actress Margarita Xirgu performed dramas by Euripides in the Greek Theater. García Lorca opened his most acclaimed plays in the Teatro de Barcelona. Ignacio heard García Lorca recite his magnificent *Romancero gitano* in the Lecture Hall of the Escuela Industrial (Industrial College) that overflowed with students.

In the Lecture Hall of the Casal del Medge (Doctors Fraternity Building) where Ignacio usually studied, García Lorca played on the grand piano accompanied by Pablo Casals with his violoncello, and students could hear the best music ever played. Late in the evening, Ignacio exercised in the gymnasium of the Ateneo Enciclopédico Popular (Popular Encyclopedic Athenaeum) before teaching biology and chemistry to workers and students preparing for the BA exams, the “bachillerato.” On weekends, he went with his friends to museums and concerts, and in the summers hiking in the Montserrat and Montseny mountains.

The Spanish Civil War

In 1936 Ignacio took his final exams on July 17, one day before the Spanish civil war broke out. A few days later he was a doctor in the front of Aragón. Trains filled with volunteer militia left Barcelona for Zaragoza in an attempt to take the city. Failing to take Zaragoza, the front of Aragón retreated to a line a few kilometers east of Teruel and west of Caspe to as far north as close to Huesca.

Two base hospitals were established one in Lérida and the other in the Pedro Mata Hospital in Reus. Here Ignacio was assigned to work in the team of Jimeno Vidal—a most fortunate assignment since Dr. Jimeno Vidal had studied with Böhler in Vienna and had extensive experience in the emergency clinic at the University Hospital of Barcelona that was organized by Dean Joaquín Trías, a lifelong friend of Ignacio.



The successful treatment of war wounds was based on the technique of Winnett Orr, a doctor from Nebraska who described it at the end of the First World War. It consisted of a thorough debridement of wounds rather than the use of antiseptics because they damaged the healthy tissues. It was greatly improved by Josep Trueta in Barcelona. Wounds were never sutured. Antibiotics had not

yet been discovered, but in following Trueta's protocol most wounds cured rapidly without gangrene or osteomyelitis. There were practically no deaths from infections.

Fractures were treated according to Böhler's teaching. Femur and tibia fractures were put in skeletal traction a few weeks before applying unpadded plaster bandages to better immobilize the fracture and facilitate walking with full weight bearing on the extremities for faster recovery. Open fractures were never treated with internal fixations. Ignacio's team treated some 4,000 war wounds and fractures. Hardly any failures of non-union occurred. It was impressive the speed with which the war wounds and fractures healed. Following Böhler's functional treatment of fractures, no physiotherapy was necessary to return to normalcy and functionality.

Extensive life-threatening wounds were treated right on the hospital train brought close to the front line, under the direction of Dr. Jaume Anton Agudé, another close friend for life of Ignacio's. The other patients were treated at the base hospital in Reus and a year later at the larger Sabinosa hospital in Tarragona.

A magnificent solution to avoid dangerous reactions and deaths in blood transfusions because of blood incompatibility was devised by Dr. Frederic Durán Jordá from the University Hospital of Barcelona. It consisted of mixing the blood of five or six donors in each of the four blood groups, pooled in a 300 cc. glass container, sealed under pressure with nitrogen and refrigerated. Why five or six donors? Because, although unidentified at that time, each blood group had subgroups and the mixture increased considerably the degree of tolerance to the point of preventing adverse reactions and side effects, thereby saving lives. The major advantage of keeping a good supply of number 1 blood mix was that it was universal and equally effective for the wounded in groups 2, 3 and 4. It was the first time in world history that patients with extensive wounds and severe bleeding could be saved.

After the battle of the Ebro in the summer of 1938, Ignacio was made medical captain and moved to Barcelona to care for numerous casualties evacuated to the base hospitals in the city. He worked with González Aguilar, chief of the Navy Medical Corps, who was an expert surgeon well known for his research on osteoarticular tuberculosis, and with Adolfo Ley, an expert neurosurgeon who had studied in Boston under Cushing and at the University of Chicago under Bucy and Percival Baily. Upon his return to Barcelona in 1935, Ley had introduced modern neurosurgery. It was in the hospital established in the buildings of the Orfelinato Ribas, an orphanage complex, that Ignacio helped Ley perform brain surgery and innumerable nerve sutures as well as tendon transfers following the refined technique of American neurosurgeons. The technical precision learned in his father's watch shop was indeed invaluable for this type of precise surgery.

A few days before Barcelona fell to Franco's troops, Ignacio was transporting by train along with other surgeons (Trueta among them), the wounded who had to be evacuated from the military hospitals of the city. At midnight they arrived in Gerona, some 30 kilometers south of the border with France. Dr. Puche, head

of the Army Health Services Department, entrusted Ignacio with the evacuation to France by ambulance of the wounded in the small hospital of Olot, a few kilometers from the border. A large ambulance driven by a young soldier under the orders of a commander of the regular army and a young medical lieutenant doctor were provided. Shortly before dawn they reached Olot (see map on page 7). They decided to rest for an hour by the fireplace in the front hall of the hospital before seeing the patients to be evacuated. When Ignacio and the lieutenant doctor woke up, they found that the chauffeur and commander had fled with the ambulance.

Left without transportation, they had recourse to a few cars to transport the patients over a secondary little-traveled road some ten miles north to a cottage of smugglers. Here they were provided mules to transport the more seriously wounded the next four miles to Prats de Molló in France while Ignacio put walking plaster casts on patients with tibial fractures so they could walk over the mountains. When they arrived, the French said that the mules were French. Ignacio talked them into letting him use the mules to bring the rest of the wounded. They complied. Such plaster cast applications and evacuations took three days and nights. A few days later Ignacio read with great delight that the commander who had vanished with the ambulance and crossed over to Franco's side had been shot as a traitor. A traitor is a traitor is a traitor.

3

The French Experience

In Prats de Molló, patients were all housed in a large area in the City Hall. A young doctor from Montpellier just out of school took over the treatment of the wounded with outdated techniques of the First World War. One of the wounded had a high fever due to an abscess in the thigh that needed draining. The French doctor injected some sort of ineffective disinfectant. That night with the help of the nun nurses from the convent, Ignacio drained the abscess and in the morning the fever was gone. When the French doctor found out about Ignacio's intervention, he sent him to the concentration camp where armed Senegalese guarded thousands of refugees. Two days later a French lieutenant from the Army Health Service arrived, dismissed the French doctor and called Ignacio back to care for his wounded.

After a few weeks, they were moved to a new structure by the train station of Arles sur Tec, built by the Spanish refugees by order of the city mayor with money from the SERE (Sociedad Española de Refugiados en el Extranjero [Spanish Society for Refugees Abroad]). It was supposed to be a hospital but the mayor intended it for storing apples. A month later the Spanish refugees were moved once more, this time to the Caserne (barracks) de Maraussant built near Bezier toward the end of the First World War. This building housed about three hundred beds most of them for the wounded, but in other halls for the sick with pneumonia and gastrointestinal problems acquired in the concentration camps. Ignacio would pick them up in an ambulance. In the hospital, there were several Spanish surgeons and internists. One of them, Dari Huguet, had extensive experience in private practice. At night he gave Ignacio and another doctor classes about exactly which medications were indicated to treat which diseases and infections. Such information completed professor Soler Vicens valuable classes on internal medicine at the University of Barcelona.

Now Ignacio operated on acute appendicitis, drained abscesses and, on numerous occasions, performed circumcisions for presumed acute phimosis, on middle-aged or elderly refugees to keep them out of the inclement weather in the concentration camps. In southern France, Antonio Machado, one of the greatest poets of Spain, died poor and destitute. In a most touching poem he foresaw his end: "My time! --I cried-- / Silence replied: Fear not. / You will not see your last

drop / trembling in the clepsydra. / On a pure and bright morning you'll find / your boat tied to another shore."

After crossing the Pyrenees, the language Ignacio heard from the lips of many older people was Catalan or French with a strong Catalan accent. The reason is that the Roussillon and La Cerdagne were Catalan provinces just north of the Pyrenees for many centuries. In 1659 the disastrous Castilian Conde Duque de Olivares, Philip IV's prime minister, abandoned the Catalan provinces occupied by the French. The Catalan courts never accepted the deal. Years later, when in 1966 we went to Montpellier because Ignacio was invited by Professor Pous to participate in a doctoral exam, we still heard Catalan--French, from the lips of his parents. As a matter of fact, the very name of the inviting professor Pous, in Catalan, means "wells."

Anticipating the coming war with Germany, the Prefect of the province invited the Spanish doctors to enlist in the French army with the same rank they had in the Spanish army. When Ignacio asked him whether those who enlisted would be granted French citizenship after the war, the commissioner replied, "Oh no, la France..."

President Cárdenas of Mexico, on the other hand, opened the doors of his country to the thousands of Spanish refugees without nationality in the French concentration camps. He welcomed the textile workers of Catalonia, the Basque iron makers of Bilbao, the agriculturists of the east and south of Spain, professors, doctors, writers, artists, and granted them all Mexican citizenship. His political clairvoyance implemented a program of social change and progress that lifted Mexico into the modern world. With the help of the SERE, thousands of Spaniards were transported to Mexico by boat.

The Mexican Years

In July of 1939 Ignacio boarded the *Mexique* in Bordeaux bound for Veracruz. He arrived just before the start of the Second World War. The Spaniards were housed in a storage building in the harbor and slept in cots. About two weeks later they were taken to Mexico City where seven or eight of them rented an apartment. The women slept in the bedroom, the men outside on the floor. Their main concern was to find work since they had to survive on a small pension from the SERE. Days went by and they grew anxious. One day one of them returned to the apartment all dressed in black, as for a funeral, but he was jovial: he had found a job in a funeral parlor.

Mexico City had, at that time, about one million inhabitants. It was one of the most beautiful, elegant cities in the Americas. In the capital Ignacio met Dr. Juan Faril, the respected head of the children's orthopedic hospital. Faril was an educated, refined man, consulted by such people as the great painter Diego Rivera and his equally gifted wife Frida Kalo. Faril was born with clubfeet, several times operated, walked with a cane in pain and with increasing difficulty. His main interest was to improve orthopedics in Mexico.

Again, unable to find work in the city, Ignacio moved to Juchitepec, a town of about 5,000 inhabitants south of the capital, near the Popocatépetl. He was informed a doctor was needed because the one they had was run out of town at gun point by the father of two sons lost to high fever. Providence was giving Ignacio a chance. The first thing he saw upon his arrival into the small town was a poor peasant carrying his dead son in a homemade wooden box toward the cemetery. Behind him walked his crying wife followed by five or six children.

The valley was very fertile. It gave two crops a year: wheat in winter and corn in summer. In 1929, President Calles had distributed the land among the farmers but ten years later there was extreme poverty and the moneylenders and profiteers exploited the town. Ignacio arrived at the start of an epidemic of typhoid fever. He immediately ordered the water boiled. But the hygiene in the town was very primitive and the epidemic spread. He had more than sixty sick people with typhoid fever but was lucky to save them all by maintaining hydration and feeding with whipped bean grub for three weeks, the duration of typhoid fevers he knew. In the streets he met the priest of the town who congratulated him on the dramatic drop in funerals. This priest was quite original:

he lived with two nieces, and on Sundays he called to mass not by ringing the bells but with fireworks.

Ignacio also had to care for children with diarrhea whom he was not able to save despite Professor Soler Vicens' classes, those of Martínez García, or even by following Huguet's lessons, because the proper electrolyte balance in water for the treatment of diarrheas in children was unknown at that time.

There was no pharmacy in the town, and Ignacio had no money to buy the most indispensable medicines. Wenceslao Dutrem, a doctor and pharmacist from Barcelona who had moved to Mexico City in 1937 and established the FARBAR laboratories, lent him the most indispensable supplies to make himself a small pharmacy in Juchitepec. On one of his trips to Mexico City to get more pharmaceutical provisions, Dutrem, who was Trotsky's doctor, told him that Trotsky, exiled in Mexico, had been attacked with an ice pick and had a very serious injury in his head. Since Dutrem knew of Ignacio's work on head injuries with Ley in Spain, he asked him to see Trotsky who was under the care of good Mexican neurosurgeons. However, by the time they arrived at the hospital Trotsky was dead.

As the only doctor in Juchitepec and surroundings, Ignacio often traveled by motorcycle to see his patients, but was forced to discard it in favor of a horse because the volcanic sands caused him several falls. On such visits he took care of respiratory ailments, numerous infectious diseases, fractures, knifings and even more numerous deliveries which were usually very easy because most mothers were young. In one case of a difficult dystocia, the frightened family called the exorcists of the town to dispel the bad spirits with their monotonous dances at the tinkle of their ritual bells in the patio of the ranch. The baby was finally safely born after a whole night of trying and was greeted by a full moon.

The town had its charms. Ignacio's hair had grown very long and he needed a haircut. He went to a middle-aged barber, father of numerous children. The barber had very good manners and much need to talk. When Ignacio told him he was in a hurry, the barber suggested that he go to another barber who would cut his hair in a jiffy because he himself could not cut the hair of someone he did not know well. When Ignacio asked him what should he do to be better known, the barber handed him some poems he had written and told him to come back after reading them so they could talk. The poems were not bad. Ignacio liked them and told the barber so a few days later. After talking for a while, the barber handed Ignacio more poems because he still did not know him well enough. Upon returning to the barber for the third time with much longer hair and after talking for another while, Ignacio got the best haircut ever.

Another charm of Juchitepec was the pulque pub called Los Sabios sin Estudio (The Wise Without Studies) that filled to capacity on weekends. Clients did not talk. Silence reigned. They drank pulque at the counter and pissed on the wall across. Some became quite intoxicated, vendettas fired up, knives appeared and the doctor had to make many sutures to repair the damage. On one occasion, a man of means was wounded in the heart. Ignacio saw him after a few hours, pale but standing. His pulse was weak. After lying down he recovered

some. Ignacio thought he had bleeding in the pericardium and advised the family to keep the man in complete rest. The man kept improving during the following days, but the family insisted on getting a doctor from the capital. The doctor arrived and said he would take the wounded man to the clinic in Mexico City by car. Since the road to Tenango was very bad, Ignacio advised the family not to expose the wounded man to such a trip because with the bumps on dirt roads he could die. Sure enough, after half a kilometer he did die. Ignacio's sadness increased and so did his prestige.

In Juchitepec the "doctorcito" (an endearing diminutive) felt incommunicado for lack of newspapers or radio. On his monthly trips to the capital he followed, horrified, Hitler's advance in his conquest of Europe, the London raids, the fall of France. On his visits to see Dr. Juan Faril, they talked about medical schools in the United States. Faril had studied orthopedic surgery in Iowa City with a Guggenheim fellowship. He admired Dr. Arthur Steindler, the head of the Orthopaedic Department at the University of Iowa. Steindler's book, *Mechanics of Normal and Pathological Locomotion in Man* published in 1936, was considered fundamental. Faril wrote to Steindler recommending Ignacio. During his almost two years in Mexico he had saved \$1000, the required amount to enter the U.S.A. as a guarantee of not becoming a burden to the States. His purpose was to be a postgraduate student for one year.

In May of 1941 Ignacio left Juchitepec by bus leaving behind a much more sanitized town than he had found. But years later, when he returned to Mexico City from Iowa to give some lectures at a congress of orthopedic surgeons, a delegation of former patients came to fetch him as far as Tenango where he was driven by car, to take the "doctorcito" back to Juchitepec on horseback: the same rats, the same half-demolished houses, the same abandoned streets greeted him as if he had never been there. But the poetry of the barber still rang in his ears.

5

Arrival in a New World:

Iowa

After two days of traveling by a Mexican bus, keeping one eye open to watch his suitcase, and stopping frequently in small towns on the way for the driver to visit his extended family, he arrived at the Río Grande in Laredo. When crossing the border he was astounded to see well-nourished dogs with good manners. The immigration officers were courteous and well dressed. His Mexican passport was stamped after a few brief questions, one of them to be answered in writing, a most astounding one: Did he intend to kill the President of the United States?

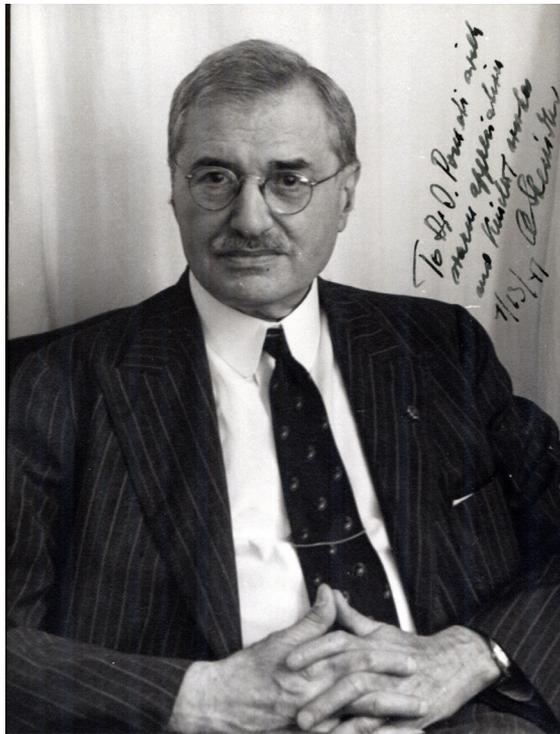
The bus driver of the Greyhound on the American side of the border wore an impeccably starched blue shirt. But when he picked up Ignacio's suitcase to place it in the luggage compartment under the bus, Ignacio feared he would never see it again. After San Antonio, in a full bus on the way to Dallas, Ignacio was astounded to see the driver make the black passengers in the back of the bus get out in the middle of nowhere so that a white family waiting on the roadside could get on.

It was a clear, cool, spring day shortly before sunrise when the bus left Des Moines heading east on a two-way narrow Highway 6 with shoulders on both sides. Ignacio was impressed watching the recently plowed dark earth with its rows of young, green corn stocks. Tidy farmhouses with their small, black cattle grazing here and there defiled before his eyes. Every so often the bus entered the streets of small, nearly deserted towns to pick up passengers with northern European faces some with bandages obviously heading for the hospital. The houses were very similar in shape and form, separated by small green lawns. The bus rode along Newton, Grinnell, Brooklyn and Marengo before reaching the University Hospital where the patients got off. Finally, they arrived at the bus station, and there was his suitcase, unattended, waiting for him. It was June 1, two days before he turned 27.

Dr. Arthur Steindler received Ignacio in his garden. He was reading *El alcalde de Zalamea* (*The Mayor of Zalamea*), one of Calderón de la Barca's most vibrant Spanish plays. Steindler was educated in Vienna. He had studied orthopedics under Adolfo Lorenz and Edward Albert before arriving in Chicago in 1910

to work with John Ridlon. Three years later he established the Department of Orthopaedic Surgery in the medical school of the University of Iowa. He played the piano well, spoke several languages, was well read, and a renowned teacher.

The state of Iowa had a very advanced program of medical services. In the early twentieth century schools of medicine were established in the United States according to Abraham Flexner's norms. They were built on the conjunction of German scientific investigation and Great Britain's medical education norms. They were implemented by Johns Hopkins University with a view to reforming the United States medical education. The medical faculty at the University of Iowa was committed to teaching, research and patient care full-time. Faculty and residents were an integral part of the University.



Dr. Arthur Steindler in 1945

Steindler demanded one year of Postgraduate School before applying for a three-year residency in the Orthopaedics Department. When Ignacio arrived the course was to start a month later. His only document was a Certificate of Studies since the day after passing his final exams for his M.D. the Spanish civil war broke out and no diplomas were distributed. Steindler introduced Ignacio to Professor of Anatomy Ewen M. MacEwen, who was dean in his spare time. Fortunately, his secretary, Miss White, ran the Medical School impeccably. Dean MacEwen was at a loss about what to do with Ignacio's credentials and sent him to see Dean Carl

Seashore of the graduate school. They talked for about 15 or 20 minutes about Ignacio's medical interventions during the three years of the Spanish civil war. Dean Seashore knew about Madame Curie and about Albert Einstein recruiting volunteers in Paris for the Spanish Republic to fight against Franco. He also told Ignacio that Mrs. Eleanor Roosevelt was actively backing the Spanish Republic against the policies of Secretary of State Cordell Hull who sided with England and France for the cause of nonintervention. In the middle of the conversation Dean Seashore picked up the phone, called Dean MacEwen, and said, "Take him."

Thanks to Steindler an exception was made in Ignacio's case; his Certificate of Studies was accepted instead of a diploma. In 1944 he was made provisional member of the faculty until 1946 when through the Spanish Consulate in Chicago he finally received his diploma and his position became legalized. Two years later, in 1948, he got his American citizenship. During the month after his arrival in Iowa City, before classes started, Ignacio's work consisted in translating into Spanish twenty lectures Steindler was to deliver in Mexico City in the fall and teach him how to pronounce them correctly. He was Steindler's chauffeur and constant companion from 6 A.M. when he arrived at Dr. Steindler's home, had breakfast with him, and worked all day on his lectures.

Ignacio wanted to improve his English accent and went to see Wendell Johnson who was head of Speech Defects Clinic, nationally known for its excellence, and started a weekly session. Some weeks later Dean MacEwen called him to his office and requested he stop the lessons. Why? "Because when professors Arthur Steindler and Emil Witschi retire we need an accent to keep up our prestige." Since the rise of fascism in Italy and Germany, American universities had been recruiting European doctors and scientists. What a reversal by the end of the century when because of the excellence of the American Medical Schools, universities and colleges had become the mecca for graduate students from Europe and other parts of the world.

In postgraduate school, anatomy of the extremities and the vertebral column, pathology, biomechanics, biochemistry of cartilage, bone and connective tissue, endocrinology, and biology of growth were studied in addition to orthopedic surgery. Three graduate students were chosen for the residency. Residents lived in the hospital where their main job consisted of seeing and treating patients in addition to participating in basic science and clinical investigation. It was a well-rounded training. When in December 1941 Japan attacked Pearl Harbor and the United States entered the Second World War, numerous faculty members were mobilized. The number of residents was substantially reduced and the workload dramatically increased for the few who remained.

Winnett Orr, a medical officer in the American army in the First World War, was head of Children's Hospital in Lincoln, Nebraska. He was a good friend of Steindler. Orr invited Ignacio in 1942 to spend a couple of summer months with him. He had written extensively on the treatment of war wounds and of osteomyelitis. His knowledge of the biology of inflammation had led him to discard the use of disinfectants as well as frequent dressings so as not to interfere with the

body's natural defenses. War wounds and fractures were treated by debridement, covered with vaseline gauze and immobilized in long plaster casts.

Orr was very interested in knowing in detail how his technique, refined by the Catalan doctors, had worked in Spain. He was impressed with the results described in a book by the Catalan Professor Trueta, *Treatment of War Wounds and Fractures* published in England in 1940 for which Orr himself had written the preface. Ignacio gave him a detailed report: debridement and drainage were extremely thorough and plaster casts were shorter than Orr's prescribed protocol. Unpadded plaster casts were used to allow greater mobility of the wounded extremities. Orr had rejected Böhler's functional treatment even in closed fractures, the very method Ignacio learned to use in Spain when he worked with Jimeno Vidal during the war. This treatment was superior to Orr's because it shortened recovery time and the results were excellent, much better than those obtained in previous wars.

Upon his return to Iowa City, Ignacio wrote two articles on his experiences during the Spanish Civil War: "General Principles in the Treatment of Wounds and Fractures in the Spanish Civil War" published in *The Military Surgeon* in 1942, and "Treatment of War Wounds and Fractures" published in *Northwest Medicine* in 1943. Dr. Puig Guri, who worked alongside Ignacio during the war in Spain and followed him to Iowa City, was a coauthor of these articles. During 1942-44, Ignacio was invited to Fort Leonard Wood, a military base in Missouri, to give courses on war surgery to young doctors enlisted in the army. He also gave lectures on the same subject in Chicago and New York. The great advances in the treatment of war wounds in Catalonia were of the greatest interest in the United States at that time.

The Department of Orthopaedic Surgery at the University of Iowa occupied more than half of Children's Hospital. The three most common diseases were poliomyelitis, osteomyelitis and osteoarticular tuberculosis. The last two disappeared almost completely with the discovery of penicillin and streptomycin in the forties. But during the great epidemics of poliomyelitis, hundreds of children fell victim to paralysis. The most severe cases were placed in iron lungs to facilitate breathing. Together with Dr. John MacQueen, an excellent pediatricist, Ignacio worked long days. In 1954 poliomyelitis decreased with the discovery of Salk and Albert Sabin vaccines. Rickets had decreased a few years before by adding vitamin D to milk. The work of the orthopedic surgeon changed radically. Congenital deformities, scoliosis, osteoarthritis and mostly trauma from accidents and sports filled clinics and hospitals.

Dr. Steindler had been appointed in 1913 to organize the Department of Orthopaedic Surgery in the University of Iowa. In addition to patient treatment and teaching, he was interested in the study of the natural history of skeletal disorders and the long-term results of their treatment. This was possible in Iowa owing to the centralized health care since 1916, the stable and compliant population of the state, and the well-organized files Steindler kept. He had a full-time secretary to keep files and recall patients for these studies.

Ignacio's first project was to study the incidence of intervertebral disk protrusions in cadavers just dissected by the anatomy students. He performed extensive laminectomies on 32 cadavers and found disk hernias in 10 of them. Steindler, who was a conservative surgeon, believed that too many surgeries for disk herniations were performed. He was surprised at such a discovery but did not want Ignacio to publish it because there were no clinical histories of the cadavers to find out whether they had had symptoms. Today it is known through MRI's that 30% of all adults have disk hernias often without symptoms, therefore without treatment. In 2006 the long-term results of spinal surgeries performed in 15 prominent medical centers, published by Dr. James Weinstein et al. in the *Journal of the AMA*, revealed that surgery did not benefit patients and proved Steindler right.

A second project of Ignacio's was to study the results of surgical interventions on clubfoot babies during the decade of the 20s. He recalled 24 of these patients over twenty years of age. Their feet were rigid, weak and painful. In most, the radiographs revealed misshapen bones and joints. Steindler discouraged Ignacio from proceeding with such a study alleging that surgery had improved since the twenties and that results in the future would be better. But Ignacio was not convinced that clubfoot surgery, severing ligaments and joint capsules to align the bones of the foot could show better results and not lead to stiffness, weakness and pain. Surgery, no matter what improvements, would always be very damaging to the foot. He was determined to find a noninvasive, safe alternative.

To this end, he studied many histological sections of aborted fetuses with clubfeet and also dissected clubfeet in stillborns to understand the pathology and the biomechanics of the deformed feet. Then he proceeded to devise a way, to correct the deformity based on the functional anatomy of the tarsal joints and the gradual stretching of the contracted ligaments. In 1948 he started treating babies his way, and in 1963 he published a 10-year follow-up with his good results in the *Journal of Bone and Joint Surgery*.

Why was it possible to correct the deformity so easily? Because the anlagen forming the skeleton in the baby's feet are mostly cartilaginous, soft and easily molded into their right shape by manipulations following the functional anatomy of the feet. The joint surfaces reshape congruently after each manipulation. To maintain the correction, a plaster cast extending from toe to upper thigh is applied and worn for 4 or 5 days. After 5 to 6 manipulations and castings, the clubfoot is corrected. To prevent a relapse, the child wears a foot abduction orthosis (abduction bar with shoes attached at each end) for three months and thereafter at night and napping hours for about three to four years. From then on, a relapse is extremely rare. Such treatment proved that the feet of these children develop as well as those of normal babies.

The article was ignored by orthopaedists. They continued to devise more complex and extensive surgeries that further damaged feet. When participating in the instructional courses of the American Academy of Orthopaedic Surgery, Ignacio was told that his treatment might be accepted by Iowa farmers who wear large boots but not by city dwellers, a double insult to doctor and Iowans.

The Department of Orthopedics had a bone pathology laboratory established by Ernest Freund. Freund had studied in Austria with Erdheim, a famous professor of pathology and in 1932 with Jaffe in New York. When Steindler invited Freund to come to the University of Iowa, Freund brought with him part of the collection of Erdheim's pathological anatomy. Freund established the archives of all the histological preparations of tissues and specimens obtained in the operating room. He described the pathology thoroughly and bound the reports yearly. Vernon Luck, one of Steindler's residents, took charge of the laboratory when in 1936 Freund left to work with Albee at the Recovery Center for his patients in Venice, Florida. When Ignacio arrived in Iowa City, he started working nights in this laboratory. His previous training in pathology with Roca de Vinyals in San Pablo hospital in Barcelona had prepared him well for this kind of work.

In the summer of 1943, Ignacio went to the University of Chicago to further study bone pathology. Phemister, the head of surgery and Hatcher, the head of the division of orthopedic surgery, were outstanding teachers and collaborated in experimental and clinical pathology studies in their laboratory. It is in this laboratory that the nucleus of outstanding researchers trained to fill important university positions around the country. On rounds one Monday, a resident presented a Greek patient who had a large, round, mysterious lesion in his right lung. Ignacio, sitting next to Phemister, prompted that it was a hydatid cyst common in the Mediterranean. He had often seen such cysts in his medical school in Barcelona. Phemister commented on the importance of geography in medicine. Back in Iowa City, Ignacio was assigned to teach bone pathology to orthopedic residents and medical students.

Throughout the war years and a number of years thereafter, there were few doctors and orthopedic surgeons left in Iowa. The University responded by enlarging the well-organized child health system throughout the state. At least once a month a pediatric doctor and Ignacio traveled throughout the state to clinics organized by very well-trained County nurses to follow up children's disorders to determine which patients needed to come to Iowa City when care was not available locally. Ignacio became well acquainted with Iowans in all parts of the state. Following his experience, acquired in the countries where he had practiced medicine, that medical problems are very often related to the habits and origin of patients, he studied the makeup of the population in the towns he visited.

After the Black Hawk defeat in 1832, new settlers began to come to Iowa at the time and after Iowa was admitted to the Union in 1846. About 50% were of German and Bohemian origin. Swedes and Dutch settled in the northwest, Norwegians in the northeast and a few Irish, Greeks, English and Belgians in the center of the state. Each of these groups brought their own genetic disorders. Health problems were more severe in the south where the land and the economy were not as good. In the county clinics doctors were most welcomed by the nurses. The Iowa population—congenial, and pleasant—remained unchanged until after the Second World War. The state took good care of needy families.

Two towns several times visited by Ignacio and his companion the pediatrician were Decorah in the northeast corner of the state and Spillville a few miles

south. Mostly Norwegians settled in Decorah. It was a beautifully clean city once visited by the King of Norway, hilly and with woods close to the Mississippi. As for Spillville, it will forever evoke Antonín Dvořák's *American Quartet in F Major* that was inspired during the summer of 1893 spent at the Czech immigrant settlement of the town, exalting American folk music and the beauty and promise of Iowa, like his *New World Symphony* (1895), composed in New York City, exalted the promise of America.

When at the end of the Second World War doctors who had experience in the treatment of war wounds and fractures in the armed forces came to Iowa City to finish their training in orthopedic surgery so as to pass the boards, Ignacio was very involved in their clinical and surgical training. In the evenings, he worked with those interested in research. The close friendship engendered through collaborative work resulted in interesting publications such as the "Osteoid Osteoma" and "Slipping of the Capital Femoral Epiphysis" with Chet Barta, and "Evolution of Metaphyseal Fibrous Defects" with Barry Friedman, demonstrating the spontaneous resolution of such bone lesions. Chet Barta had been a medical officer in the army at the landing in Omaha Beach. Barry Friedman had served as a medical officer in the navy in the Pacific.

The incidence of bone and joint tuberculosis in Iowa had sharply decreased after the slaughter of the infected cattle in the thirties. However, still in the forties, thirty to forty patients with the disease were hospitalized in the Oakdale Sanatorium. Ignacio cared for them and saw them weekly with their doctors. Those who needed surgery were brought to the University of Iowa Hospitals for a short stay. Tuberculosis of the hip was particularly difficult to treat. After an extensive and long study of the pathology of tuberculosis of the hip and the degrees of severity of the disease, Ignacio determined which approach, timing, and manner of intervention would be best to get good results. By the time his article appeared in *Surgery, Gynecology and Obstetrics* in 1948, streptomycin and PAS, the antibiotic that prevented and cured the nightmarish tuberculosis disease that had caused the death of millions, had been found. His article as well as reams of papers and books on bone and joint infections written through the ages became obsolete.

During the decade of the forties two very important monographs on congenital dislocation of the hip were published: one by Erik Severin from Sweden on the poor results of late treatment, and another by Ortolani from Italy who found the way to discover and treat dislocation of the hip soon after birth by applying the "scatto" sign and holding the hips in the proper position for two to three months. To find the results of congenital dislocations of the hip at the University of Iowa, Ignacio recalled 129 of those patients treated since the twenties. It was evident that good results could be obtained when a concentric nontraumatic reduction of the head of the femur was done soon after birth. He published two papers—one on the cause of failures of the treatment (1944) and another on the pathomechanics of the hip after the shelving operation, successful only if the head of the femur is well centered in the socket (1946). It was clear that hip dislocations had to be discovered and corrected in early infancy.

In 1950, Ignacio published an article in the *Journal of the Iowa Medical Society* on the early diagnosis of hip dislocation in babies and gave lectures in county medical societies throughout Iowa to inform doctors and nurses how easy it was to discover hip dislocations in babies and successfully reduce them to obtain a well-developing hip. Thereafter, this crippling disorder in Iowa was greatly reduced. When years later he visited professor Chiari in Vienna, Chiari told him that he agreed with his findings on the pathomechanics of the dislocation of the hip and that it coincided with his own findings and treatment. That night, they went to the newly rebuilt opera house to hear a magnificent production of Wagner's "The Flying Dutchman."

When Dr. Steindler retired in 1948, Dr. Robert Newman who had trained in Iowa City in the late 1930s and early 1940s, had joined the navy during WWII and was back in Iowa City, was made acting head. Dr. Newman and Ignacio were the only staff in Orthopaedics at that time. Ignacio suggested inviting Doctor Michael Bonfiglio from the University of Chicago to join the department. Dr. Bonfiglio came at the end of 1949.

A search committee headed by Dr. Dabney Keer failed to recruit a new head of the department. Dr. Robert Tydrick, head of surgery and a member of the Dean's Committee proposed Dr. Newman as head. Dr. Newman's qualifications were inadequate for the job. Dr. Dabney Keer asked Ignacio to go to Boston to see whether Dr. Carroll Larson, who had a medical degree from the University of Iowa and had taught at Harvard for ten years, would be interested in the job. In 1950 UI was most fortunate to welcome Carroll Larson to Iowa as professor and head of the Orthopaedic Department. He was a dedicated and capable teacher who commanded the respect and affection of the whole staff who felt privileged to work with him. Under his leadership the department flourished to greater heights.

In 1950 Dr. Michael Bonfiglio took charge of the bone pathology laboratory while Ignacio took over the biochemistry laboratory. Dr. Bonfiglio had a B.A. from Columbia University, an M.D. from the University of Chicago, and did his postgraduate training in Orthopedic Surgery under Drs. Phemister and Hatcher. He was an outstanding bone pathologist, clinician, surgeon and teacher. His publications on bone pathology became classic. He was well qualified for the job. Ignacio moved to do research in the biochemistry laboratory.

The biochemistry laboratory had been developed in the twenties by Professor Jeans, head of pediatrics. Dr. Genevieve Sterns, an outstanding biochemist from Michigan, was the director of the laboratory. It was mostly devoted to the study of nutrition in babies. When Dr. Jeans retired in 1949 his successor, Dr. Charlie May, turned the laboratory over to Ignacio who was delighted to have Dr. Sterns and her laboratory in the Department of Orthopaedics. Now, for the first time, the metabolism of calcium, phosphorus, and proteins was studied in patients with severe scoliosis. No abnormality was found in the mineral metabolism, but a disturbance in the catabolism of proteins, the nature of which is still unknown, was noted.

Clinical and laboratory studies on scoliosis (curvature of the spine) have spanned most of Ignacio's professional life. In the late forties he studied the deformity with his resident Barry Friedman in some 400 patients nonsurgically treated. The patterns and evolution of the different types of spinal curvatures as seen in X-rays were defined for the first time in 1950. This clinical study was continued 20 years later in greater depth with another resident, Denis Collis, and more recently (in 2003) by Stuart Weinstein and Lori Dolan who recalled patients for a 50-year follow-up. They found that all had lived normal lives with no greater impact on their work and activities than the controls, other than cosmetic concerns and slight increase of back pain for some. After the publication of each one of these studies, the authors received insulting comments from some spinal surgeons who favored spinal fusions.

A year after Ignacio's and Barry Friedman's publications on the classification of curvatures of the spine, Dr. JIP James from London published a paper on the infantile or early onset of scoliosis much more common in England than in the United States. In the spring of 1953 Ignacio went to London to study the problem. For a month he lived with JIP James in a mew not far from the Royal Orthopedic Hospital. He worked with Dr. Herbert Sedon, the head of the hospital. The studies with health workers, nutritionists, and pediatric doctors did not clarify the cause of the deformity in infants who responded so poorly to bracing and spinal fusions. The close friendship with JIP James, however, lasted forever.

Before returning to the states, Ignacio stopped at Barcelona for the first time after leaving in 1939, to see his family and deliver a lecture at the invitation of the Spanish Orthopedic Society. How touched he was to see his mother in the apartment where he grew up and lived until joining the army in 1936. Friends who had remained in Spain after the war were eager to study in the states and Ignacio was able to arrange visiting fellowships for some of them. One of them, Dr. Panadés, came to Iowa to study in the Department of General Surgery, and Dr. Fernando Aleu was appointed in the Department of Pathology where he was named best teacher three consecutive years.

With the objective of going deeper into the pathogenesis of spinal deformities, Ignacio studied scoliosis produced in young rats and rabbits by feeding them a diet abundant in sweet pea seed (*Lathyrus odoratus*). Soon he observed that the rats died of dissecting aneurysm of the aorta for lack of cohesion in the elastic and connective tissue fibers in the wall of the aorta. His discovery was published in 1952 in the *American Journal of Pathology*. He concluded that skeletal lesions in the growth plates and weakening of the tendon insertions in the vertebrae were the cause of scoliosis in the experimental animals. Similar lesions in the growth plates of the long bones of lathyrus animals were analogous to those observed in children with slipped epiphysis and other bone growth disorders. Such findings led to studies of the pathology of the dissecting aneurysm of the aorta in patients with Marfans and Ehler Danlos syndromes. Robert Shepard, a physiology student who worked with Ignacio on the effect of different aminonitrils on muscle skeletal lesions and wrote his Ph.D. thesis on the muscle physiology of lathyrus and vitamin E deficient animals, confirmed that in children with scoliosis

no pathological anomalies were present in the tissues of their spines. The pathogenesis of idiopathic scoliosis keeps eluding researchers to the present day.

The above studies funded by the National Institutes of Health induced the biochemists to study the cause of the weakening of collagen fibers. It was found that newly synthesized collagen was soluble in physiological saline and that beta-aminopropionitril (BAPN) extracted from the sweet pea seed was responsible for the weakening of the cross linking in the collagen fiber. BAPN became from then on indispensable in laboratory studies on collagen. Ignacio was invited to participate in congresses on the biochemistry of connective tissue and joined the yearly Gordon Research Conference on bone and tooth studies in Meriden, New Hampshire. Biologists, chemists, biochemists and crystallographers from universities around the world attended such meetings. In 1953, he presented his work at the Society for Experimental Biology and Medicine in Atlantic City and in 1954 at the American Orthopedic Association in Breton Woods, New Hampshire. Professor Jerry Gross from Harvard acknowledged Ignacio's breakthrough in his Harvey Lecture of 1974 entitled "Collagen Biology: Structure, Degradation, and Disease."

When in 1954 the Orthopedic Research Society was founded it met in Chicago the day before each congress of the American Academy of Orthopedic Surgeons so as to make research an integral part of the specialty, a crucial and visionary move in orthopedics. Ignacio was in charge of organizing the programs of the society, and in 1960 he was made its president. It was difficult those days to find a dozen research papers to fill the program. Today, thousands of papers are submitted to the society and hundreds selected for presentation in three simultaneous sessions during two days preceding the academy meeting.

In January 1955, a week after Ignacio published in *Science* an article on dissecting aneurysm of the aorta produced by aminonitrils contained in the sweet pea seed, a farmer from Kalona, south of Iowa City, called him on the phone to ask him whether he could help him find the cause for his young tom turkeys dying from bursting of the aorta. Ignacio told him to bring to Iowa City some of his very young turkeys and the feed he gave them. The following day the farmer arrived at Ignacio's office with his veterinarian and his turkeys which were small enough to be placed in rat cages. A few days later they had to be moved to the larger rabbit cages, and soon after to Dr. Larson's farm, because they grew so fast. Ignacio tested the components of the feed brought by the farmer and could not find any aminonitril in them. The turkeys were growing well and none of them died until sweet pea seed was added to their diet. Ignacio and the veterinarian advised the farmer to decrease the proportion of soybeans to corn in the diet for his turkeys and discard the diet supplement that contained, although minimal, amounts of aminonitril as shown in experimental tadpoles Ignacio used in Vitchis' laboratory. Thereafter the farmer reported they grew well.

Shortly afterward, Ignacio lectured at the University of Montreal in Canada and was named Claude Bernard Visiting Professor. In 1957 he lectured at the Royal National Hospital in London and at a congress of the International Society of Orthopedic Surgeons in Barcelona. That very same year, he went on a lec-

ture tour in Latin America at the invitation of societies of Orthopedic Surgery in Buenos Aires, Rosario, Córdoba, Montevideo, Santiago de Chile, San Pablo and Río de Janeiro. The Surgical Societies in Argentina, Brazil and Chile made him an honorary member.

In the decade of the fifties, the only laboratory devoted to the study of the chemistry of the skeletal growth plate was that of Professor Zambotti at the University of Pavía, Italy. Ignacio went to the University of Pavía on several occasions. Great scientists had worked there in the past—Volta, Scarpa, and Golgi, among others. On one of those occasions Zambotti took Ignacio to the Scala Opera House in Milan to listen to “la diva” Callas, a unique experience. In Pavía he also met Professor A. Castellani, whom he invited to work in his laboratory at the University of Iowa. Castellani arrived with his wife, Carla, an inorganic Pavía chemist. Ignacio asked Stan Wazoneck, the head of the Chemistry Department at the University of Iowa to find her a place in his laboratory, which he did—a table in a corner of the lab for graduate students. A couple of years later he called Ignacio on the phone: “Ponseti, who is this Carla Castellani who has written a first-prize paper she says she put together in my lab?” Those were different days.

The Russians’ launch of the Sputnik in 1957 was a startling awakening of our need to surpass the Russians in their technological advances. Our universities were given large funds to increase education and research in physics and other sciences, including biology. Ignacio was chosen to join a committee of orthopedic basic scientists, among them Robert Robinson from Hopkins Medical School and Vern Inman from the University of California in San Francisco to establish research centers devoted to the study of muscular skeletal disorders in twelve medical schools. The object was to introduce a more scientific approach to orthopedic surgery. So Ignacio traveled often to Washington and to several university centers to evaluate research work in their laboratories.

In 1960 when Ignacio was invited to Bologna to lecture at the Instituto Rizoli, he met Ortolani, the famous Italian pediatrician who introduced the early diagnosis of hip dislocation in babies by his “scatto” sign, as mentioned earlier. Ortolani took Ignacio to his laboratory in Ferrara where he kept a most interesting collection of specimens of stillborn infant hips in different degrees of dislocation. His impressive, careful and precise study of the hip in babies led his visitor to a new understanding of the nature of the deformity.

From Bologna Ortolani took him to Ravenna to visit the splendid basilicas and the mausoleum of Galla Placidia, a unique treat for the visiting surgeon whose interest in the arts rivaled his interest in science. On all his trips he took time to visit museums, see paintings and sculptures, and study the architecture of monuments since antiquity. One sculpture kept fascinating him, *David* by Michelangelo: the precision of the contours of bones, muscles and veins, rendered with exquisite accuracy, revealed the artist’s knowledge of anatomy acquired from his dissections. One year while vacationing in Mallorca, Ignacio dreamed he had made a beautiful sculpture that rivaled Michelangelo’s.

That same year of 1960 Ignacio received the prestigious Ketoen Gold Medal award from the American Medical Association for his studies on the pathology

of skeletal growth disorders. In July he attended, with four of his colleagues, a convention of Eastern European Orthopedic Surgeons in Prague followed by a meeting in Brno with Russian surgeons. Prague was at that time under oppressive communist rule but vibrant with its great architecture and tradition in the arts. It was here that Mozart's "Don Giovanni" was first performed and Dvorak folk operas and great symphonies were heard at the turn of the twentieth century. And fortunately, while in Prague, Ignacio was taken to hear Dvorak's folk opera "Margaret and the Devil."

In Brno Ignacio made an escapade to the Augustinian monastery, now a car repair shop, where Mendel discovered while working with sweet peas in the garden his earthshaking laws of heredity he presented at the Natural Science Society in 1865, published a year later but not recognized until long after his death. It was about the same time that Darwin published his *Origin of Species*. However, the integration of Darwinian selection and Mendelian genetics as well as the proof that variation in organisms are not directed but fortuitous was not generally accepted as the explanation of evolution until the early part of the twentieth century.

The American Embassy in Prague advised the American doctors not to proceed to Moscow as had been planned because the Soviet Union had shot down an American high altitude spy plane, the U2, above the Ural mountains and Khrushchev had refused to meet President Eisenhower at a summit meeting in Paris. So, the American doctors went south to Austria crossing the Iron Curtain. Vienna appeared prosperous and the Opera House had been rebuilt to its former splendor.

Back in the states, Ignacio went on a lecture tour in Minnesota, Arkansas, Alabama, Atlanta, Chicago and New York before attending an orthopedic congress in Mexico City. All these lectures were illustrated with the beautiful slides made with great skill and artistry by Fred W. Kent, the University photographer whose hobby was to surprise with his camera the life and habitats of owls, hawks, woodpeckers, finches and other birds. With his son Tom he wrote a revealing book on migrations of birds in Iowa.

A biochemist from Pavía, Vitorio Pedrini, was invited to join the biochemistry laboratory of Ignacio's Department. He settled in the outskirts of the city with his wife Angela Pedrini-Mille, also a biochemist, and his children. Ignacio and Pedrini studied the histology and biochemistry of the cartilage in the iliac crest in normal children and in those with scoliosis. The iliac crest is both the main growth plate of the pelvis and a traction epiphysis where the tendons of the abdominal and back muscles insert in the pelvis. The iliac crest is similar in structure to the growth plates in the vertebrae. Both grow very fast in infancy and in adolescence. No changes were found in children or in adolescents with scoliosis.

Biopsies of the iliac crest were very basic in the study of skeletal growth disorders in the spine such as dwarfism as seen in achondroplasia, Morquio, and other deformities. Drs. Reginald Cooper, Ernesto Ippolito and Jerry Maynard at the University joined Ignacio in the study of the histochemistry and the ultra structure of the iliac crest cartilage while Dr. V. Pedrini and his wife Angela studied the biochemistry. These studies revealed cellular and intercellular changes that were better understood later with genetic breakthroughs.

An Unexpected Encounter

It was shortly before Christmas of 1960 that Ignacio and I met by the art, intuition, and will of Matilde Macagno, a professor of mathematics at the University of Iowa married to Professor Enzo Macagno, a hydraulics engineer at the University. At the time, I was a professor of Spanish language and literature at Grinnell College and chairperson of the Spanish-Russian Department.

That day I had traveled to Iowa City to meet Professor Enzo Macagno, originally from Argentina, to induce him to participate in a panel I was organizing at the request of the State Department to conduct a citizen consultation on the subject of my expertise, Latin American Literature. Such citizen consultations in the 1950s were established to impart knowledge to the general public about areas outside their realm of occupation. Being a gentleman and not knowing how to refuse a lady's request, Enzo invited me to lunch to meet his wife Matilde who would know how to get me off his hands. No sooner did Matilde see me than she invited me, and my mother who had come for the ride, to dinner that night. She wouldn't take no for an answer and reserved a room at the Jefferson Hotel for us so we would not have to drive back home in the dark.

That evening Ignacio had two invitations to dinner, was working in the lab, forgot them both and ate at the hospital. The other party, Marilyn and Earl Berglund located him and told him they had prepared pheasant for him. He ate a second dinner at their home. Matilde called all over town, located him at the Berglunds and told him to come for desert. Ignacio arrived half an hour or so before mother and I got up to leave. At the door he asked me where I was from. "Valencia," I replied. I asked him where he was from. "Barcelona" he said. "Oh, I know 'el cant dels ucalls' ('the song of the birds') Pablo Casals played at the end of every concert," and I sang it to him in Catalan. Then, I rushed to the car where mother was already waiting.

We saw each other just a few times between January and June. He came to Grinnell on commencement day, the year I was named James Morton Roberts Honor Professor, the third and last time that honor was bestowed. It had been created the year before to recognize a most distinguished history professor, Joseph Frazier Wall, who ten years later further proved meritorious by publishing the best-documented biography of Andrew Carnegie, the enterprising Scottish-

born millionaire philanthropist, a foremost example of American idealism. Shortly after commencement, Ignacio asked me to go with him to a justice of the peace to get married. I accepted. How come so fast?

Perhaps a few words about my background are appropriate. My father, Nicolás Percas Kioli, was born in Alexandria, Egypt, in 1889 from a Greek father who had business in that city and an Italian mother. By that very fact, he spoke Greek, Italian, Arabic, and—because Alexandria was a gateway to Africa and Asia—Russian, French and Spanish.

My mother, Ana Babenco was born in the Ukraine but went to Egypt in her early teens where her father, his second wife and their six children lived. After Nicolás and Ana were married, they went to Paris to study and when the First World War broke out in 1914 they moved south to Valencia where I was born. My father was a very cultured man, trained by the Jesuits in Alexandria with whom he parted ways when they tried to indoctrinate him. Because of his very solid preparation, he found a job right away at the University of Valencia and founded a school of languages right in our home. One of his students was Vicente Gaos, later to become the author of an excellent annotated edition of Cervantes' *Don Quijote de la Mancha*, one of the reliable sources in my research. I met Gaos at a conference on Cervantes in Fordham University in the 1950s.



Nicolás Percas Kioli, Helena's father, at age 62

Before I learned to walk I learned to swim as my father kept me afloat by my bathing suit straps. Shortly after learning to walk I started running and ran everywhere—to the playground, to school, on errands, to the colleges and universities where I studied until I was 40. Before I learned to read, I memorized and recited the poems my father read to me. In high school Cossío in Valencia when, on parents day, I recited Ruben Darío's "The Wolf's Motives" for escaping back to the wild, I did so with such theatrical emotion I did not know that I brought tears to some grown-ups. I memorized and sang folk songs in Spanish, French, Italian, English, and even in languages I did not know (German, Czech, and Russian).

As a child, my only toys were a doll and a *mecano*, steel strips with which to erect all kinds of constructions. I played Tarzan, went up quarries, and invented dangerous adventures in which I was always the heroine. I made myself docks and boats with matchboxes, or airplanes with my father's writing paper that I launched from our terrace. One day, I went with all my new fleet to the terrace and launched it unawares that the parade of King Alphonse XIII was passing by right below. All eyes followed my fleet across the river Turia all the way to *Los viveros*, a large garden and zoo on the other side of the river. Horrified, I ran to hide under the bed. Alphonse XIII exiled himself to Italy when he lost the elections in 1931 and the Republic was proclaimed. I liked him for sparing the country from bloodshed. I will spare the reader all my childhood mischief borne out of my unbridled imagination.

All the schools I went to in Spain were coed. Boys and girls went through exactly the same educational programs. At the Instituto Escuela of Valencia, the third of such schools in the country (the first being in Madrid and the second in Barcelona), boys and girls learned to repair clothing, polish wood on the lathe, work on leather, jump over the high bar, play soccer, compete in speed and endurance races, learn defense strategies if attacked, and how to fall without breaking your bones. This training proved to be the most useful education throughout my life. Also throughout my life it was my good fortune to have the very best teachers, starting with my father and then Aranegui, the biology professor at the Instituto Escuela under whose guidance we dissected frogs, studied plants, classified rocks and went on field trips (1932).

Unlike Ignacio, I never knew my grandparents on either side, and unlike him I could not trace my ancestry further back than half a century and, on my mother's side, not without nebulosity. In Valencia, in our dining room, there was a majestic painting of my paternal grandmother. I never saw any pictures or photographs of any of my maternal grandparents.

When the Spanish civil war broke out in 1936, my parents sent me to London because the Instituto Escuela of Valencia was not opening that fall on account of being turned into militia quarters. I was 15 at the time and had no say about my wishes. I felt guilty to be spared when my schoolmates stayed behind in Valencia. So, I reluctantly went to high school in London and then to Paris where my father had been named Attaché Commercial by the Spanish Republic. I got my French B.A. (*baccalauréat*, *bacho* for short) in 1938.

When the Republic lost the war (1939), there was no thought of going back to Spain so we crossed the Atlantic to Venezuela, where my father had been asked to create the Literature and Philosophy Studies at the Universidad Nacional of Caracas. Only sciences were taught then. My father soon established himself and was extremely successful. I taught failing students in high school all the subjects of the *bacho*: physics, chemistry, math, history, French. I also got a job teaching English at the Underwood Gregg Commercial College. Those days you could get paid in paper or gold in the Caracas banks. I chose paper, for I could not see myself going about town with a little pouch of gold coins. My instinct for money has never been very high.

Unable to continue my liberal arts education in Caracas and after earning \$1,000 (the amount necessary to enter the United States) I decided to go to Barnard College in New York City. I filled out the application with the help of a visiting youth from New York City and arrived by boat in full view of the Statue of Liberty in 1940. At the immigration office, I was stunned to be asked to answer two questions in writing: whether I intended to kill the President of the United States and whether I was a prostitute. For many years, I was puzzled about such naïve questions until I concluded that it had to do with Protestant ethics: lying is the most serious and punishable offense because the deed is preconceived.

At Barnard I was accepted as a junior on the strength of my French *bacho*. Dean Virginia Gildersleeve gave me a scholarship to finish my senior year. She was amused at my concerns that "I was a poor risk," I warned her in my wobbly English. Without such scholarship I would have had to go back to Caracas to earn another \$1,000 to return and finish college. Dean Gildersleeve was the first to write vignettes about life in China and the only scholar appointed by Franklin Roosevelt in 1945 to the United States delegation to the San Francisco Conference charged with writing the Charter of the United Nations. While presiding at Barnard, she brought writers to teach literature at the College. One of them was Gabriela Mistral, a Chilean poetess, the first woman and the first Latin American to receive a Nobel Prize (1945). I missed meeting her by a few months in 1940.

After I got my B.A., I refused to go back to Caracas and decided to continue my studies in New York City. My parents then decided to come to the United States. Federico de Onís, the founder of the Hispanic Studies at Columbia University in New York City and my professor in graduate school, found a teaching job for my father at St. Laurence University in Canton, New York. From Canton he moved to Rockford College in Illinois, and from Rockford College to Grinnell College in Iowa to teach Greek, Latin, and comparative literature. He was recognized with the Trustees Honor Professorship in 1950-51.

I continued my studies in New York taking an MA at Columbia in 1943, taught at Russell Sage College, and finished my Ph.D. in 1950 at Columbia University. So, while Ignacio's first job, fresh out of the University was at the front caring for the war wounded in the Spanish civil war, I was going through school and working in four countries.

At Columbia University I pursued my doctoral studies under Federico de Onís. He was a visionary teacher whose lectures were revelations. He also

taught us folk songs. At Christmas time he gathered us many an evening at the Hispanic Institute to rehearse the charming Spanish Christmas carols called *villancicos*. In these carols, the Virgin washes diapers and spreads them out to dry on the rosemary bush, while the little birds sing, and the streams laugh passing by.

On holidays, we performed plays by Spanish classics—Lope de Vega, Calderón de la Barca, Juan Ruiz de Alarcón and the famous poet and playwright Federico García Lorca, the author of *Poeta en Nueva York* written after visiting the city in 1929 (translated in 1940 and 1955, *Poet in New York*). Lorca was murdered in Granada at the beginning of the Spanish Civil War for his liberal ideas reflected in his poetry and plays. His brother, a professor at the Hispanic Institute of Columbia University with whom I performed in one of Lope de Vega's plays—*Fuenteovejuna*, a magnificent drama about popular justice against a tyrant ruler—was later, in 1945, a colleague of mine at Queens College. It is at the Hispanic Institute where I met a number of outstanding writers from Latin America and Spain, among them Ciro Alegría, the Peruvian author of *La serpiente de oro* (tr. in 1935 *The Golden Serpent*) and *El mundo es ancho y ajeno* (tr. 1942 *Broad and Alien is the World*), a novel that portrays the neglect and hopelessness of the destitute. Has anything changed in the world of today?

It was in New York City where I discovered a studio owned by a Spanish gypsy who taught the traditional folk dances of Spain, among them “la jota aragonesa” and “la jota valenciana,” the second one a dance I watched Valencians dance in my native town. She also taught me to play the castanets. So, it was in New York City where I learned Spanish culture and Spanish folk songs and dances I later taught to my students at Russell Sage College, Queens College and Grinnell College.

In 1948 I accepted a job at Grinnell College where my father was teaching Greek, Latin and comparative literature. He was earning \$5,000 a year. I was offered \$3,000. Between us the family could survive. At Grinnell College, in addition to teaching Spanish language and literature, I directed Spanish plays, the legacy of Federico de Onís. They were performed by our fired-up students, all excellent actors and actresses, but with occasional charming American accents that sparked a smile on Spanish visitors in the audience. And the “villancicos” learned from Federico de Onís, toured at Christmas time with the Grinnell College choir. Grinnell College was and continues to be today a very special place. I feel proud to have been associated with it and to have contributed to its high standing.

President Howard Bowen of Grinnell College gave Beth Noble and me, the two senior full professors of the Spanish-Russian Department the latitude to build from strength. Beth Noble had learned Russian at President Bowen's request during her sabbatical by going to California and Indiana, then to Russia with a tour of students. The Modern Foreign Language Department was broken up into language departments, and we became the Spanish-Russian Department. In 1959 we were the only women in our department and we thought we needed a man. A brilliant graduate from Yale University, Andrew P. Debicki, was being interviewed

by a number of universities across the country. On his way to the west coast, he decided to stop at Grinnell. He was enchanted by our department, and declared he would join us provided he could teach his field. His field happened to be mine—Spanish and Latin American poetry—which I had taught since joining the college in 1948, and the subject of my lectures in the United States, in Mexico City and in Buenos Aires. My book on women poets of Argentina, *La poesía femenina argentina* (1958), was sold out. I was half way through preparing a book on women writers of Latin America at the request of my Latin American friends and colleagues. I was close to 40.

Beth and I felt so strongly that we needed Andrew that I gave him my field without hesitation. Beth said she could not do justice to the Spanish Golden Age in her survey course of Spanish Literature, and gave me the Golden Age. My life was changed in less than one minute at the President's office of the College. The literary discussions with both Beth Noble and Andrew P. Debicki were invaluable to all three of us to sharpen our wits and widen our horizons. To further widen them, we established once a month faculty discussion groups of outstanding novels, plays and essays with colleagues from other fields.

In 1960 I was invited to Buenos Aires by *La Nación*, the historical literary newspaper-journal of the capital, of the greatest prestige in Latin America, to lecture on the most revered woman poet of Italian origin, Alfonsina Storni. At the end of my lecture, a young man with tears in his eyes grasped my hand and said that it was the first time he had heard a lecture about his mother without being mentioned as her illegitimate son. What moved him most was that I read her poetry just the way she recited it. To prove it he invited me to dinner at his home and played me a record. I was stunned, for I thought I heard my own voice and inflexion. Alfonsina committed suicide in 1938 when at the age of 46 she discovered she had an incurable cancer. Just before, she had announced her decision to *La Nación* in a sonnet entitled "Voy a dormir" ("I am going to sleep").

It was on that occasion that I met Jorge Luis Borges, the great Argentine poet, novelist and critic, a professor of English literature and the director of the Buenos Aires prestigious Public Library. He was among the public when I lectured on Alfonsina. By virtue of being almost blind, Borges had developed a tremendous memory that retained everything his mother, who was his eyes, read to him. In a short story I termed onomatopoeic, called "*Funes el memorioso*" ("Funes, the Memory Man"), Borges reveals the anguishing experience of being unable to forget anything. The very name Funes suggests it phonetically: funeral, funereal, gloomy.

Because Borges could not read an article I had written about his prose style, he invited me to read it before a small circle of friends gathered at the coffee house where they usually met. Needless to say, I was overwhelmed by such distinction and even more so when he invited me to the home of Bioy Casares and his wife Silvina Ocampo, one of the women poets in my book on Argentine poetry. Her sister, Victoria Ocampo, was the prestigious founder of the journal *Sur*, of international circulation for its revealing and enlightening cultural aspects

of Argentina. Borges, Bioy Casares and Silvina were writing a collection of short stories and engaged me in their discussion.

Although I first met Ignacio at the Macagnos, it was not the first time we had seen each other. Our first encounter happened one summer, in the 1930s in Cala Molins, a tiny sandy beach in the north of the island of Mallorca, lined with a natural rock wall at the mouth of a dry torrent. I was nine at the time and the sole 'proprietor' of the beach. Six teenagers arrived on their bicycles for a swim. I was annoyed. They swam in my sea and dried themselves on my sand. The boys were equally annoyed that the girl was always there, and they could not swim in the raw before drying themselves on the warm sand. We found out about our silent encounter in our first conversation at the Macagnos.

What brought us together was sharing the same beliefs, having analogous emotional experiences when talking about past and present wars, about strengths, weaknesses and flaws of human nature. But, above all, what brought us together was our boundless admiration for the United States and our gratitude to the country that had given us the opportunity and the freedom to pursue our goals. We recalled our analogous experience at the border when we entered the country.

Marrying Ignacio was my liberation. I finally could do the things I wanted to do all my life, to hike for miles in the mountains and visit new lands. Ignacio was a seasoned hiker. He often had hiked in the mountains north of Barcelona, Montserrat, Montseny, Matagalls and Agudes; in the Pyrenees, Montperdut and Maladeta; in Mexico, the Popocatepel (1788 feet high); in the states, the Tetons, the Grand Canyon of Colorado down the Angel Trail and up to Flagstaff in one day. In Iowa City he had joined the Mountaineers on several occasions when his work allowed.

Guatemala and Yucatan

Our first trip together was to Guatemala one month after our wedding. Ignacio was invited to deliver lectures on children's orthopedic surgery as visiting professor of the University while I was asked, *sur place* to speak on Argentine women poets. The Guatemala capital was at that time a beautiful city of about half a million inhabitants. The University was modern and had a good faculty. The president of the Surgical Society took us to visit the highlands, a volcanic region with a spectacular lake densely populated by Maya descendents. When we arrived in Chichicastenango, a prosperous city on a hill, it was market day. The market exhibited a colorful display of hand knitted clothes, fruits and vegetables neatly arranged on stands.

Adjacent to the market was the church of Santo Tomás. To the right of its doorway there was a *quemador*, a basin where copal incense was burning in honor of Maya gods. While Maya Indians are nominally Roman Catholic, they retain elements of their native religion such as deities and ceremonies associated with soil fertility. We saw a family of worshipers walking up to the *quemador* to pay their respects to their gods before entering Santo Tomás, now on their knees, accompanied by an intermediary who walked beside them with his right hand on the head of the family man while addressing Jesus on the cross on the main altar with his left hand. We asked the Roman Catholic priest the meaning of the strange way of worshipping. He told us that the important thing was to get them inside the church whatever rituals they followed. Suddenly, I thought of how the Spanish conquest of Latin America was a conquest of spirit by building churches over the native temples, and also how the Mezquita de Córdoba (a Moorish mosque in Southern Spain) was architecturally conquered by encircling it with Christian chapels and walls. Conquests take many forms.

Before leaving Guatemala we went to visit Antigua, the old capital of the Spanish Empire in Central America with its many stately, elegant, baroque buildings badly damaged by an earthquake in the eighteenth century. Bernal Díaz del Castillo one of Cortés' soldiers had retired in Antigua to write his famous *Verdadera historia de la conquista de la Nueva España* (The True History of the Conquest of New Spain) as a protest against the academic chronicles of sedentary historians who had not witnessed the events while he was an actor and eyewitness, better prepared than they to record the truth of expeditions in their topographic and

military details. Still today his work, a basic source to follow that epic, is written in an unassuming, colloquial style, enlivened by popular expressions. It is a unique historical legacy.

On our way back home we stopped for a week in Yucatan to see Chichén Itzá, Uxmal, and Mayapán with their brilliant and elaborate architecture, temples and sculptures of the Maya classic period of the twelfth to fourteenth centuries.

Back home in the states, I taught *Don Quijote* and lectured on Cervantes. It is on Cervantes that I have done most of my research since I was forty: numerous articles and two books, the first in Spanish on his concept of art: *Cervantes y su concepto del arte* (1975), the second in English, *Cervantes, the Writer and the Painter of Don Quijote* (1988). Since then, I have continued to write articles requested by Cervantes scholars to the present day as well as to give lectures on Cervantes and the Spanish Golden Age, also, on Latin American women poets, the subject of my preceding research.

Because President Howard Bowen and my colleagues at Grinnell College did not want me to leave when I married Ignacio and because I needed to take care of my mother, now widowed and living in Grinnell, I became the first commuter in Iowa, about 120 miles round trip. For the first 6 years I traveled the two-way Highway 6 used by the interstate traffic, the local traffic and the tractors! And, to make things worse, I taught 6 days a week! When the interstate was finished, I could prepare classes, exams and meetings while driving, thanks to my good memory and recall facility in those days. My acquaintances and friendships doubled, adding Ignacio's to mine. Until my retirement twenty years later, uninterrupted concentration made the three-hour round trip seem shorter.

Howard Bowen was an admirable president who wanted to know firsthand how everything was going at Grinnell College. He dropped in on classes unannounced and appeared at functions of departments, at lectures of guest speakers and at plays and recitals. When we had Spanish or Latin American guest speakers, we were proud to show off our students interacting in Spanish with the guests. The Argentine poet María de Villarino arrived with a translator on the tour of the United States I arranged for her. We had the translator sit by a marveled Howard Bowen.

Bowen also sat in the audience when Jorge Luis Borges, whose tour I helped arrange, came to Grinnell, via the University of Iowa where he gave a terrific lecture dismissing the notion of plagiarism if a work opens a new window to a known intellectual landscape. Classes at Grinnell College were dismissed that day. Dean James Stauss seized the occasion to extend to all students the unique experience of listening to a world-acclaimed writer. The session was a great success. Borges spoke impeccable English. He declared at the start, after a brief introduction on poetry and metaphor, that he did not like to lecture. He much preferred to answer questions about any author, poem, novel, life, ideals, or historical milieu of writers. By virtue of his tremendous memory he spoke *ex abundancia* and in conversational form that charmed the audience. Despite the burden of remembering everything, as he implied in his above-mentioned short-story "Funes, the Memory man," he enjoyed the question-answer session no end with the bright and stimulating Grinnell students.



Helena Percas-Ponseti (left), at the Quadrangle Stage of Grinnell College, listens to a lecture given by Jorge Luis Borges in the spring of 1968.

Sabbatical in Europe

In the spring of 1966 Ignacio was given a scholarship by the Commonwealth Fund to visit important clinical and biological research centers in Europe. I asked for a sabbatical. We traveled through Europe for nearly five months. In Paris Ignacio visited the Clinique de Génétique Médicale directed by professors Lamy and Maroteau, leaders in the study of growth disorders, to discuss with them new findings in the anomalies of growth cartilage.

Dr. Petit, professor and head of Children's Hospital and a very influential teacher was discouraged with the results of their treatment of clubfeet. He had seen no improvement in their results for thirty years. Ignacio observed that the one in charge of applying plaster casts to the deformed feet was a nun who had no idea about how to correct the deformity and kept repeating the same mistakes during all thirty years she was in charge.

With Dr. Queneau, who had been a visiting fellow studying with Ignacio at the University of Iowa, we went to the service of Dr. Grobind in the Hospital Ramond Poincaré on the outskirts of Paris for the treatment of polio. Vaccination against polio did not become compulsory in France until after 1965, so children with acute polio were still seen. In the United States on the other hand, thanks to the vaccines for polio developed by Drs. Salk and Sabin, the disease had been controlled ten years earlier.

Duval Beaupère observed that spinal curvatures in paralytic children resembled the curvatures seen in children without polio and that scoliosis in polio was induced by a contracture of the back muscles during the adolescent growth spurt. Scoliosis did not develop in adults with polio: very interesting and useful information that scoliosis, regardless of cause, develops during periods of spinal growth in infancy and in adolescence.

Berck Plage, in northern France, had been a large construction with 10,000 beds as the center for the treatment of bone tuberculosis during the first half of the twentieth century. Since the successful treatment of this disease in the 1950s, a number of its available facilities were then used to treat orthopedic disorders in children. Dr. Yves Cotrel, who had visited Iowa City to consult Ignacio on his recent work on scoliosis, was in charge of about 400 beds for children with scoliosis. Cotrel used body plaster casts to correct vertebral rotation and improve spinal and thoracic deformities. Later on, he developed the best instrumentation to derotate and stabilize the spine.

In England we visited first the Strangeways Laboratories in Cambridge directed by Dame Honor B. Fell, one of the most outstanding biologists of the century. She was very interested in Ignacio's work on the effects of aminonitrils in cartilage growth and connective tissue. Then we traveled to Oxford where Dr. Duthy, just back from the United States, was in charge of the Professorship of Orthopedics. He showed Ignacio the new research areas in the Nuffield Orthopedic Center, established by Professor Trueta, the Catalan professor who left Barcelona on the same train with Ignacio as they evacuated patients toward France in 1939 at the end of the civil war. In his 25 years at Oxford, Trueta had done excellent research on blood circulation in bone and in kidney.

In London Ignacio participated in several clinics and conferences at the Royal National Hospital with Dr. Sissons working on osteoporosis and Dr. Manning on scoliosis, both leaders in their fields. In Stanmore Hospital for Children, Dr. Sedon and Dr. Trevor worked on untreated or neglected older children with residuals of polio or brachial plexus palsy, congenital dislocation of the hip and severe spinal deformities.

While Ignacio was working with Sir Herbert Sedon and Trevor, I spent my days in the British Museum Library. Grinnell College had given me the sabbatical to continue working on my history of Latin American women writers requested by the Hispanic profession after my book on women poets of Argentina was published. I had several files of bibliography and notes as well as many pages of my manuscript that I could not take with me to Europe. Since by this time I was teaching *Don Quixote* by Cervantes, I took along the chapter of the descent of Don Quijote into the cave of Montesinos, a fantastic adventure widely differently interpreted by every critic of the book. I discovered that over the character's vision of medieval life Cervantes built several levels of meaning ranging from human and ideological conflicts, to contemporary Spanish history, to philosophy of life, to his autobiography. Such study led to my first article on Cervantes two years later and to my book *Cervantes y su concepto del arte* (Cervantes and His Concept of Art) in 1975.

From London we went to Edinburgh where Ignacio gave several lectures to residents and medical students and was awarded the Lawrence Pool Prize for his leading research. Dr. JIP James, a close friend of Ignacio and his host years earlier, was the professor who had built a first-rate department for research and clinical work on genetic studies, scoliosis, spina bifida, osteoporosis and osteomalacia in old women related to poor diet and little sun.

South to Belgium we were the guests of Joseph Mulier, professor of orthopedic surgery in the Flemish Medical School of Louvain. Dr. Mulier had trained in Iowa City under Ignacio and had developed one of the most important orthopedic departments in Europe for undergraduate and graduate students. In the Catholic University of Louvain, professor Lacroix was working on the growth plate and showed Ignacio his histological studies of the perichondrial ring that surrounds it to facilitate normal bone growth. Dr. Mulier took us then to Bruges and to Ghent to see the great Flemish paintings of the fourteenth century, among them Jan van Eyck's panel "Madonna of Canon George van der Paele" and Hans

Memling's St. Christopher Altarpiece in Bruges; and the "Adoration of the Lamb" by the brothers van Eyck in Ghent, indelible in our recollection through the years. In Antwerp we saw Rubens' masterpieces in the cathedral and his striking atelier in his home.

From Louvain we went to Leiden in Holland for Ignacio to visit the Department of Anatomy, headed by Professor Landsmeer whose studies of the joints in hands and fingers based on sections of fetal hands became the basis for a new understanding of joint motion. We also met Dr. Huson, a professor in the same department who wrote his thesis on the functional anatomy of the tarsal joints of the foot that Ignacio had read with great delight because it proved that his manipulative approach to the correction of clubfoot was sound.

On this occasion, I thought it was by mere coincidence that we arrived in Holland, just during the spectacular tulip festival when, in fact, it had been planned by Ignacio with enviable precision. The numerous, colorful displays, competed for the few prizes to be given. For the viewer it was like walking in a paradise. With few exceptions all of our work/travel together—lectures, research, meetings, conferences, symposia, convocations—were combined with visits to museums, monuments, and archeological sights. Because Ignacio was passionate about sculpture, painting, history, geography, music, architecture and historical sites he always managed to include them in our travels. For me it was a constant instruction in discovery.

A startling contrast came as we arrived in Germany. We were appalled to learn of the tragedy caused by thalidomide used by pregnant women. Several thousand babies were born without arms or legs. In Munich, Professor Heff headed the center to help these children and their families. The United States was spared such disaster thanks to a knowledgeable biologist from the University of Chicago, Frances Oldham Kelsey, who had joined the FDA early in 1961. At the time, the prevailing U.S. law was the 1938 Federal Food, Drug, and Cosmetic Act requiring that proof of safety be sent to the FDA before a medication could be approved for sale in the USA. The law also allowed "investigational" or "experimental" use of a drug while approval for its sale was being sought. The FDA had 60 days to review a drug application. If the FDA reviewer found incomplete or unsatisfactory a particular medication, it had to be resubmitted for another 60 days. Because Frances Oldham Kelsey kept having concerns about the possible effects of thalidomide on human embryos, and because in successive applications no new information was given on the metabolism, chemistry and pharmacology of the drug, she refused six times to grant the approval.

In Basel, Switzerland, we were the guests of Dr. Fredenhagen who had also studied with Ignacio at the University of Iowa. He introduced us to professors Chapchall and Muller who had devised small, effective surgical appliances for better reductions of joint fractures. In Pavia, Italy, Dr. Bolognani was continuing the investigation started in Ignacio's laboratory on cartilage and collagen changes caused by aminonitrils. Professor Goidanich, invited Ignacio, whom he had met a few years earlier in Bologna, to lecture on his latest research on experimental scoliosis in rats showing that the defect was in the structure of the newly synthesized collagen.

Our next stop was Florence, where Professor Scaglietti whom Ignacio had met a few years earlier at the American Academy meeting in Chicago, showed us his enormous newly built orthopedic hospital with 550 beds and 56 doctors on the staff. The ingenious arrangement of wards and operating rooms saved doctors' time and made possible speedy and appropriate care of patients. His interest in Ignacio's visit was to discuss the treatment of congenital dislocation of the hip.

In all universities in the Scandinavian countries, orthopedic surgery was considered a separate specialty for the treatment of musculoskeletal diseases and disorders, including fractures. Dr. Karl Hirsh, the professor in charge in Goteborg, directed theses of postgraduate doctors from Sweden and the United States in biomechanic studies of the spine and hip joint. His colleague, Dr. Nachemsson, had studied the changes of intervertebral disk pressure in different body positions and Drs. Rilander and Jorge Galante were completing a study of the forces acting on the discs following spinal fusions. During a week at the Karl Hirsh country home, he discussed with Ignacio the ongoing research in Iowa City on the pathology of scoliosis. Dr. Moberg showed Ignacio his excellent techniques in the treatment of hand trauma, and then treated us to sailing on the Skagerrak waters for three sunny, warm days.

In Malmo, Drs. Andren and von Rosen had established the early diagnosis of congenital dislocation of the hip using Ortolani's "scato" sign. Because they discovered that the deformity had been missed in five babies during the previous 15 years, two of which had complete dislocations, they decided to take X-rays of all babies at 6 months of age to be certain that no hip dislocation would be missed again. As stated earlier, in the late forties and early fifties, Ignacio taught doctors and nurses in Iowa how to apply the Ortolani "scato" sign correctly to eliminate undiagnosed hip dislocations in babies. When doctors missed cases, they thought that the dislocation had occurred some time after birth. So they changed the name of congenital dislocation to developmental dislocation advising hip testing every three months to detect late cases!

In Lund, Professor Gunnar Wiberg, universally known for his studies of congenital dislocation of the hip, was our host. His colleagues, Drs. Hansson and Sunden, were studying with tetracycline staining how skeletal growth in rabbits was affected by temperature changes following sectioning of nerves. In Stockholm, Professor Sten Friberg, head of the Orthopedic Department, Director of the Karolinska Institute, and Chairman of the Nobel Peace Prize Committee, knowing that we were from Spain, told us how difficult it was to give the poet Juan Ramón Jiménez the Nobel Peace Prize because he was exiled to Puerto Rico, unable to travel, and wouldn't have Franco's Spanish ambassador receive the Nobel Prize for him. So, it was the president of the University of Puerto Rico who did.

In Helsinki, Finland, Ignacio was invited by Professor Langenskiöld to lecture on scoliosis. He was intrigued by Dr. Langenskiöld's experiment (conducted together with his staff headed by Dr. Michelsson) to produce scoliosis in dogs, pigs and rabbits by destroying intervertebral ligaments or by resecting the proximal ends of several ribs. He was equally intrigued by Dr. Ritsila's experiments to

produce clubfeet in newborn rabbits by sectioning the peronei tendons and the extensors of the toes and making the deformity permanent by applying a plaster cast. Such experiments were interesting, Ignacio thought, because they showed how the balance of the spine could be altered, but he wondered what significance they could have for idiopathic scoliosis in humans.

Dr. Ingulf Medbo, who had studied in Iowa City for three years, was in charge of Children's Orthopedic Clinic in Oslo, Norway. He was doing good clinical research, but the department had no laboratory for basic science research. Ignacio was asked to hold several clinics and give two lectures on the subject. Dr. Medbo took us to a lodge south of Trotheim. From there we walked for two weeks in the beautiful Norwegian mountains and crossed two fiords before reaching Bergen.

The Commonwealth Foundation grant was extremely valuable to Ignacio for the knowledge he gained by visiting the many laboratories and clinics in Europe and exchanging views and information with the leaders in musculoskeletal research.

Visit to Ignacio's Family

Before returning to the United States we went to Spain. Traveling to Barcelona over the Pyrenees I was moved to recall what Ignacio had told me about his crossing to France 27 years earlier at the end of the Spanish Civil War. His brother Miquel had been taken prisoner at the end of the war but was saved by their Uncle Ignacio, a commander in Franco's army in Mallorca. Now, he was a professor on the faculty of architecture at the University of Barcelona and a prominent architect in the city. In Barcelona, he had erected by that time more than one hundred buildings including office buildings, laboratories, condominiums, a theatre, hotels. His work extended to the provinces and to Mallorca. In addition, Miquel was an accomplished painter. He painted squares and streets of the old Barcelona and excellent portraits of family members.

Miquel had also been named municipal architect of the city. In the mornings he worked in the Ayuntamiento (Court House) a few yards from the house where he and Ignacio grew up. Whatever Miquel did, he did fast and well. The six years of the Bachillerato (B.A.) he had finished with honors in four at the age of 15. After his Ph.D. in mathematics and his degree in architecture, he received the Premio Nacional Español (First Spanish National Prize) at age 25. When he was elected councilman of the city after Franco's death, he took it upon himself to change back into Catalan the names of streets and avenues that had been changed by the Franco regime. For instance, La Diagonal, the main avenue crossing the city diagonally, hence its name, had been changed to Avenida del General Francisco Franco. Shortly after the dictator died, Miquel chose the names of the many new streets in the fast-growing metropolis. Today, those streets are known by the names he gave them.

On several occasions when we went to Barcelona, we paid visits to Ignacio's teachers, friends and classmates: Joaquín Trias, the outstanding dean of the Medical School in Barcelona, back in Spain after years of exile in France and Andorra; Adolfo Ley, head of neurosurgery service in the Hospital Clínico, and Jimeno Vidal, head of a private trauma clinic, both of international reputation; classmates Felipe Bastos and his wife Katerina, Antoni Taverna and his wife Angels, Antoni Viladot and his wife Carmen, Moises Broggi, a superior surgeon treating the extensive wounds of the International Brigades around Madrid, and his wife Angelina with whom Ignacio went to German School. The younger son

of Dean Trias, Antoni Trias, trained in Chicago and often came to Iowa City to see Ignacio. He taught at the University of Halifax in Canada and at Sherbrooke University in Quebec. After returning to Barcelona he was editor of *International Orthopaedics (SICOT)*. We were his guests on several occasions. He died suddenly of a heart attack just the day before we were to meet for lunch after arriving in Barcelona.

On one occasion, we met Totó Medrano through the Beltrans. She was the owner of an art gallery in Palma de Mallorca that we visited several times before meeting her. We became instant friends. She lived in Barcelona. When we told her we had to go north to Montpellier (France) she offered to drive us there for she had friends who lived nearby. Ignacio told her that he knew General Medrano, commander of the coast during the Spanish Civil War. He had treated him for a leg wound at the base hospital of la Sabinosa. Totó exclaimed, "He was my father." And told us that after the war he was murdered for having been on the Republican side even though he did not fight in the war and protected a number of nuns and priests. Ignacio recalled that on one occasion, when a train full of wounded soldiers arrived at La Sabinosa in the middle of the night, he turned on the lights of the operating rooms facing the sea. General Medrano picked up the phone and roared, "Ponseti, do you think you are in Montecarlo?" The following day a number of black curtains for the windows were received. The last time we went to Spain was in 2005—Ignacio to the Orthopedic Congress in Palma, and I to the Congress celebrating the four-hundredth anniversary of the publication of *Don Quixote*, Part I in Barcelona. On this occasion, I stayed at Toto's home.

One day on our way to the *Barrio Gótico* (Gothic Quarters) where Ignacio grew up, just before getting there, we decided to stop at a bookstore of unique reputation in *La Plaza del Angel* (Angel Square). José Porter, the owner, received us at the door. We were full of questions. He wanted to know where we were from, and when we told him that we were Americans born, Ignacio in Barcelona and I in Valencia, he exclaimed, "Follow me" and took us up one long flight of stairs to an enormous hall where he proceeded to show us the magnificent art books, history books, ancient maps, first editions of rare books, and, low and behold, canvasses and paintings of the best known artists of Spain, and incredibly, a number of large oils by American painters of portraits of American Indians. His daughter was in charge of the bookstore downstairs. More than a bookstore owner, José Porter sounded like a professor, a historian or an art collector.

On several other trips to Barcelona we went to visit him. On our last visit Porter greeted me with "we now carry your book"—he was referring to my first book on Cervantes of 1975. I was touched. On two previous occasions we bought the first time the fifth edition of the *Desastres de la guerra* (The Disasters of War) 80 etchings by Goya; the second time the sixth edition which we donated to the Art Museum of Grinnell College where I was teaching. For nearly a third of a century, Goya had been the official painter of the Spanish Court even after the Napoleonic invasion of 1808. At first Goya favored the invasion because he expected it would abolish the Inquisition he detested, and had kept combating in his paintings and etchings, with barely veiled allusions. At first he hoped Na-

oleon would bring order and progress to Spain, put an end to the abuses and fetters of the Holy Office and to the degradation and violation of women, but he soon witnessed in horror the devastation of fields, the heartless killing by invaders as well as by defenders whose fierce resistance was unparalleled. Some of the worst atrocities Goya depicts can only be watched for the aesthetic beauty of the bodies while blocking out the horror of the acts.

Goya's accusation of the Holy Office is ironically alluded to in an etching showing a priest balancing himself on a tightrope while addressing the crowds below. The caption reads "*Que se rompa la cuerda*" (Watch out, the rope is breaking).



An etching depicting women's heroism is that of a woman in a long dress and flowing black hair about to shoot a cannon while two men's corpses lie at her feet: "*Qué valor*" (What courage) reads the caption. This is one of the few prints one can look at without the need of blocking any part of it. According to F. Soldevila,⁸ Goya's etching depicts a real person, the Catalan Agustina Saragossa, thereafter called Agustina de Aragón to refer to her province.

Goya's ironic captions intensify his ulterior pessimism and hopelessness about mankind. On one etching he portrays people on their knees begging for peace before a wild animal (a wolf, says one of my sources) writing its verdict on a parchment: "*Misera humanidad la culpa es tuya*" (Wretched humanity, the fault is yours). The caption reads "*Esto es lo peor*" (This is the worst). It acquires its full meaning after reading the beast's verdict: Humanity's blindness to know the cause of its mental and physical torture.



Goya did his etchings from drawings sketched in Madrid during the tragic events while self-exiled to Bordeaux for fear of the renascent Inquisition under the restored monarchy of Ferdinand VII, one of the most stupid and cruel tyrants Spain ever endured. They were engraved some ten to fifteen years after the events. On some of the drawings one can read on the margin, *Yo lo vi* (I saw it). The contrast between the black and the white of the etchings exposing the brutal, nightmarish images have shaken and influenced artists ever since.



As for the despicable personality of the King Fernando VII, Goya visually described him with his brush better than words could. Looking at the portrait of the royal family in the Prado museum of Madrid, one wonders how the Crown was so pleased with its image.

Ignacio gave me a tour of the famous monuments in Barcelona, starting with Roman and mostly Gothic churches built in the Middle Ages at the height of Cataluña and Aragon's cultural and commercial apogee. It ranked with Genoa and Venice as one of the leading commercial cities of the Mediterranean. In the *Reales Atarazanas* (the old royal shipyards) we saw the flagship commanded by Don Juan de Austria that destroyed the Turkish navy in the battle of Lepanto in 1571 where Cervantes had been injured. After the decline of Barcelona (as a result of its exclusion from trade with the New World), and the loss of autonomy after the war of Spanish Succession, the city began to prosper again in the course of the nineteenth century. It culminated with the architecture of Antoni Gaudí, Domenech Muntaner and others whose buildings gave Barcelona originality and stature. Gaudí's *La Pedrera* (appropriately named The Stone Quarry for its irregular façades, rounded balconies and irregular halls and roofs) is an outstanding example of his style.



Park Güell (top pictures). Closeup of mosaics in Park Güell (bottom pictures).

One of Gaudi's achievements was Park Güell, a fantasy park with buildings covered with wrought iron and mosaics fashioned from *trencats* (broken pieces of colored tiles) he collected wherever he found them. He also lined benches with *trencats* in gardens with fountains that seemed to belong to a world of myth, reminding of Swift.



Gaudi also built in Colonia Güell a chapel with an arched roof held by leaning columns where today weddings take place. We attended the wedding of a cousin of Ignacio in the chapel.

Gaudi's vision was to create an architectural world that mirrored nature. He was very admired by the Catalans. When Gaudi died in 1926 as a result of a tram accident, hundreds of citizens turned up at his funeral procession to pay their respects. Ignacio, then 12 years old, went with his father.

The Picasso Museum was one of our greatest attractions. It occupied the twin aristocracy palaces of yesteryear on Moncada Street in the neighborhood where the artist grew up and started drawing and painting. His lawyer-friend Sabartés had donated many of his early works to the city of Barcelona. We kept looking at Picasso's imaginative and suggestive distortions of Velazquez's "Meninas," as if reflecting their unsettling inside rather than their stately outside. On the other hand, the portrait of his mother was fascinating to us: unlike most of his paintings, it is a realistic, sober, sad face that tells a lot about her feelings and personality.

Ignacio took me to the once fortified hill of Montjuich, now a park with a museum holding the best Romanesque frescoes rescued for posterity from small churches in the Pyrenees where they were deteriorating. A robbery? Perhaps. You could say the same of the Elgin marbles—the Greek Parthenon frieze in the British Museum of London with its breathtaking sculptures of chariots and horse-men acquired by Lord Elgin, hence its name, on the authority of a grant and subsequently sold in 1816 to the British Museum where we saw them. They were, indeed, saved from destruction by weather and neglect. You could also say as much of the breathtaking Cloisters in New York City, a medieval art museum built stone by stone from European monasteries, mostly from France and Catalonia, whose broken roofs and grassy floors forecasted disappearance. Walking in the Cloisters over stairs worn down by thousands of feet, we felt as if we were walking in the Middle Ages.

We visited the magnificent Hall of the Kings (El Tinell) in the palace behind the Cathedral of Barcelona where Ignacio and the son of the Archivist of the Crown of Aragón climbed as children. The secret stairs to the Tower of Kings Square was particularly moving to me. From there he took me to the magnificent Cathedral of Barcelona, mostly built in the thirteenth century, displaying its stun-

ning colored stained glass, majestic gothic arches, the chapel of the Christ of Lepanto (again a moving reminder of the battle in Greece [1571] where Cervantes lost the use of his left hand “to the greater glory of the right one,” as most Spanish biographies keep reminding us referring to his *Don Quixote*). Such battle stopped the invasion of Europe by the Turks. Next, we went to the church of Santa María del Mar, a magnificent simple-lined Catalan Gothic, and to *La Sagrada Família* (Temple of the Holy Family), another magnificent work of the revered Antonio Gaudi. The visitors of Barcelona enjoy such displays to this day.

Ignacio spoke Catalan with Miquel and his family. In order to participate in the conversation, I had recourse to my self-taught, foolproof, almost instant language acquisition—to pick up a novel in Catalan and read it out loud. The only *sine-qua-non* was to pronounce correctly. That’s how I learned English—in the two weeks on my journey to England by boat when I was 15. So, I chose *La Plaça del Diamant* (Diamond square) by the renowned Mercé Rodareda. Two days later I participated in the conversation—Catalan being quite close to Valencian in vocabulary, and pronunciation presented no great challenge to me as a Valencia born.

After two weeks in Barcelona we proceeded south to my hometown. Spanish had been imposed in Valencia in the early eighteenth century, as it had in Aragon and Catalonia, by the Bourbon dynasty. In schools and in the University of Valencia with rare exceptions, classes were conducted in Spanish. However, I heard Valencian in grocery stores run by farmers, in pharmacies, mechanic’s shops, and in the market place when I was growing up. Mallorquin, Valencian, and Catalan are in fact variations of the same language with differences in pronunciation.

Now, I was the guide. I took Ignacio to the two medieval gates to the city, the Towers of *Serranos*, built between 1392 and 1398, in perfect condition today: and the Towers of *Quarte* built in 1494, showing the gaps caused by the French shelling during the War of Independence, pictorially condemned by Goya (see pp. 49-50 of this book).



Towers of *Serranos* (left) and Towers of *Quarte* (right). By permission of *All Valencia*, (pp. 33 and 35).

It is along the avenue running between the Serranos tower and the river Turia that I ran to school when I turned 11 until I was 15 because the trolley was too slow.

Some of the orange trees of the many growing around the city where the Roman ramparts built in 1356 by Peter IV once stood, were still there, although the city had grown way beyond its original walled circle. We went to the *Mercat central de Valencia* (the Central Market of Valencia). It is a beautiful, wide building with external walls decorated with *azulejos* (colored tiles) above the glass and iron windows, and doors above majestic stairs as of a cathedral. Its architecture is of such grandeur, with its 1,000 stalls, that it is declared in the *Encyclopaedia Britannica* under Valencia as one of the largest and most spectacular in Europe.



Mercat central de Valencia. By permission of *All Valencia* (p. 42).

Right across the street we entered *La Lonja de la Seda* (Market of the Silk Exchange) erected in 1498 on the site of a Moorish alcazar. *La Lonja*, similar to the one in Perpignan, France, and in Palma de Mallorca (Balearic Islands) is considered “one of the best Gothic buildings in Europe,” a living monument open to the city, for which reason UNESCO declared it a “Heritage of Humanity.” In its basement were kept the folk art humorous figures or miniature buildings erected in street corners and squares during the *Fallas* festival. The winners of the first prize were spared from burning on the nineteenth of March, the night of St. Joseph. The figures, called *ninots* (Valencian for “puppets”) were preserved in the basement of *La Lonja*. It was very moving to recognize the three I saw on three consecutive years when I was growing up. Today the *ninots* have a home of their own, the Fallero Museum, open to the public.



La Lonja de la Seda. By permission of *All Valencia* (p. 37).

One Thursday we happened to stop in front of the *Puerta de los Apóstoles* (Door of the Apostles) of the *Cathedral* where a quaint and charming ritual from the eighth century—before the reconquest from the Muslims, called Moors in Spain—has been conducted since the early fourteenth century on Thursdays at 11:30 after mass by *El Tribunal de las Aguas* (The Tribunal of the Waters). Why on Thursdays? Among the Moslems, Friday was their day of rest and this tradition has been kept alive. Because the countryside of Valencia was and still is fertile and grows all kinds of vegetables and fruits irrigated by a single waterway (the Turia), farmers had to take turns opening the gate to their farmland for a specified number of hours. Many disputes arose.

Standing among the public, we watched a reenactment of how the Tribunal of the Waters had settled a dispute: seven judges, called *acequias* (irrigation

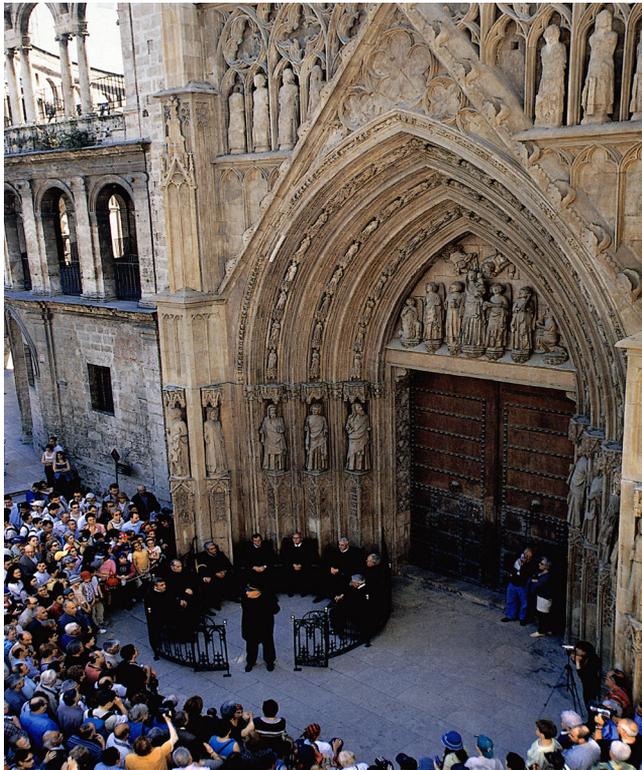
ditches) dressed in black robes—not as Ferrándiz painted them—sat outside the front door of the cathedral on a sofa they brought from inside, facing a low grating behind which the public and the litigants stood. The *acequias* wore the typical farmer *espardeñes* (hemp sandals) tied up their legs. The central judge pointed to one of the litigants with his hemp sandal giving the order in the Valencia language: “*parle voste*” (you speak), then shutting him up with a “*calle voste*” (you keep silent) before turning to the other litigant with his order, “*parle voste*.” Why address the complainers with the hemp sandal? Brought from Islam (following the laws of the Koran), it was the custom of the *grandees* to address those of lesser position in this way. The other *acequias* exchanged views, leaning toward the central judge. The latter would utter the unappealable verdict: “You are right. You are wrong.” It was accepted without a protest. As we watched this performance we felt transported to medieval times.



Tribunal of the Waters with the typical footwear of the period.
Oil on canvas by Bernardo Ferrándiz⁴

The origin of this quaint court dates back to the early twelfth century when two educated Christian kings with Arabic names—Mubarak (“The Blessed”) and Muzafar (“The Winner”)—took refuge in peaceful, orderly Valencia from the persecutions of the Berbers in Cordoba. Significantly, the two first kings of Valencia had been in charge of administering the waterways since the Romans and created its court. Also significantly, the first settlers in the VIII century were Christian laborers from Syria, Lebanon and Egypt sent from Seville to Valencia by the military commander Tarik to control Christian lands.

Nowadays, the *Tribunal de las Aguas* continues to operate but in a different manner. The judges, dressed in modern clothes and shoes, sit in chairs surrounded by a low iron fence while the litigants and the public stand in a circle a short distance away.⁵



Today's *Tribunal de las Aguas*. By permission of *All Valencia* (p. 9).

Now that we were in Valencia, I thought I would take Ignacio to a parcel of land my parents owned on the outskirts of the city. Since the 1930s, a farmer of Moorish descent by the name of Alepuz was cultivating it for free. On occasion, he brought us eggs and vegetables. When we got to Valencia, Alepuz was making a pretty good living out of the land he considered his own. He offered to buy it and I suggested a very low price. He asked me to lower it further. I did.

Then, again, to lower it further. I did. Once again he found the price too high. This time, I went back to the original price with a “take it or leave it.” He took it immediately.

This was my introduction to the bargaining style of Spain inherited from the Moors. But it was not just the style of Spain. I experienced a similar way of bargaining in 1982 when we went to Egypt. Our bus stopped in front of a tourist store attraction. A vendor kept trying to get my attention and sell me a trinket. “I really don’t want it,” I told him. He kept lowering the price, once, twice, three times. I felt sorry for him, and when I said “OK,” he started upping the price until finally I said, “Thank you, no.” Again, we had similar experiences in Greece and Italy.

Our next stop was Granada where we stayed at the spectacular Parador of the gardens of the Alhambra built in the eighth century by the Moors. We listened to the waters running through a net of small tile streams with their fountains and waterfalls and smelled the perfume of the exotic flowers of the gardens. The great Spanish composer Manuel de Falla lived close to these gardens, a source of inspiration, while the equally great Spanish poet Federico García Lorca lived in downtown Granada, also a source of inspiration for his greatest poems. The mountains of Sierra Nevada rising on the horizon are the source of irrigation for the large valleys of Andalucía in southern Spain. The name Andalucía derives from Alándalus designating the Islamic domain in the south of the Iberian Peninsula during the Middle Ages. Alándalus, is a probable corruption of the Greek Atlántidos (Isle of Atlantis), a legacy of the Platonic myths divulged with the Greek philosophy and culture through the Mediterranean.⁶

Granada is where the *Reyes Católicos* (the Catholic Kings) Isabel and Fernando are buried. Isabel was considered to be more important than her husband, so her stone pillow dips under her heavier head. Isabel was an art collector. On the walls of an adjacent room are exhibited admirable Flemish primitive paintings. We were given a copy of the decree of the eviction of the Jews in 1492 that changed the history of Spain. A number of them converted to Catholicism to remain in the country.

In Córdoba we visited *La Mezquita*, the magnificent mosque built in the eighth century on columns and without walls so that the blue sky was visible from any direction. The mosque was built by Abd-al-Rahman I at the site of a Roman temple and a Visigothic church. In the sixteenth century numerous chapels along the sides of the vast quadrangle of the Mezquita were built encircling it, and in the interior a large Crucifer was erected in place of the old minaret. The character of the mosque was thereby altered. As mentioned earlier, there are all forms of conquests. To our surprise, our guide gave us a masterful history lesson and answered in detail all our questions. “Who are you?” we asked. “A professor of history who needs to work to make ends meet”—a result of the misery into which Spain dipped after the Spanish Civil War.

On our way North to Madrid where Ignacio was invited by the Fundación Jiménez Díaz to speak about the results of his latest research on spinal curvatures in experimental animals as well as in infants and adolescents, we crossed Sierra

Morena heading for La Mancha to see the cave of Montesinos where Don Quixote (Cervantes' hero) had descended. Inside, the story goes, Don Quixote saw a crystal palace where the legendary character Durandarte was lying dead but alive on his marble tomb as his lady Belerma approached him followed by her ladies in waiting all dressed as men with Turkish turbans on their heads. Whom he really saw was not Durandarte but his maker Cervantes, a prisoner of the gay Moorish king of Algiers, his master in the 1570s, followed by a sequel of lovers, as I unraveled years later in my book on *Don Quixote* (1975).⁷

Our greatest interest was the Prado Museum, containing perhaps the most select collections of Renaissance painters of Spain in addition to exquisite samples of European painting. Such selectivity is due to the fact that the Spanish Crown relied on the court painters to do most of the selection. The Prado thus contains chosen paintings not only by Spanish masters—Velázquez, El Greco, Murillo, Rivera, Goya, Zurbarán—but also by the very best Italian and northern European painters—Brueghel, Bosch, Dürer, Tiepolo, Botticelli, Titian, Tintoretto, Rubens, Rembrandt and more.

North of Madrid we went to El Escorial (the Dump). It is thus named because it was built on a barren granite site in the Guadarrama Mountains. Juan Bautista of Toledo (the architect) had worked in Italy. He began this Royal Pantheon in 1563. It was completely reworked in 1584 by the great Spanish architect Juan de Herrera who turned it into one of the wonders of the world. Philip II engaged numerous Italian and Spanish artists to embellish this burial site for the kings of Spain and for himself. We were entranced with the sculptures, paintings and tapestries by Goya and artists of the French and Flemish schools. Its paintings, which art books tell us rank among the finest in the world, contain masterpieces by Bosch, Titian, Tintoretto, Veronese, Velazquez, and Ribera among others. It also contains a unique collection of illuminated manuscripts, many in Arabic, and a collection of the only Mozarabic codices in existence. Once again, I admired Ignacio's knowledge of what we were witnessing, because before going anywhere, he spent a day in the library learning about what we were going to see or refreshing his memory on what he knew so that he could instruct and guide me.

On our way north we stopped at the caves of Altamira near Santander. At that time it was possible to enter them alone or in small groups by just purchasing an inexpensive ticket at the entrance. On the walls and ceilings, artfully illuminated with indirect lighting, one could see engravings and paintings of bison, deer, elk and boars in all kinds of postures—standing, lying, running, mooing. They belong to the climax of the realistic style at its fullest development in the middle of the Magdalenian period. Why paint underground in such inaccessible places? Could it be for religious reasons, to attract game through magic, to preserve them, simply for artistic purposes as a peaceful mare with its colt suggests, or even for all of these reasons together?⁹

We spent the night nearby in the Parador de Santillana del Mar before driving east along the northern coast to the small town of Guernica, the center of Basque nationalism, which was flattened at the beginning of the Spanish Civil War on



Paintings on walls and ceiling of the caves of Altamira near Santander

market day by German planes to test the destructive power of their bombs when backing Franco, who chose Guernica to demonstrate what was in store for the Basques and their nationalistic stance if they did not surrender. Picasso's canvas *Guernica* records the stirring emotions of horror and indignation at such a satanic deed. I was in Paris in June of 1937 when *Guernica* (shortly after it was painted) was first exhibited in the Spanish Pavilion of the World's Fair. I was instantly struck by its symbolic realism: evil, pain, despair, struggle, all illuminated by an uncanny lamp above the destruction.

Later, I read that the horse symbolizes innocent suffering and mortal anguish, the fallen warrior with the broken sword the cause of justice. To me the flower in his hand speaks of trying to hold on to life. The woman holding the lamp portrays her compassion as she illuminates the horror; the bull stands as a symbol of hope (but for me, the bull also stands as a symbol of strength and endurance of peninsular Spaniards). To art critics the lamp on the ceiling is another symbol of hope. After looking again and again through the years at Picasso's



Picasso's *Guernica*

Guernica, I feel the lamp seems to tell of false hope. An image of analogous import is the Goya etching mentioned earlier ("Esto es lo peor," p. 50) about men on their knees praying for peace to the beast they actually have within. But the multidimensional meaning of *Guernica* is the reflection and reflexion of viewers' experiences during the historical upheavals of their times.

I was so overwhelmed by *Guernica* that I did not notice right away *El Segador* (The Reaper) nor the large Joan Miró mural in the vast hall, nor Alexander Calder's striking mercury fountain to recall the mercury mines of Almadén in central-south Spain, the first of the mobiles he would pioneer, using liquid metal instead of water.

The World's Fair in Paris seemed to be an intellectual, architectural, artistic exhibit among the forty-four nations of Europe, and a confrontation between Germany and Russia. Their enormous pavilions, the Germans with a pair of triumphant sculptured figures and a swastika in the claws of eagles, looked down at the Russian oversized sculptures declaring its grandeur. By contrast, the Spanish pavilion, the work of the Barcelona architect Josep Lluís Sert, was largely prefabricated from basic materials to reduce as much as possible the scant resources of the Spanish republic: a flat roofed, three-story structure with walls of plywood and corrugated asbestos. But the greatness of the paintings of two Spaniards, Picasso and Miró, and the imaginative artwork of an American, Calder, continued to grow with time.

Guernica had been by and large reconstructed when we were there, but its holocaust had left an indelible mark in the hearts and minds of its inhabitants. The symbol of Basque independence, an aged tree that escaped the devastation was still standing in the main square, another contradictory symbol of life and death.



Ignacio and Helena on their patio

Guernica illustrates a new type of warfare: destruction without confrontation, annihilation of entire cities by bombs dropped from airplanes killing thousands of citizens, as in Barcelona, the last stronghold of the Republic, as happened through the Second World War, and was repeated in Hiroshima and Nagasaki, the last dramatic examples of man's barbarism.

Back in Iowa, Ignacio whole-heartedly started his clinical work, teaching, and research and I my teaching at Grinnell and research on Cervantes. Our only hiking was reduced to our steep backyard down to the Iowa River along the paths we had built and lined with bushes, flowers and trees we had planted.

It was a period of avid participation in the exemplary, rich, artistic and literary life of Iowa City. Here, the first creative writing degree program in the United States was started. In 1922, Carl Seashore, the dean of the Graduate College (the one responsible for accepting Ignacio's study credentials in place of his diploma) conceived creative writing as a thesis. But it was Wilbur Schramm who founded the program and Paul Engle, a native Iowan and brilliant professor of English at the University of Iowa, who was appointed acting director in 1941 and then director for the next twenty-four years. With his second wife, the Chinese poet Hualing Nieh, he cofounded the International Writing Program where distinguished writers (among the first were Robert Frost and Robert Penn Warren) came to lecture and discuss students' work.

One such teacher was an accomplished Chilean writer, José Donoso, who remained in the city from 1965 to 1967. That's when we met him. Because my first field of research was Latin American writers, we became close friends and discussed literature, at times with Ignacio's participation. Donoso asked me to read and comment on the manuscript he was then writing, *El obsceno pájaro de la noche* (*The Obscene Bird of Night*, 1970). It was a valuable analytic exercise for me as well as a suggestive, critical exercise for him. It was the manuscript of his future masterpiece. When the term was ended, since he and his wife wanted to settle in Mallorca, Ignacio directed them to find a house on the side of the stairs leading to the Calvary of Pollensa. They adopted an infant and lived there for several years before going back to Chile. Sometime later Donoso returned to Iowa City for medical checkups, and that was the last time we saw him.

Another great writer teaching in the Writers' Workshop at the same time was the American Kurt Vonnegut who was to become one of the greatest of the twentieth century. We were guests for dinner at a friend's home where the future author of *Slaughter House-Five* was also a guest. He had just finished the manuscript for this well-documented historical novel (with the title "Slaughter House, Number Five") since he was an eyewitness to the horrifying, relentless bombing of Dresden at the end of World War II. Vonnegut was taken to another room by each of two publishers trying to have him sign a contract with them and get the rights to the manuscript by upping the price.

The greatest surprise recently has been to discover that the 2006 Nobel Peace Prize winner Orhan Pamuk, the admirable Turkish author of six acclaimed novels (three of which we have both read at the recommendation of our erudite friend Michael McGaha—*The Black Book*, *My Name Is Red*, and *Snow*) was teaching in

the Iowa City Writers' Workshop two decades ago. Professor McGaha went to Turkey to meet and write about Orhan Pamuk. He went so far as to study Turkish to truly grasp the underlying, contextual meaning behind the writer's words. Professor McGaha is today one of the most prominent, incisive, revealing critics on a range of subjects from Cervantes, Fray Luis de Leon, and the Cabala to the symbolic meaning of the Tapestry of Creation in the Cathedral of Gerona, Spain. The Tapestry of Creation is written in Catalan, a language he also learned.

Language as the way to understand and penetrate the culture, meaning and turn of mind of another race was conceived in the fifteenth century by a Spanish humanist and grammarian, Antonio de Nebrija, a professor at the Universities of Salamanca and Alcalá de Henares. He wrote the first Castilian grammar dedicated to Queen Isabel la Católica because, he said, to truly conquer the lands in the New World, its inhabitants must be conquered through language. If, linguistically, the United States has conquered the world where communication is in English, you could also say that, in turn, the world has conquered the English-speaking countries by thinking in their language.

But let's go back to Ignacio. The interdisciplinary setup at the University of Iowa in the 60s and 70s was conducive to advancing the knowledge of the pathology of skeletal growth disorders. Studies of the fracture callus on rats fed the aminonitril from sweet pea revealed a great increase in their size but not in their strength. Their collagen and bone were weak; therefore, Ignacio concluded that aminonitrils were not to be used clinically in fracture treatment or after tendon grafting in hand surgery (as was being done).

Further in-depth studies of the growth and development of the hip joint in normal children and in children with congenital hip dislocation showed a process of changes occurring in the socket and in the head of the femur causing the dislocation. The long-term follow-up of reduced hips done in collaboration with doctors John Lindstrom, Denny Wenger and Yoshiaki Ischii also revealed the various speeds and degrees of recovery. In his effort to improve the results obtained with close reductions of hip dislocations, an open reduction through a medial approach was later developed with his now colleague, Dr. Stuart Weinstein.

Histochemical studies in fetuses and children done by Dr. Ernesto Ippolito, who came to the University of Iowa from Rome, opened the way to advancing the knowledge of the structure of tendons, ligaments and cartilage in congenital clubfoot and other skeletal growth disorders. It was found that the abnormality in the vertebral growth plate and epiphysial bone in juvenile kyphosis was similar to that observed in Legg-Perthes disease. Today, Professor Ippolito is a leading pediatric orthopedist in Europe.

However, laboratory studies with the Pedrinis on the biochemistry of the intervertebral disk, ligaments and cartilage in the spine of patients with scoliosis did not yield any clear explanation for the development of the deformity. A new field of research was necessary, based on possible defects of the sarcomere in the vertebral muscles. No physiologists at the University were prepared to engage in such research. So, Ignacio turned to another major orthopedic disorder, the congenital clubfoot deformity, whose treatment he believed he had solved in the 1950s.

During the seventies I accompanied Ignacio on a lecture tour in the States and abroad to present his latest research on the pathology and results of treatment of skeletal growth disorders. We went to Chicago; Madison, Wisconsin; San Juan de Puerto Rico; Mexico City; Munich; Madrid and Barcelona; Rome and Naples; Paris, Toulouse and Montpellier; Quebec and Sherbrooke; and in 1979 he was guest lecturer of the British Orthopedic Association in Exeter, England. When in 1981 Ignacio was asked to lecture in San José de Costarrica, I met the director of the Instituto Costarricense de Cultura Hispánica, a man who happened to have trained, like myself, at the Instituto Escuela in Spain. He asked me, *sur place* to give a lecture on anything I chose. I spoke extemporaneously on the distressful life of the Argentine poet Alfonsina Storni, reflected in poems I could recall thanks to my good memory those days.

When in 1973 Dr. Carroll Larson retired, Dr. Reginald Cooper was made head of the Orthopaedic Department. He had come to Iowa in 1955 from West Virginia for his rotating internship and his residency in orthopedics from 1956 to 1960. After two years in the Navy, he joined the department, went for one year to Hopkins University to study the new techniques to visualize bone using transmission electron microscopy under Robert Robinson. After returning to Iowa City in 1965 he developed the electron microscope laboratory and wrote three papers now classic: (1) "Immobilization Atrophy-Regeneration of Skeletal Muscle"; (2) "Electron Microscopy, Morphology of Osteone"; (3) "Electron Microscopy of Tendon and Ligament Insertions." Dr. Cooper was made chairman without a search committee. Dean Jack Eckstein accepted the advice of the senior staff of the department that Dr. Cooper's qualifications could not be matched. His tenure until 1999 has been a period of major departmental and institutional growth and distinction. His successor, Dr. Joey Buckwalter, an excellent researcher on the ultra structure of the proteoglycans, has taken over the chairmanship of the department.

We took our vacations twice a year, in the summer to hike in the mountains of the U.S.A. and Canada, Lake Louise and Lake O'Hara, or in the Rocky Mountain National Park, the Indian Peaks in Colorado, the Cascade Mountains in Washington and Oregon. In West Virginia we followed the trails of Stonewall Jackson. Our son William and his family often joined us. On many occasions we hiked in the Rocky Mountains with Ignacio's young, esteemed colleague Stuart Weinstein and his wife Lynn. When in Europe we hiked in the Swiss Alps, Riederalp, Mürren, and Lautenbrunnen with our daughter Marta and her family. When in England we visited the Lake District, recalling Wordsworth poems, particularly the touching one about Lucy's death, "Rolled round in earth's diurnal course, / with rocks and stones, and trees," concluding in another poem, "But oh the difference to me."

In the winter of 1982, after a short stay in Rome with Ernesto Ippolito to go over his current work, we went to Greece and Egypt for one month to see the wonders of two great civilizations. We spent two days in Athens visiting the museum, the Theatre of Dionysus and the great marvels in the Acropolis. We traveled through the Peloponnesus through Olympia and north to Killini, not far from where the battle of Lepanto took place in 1571 and Cervantes was wounded. Crossing the

Gulf of Corinth we arrived at Itea to see Delphi and Mount Parnassus.

Back in Athens, we sailed to Crete to see Knossos, the prehellenic palace of the legendary Minotaur who devoured anyone who ventured in it. Kazantzakis, the author of *Zorba the Greek*, who lost to Camus by one vote the Nobel Peace Prize in 1957, was from Crete. Kazantzakis is also remembered by the Greeks for his statement "I expect nothing, I fear nothing, I am free." It is in Chania, Crete, where one of Spain's world-known painters, Domenikos Theotokopoulos was born. Finding his Greek name difficult to remember, they referred to him by El Greco, The Greek. After studying in Italy under Titian, and absorbing the work of Tintoretto, Veronese, and Bassano, he went to Toledo, Spain, where he painted almost all his extraordinary and original works in the sixteenth and early seventeenth century.

From Greece we went to Egypt to join the Lindblad tour. In Cairo the Egyptian Museum overwhelmed us as we looked at the antiquities of the Pharaonic and Greco-Roman periods, the colossal statues of Ramesses with the Asiatic Goddess Anta, the statue of King Zoser, and the sarcophagus and statues of many dynasties, gods and goddesses in the Egyptian Pantheon, a collection of scarabs of all periods, a magnificent collection of jewelry from the First dynasty to the Byzantine period, and the most spectacular treasure of Tutankhamun. From the bus along the highway we saw the long cemetery inhabited by homeless families with their children and dogs under the roofs of the tombstones built for the dead.

We flew to Luxor and marveled at the supreme elegance of the Temple, mainly the work under two famous pharaohs, Amenophis III and Rameses II. Six colossal sculptures of the second pharaoh can be seen at the entrance. The superb colonnade of Amenophis III is still supporting a massive carved architrave. The large obelisk in the Place de la Concorde in Paris had been removed from the façade of the temple in 1836. About a mile and a half north we arrived at Karnack where its many beautiful temples are spectacularly illuminated in the evening.

Across the Nile, the whole Valley of the Kings with its statuary, wall paintings, and limestone relief carvings and stelas in the monumental tombs erected for their pharaohs by many generations is a magnificent sight that cannot be forgotten. The most spectacular, perhaps, is the mortuary temple of Queen Hatshepsut at Deir El Bahri. She was the acknowledged ruler of Egypt, who assumed full regal power as visually proclaimed on her monuments by her masculine garb and aspect of a king. What impressed us the most were the striking paintings and sculptures in the temple.

From Luxor we proceeded to Aswan, another striking city. A half finished laying obelisk of beautiful granite and the recently built enormous dam with a large lake that submerged the villages in the valley for many miles is a sight that cannot be forgotten. Thanks to UNESCO, the rock temples of Abu Simbel were sawed into sections and re-erected on top of the rock face from which they were originally hewn thereby saving them for posterity. Another impressive sight is that of the four colossal figures of Ramesses II carved in stone by way of a façade. Back in Luxor we took a boat down the Nile on which shores many spectacular temples and sculptures rise along the small towns on the way north to Cairo.

Our last visit was to the pyramids in Giza and Saqqara before returning home via Rome and Barcelona.

It was in the late seventies when we started taking our winter vacations in Mallorca to take care of my parents' properties acquired in 1934, now in my mother's name after my father's death. These properties were in Cala Molins, the little beach where Ignacio and I had first seen each other from a distance so many years before. It was through Banca Catalana in Palma that we were then paying our taxes, so we went to this bank to see its president, Joan Beltrán.

It was that very morning that Joan Beltrán took charge of all legal matters, invited us to his home for dinner and to go hiking on Sunday with his friends (our friends thereafter to this day). We became their guests in their summer homes, and they were instrumental in helping us sell a few years later my mother's properties almost lost to crafty operators.

One year the Beltráns took us to meet the revered Joan Miró when we told them we had a color lithograph by him in our home in Iowa City. Joan Miró was quite old then and looked it. But when I told him the title of my book, *Cervantes the Writer and Painter of "Don Quijote"* (1988) his eyes brightened, his face became young, and he talked at length about communicating through colors and forms more significantly than through words. It was a memorable visit. It suddenly reinforced my reading of Cervantes' meanings behind his characters' words and actions through their apparel, its color, and their stance.

On a February day early in the 1980s, the Beltráns took us to the *Círculo de Bellas Artes* (Arts Circle) of Palma to listen to a lawyer who dabbled in literature. His name was José María Casasayas. His lecture was on the episode in *Don Quixote I* when the knight meets some goat herders, one of whom tells the story of disdainful Marcela and the death of her spiteful suitor Grisóstomo (chapters 11-14). The audience was very small. At the end of his presentation, Casasayas asked whether there were any questions. There followed an uncomfortable silence. I broke it with a question. He answered it and another silence followed. I asked a second question. He answered. Silence. A third question. This time I kept silent. As we were leaving he rushed after me and asked: "Who are you?" When I told him my name he exclaimed, "I have your book." He referred to my first book of 1975 on Cervantes mentioned earlier.

In parting he asked us to come to his pastry shop. We did so the next day. He greeted us at the door, took us up a flight of stairs and opened the entrance to a spectacular two-floor library (card catalog and all) filled with sixteenth and seventeenth century books, many of them first editions which he immediately put at my disposal. Then, he took us to his home where he had another large library and treated us to a superb dinner prepared by his wife, while he played classical music for us on his excellent auditive system. Every time we returned to Mallorca, Ignacio and Casasayas talked nonstop about music and classic art, and Casasayas and I engaged in discussions about the Spanish Golden Age and Cervantes.

Meeting Casasayas was a stroke of good fortune. He was a genial and resourceful organizer, and when I told him in 1987 that it was a disgrace not to have a Cervantes society in Spain when there were several around the world, on

our next journey to Palma he greeted me with a "I have got it but I need your signature." So, I became a founding member of the *Asociación de Cervantistas*. Casasayas then organized conferences and lectures not only at the University of Alcalá de Henares, where Cervantes was born, but also in Italy, Greece, and as far away as Seoul in Korea just this past 2004, the year this visionary man died.

Islands sometimes are unique milieus for professionals and artists to be creative. In Mallorca lived a world-renowned linguist, Fransec Moll, who wrote the best reference dictionary of the Catalan, Mallorquin and Valencian languages, variations of the same language derived from Italianate Latin, as mentioned earlier. With some of the hikers (like Miquel Massot, a well-read lawyer), we could talk about Cervantes and other writers as about law, botany and linguistics. Miquel Sastre, a resourceful businessman, was an excellent landscape and sea grotto painter, like the husband of Ignacio's cousin Maria, Juan Alemany, a waiter in Pollensa in the north of the island who painted spectacular landscapes and submarine life scenes when off duty. With his palette Ignacio painted rural landscapes, two of which I refused to leave behind. In another town, a first-class painter, Coll Bardolet, captured with his impressionistic palette a live Mallorquin folk dance, now hanging on our dining room wall. The Beltrans took us to Coll Bardolet's country house adjacent to the monastery where Chopin and George Sand lived and where Chopin composed, among other studies, his famous "Prelude in D-flat major."

On some occasions, Helena's colleague Beth Noble or her former student Bonnie Brown hiked with us in Mallorca. On other occasions Ignacio's colleagues, Dick Caplan and his wife Ellen, George Bedel and his wife Miriel, joined us. When in Barcelona we hiked in the nearby mountains of Montserrat and Monseny, close to Barcelona, and in Sierra Morena and Sierra Nevada in southern Spain. And wherever we went, Ignacio refreshed my memory on the characteristics of plants, animals and rocks I had studied in the thirties with my teacher Aranegui at the Instituto Escuela of Valencia. On every vacation in Mallorca, our friends asked Ignacio to see children or grown-ups with orthopedic or other disorders, so he became a consultant, a diagnostician and, on occasion, the doctor who treated friends and relatives or corrected their children's clubfeet.

The publication of my first book on Cervantes in 1975 was also the beginning of lasting friendships with the first three scholars who reviewed it—John Jay Allen, Michael D. McGaha from the U.S.A. and E. C. Riley from Scotland. To Allen, the first president of the Cervantes Society, and to McGaha, the first editor of *Cervantes*, I owe a debt of gratitude for involving me in the organization of the society and for inviting me to participate in lectures and symposia in the Modern Language Association.

One September day in the fall of 1976, my Grinnell colleagues from the English Department greeted me with clippings from the *Sunday London Times Literary Supplement*. They were about Professor Edward C. Riley's encomiastic review of my book. Riley called it a "long, rich and penetrating study [...] elucidating the nature of Cervantes' art in the *Quixote*." He was startled by my perception that Don Diego de Miranda, considered by Cervantine scholars the

epitome of nobility, was nothing other than a fake and a rake. On the other hand, Zoraida, considered a charming Moorish girl, I convincingly revealed to be a "little schemer." Riley concluded that I "worked it all out from textual basis" and it was "difficult to quarrel with the general tenor of [my] conclusions." I was overwhelmed. We exchanged few letters during the quarter century we were friends and met only four times, the last one a few months before he died in 2001 at his home in Scotland. Ignacio had engagements north and south of where Professor Riley lived. So the scholar thought it would be simpler if we were his guests. Both Ignacio and I retain indelible memories of those few days.

It was before going to San Francisco in 1976 for a meeting of the Modern Language Association, where we first met Michael McGaha, that Ignacio received a letter from Joan Berger, a Steindler patient from the forties who remembered his resident and requested an appointment for a checkup of her orthopedic condition. Ignacio replied that he was accompanying me to San Francisco for a meeting and could see her there for she lived nearby in Carmel Valley. It was the beginning of a close and long lasting friendship with Joan and her husband Phill to this day. Joan has supported Ignacio's lab, and more recently she has donated substantial amounts for the treatment of needy families with clubfoot babies. On several occasions we have been her guests in Carmel Valley.

The coastline is remindful of Mallorca. As a matter of fact a street leading to San Carlos Mission in Carmel, founded by the Franciscan Junípero Serra, born in Mallorca, is called Mallorca Street. But the importance of his work is that the missions up the California coast from San Diego (1769) to Sonoma (north of San Francisco) provide the first information about its native inhabitants. Not until the Gold Rush of 1849 did Americans go to California. In the Carmel mission we saw the wooden cot on which Junípero Serra died in 1784.

I had no intention of writing any more after 1975. It seemed to me I had said everything I knew with the publication of my first book on Cervantes, but after every participation and discussion with colleagues, I kept finding one more thing that needed to be said and wrote "one last paper." Ignacio kept calling these papers "the next to the last," and he has been right to this day.

One Cervantes scholar I am deeply indebted to, John Jay Allen, has kept being my friend despite the fact I did not always perceive in time to discuss them the basic revelations he made in superb works he kept sending me all along. Such is the mark of a great man. I grasped too late their relevance to what I was writing. The same is true of Professor Elias Rivers, one of the giants of Cervantine scholarship. And recently it is also true of José Montero Reguera, a Spaniard whose work I often acknowledged after the fact. As a true gentleman he has not held this against me. Today, he is one of my closest friends whom I finally met in Barcelona in April of 2005. Professor Montero is the outstanding Cervantes scholar who has continued the work of José María Casasayas as president of the "Asociación de Cervantistas" of Spain.

Looking back upon my life I feel I was extremely fortunate to have known and learned from the best minds Providence placed in my way, starting with my father and, thereafter, my professors, colleagues and scholars met at various con-

gresses and symposia. One of them, not mentioned earlier, was Luis Monguió, an outstanding Latin-Americanist professor at Berkley, whom I met several times at congresses of the Modern Language Association, and then with Ignacio with whom he had a lot in common, for both of them grew up in Cataluña a few miles apart on the same coast. Professor Monguió had a gift for presenting orally and in writing a range of subjects from Spanish America's twentieth-century poets to Spanish literature from the eighteenth to the twentieth centuries, in a style combining thorough documentation with critical judgment. Equally outstanding is his wife, Alicia de Colombí, perhaps the foremost scholar of our times in the field of Golden Age Poetry and Colonial Poetry of Latin America. Above all, I feel fortunate to have met Ignacio, whose knowledge and interests range far beyond his professional scientific work: he keeps on reaching when most begin to let go.

There is a great omission in the recount of my blessings: my mother. My great debt to her is of a strange nature. Her secretive, duplicitous personality dotted with evasive but suggestive half-truths and confidences of real or invented events, the sequence of which was baffling to me since childhood. Trying incessantly to penetrate her mysteries sharpened my wits and analytical perception. I first became aware of this gift in graduate school as I sensed the hidden emotions and significance of the words prompting them. And then, throughout my life, I keep discovering that my first impression of people just met is a window into their nature and personality gleaned from their words and manner, as time keeps proving.

A student of mine at Grinnell College and today one of our closest friends, Bonnie Brown, corroborated the impact of the revelatory nature the study of poetry had in her life. Her brilliant published thesis in graduate school under my former colleague Andrew Debicki, to whom we recommended her, was on José Hierro, a poet she went to Spain to meet and was to receive the prize "Cervantes" in Cervantes' birthplace of Alcalá de Henares from King Juan Carlos.

After a 10-year long career as a professor of Spanish literature at the university level, Bonnie started and developed an extremely successful business she called "Transition Dynamics" to advise lawyers and bankers dealing with matters of inheritance on how to help their clients in moments of dire distress. She told Ignacio and me she developed the ability to sense her clients' wishes behind their words from her analysis of poetry in our poetry classes at Grinnell, thereby finding the appropriate language to express her client's wishes without conflict or offense. Today she is constantly in demand for lectures and advice from the U.S.A. to Latin America, Asia and Europe, including Spain where chauvinism still existed a few years back when she was there: a conquest.

10

Mandatory Retirement

In 1983, an International Symposium in the University of Iowa to honor Ignacio before his mandatory retirement at age 70 (1984) brought to the campus more than a hundred friends and alumnae. Professor JIP James from Edinburgh, Anthony Catteral from London, Ruth Wynne-Davis from Oxford, Henry Mankin from Boston, and Alf Nachemson from Göteborg lectured on this occasion. The Ignacio V. Ponseti Professorship was established to recognize an outstanding researcher of the Orthopaedic Department. Also in 1984 the University of Barcelona named him Doctor Honoris Causa, a moving ceremony because it came from the University where Ignacio was formed.

He turned to drawing and to studying art history and took classes on European Renaissance, classic art, and modern American expressionism. While learning more about the great art through the centuries, he continued to work in his biochemistry laboratory and went back to further study of elastin in the spinal ligaments with a new technique described in 1985 aimed at finding possible anomalies in idiopathic scoliosis. He had the good fortune to work in conjunction with Michael Solursh, an outstanding scientist in the Biochemistry, Department at the University. A resident, Nancy Hadley, knowledgeable in biochemistry started her studies of elastin in intervertebral ligaments of patients with scoliosis. No significant differences were found in the elastin of scoliotics compared to normals.

As mentioned earlier, severe clubfoot patients initially treated by Ignacio from 1948 to 1956 were recalled for a clinical and radiographic examination with the assistance of a graduate student, Eugene Smoley. The results were published in the *Journal of Bone and Joint Surgery* in 1963. A complete correction of the deformity had been obtained on these patients, but relapses occurred mostly when the foot abduction orthosis was discarded prematurely. Permanent correction was obtained in these cases by a simple transfer of the anterior tibial tendon from the inner side of the foot to the middle of the foot. This first recall proved the soundness of the mechanical and biological principles guiding his treatment. The medical profession ignored the good results. Ignacio did not push his method at this point because he thought he needed a long term followup to be certain of the positive results.

Sometime later, Ignacio happened upon a doctoral thesis written in Dutch in 1961 by a bioengineer from Leiden (Anthony Huson) entitled "An Anatomical and

Functional Study of the Tarsus.” In the English summary at the end, Ignacio was thrilled to discover that Husson’s description of the motions of the foot joints coincided with his own. Still years later, Ignacio found that in 1872 Dr. Farabeuf had described the foot motions in the same way. Now, he was certain his clubfoot treatment was the correct one since his treatment was based on the functional anatomy of the foot not on the erroneous anatomical description that had been perpetuated in textbooks and scientific journals.

Studies conducted with Ernesto Ippolito, who came a second time from Italy with an excellent collection of histological sections of clubfeet in the human fetus, showed extensive fibrosis between the tendons and the very thick ligaments on the posterior and medial aspects of the foot causing the foot to turn in and up. The muscles were atrophic and the bones, made mostly of cartilage, were misshapen. These findings were published in the *Journal of Bone and Joint Surgery* in 1980. That same year, Dr. Sterling Laaveg’s follow-up review of the patients Ignacio had treated in the fifties and sixties showed continued good results. Ultrasound showed that the deformity develops in the second trimester of pregnancy when the fetus begins to kick. They also observed that the ligaments of the clubfeet of stillborn babies were stretchable, facilitating the correction of the deformity.

11

Return to the Orthopaedics Department

In the early nineties Dr. Stuart Weinstein asked Ignacio, now in his late seventies, to return to the department to show how to correct clubfeet properly. In 1995, a thirty-year followup by Drs. Douglas Cooper and Frederick Dietz of the patients treated by Ignacio in the fifties and sixties revealed that the corrected clubfeet showed no significant differences in their functional performance compared to a population of similar age born with normal feet. Ignacio was now totally convinced that he had found the right and only way to correct the deformity.

While walking toward his office in the hospital one day, he expressed to me his frustration. It was proven that clubfeet could be corrected without operating; he had written and given lectures on the subject for years, and nobody was interested in learning how to do it or even consulting him about it. I told him that there is a tendency to consider the last article on any subject to be the last word regardless of whether it is good, mediocre, or plain bad, that he needed to write a book to explain why it was crucial to understand the biomechanics and the biology of the clubfoot deformity to properly correct it without cutting ligaments and opening joints, which lead to stiffness and pain after the growth spurt if not before—a prescription for a miserable life forever. He finally agreed that a book had to be written. I learned to use the computer to type it under Ignacio's dictation. I was past 70 at the time. To be able to type what he dictated to me I had to understand the precise meaning. Ignacio had to explain everything in crystal-clear terms for me so I could find the precise language to produce a crystal-clear manuscript. It was completed in 1995.

No publishing house was interested. Editing houses were putting out too many books on clubfoot surgery with the variety of operations and variations orthopedic surgeons were performing in a never-ending attempt to improve surgical intervention or find the right one. No more manuscripts on the subject were welcome. Drs. Stuart Weinstein and Jody Buckwalter intervened. Both had trained under Ignacio, were now his colleagues, and enjoyed great prestige worldwide as leaders in the field. Jody Buckwalter was just back from a sabbatical in Oxford.

Both decided to recommend Ignacio's manuscript to Oxford University Press. It was instantly accepted for publication and *Congenital Clubfoot: Fundamentals of Treatment* came to light in 1996. It was reprinted in 2000 and a third printing, an exact reproduction of the book by permission of Oxford University Press came to light from the University of Iowa Printing Department in 2004.

A year after Ignacio's book came out in 1996, some prominent orthopedic surgeons from the States were the first to follow and promote his long-time found solution to the correction of the deformity. John Herzenberg, from Baltimore, read Ignacio's book three times and sent a long letter to his mentors and leading experts on clubfoot treatment explaining that he had used Ignacio's technique in about a dozen patients with excellent results. Dr. Wally Lehman, a professor of orthopedic surgery at New York University, and a few other surgeons came to Iowa City to see how Ignacio corrected clubfeet in order to follow his method.

Dr. Herzenberg even reprimanded Ignacio for not pushing his effective, inexpensive corrective technique from the very beginning. The reason he didn't, Ignacio explained, was that before promoting it, he had to be certain that the corrected clubfeet would be functional and painless for life. A colleague of Ignacio, Dr. Charles Saltzman, a clairvoyant and resourceful foot and ankle surgeon, urged him to describe his treatment on the internet, which he did.

At this point an interesting development took place. Mr. Martin Egbert, a developer from Las Vegas, had a sixth child with clubfeet. He read the abundant literature on the numerous operations devised to redress clubfeet and was horrified. Mr. Egbert contacted Dr. John Herzenberg in Baltimore who told him to contact Ignacio, who was the one who devised the method he used, and was so much closer to him. Mr. Egbert decided to contact Ignacio. His son was now 3 months old. He asked many questions, and called three times. Finally, Ignacio said to him, "Stop shopping around and let me redress your baby's feet." After five manipulations followed by plaster cast applications, the clubfeet were corrected.

On their way home, Martin Egbert and his wife Alison together with other parents created the support group that turned around the treatment of clubfeet in the States. And what could not be established for half a century of successful corrective treatment was established in four to five years by Ignacio's little patients' parents through a support group on the internet. Martin Egbert has gone out of his way to map the number of clubfoot incidence around the world, has attended pediatric orthopedic meetings in the States and abroad and has been asked to share his statistical knowledge at such meetings. The most active parents in the States alerted other parents not to let their babies be operated on and even advised them about which doctors followed Ignacio's safe way to achieve correction and normal development for life. The first ones were Jennifer Trevillian, Teresa McLaughlin, Dessi Pickett, and Teresa Audilet. The same thing happened abroad: Matteo Procacci in Italy, Karen Moss in South Africa, Jolanta Kavaliauskiene in Lithuania, Julia Gafsi in Germany, Paula Viegas in Portugal, and so many more who were instrumental in stopping operations on clubfeet in their countries.

It was difficult for doctors to understand the biomechanics of the tarsal joints basic for the correction of the deformity. The tarsal bones are in the extreme position of equinus, varus and adduction, that is they are turned down, over and in. Such extreme positions are reversible because the tight ligaments are stretchable. To illustrate how to bring the bones back to their normal positions a model was necessary. Ignacio had recourse to a gifted craftsman, John Mitchell, who made plastic skeletons for teaching instructors. We went several weeks to his shop in Nichols, 25 miles southeast of Iowa City. I took my work with me while Ignacio and John devised a clubfoot model. After several alterations in the shape of the plastic bones and elastic strings by way of ligaments, a clubfoot model was built to clearly show the proper corrective manipulations.

The clubfoot model became a most useful tool to teach doctors and doctor assistants how to redress clubfeet. In addition, Ignacio asked John Mitchell to make several small, soft, plastic feet in the several stages of correction also for teaching purposes. The commercial shoes used in foot abduction braces to prevent relapses after correction, made of poorly molded hard leather, caused blisters and sores on babies' feet. John further devised soft plastic sole shoes with leather straps that were very comfortable to babies. Thanks to the guidance of John Spitzer, a professor of finance for entrepreneurs at the University of Iowa School of Business, who happened to have been Ignacio's patient for knee surgery in 1960, John Mitchell today owns a small factory that distributes shoes, abduction braces, and clubfoot models all over the world.

But let's go back to the 1990s. When in 1997 Ignacio was asked to lecture in San Joan de Deu, the main children's hospital in Barcelona, a newly appointed assistant, Anna Ey, brought him a clubfoot infant who had been abandoned at the hospital door. Ignacio showed her how to correct the deformity. She understood it immediately and became the first expert in Spain to correct clubfeet and teach other women doctors how to do it. When Ignacio gave a course at the University of California in San Francisco, Dr. Michael Colburn, a podiatrist, learned the technique and introduced it throughout California. After a visit to Lyon a few years later, Professor Jacques Bérard and his staff learned it and introduced it in France.

A few years later, in 2001, Dr. Lehman asked Ignacio to come to the Hospital for Joint Diseases in New York City to demonstrate his technique and receive the honor of having the clubfoot clinic named after him. Shortly afterwards, the clubfoot clinic in the University of Iowa Hospitals and Clinics was also named after him.

Today, Ignacio has patients from five continents and visits from international doctors who wish to learn the technique and become teachers of other doctors in their countries and adjacent ones. Scores of orthopedic surgeons from the States and abroad come to Iowa City almost every week for that purpose. Among the first to arrive in this order were Naomi Davies from England, Rachel Short from Scotland, Sari Salminen from Finland, Cristina Alves from Portugal, Katrin Scheling and Oliver Eberhart from Germany, Christof Radler from Austria, Rafael Velasco and Erika Lamprech from Switzerland, Bertil Romanus from

Sweden, Monica Nogueira and Laura Alves Ferreira from Brazil, Dalia Sepulveda from Chile, Amidar Cagurla and Mario Shimchake from Uruguay, Minud Chandhary from India, David Davidson from Philadelphia, Morrisy from Atlanta, Kevin Walker from Minneapolis, Enrico Stazone from New Mexico and many more. In turn, they instructed others on how to do it. Dr. Haemish Crawford, now in New Zealand, was one of Ignacio's first students to learn his technique and instruct others.

It is impressive to witness how quickly mothers sense from the very first manipulation and plaster cast application to their baby's feet that the deformity is on its way to correction. They are further overwhelmed by the gentleness and delicate touch that relaxes their babies during manipulation so most don't cry and others barely unless they are ill tempered. To further soothe the babies they are played Mozart's music, very effective during manipulation; some even fall asleep.

A very kind, very bright, knowledgeable, and effective secretary, Joyce Roller, who came back after retirement just like Ignacio did, is the first to be in touch with parents and answer their questions; and a superb, knowledgeable and dedicated nurse, Maria Paulson, who puts babies and parents at ease, have been Ignacio's invaluable team for his success. The little patients come with their families and stay at the recently enlarged Ronald McDonald House to accommodate ever more families with children suffering from a number of difficult disorders and diseases that require expert treatment. Invaluable to both Ignacio and me has been Nancy Love, Dr. Stuart Weinstein's secretary who, more accurately, is *de facto* everybody's who needs her. Last but not least Paul Etre, a sensitive and clairvoyant administrator of the Department of Orthopaedics, finds solutions to all problems and runs it like a clock. Personally, I am thankful to Jennifer Whitmore and Kyle Askling who have come to my rescue whenever I came to an impasse with my sophisticated computer.

Equally invaluable to Ignacio is the assistance of Dr. José Morcuende in the clinic. He came from Madrid, Spain, a few years ago to study and do research on cartilage chemistry and genetics. He spent two years in Florida and returned to join the orthopedic faculty at the University of Iowa in Iowa City. His unending energy to work and travel to many countries in the world to show hands on Ignacio's clubfoot correction technique is admirable. In the last five years he has traveled to Europe—Spain, Portugal, Sweden, Norway, Russia, Finland, Switzerland; to Latin America—Nicaragua, Columbia, Brazil, the Dominican Republic, Uruguay, Argentina, Mexico, Chile, Paraguay; to Asia—Japan, India, Thailand, Malaysia, Turkey, China, United Arab Emirates, Saudi Arabia; and to some of these countries more than once. Dr. Frederick Dietz has taught courses in Manchester, England in Dr. Naomi Davies clinic, and has also traveled to Southeast Asia to teach the method.

The first country to adopt Ignacio's protocol was Uganda, in Africa. Here clubfeet are very common. Untreated children are so crippled that they walk on the sides of their feet or on their knees, are outcasts and reduced to beg for survival. Two generous and self-giving doctors who have read Ignacio's book,

Norgrove Penny and Shaphique Pirani spent time in Uganda (Penny, 6 years; Pirani, a month every year) to turn around life for children born with such a devastating deformity. Since there were only two surgeons in the country, Drs. Penny and Pirani organized the early treatment of the deformity by most successfully training some fifty medical assistants around the country to do the manipulation and correction of clubfeet according to Ignacio's protocol.

Today, with the backing of the health authorities, Uganda experts are teaching doctors in neighboring African countries to treat their infant patients. A Dutch physical therapist, Michel Steembeek, living in Uganda, was a pioneer in making inexpensive soft leather shoes attached to an effective orthosis to maintain the clubfoot correction full time for the first months and thereafter whenever the baby sleeps so as to prevent relapses. He organized 20 clubfoot clinics in the most populated areas of Uganda and supervised the orthopedic officers treating babies. His orthosis is being used now all over East Africa.

Dr. Lynn Staheli, the editor and publisher of *Global HELP*, has organized and published a 30-page pamphlet illustrating the Ponseti method, and several doctors, experts on the method, have contributed chapters to show how effective it can be all around the world. The pamphlet keeps being translated into more and more languages and is distributed at little or no cost.

Follow-up studies in orthopedic centers in the United States and abroad keep proving that Ignacio's management of the clubfoot deformity is best for all countries and cultures. Even so, many orthopedic surgeons continue to do unnecessary and damaging surgery on infants. Since they do no long-term follow-ups beyond adolescence, they are unaware of the irreparable damage they cause, as shown by Dr. Matt Dobbs' recent 30-year review of operated cases. Many surgeons conditioned by the prolonged indoctrination of traditional classroom, clinic and textbook knowledge continue to perform invasive surgery and to damage feet irreversibly.

In 2006 under the leadership of the visionary John Buchanan, professor emeritus of the Tippie College of Business at the University of Iowa, the Ponseti International Association for the Advancement of Clubfoot Treatment has been established. Its mission is to promote worldwide broad-based training programs in the use of the clubfoot method of corrective treatment. This foundation will be sponsoring seminars and tutorials in Iowa City and other centers in the United States, Europe, Latin America, Africa, India, China, Japan, and the Pacific islands. It will provide trained specialists in the main hospitals throughout the world and in areas adjacent to Ronald McDonald Houses to eradicate congenital clubfoot, the most common musculoskeletal birth defect in the world.

Recently, major business leaders Bridget and Roger Berman, whose six-year-old son Reese's clubfeet were successfully corrected following Ignacio's method by Dr. Joshua Hyman in Children's Hospital in New York City, have come to Iowa City to meet Ignacio's team and have pledged to help bring funding to provide awareness, training and tools to support his method around the world.

In August 2006 the American Academy of Pediatrics endorsed the Ponseti Method as the "most successful non-invasive, and cost-effective" clubfoot treat-

ment and urged its use worldwide. The American Academy of Orthopedic Surgeons has also endorsed the method. Since, when properly learned, it can be administered by health care providers such as nurses, midwives, and physical therapists at very little cost, it is a most effective treatment for underdeveloped areas where there are few or no doctors.

In his so-called retirement, Ignacio is most fortunate to be surrounded by his internationally known former students—today his close colleagues and friends—Drs. Reginald Cooper, Stuart Weinstein, Jody Buckwalter, John Callahan, all of whom left in the past for extended periods of time to work and do research at other universities and came back to be leaders in the Orthopaedics Department of the University of Iowa, preside over the American Orthopedic Association, the American Academy of Orthopedic Surgeons, or the American Orthopedic Research Society. Dr. Richard Johnston, a former gifted colleague and a brilliant total joint replacement surgeon—back in Iowa City after retirement—has developed a computerized system to study the long-term results of the many orthopedic treatments thereby widening the scope of teaching and research in this and other university departments. Dr. Reginald Cooper, the former visionary and effective department chair, is actively collaborating with Professor John Buchanan, the mastermind of the establishment of the Ponseti International Association for the Advancement of Clubfoot Treatment that is presided over by Dr. José Morcuende.

Following the Iowa tradition of providing health care to all, the chief executive officer of the University of Iowa Hospitals and Clinics, Donna Katen-Bahensky, is supporting the Clubfoot Clinic of the Department of Orthopaedics to treat clubfoot babies from all over the world.

The departure from Iowa City of our good friends and former colleagues of Ignacio—Dick Brand, now editor of *Clinical Orthopedics and Related Research* in Philadelphia, Stan James, a leader in the treatment of sport's injuries to the knee with whom we have hiked on several occasions; Dave Murray, now a retired professor of orthopedics from Syracuse; Dennis Collis, a prominent hip and knee surgeon; and Sinesio Misol, a first-rate anatomist retired in Des Moines, who made an excellent dissection of a stillborn clubfoot—are always present in our minds.

Today, Ignacio's constant focus is on the clubfoot deformity, its origin and cause. Why does it develop in the middle of pregnancy when the fetus begins to kick? Recently, it has been found that a mutation in the fetal myosin chain genes causes severe congenital contractures (distal arthrogryposis) in hands and feet. Ignacio suspects that a defect in the fetal myosin in the leg and foot muscles could be the cause of muscle contractures and fibrosis, thereby producing clubfoot. It has been found recently that the defective fetal myosin decreases after birth and is replaced by normal adult myosin. This explains why the clubfoot, when properly corrected and held corrected three to four years until adult myosin takes over, develops normally through life.

As for the spine Ignacio suspects that scoliosis may be caused by a localized defect in the complex spinal musculature activated by the hormone surge in pu-

berty, occurring simultaneously with the increased rate of trunk growth. Muscle physiologists and geneticists are the ones who can find whether he is right.

Ignacio's success as a surgeon throughout his career, and as a magician redressing clubfeet to perfection, is due to his immense respect for nature, and his great love of art. Invoking the great Roman poet Horace's (8-65 B.C) marriage of art and nature, by bringing up his name, Cervantes put it this way in 1615: "Art does not surpass nature but perfects it."¹⁰ The higher reason for Ignacio's success is his thorough knowledge of anatomy, of the biology of muscles, ligaments, cartilage and bones, of the complex motions of bones in the normal as well as in the clubfoot, and his exemplary discernment that enables him to guide back, gently but firmly, the displaced bones to their proper positions.

Notes

1. Ciutadella is the Minorca pronunciation of the sixteenth-century English “citadella,” citadel. This island founded by the Carthaginians, conquered in turn by the Romans, the Vandals, the Byzantines in the sixth century, the Turks in the thirteenth century, the Catalans in the sixteenth century, then again the Turks, was ceded to England during the War of Succession in the eighteenth century, then to France, then back to England, and in the nineteenth century it was returned to Spain. While I was in England, I learned a song about the departure of the English sailors from the island. It goes this way:

Farewell and adieu
 To you Spanish ladies
 Farewell and adieu
 To you ladies of Spain
 For we've received orders
 To sail for old England
 But we promise, fair ladies,
 We'll be back again.

2. Margalida is the Catalan-Balearic Island pronunciation of Margarita in Spanish and Margaret in English.
3. A fascinating recount of the linguistic turns and legends in the shaping and reshaping of the languages in Spain is offered by Ralph A. Giesey in his book *If Not, Not. The Oath of the Aragonese and the Legendary Laws of Sobrarbe* (Princeton, Princeton University Press, New Jersey), 1968.
4. Illustration from Carmen Gracia, *El Tribunal de las Aguas, Ferrandiz ante la Modernidad. Institucio Alfons el Magnanim*. InstitucioValenciana d'estudis I investigacio, Valencia, 1986, p. 54. I am indebted to Juan Gil Guardiola, a dear high school friend of mine from the Instituto Escuela of Valencia (1932-36) for this revealing, historical account of the origin of the tribunal. A heartrending story of the vendetta arising between two farmers is found in the Valencia writer Vicente Blasco Ibanez's powerful novel *La barraca* (*The Barrack*) (1898). He is a passionate, crude realist with a gift to arouse emotion in his readers. A good edition with introduction, notes and vocabulary is that of Paul T. Manchester of Vanderbilt University (New York, Macmillan Co., 1933). *La barraca* is by far the author's best work although he is known and celebrated abroad for his novel *The Four Horsemen of the Apocalypses* (translated in 1920) about the First World War, followed by the *Fifth Horse of the Apocalypse* (1928) exalting the lasting peace that would follow the accord of The League of Nations, that, as we now know too well, remains an unfulfilled dream.
5. By permission of *All Valencia*, Editorial Fisa Escudo de Oro S.A., Serranos and Cuarte towers, pp. 33 and 34; Interior of the Central Market, p. 42; Today's Tribunal of the Waters, in front of the Gothic-style Door of the Apostles

- dating back to the fourteenth century, p. 9. Again, I owe *All Valencia* to Juan Gil Guardiola.
6. *Diccionario de arabismos y voces afines en iberorromance* by Federico Corriente, Editorial Gredos, Madrid, 1999, pp. 214-15.
 7. *My Cervantes y su concepto del arte. Estudio crítico de algunos aspectos y episodios del 'Quijote'* (Madrid, Editorial Gredos, 1975), chapter 8, pp. 448-583.
 8. *Historia de España*, Archivo de la Corona de Aragón, Editions Ariel, Barcelona, vol. 6, p. 323.
 9. Animals in the cave, postcard given to us at the time of our visit to Altamira.
 10. Any edition of *Don Quixote*, Part II (1615) toward the end of chapter 16. Cervantes' reference is to Horace's *Satires*, most frequently called his *Ars Poetica*. Could Cervantes have in mind these verses, vv.408ff?

'Tis long disputed, whether poets claim
 From art or nature their best right to fame;
 But art, if not enriched by nature's vain,
 And a rude genius, of uncultured strain,
 Are useless both, but when in friendship joined
 A mutual succor in each other find.
 (Horace trans. By Francis)

Reference: My private encyclopedia, a foremost golden-age scholar, my friend Alicia de Colombí-Monguió.

Ignacio's Publications and Awards

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Book

Congenital Clubfoot: Fundamentals of Treatment. Published by Oxford University Press "in the UK and in certain other countries," 1996.

Congenital Clubfoot: Fundamentals of Treatment was reprinted, exactly like the 1996 printing with the same covers by permission of Oxford University Press, in Iowa City by the University of Iowa Printing Department in 2000 and in 2004.

Honors and Awards

- 1955 Kappa Delta Award for outstanding orthopaedic research
- 1960 Ketonen Gold Medal, American Medical Association
- 1966 Commonwealth Fellowship
- 1966 Lawrence Pool Price, University of Edinburgh, Scotland
- 1975 Shands Award Lecture, Orthopaedic Research Society
- 1983 Ignacio V. Ponseti International Symposium
- 1984 Doctor Honoris Causa, Univ. of Barcelona, Barcelona, Spain
- 1984 Honorary Member, Spanish Society of Orthopaedics and Trauma
- 1985 Gold Medal, City of Ciutadella, Menorca, Spain
- 1988 Honorary member, Pediatric Orthopedic Society
- 1989 Honorary member, Colegio Oficial De Médicos de Baleares
- 1989 Honorary member, Asociación Balear de Cirugía Ortopédica y Traumatología
- 2002 American Academy of Orthopaedic Surgeons—award-winning video
Tape program on Treatment of Congenital Clubfoot
- 2003 AOA-Zimmer Award for Distinguished Contribution to Orthopaedics
- 2006 Pediatric Orthopaedic Society of North American Award for Distinguished
Service
- 2006 Iowa Orthopaedic Society James J. Puhl, M.D., Humanitarian Award
- 2006 European Pediatric Orthopaedic Society Maximum Meritus Medal
- 2007 Children's Miracle Network award, Orlando, FL



Helena Percas-Ponseti (Valencia, Spain, 1921). Studied in Spain and England (high school), France (baccalaureate, 1939), and the United States: Barnard College (B.A. 1942); Colombia University (M.A. 1943 and Ph.D. 1951). She has been Assistant in the Spanish Department of Barnard College (1942-43), and at Columbia University in General Studies (1945-46); Instructor at Russell Sage College (1946-47); Lecturer at Queens College (1947-48); and Assistant Professor to Full Professor at Grinnell College (1948-84) where she was named James Morton Roberts Honor Professor for 1961-62 and Seth Richards Professor of Modern Languages in 1963. Establishment of Research Scholars International Grant in her honor for faculty in the Humanities and Social Science Divisions, 1981. Elected to the Board of Trustees as Honorary Associate of the Hispanic Society of America in New York City, 2001.

She is the author of 44 articles and review articles in the field of Latin American Literature, and a book *La poesía femenina argentina* (1958). In the field of Spanish literature, she has authored 17 articles and review articles and two books on Cervantes—*Cervantes y su concepto del arte* (1975) and *Cervantes the Writer and Painter of "Don Quixote"* (1988).

