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TRIBUTE TO 100 YEARS OF THE BIRTH OF PROFESSOR ZERBINI

Euryclides de Jesus Zerbini: a biography

Euryclides de Jesus Zerbini: uma biografia

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Professor Euryclides de Jesus Zerbini, E. J. Zerbini, as he liked to be quoted, is undoubtedly one of the great figures of Brazilian Medicine. His contributions to the Thoracic and Cardiovascular Surgery, as well as his legacy as a teacher and opinion maker, grant him an ideal place for posterity. Reviewing the steps and the circumstances that shaped the temper of this pioneer means another tribute to the master, also covered with an educational nature for future generations. Zerbini was born May 7, 1912 in the city of Guaratinguetá, Vale do Paraíba. He was the sixth child (the youngest) of Eugênio and Ernestina Zerbini (Figure 1), he who was born in the small Italian town of Serravalle, in Emilia-Romagna and she registered in Argentina, daughter of Genoese fathers. Eugene, a professor, ostensibly cultivated the discipline and dedication of the children to school. Zerbini studied until the first year of high school in his hometown. With the transfer from father to Campinas, he finished the Scientific Course, at Colégio Diocesano Santa Maria, in that city (Figure 2).

Fig. 1 - The couple Eugênio and Ernestina Zerbini and children. Dr. Zerbini is the first at right, standing

Fig. 2 - Zerbini at the time of completion of high school course in Campinas

According Zerbini's own words, as he didn't believe it was his vocation to a career, his father suggested he could study medicine. Thus, from Campinas he moved to the house of his sister, Eunice, in São Paulo, preparing for the difficult entrance exam. In 1930, he was approved for one of the 50 seats of the Faculty of Medicine, University of São Paulo (USP), ranked among the top 10! At the time, FMUSP had an excellent reputation, which was supported in part by the Rockefeller Foundation [1]. Studying Medicine in São Paulo was not cheap, even considering that the College was free. To alleviate the financial burden of his father, he

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taught Chemistry, Physics and Natural History in pre-university courses, already during his first year in college. FMUSP, which was held in the city center, moved to the building of Dr. Arnaldo Avenue in following year, 1931. The "Hospital School" of the College was the Santa Casa de Misericórdia de São Paulo, where Zerbini has been acting as an academic procedure in the 17th Chair of Surgery, headed by icons of the time, sequentially: Professors João Alves Meira, Benedito Montenegro and finally, Alípio Corrêa Netto, his master and mentor (Figure 3). During the course, and the Constitutional Revolution of 1932, there was a great mobilization of teachers and students in FMUSP, and Zerbini participated in the movement at Vale do Paraíba. In 1935, he graduated doctor (Figure 4). In 1939, still at Santa Casa, when the Faculty of Dr. Edmundo Etzel's team left, just four years after graduation, Zerbini was appointed to be the Head of Division, occupying the highly coveted post of first assistant, a position immediately below of Titular Professor. Professor Alípio Corrêa Netto could have chosen for that important position, one of his older assistants. But, surprisingly, he chose to name the young Zerbini, seeing in him the great capacity that the future would prove to be true. In 1941, he was 29 years old and was submitted to this contest for Full Professor, studying hard for a year, when normally required at least five years of preparation. The theme chosen for his lecture was: Supratentorial Brain Tumors, and was approved with note 9.41 on a scale of 10 (Zerbini, 2010).

Fig. 3 – Prof. Dr. Alípio Corrêa Neto

Fig. 4 - Graduation at the Faculty of Medicine, University of São Paulo in 1935

First contact with the heart

Although its activity was mainly in General Surgery, he worked at Hospital São Luiz Gonzaga in the suburb of Jaçanã, performing Thoracic Surgery in patients with tuberculosis, which was highly prevalent. In February 1942, a fortuitous event would mark his first contact with the surgical approach to heart. At that time, the heart was still an anatomical fiction, which could only be seen or touched in autopsy rooms.

A seven-year-old boy called Disnei was received in a critical condition in the Emergency Department of Santa Casa, with a metallic shrapnel which penetrated the precordium. They team decided to call Dr. Zerbini, who as always, was in the hospital. The case was unusual, and therefore they consulted their master. They decided to operate on the patient! It dealt with heart wounds, involving the anterior descending coronary artery that was occluded in the suture. The patient survived the procedure and the surgeon himself. It was the first suture, successfully, of a heart wounds in the country, earning international publication in the Journal of Cardiac Surgery, in 1943, entitled: "Coronary ligation in wounds of the heart". It was also the first procedure on the heart of this pioneer of heart surgery in Latin America.

To the United States

Despite this historical event, Dr. Zerbini continued to devote himself to the Thoracic Surgery. Dissatisfied with the limitations of it, which acted only on the chest wall and pleura to perform pneumothorax and thoracoplasty, in order to collapse the lung with tuberculous caverns, Zerbini decided, with the support of Prof. Alípio, to visit the United States. He attended the service of Dr. Evarts Graham, who had performed the world's first pneumonectomy for treatment of lung cancer, in St. Louis at Barnes Hospital. Excited by what he saw, asked the Cultural Union Brazil-United States and the Institute of International Education a scholarship in te U.S. State Department. He received approval on January 17, 1944, and six months later, he went to the United States for an initial period of one year (embedded in a Douglas DC-3, which took three days to reach the destination).

At Barnes Hospital, surrounded by leaders of his specialty at the time, having at its disposal the latest surgical technology available, Zerbini felt like he was in another world.

As always, very lucky! He found little competition from American residents, since most young doctors had been called to the Armed Forces during World War II. Having completed six months at Barnes Hospital, Zerbini moved to Boston, where he remained for another six months under the guidance of Professor Oliver Cope, at Massachusetts General Hospital. Between July and September 1945, Zerbini also visited several U.S. departments of surgery, including Dr. Alfred Blalock in Baltimore.

The principle of all

With the knowledge gained, Zerbini brought to Brazil the fundaments for Thoracic Surgery and the beginnings of modern heart surgery. With its pioneering spirit he performed at the Clinics Hospital, USP, the second surgery, modified Blalock-Taussig shunt in Brazil. The first had been performed in Santos, by Dr. Domingos Pinto, who had been trained by Dr. Charles Bailey, and had instruments suitable for intervention. Soon after, Zerbini performed the first ligation of a patent ductus arteriosus in a 18-year-old young, having been the first to repair an aortic coarctation in the country. In mid-1952 when the World Heart Surgery took its first steps to penetrate the heart cavities, Zerbini started intracardiac procedures with moderate hypothermia to treat simple congenital heart diseases, such as interatrial communications, which had been performed recently, pioneered by Lewis, Varco and Taufic (the latter, Brazilian), in Minneapolis [2].

Rheumatic fever, epidemic in the world, including the United States, was also prevalent in Brazil, causing severe sequelae of the heart valves, especially mitral stenosis. This disease was treated blindly with the introduction of the index finger of the surgeons, who were easily recognized by failing to grow, for obvious reasons, the nail of that finger. In addition the nail, in more complicated cases, they used small flexible knives, difficult to handle. The valve opening provided excellent results, but the methods required a lot of poor diagnostic accuracy of clinical auscultation because it was essential for the indication of the intervention. The electrocardiogram helped to indirectly assess the presence of severe pulmonary hypertension.

We remember Professor always asked in discussions how was the R wave in V1 – pure R wave contraindicated the surgery. The same occurred with atrial fibrillation, because the possibility of preventing atrial thrombi in treatment. History shows us that it is difficult to be ahead of time. We can imagine Elliot Cutler, from Boston, on May 20, 1923, and Sir Henry Souttar, London, on May 6, 1925, who had successfully performed such interventions in a time that surgery, as science, took its first steps. These memorable experiences were only revived in the late 40's, when Charles P. Bailey, in Philadelphia, followed by Dwight E. Harken in Boston, began the modern era of mitral commissurotomy and Cardiac Surgery.

Open surgery

Soon after, in the early 50s, Zerbini began a major world experiences in the treatment of mitral stenosis. It is worthing revealing that a medical student named Adib Domingos Jatene participated on the first intervention,, who was enchanted by the new Cardiac Surgery. This made all the difference: 32 years later, he would replace Prof. Zerbini as Professor at FMUSP in 1983. One of the authors of this study, Domingo Braile, in 1958, was commissioned to do a survey of patients undergoing mitral commissurotomy by that date. There were more than 1,500, with results that compete with international statistics.

In his lectures and conferences, Prof. Zerbini didactically divided the Cardiac Surgery in the periods. The first, which dealt with the disease "around the heart" and, second, on which the defects were corrected with the heart opened, under direct vision of defects. On May 6, 1953, John Gibbon, in Thomas Jefferson University Hospital, in Philadelphia, successfully performed the first heart surgery with cardiopulmonary bypass. The chambers of the heart were opened and the immense field of Cardiac Surgery of our Age. Zerbini, always attentive to the progress and development of specialty and supported by the institution of higher scientific weight in Latin America, the University of São Paulo, followed by meetings of his group, showed the way to be followed [2].

The wide development of open heart surgery in the United States occurred in 1955 with the development of reproducible techniques by Dr. Clarence Walton Lillehei and Richard DeWall. In Brazil, interest was growing, with

the completion of experimental procedures, allowing the deployment of new technologies in the short term. With these bases well established, Professor. Zerbini, accompanied by physician Dr. Dirce Costa Zerbini (his wife), traveled to Minneapolis in 1957, the Mecca of cardiac surgery at the time to familiarize himself with cardiopulmonary bypass and techniques involving the complex intracardiac operations.

Artificial Heart-Lung Workshop

Back in Brazil, along with his assistants Delmont Bittencourt, Geraldo Verginelli, Adib Jatene, Edgar San Juan, Rubens Arruda, Dirce Costa Zerbini and Antonio Geraldo de Freitas Neto, immediately began operations with cardiopulmonary bypass in the room "C" of the Clinics Hospital, USP, which was gave him only once a week. Soon after, other enthusiasts of Cardiac Surgery added to the group, as Euclides Marques, Seigo Tsuzuki, Magnus Coelho de Sousa, Dagoberto Conceição, Ruy Gomide do Amaral, Domingo Braile and Noedir Stolf, among others, and dedicated technicians. The mood was of high commitment to the patient during operations and during the often stormy postoperative period.

The operations lasted all day and often progressed into the night, with results not always satisfactory. Most of the instruments and equipment were imported, very expensive for the Brazilian reality. Their maintenance was almost impossible, depended on American technicians to repair them, which generated even more costs and large waiting time. With a rare sight for a professional academic, Zerbini chose to create in the basement of the Clinics Hospital, the Artificial Heart-Lung Office. Such a unit would be for the construction and maintenance of equipment for heart surgery, rather than buy them outside Brazil. That made a huge difference, as proven over time. With his simplicity, he said: "Dismantle these huge machines that we sell for high prices, and you will see that they are black boxes with half a dozen components inside, and that we can develop here without any problem". In 1954, Dr. Adib Jatene left the capital to exercise his profession at Triângulo Mineiro, where his family had moved after his father's death in Xapuri, Acre, where he was born.

In Uberaba, was Professor of Topographical Anatomy, but remained interested in cardiac surgery, and there has developed a heart lung machine.

In 1960, Zerbini, aware of the deed, invited him to rejoin the group, returning to the Clinics Hospital and FMUSP, where he graduated.

I quote here the words of Professor. Adib, chronicling the beginning of a Brazilian epic moment:

"I went back and established in the Clinics Hospital, a small workshop (which initially was in the elevator machine room side Rebouças).

There I made the first model of artificial heart-lung's Clinical Hospital, which used a disk oxygenator and a roller pump. Then they arranged a maintenance area and I established what I called the Workshop and Experimental Research, and we produced and systematized cardiopulmonary bypass".

The Workshop began to work with an engineer and three employees: two turners, who were brothers, and an adjuster, and some curious students of electronics and mechanics: Gerônimo, Waldomiro, Benvindo and Eng. Nemésio (Figure 5).

This unit was the incipient embryo of the Bioengineering Division, Heart Institute (InCor). At the same time and in the same way, an Experimental Laboratory, specific for tests of equipment and development of pioneering techniques, was created together with the Department of Surgical Technique.

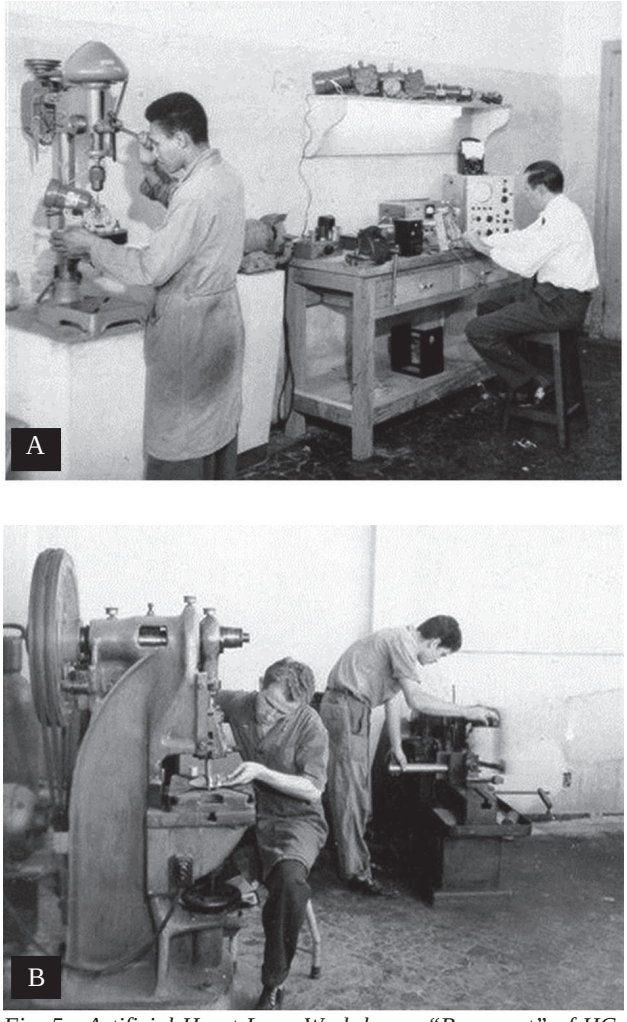

Fig. 5 - Artificial Heart-Lung Workshop – "Basement" of HC-USP - São Paulo. From left to right, Benvindo - drill, Eng. Nemésio - Electronics, Waldomiro – press and Braile - planer

This enabled all products, as well as new techniques were tested by the team, usually dogs, before starting in 1958, the continued use in patients. The two authors of this study, Noedir Stolf and Domingo Braile, had the opportunity and honor to work in the early and well-equipped, for the time, laboratory, even when medical students in FMUSP.

Nothing can resist Work

In those days of pioneering, despite all the effort, dedication and studies, mortality was high, as we see in the article "Cardiovascular Surgery in Brazil: Achievements and Possibilities" [3], published when the thousandth surgery with cardiopulmonary bypass was performed by the team. Many were the reasons for failure and little was known of the metabolic consequences induced by cardiopulmonary bypass itself. Zerbini, worried, instructed Dr. Ruy Vaz Gomide do Amaral, anesthesiologist, to study the reasons for the failures. This, after training in the United States, showed that one cause of death was a result of acidosis that followed the procedures. Zerbini bought immediately the first unit of gasometry of Brazil, installing it in the anteroom of the operating room, with technicians available 24 hours a day! It was a huge breakthrough. From such knowledge, others were added to gradually do away with the stigma that haunted heart surgeries that often resulted in failure and patient death, to the dismay of the entire team.

Dr. Ruy Vaz Gomide do Amaral was rewarded, had a brilliant career, becoming Professor of Anesthesiology at FMUSP.

Times were hard, it was necessary to have courage to face the criticism that would not forgive scientific advances. This unfortunately does not jump, but results from the daily work of idealists who believe overcome the difficulties with study and work, hard work. It is worth mentioning that we have inherited the aphorism of Professor Zerbini: "Nothing can resist work". It had fundamental importance in the development process, the Professor of the 1st Surgical Clinic, Professor Alípio Corrêa Netto, who always believed in Prof. Zerbini and his team, offering full support so that even facing difficulties, the group could succeed.

"Zerbini Caravans"

With better results, the number of patients who underwent surgery by Prof. Zerbini was growing alongside his prestige in Brazil, Latin America, and even in the concert of nations. The influx of surgeons, mainly from Hispano-America, seeking training was increasing. There was a time on which Castilian was more spoken in the operating room that Portuguese, many were foreigners who were here to learn high quality surgical techniques practiced.

For wider disclosure of technics and feasibility of Cardiac Surgery as a reality accessible to everyone in the early 60s, Professor created "Zerbini Caravan". They moved up throughout Brazil and many countries in South America, with a full team of surgeons, perfusionists, anesthesiologists and cardiologists. They carried all the equipment necessary for the diagnosis and treatment of heart disease in hospitals in cities that were not prepared to live the new reality. The results were equal to the sacrifice and work such moves accounted for their leader and all his excited team (Figure 6).

Hilarious facts and situations of great tension were always with those who had the opportunity to participate in this democratic demonstration of patriotism and dedication to colleagues and patients. It would be possible to cite dozens of unusual events during the Caravan, but we will mention only one. The team was doing demonstrations in the capital of Goiás. Everything was doing well during the patient's surgery with tetralogy of Fallot, when the heart lung machine caught fire! The perfusionist was Dr. Dirce Costa Zerbini. The panic was general, many fled in terror, while she remained calm. The

Fig. 6 - Zerbini Caravan (Belém, 1960)

only liquid near was a bottle with urine of the patient being operated. She had no doubts: threw urine from the flames that, miraculously, became extinct. The surgeons, aware of the operative field, did not even realize what had happened and the surgery was completed without incident. And it was a miracle because the machine worked with an electronic valve (Tyretron) which produced 20,000 volts! After this occurrence, the pump circuit was completely changed, from Brazilian technology, which eliminated the possibility of new fires.

BSCVS and BJCVS

Today, Heart Surgery is in all capitals and major cities from north to south and east-west Brazil. The number of heart surgeries is the second largest in the world, performed by more than 1,000 surgeons, meeting at the Brazilian Society of Cardiovascular Surgery (BSCVS). Founded in 1969, BSCVS had Professor Zerbini as its first president. He has been in such position for 15 years, offering his work and dedication until the association became strong and could evolve under the command of new leaders. This demonstrates the spirit of the master, who has always supported the associative activity, making it an element of reconciliation and development of colleagues in the art. He spared no effort to honor the scientific activity within the BSCVS, attending all meetings, demanding discipline with the times, always sitting in the front row and ready to guide the work and discussions.

In 1986, Professor Zerbini was one of those who pushed the board to BSCVS had its own scientific journal. Thus, the Journal of Cardiovascular Surgery (BJCVS) was born, with the first Chief Editor Prof. Adib Domingos Jatene. Since then, both the Congress of BSCVS and BJCVS grown exponentially, setting an example for other societies. But an event would bring visibility to the extraordinary figure of Dr. Zerbini and his group.

Heart Transplant

On December 3, 1967, Dr. Christiaan N. Barnard, in Cape Town, South Africa, performed the first heart transplant between humans in the world. Although the patient lived only 18 days, in spite of negative reviews, this feat aroused enormous interest in heart surgery centers around the world. In the U.S., at the same month of December, Kantrowitz performed transplantation in a child without success.

Immediately, Professor Zerbini met the team and other experts to start prepararation, with great care, from every point of view, to perform the transplant. From January 1968, other centers began to perform heart transplants. The team led by Prof. Zerbini would perform the first transplant on May 26, 1968, or slightly more than five months after historical transplantation in South Africa

On two occasions, in 1967, Brazil has not just become a pioneer in heart transplantation. At first, it was barred by the Council of the Clinics Hospital, USP. In the second, we could not find donors for a heart attack victim whose heart did not work even with direct massage on the open chest [4]. Then, on May 26, 1968, João Ferreira da Cunha, João Boiadeiro, received the heart of Luis Fernando de Barros, victim of trampling.

The procedure began with the long wait until the donor's brain did not present more signs of activity. Then the two teams (41 people in total) into action. It was dawn when Prof. Zerbini pulled John's heart and at the same time, Luís's heart came on a platter. We decided to leave the donor heart at normal temperature, irrigated by machine perfusion, for better protection, unlike the cooling technique used by Barnard. The transplant ended at 7:53 a.m.. The transplanted heart was beating in the chest of João Boiadeiro! The next day, newspapers splashed the feat, weaving praise for Professor Zerbini, who was also compared to Leonardo da Vinci, in an editorial on the front page of O Globo newspaper.

Despite the criticism, and the patient lived only 28 days, the effect was overwhelmingly positive. The proof is that the governor of São Paulo Abreu Sodré, went to the Clinics Hospital in the dawn of the transplant (Figure 7). Later, with enthusiastic scientific achievement, the governor approved the release of funds for the construction of the Heart Institute (InCor), one of the largest hospital complexes in the world dedicated to diagnosis, treatment and research of cardiovascular diseases. The design of its creation had been previously approved, and the area had already been donated. Luiz Venere Décourt was founder of the creation of the Heart Institute, along with Professor Zerbini.

Until 1969, two more patients were transplanted, the second lived more than 400 days and the third 60 days. The interest generated by the heart transplant, inside and outside of Brazil, was very high, both compared to the lay public, as with the medical and scientific community. Internationally, Brazil and the Clinics Hospital of the University of São Paulo were inserted between the centers of the new pioneering achievement. In a Symposium held in Cape Town, Professor Zerbini was among the 13 pioneering surgeons, discussing aspects of this treatment stage. He would participate in other scientific events on the same topic. Dr. Christian Barnard, although still controversial, no doubt, a celebrity in the world in terms of medical and social point of view, visited the Faculty of Medicine and Clinics Hospital in 1969 (Figure 8). On that occasion, he was also received with Dr. Zerbini's team, at the residence of the governor Abreu Sodré.

With the compulsory retirement of Prof. Alípio Corrêa Netto, Professor of Clinical Surgery, extinguished the chair at the University of São Paulo, it was opened public tender for the post of Professor of Clinical Surgery. Although he

Fig. 7 - Morning of the first transplant at the Clinics Hospital, attended by the Governor Abreu Sodré

was the only candidate registered, Prof. Zerbini, as a mark of his personality, prepared with extreme care. At that time, the contest included: Thesis, Curriculum Test, Memorial and Public Hearing. He, who always believed in teams, called several employees of cardiology and surgery to help in the preparation of the thesis "Late results of repair of tetralogy of Fallot". And, also, to prepare the points to the Curriculum Test, lesson to be drawn 24 hours before, including all surgical specialties. In 1969, the tender ended, he became Titular Professor of Clinical Surgery at FMUSP (Figure 9). That same year, 1969, Professor. Zerbini was invited as the first Brazilian to receive the title of "Honored Guest of the American Association of Thoracic Surgery (AATS)", featuring the "Honored Guest Conference: The surgical treatment of Fallot complex: late results".

InCor

Since the year 1968, a commission had been planning the realization of a dream of Professor Zerbini and his team: the project design and implementation of the Heart Institute with ongoing meetings and visits abroad made by Dr. Delmont Bittencourt, nurse Clarice Ferrarini and architect Nelson Daruj. This was followed by the construction (Figure 10) the installation of equipment and, sequentially, in 1976, the Division of Bioengineering was settled. In 1977, the clinic (consultation) began activities and, in 1978, the project was completed, with the hospitalization of patients and the full functioning of the Surgical Center.

Although the InCor had advanced equipment and facilities for the time, the operation was struggling with budget difficulties, as received insufficient resources, in reality, only a small fraction of what was managed by the large complex of Clinics Hospital. That's when the idea of creating a foundation of private, nonprofit, for supporting InCor arose. The process was conducted personally by Prof. Zerbini, mobilizing many politicians and businessmen, and relying on the large participation of Prof. Décourt, Professor of Cardiology.

This move sparked strong opposition from leaders of major complex of the Clinics Hospital/FMUSP. Finally, with the mediation of prominent personalities in the Medical and Civil Society, the desired agreement occurred. Pioneering project was approved, the Foundation has received the initial name of "Foundation for the

Fig. 8 - Visit of Dr. Christian Barnard at Clinics Hospital in 1969. In the foreground, Zerbini and Barnard

Fig. 9 - Tenure as Titular Professor of Clinical Surgery in 1969. With the presence of Director Prof. João Alves Meira and Secretary Dante Nese

Fig. 10 - Final phase of construction of the Heart Institute, Clinics Hospital, Faculty of Medicine, University of São Paulo

Development of Bioengineering" (FUNDEBE). Later, in fairness, was transformed into "Zerbini Foundation", worshiping the name of its creator. Over the years, many advanced projects and major developments in the field of cardiovascular surgery there had generated international attention, contributing so conspicuous, for the evolution of the specialty in Brazil and Latin America.

Retirement and Working

At age 70, after his mandatory retirement in 1982, Professor Zerbini continued with intense surgical activity. He operated with his team in the Hospital Beneficência Portuguesa in Sao Paulo, and led personally, among others, a successful heart transplantation program, in the second phase of this technique, after the advent of cyclosporine and the like, which managed to reduce the large problem of rejection. Even in the condition of "retired", Professor made a point of keeping his resumé and Memorial updated. Such that, during a tribute received in a Congress of the BSCVS showed that in the five years following retirement had collected more scientific and academic activities in the five years that preceded it. Participated actively in all membership activities; traveled throughout Brazil, never refusing an invitation, even small entities in cities away from the large centers. Humility and love of work were his trademarks.

The end of the day

Amid this intense professional activity, he had a neurological condition and the diagnosis of a brain tumor. He underwent surgery and found to treat metastasis of melanoma. A tough and short day followed with chemotherapy and resection of peripheral lesions and lymph nodes, first with local anesthetic and then with general anesthesia for inguinal and cervical dissections. Colleagues testify that Professor Zerbini behaved with discipline and consideration facing therapeutic procedures and difficult decisions, like going to treat the United States or stay in São Paulo, devoting himself more leisure and family. On October 23, 1993, died at InCor, which he created and operated as an exemplary institution. He was buried in the cemetery of Araçá, accompanied by his peers, colleagues, disciples and admirers, greeted by fellow countryman, Professor Carlos da Silva Lacaz and his future successor, Professor Adib Jatene.

A life of so intense activity, ideally should be supported by a family constellation and harmonic support. Professor Zerbini met his wife, a medical student, and married Dr. Dirce Costa, in 1949. Of Portuguese descent and temper, was partner of all times. Collaborated in the establishment of cardiopulmonary bypass, and to this area of activity devoted herself for many years, forming the first disciples of the specialty. They had three children, chronologically: Roberto, Eduardo and Ricardo. Two of them, engineers, and one, Eduardo, graduated in Paulista Medical School (now UNIFESP) (Figure 11), was approved for the residence of Surgery at the Clinics Hospital of FMUSP. Unfortunately, before starting it, died in a tragic traffic accident, an extraordinarily painful loss for Dr. Zerbini, his family and all his many friends. The teacher always had a very close relationship with his sister, Eunice, due to the proximity of the families' homes, her invaluable activity as guardian of the "boys" during their studies, as a teacher she was, and also because Dona Eunice was dedicated volunteer of InCor, Division of Bioengineering.

Master with Honours

Professor Zerbini made a huge number of trips for participation in scientific events in all parts of the world, and some travel as part of Brazilian delegations, on invitation, for example, of the Chinese government. He was received by the Pope, invited to discuss with colleagues of great prestige, organ donation at the Academy of Sciences of the Vatican. Had the honor to be bestowed by countless honors, honors and awards from national and foreign institutions, including the title of Doctor Honoris Causa by the University of Coimbra (Figure 12).

Dr. Zerbini had some leisure activities. He played tennis regularly in the form of classes or matches, with colleagues and friends at Clube Pinheiros. He went on his farm in

Fig. 11 - Dr. Zerbini and Dr. Dirce with their children Roberto, Eduardo and Ricardo

Cunha, near his hometown, Guaratinguetá, and especially liked the sound of water, lying in lush waterfall, right beside your cottage.

Zerbini's Legacy

The greatness of a man is measured by his achievements and successes, but most of all, by his legacy. The role of Professor Zerbini in the development of Cardiac Surgery in Brazil and Latin American is well known and recognized, as well as the many scientific contributions to the specialty, which had international repercussions. The contributions of Professor Zerbini transcend borders and extend for successive generations. The creation of a unit to manufacture products for cardiac surgery, instead of getting those products in the United States, gave rise to the Bioengineering Division of InCor. It was an initiative that had consequences of immense importance. He represented the model for the creation of similar units in other leading institutions such as the Institute of Cardiology in São Paulo State, later, Dante Pazzanese Institute of Cardiology.

Another consequence was the national production of the full range of equipment for heart surgery at a cost compatible with the Brazilian reality. A host of surgeons in Brazil and Latin-America, formed in the service of Professor Zerbini and the Institute of Cardiology in São Paulo State, could only start its activities in the art (in Brazil or in their countries) because such surgeons could rely on equipment made in these institutions, which had no profit. Finally, the pioneer of the Heart Workshop established a philosophy of creativity and entrepreneurship in the professionals that attended it.

Fig. 12 - Zerbini received the title of Doctor Honoris Causa by the University of Coimbra

From this, companies have created material for cardiac surgery or have other consultants. The number of these companies in the country is appreciable. They supply the Brazilian market, export and play a key role in developing new products. It was another dream held by Professor: make Brazil, from importer of technology to exporter. Today, Brazilian and multinational companies that employ Brazilians, supply throughout the international market, taking away the name of Brazil. They represent a real marker of the strength of this country that Zerbini loved so much.

More Fruits

In order to specify a little more the importance of the Bioengineering Division at InCor in the consolidation of this activity in Brazil, we can emphasize that the metal prosthesis of Starr-Edwards ball model was developed and produced under the baton of Professor Adib Jatene, for use by the Institute and others , which allowed surgery to replace heart valves on a large scale. He innovated with the prosthesis of human dura mater preserved in glycerin, which had worldwide repercussions, assembled and used in all cardiac surgery services in Brazil. This was, undoubtedly, the initial step in the production of biological prostheses, such as bovine pericardium and porcine aortic valve, pioneered manufactured by Brazilian companies.

It also developed a cardiac pacemaker in 70s, allowing the implant in poor patients, who at that time depended only on the charity to be treated. The first artificial ventricle of Latin America had its research and production performed in the workshops of InCor. It was implemented in the institution, as the initial experience in this field in Latin America in 1992, with full success. Subsequently, the patient was transplanted when a compatible donor and his better conditions allowed. The creation of the Unit of Bioengineering was thus the seed of important Brazilian companies and successful products for Cardiac Surgery.

Emphasizing the invaluable fruits of Professor Zerbini, we must insist on which the creation of InCor represented. The project of creation had been approved, the area ceded by the state, but without performing the first heart transplant and the personal prestige of the master, the financial resource would not have been released. As mentioned, the creation of the Zerbini Foundation to support the InCor was the key lever for the growth of this pioneering institution in Latin America.

Fig 13 - Photo of the participants of the Meeting of Professor Zerbini Disciples, in London

The Disciples of Professor Zerbini

Perhaps the greatest legacy has been the formation of disciples. It is estimated that more than 400 surgeons formed with Professor. Zerbini. They came from all over Brazil, from Hispano-America, from Mexico to South America and other countries, like Portugal, Spain, India and even Japan The latter sent five interns to do all their training in cardiovascular surgery in a country still considered peripheral, but whose heart surgery has loomed as one of markers of its glorious destiny. From Brazil they came from all States and today they are the best university professors, heads of major units and innovative services with international recognition. The consideration, respect and affection for Professor Zerbini reached such a level that resulted in the establishment of a scientific event called Disciples of Professor Zerbini Meeting, held annually. To him, all the direct disciples were connected, including many from abroad, as well as surgeons who, although having performed other training services, publicly declared themselves disciples for adoption (Figure 13).

So, to paraphrase the celebrated writer, illustrator and French pilot Antoine-Jean-Baptiste-Marie-Roger Foscolombe of Saint-Exupéry: *"Each one that passes in our life, going alone, because each person is unique and replaces any other. Each one that passes in our life, going alone, but it will not only not us alone. Take a little of ourselves, let a little of themselves. There are those who take it, but there are those who do not take anything. This is the greatest responsibility of our lives, and the proof that two souls are not random. You become responsible forever for what you have tamed."*

Professor Euryclides de Jesus Zerbini is included among those who spend our lives in an unforgettable way, make it abundantly, engage us and become responsible, forever, for our destinies.

Authors note:

Full Professor Noedir G. Stolf was the disciple who stood by Professor Zerbini. He graduated with distinction in FMUSP and held all offices of the University in a brilliant career. From September 2006, winning the tender for Professor of Cardiovascular Surgery, FMUSP, was Chairman of the Board and Member of the Board of Trustees of the Heart Institute, Director of the Division of Surgery at Heart Institute, Clinics Hospital, FMUSP and Member of the Board of that hospital. In addition, he was Department Coordinator of the Brazilian Association of Organ Transplantation, responsible for Heart Transplantation at InCor. Thus, it was fulfilled the prophecy of Professor Zerbini, who always saw the potential in him as a great surgeon and professor of innate qualities. He devoted with much emphasis on teaching and research, being an icon respected nationally and internationally. The performance of Noedir Stolf as a scientist, class leader and great supporter of young people, can be evaluated for his production, and he has published over 558 papers in journals of national and international impact, 137 book chapters, six books of the specialty. He participated in 350 scientific meetings in Brazil and in many foreign nations. Along with his group presented 1500 studies in Congress. Organized over 60 scientific events. He participated in examination boards in more than 80 doctoral, master's theses and tenders, and 3 were related to selection of professors and 8 of habilitation. Supervised 17 doctors and currently another 3. He belongs to the editorial board of 10 international journals and is reviewer of many. He operates in six lines of advanced research.

Full Professor Domingo Braile, formed in FMUSP, was the disciple who chose new challenges. Implemented a

Department of Cardiac Surgery in São José do Rio Preto, back in 1963, which served as an example for the dissemination of expertise in all corners of Brazil. He was one of the founders of the State Faculty of Medicine of Rio Preto, where he retired as Professor. Emeritus, where he is currently the Dean of Postgraduation Department. He introduced more than a dozen units of Cardiac Surgery in the inner cities and capitals. He was Professor at the Faculty of Medicine of Catanduva and Faculty of Medical Sciences of UNICAMP, and is now Senior Professor at University of Campinas. Since 2002, is Chief Editor of the Brazilian Journal of Cardiovascular Surgery, the only internationally recognized journal in the specialty in the Southern Hemisphere, including also Mexico and the Caribbean. He founded a company of cardiovascular surgery products that supplies Brazil and many other countries with supplie for the specialty.

Professor Noedir and Professor Braile, following the example of the master, were presidents of the Brazilian Society of Cardiovascular Surgery.

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Note: Pictures belonging to the personal collection of Profs. Noedir Stolf and Domingo Braile.