Rev. Mexicana Astron. Astrof., 7, 21-25 (1983)

MEXICAN ASTRONOMY, 1930 - 1950

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I was an observer, and in part a participant, at the re-birth of Mexican astronomy in the 1930's and 1940's. Tonight I wish to tell the story as I saw it. I shall speak briefly about the contributions made by two Mexican friends of mine, Luis Enrique Erro and Guillermo Haro, who dominated the scene during the years 1930 to 1950. Luis Enrique died from a heart attack in 1955 at the age of 58, and tonight we are honoring a hale and hearty Guillermo, who, hopefully, will be with us for several decades to come. The two of them had working with them during the period under review about a dozen or so younger people, most of who are present tonight. I name especially two, first, Carlos Graef Fernández and, second, Paris Pişmiş. I shall speak first about the beginnings of the new Mexican astronomy, which developed under the leadership of Luis Enrique Erro.

When I first met Erro, he was a suave and polished Mexican diplomat of Spanish origin and an ardent amateur variable star observer. He was a close friend of Leon Campbell and he was recognized as one of the hardest working members of the American Association of Variable Star Observers.

In the middle 1930's, Erro was known as one of Mexico's leading revolutionaries, who, later, had helped Lázaro Cárdenas build the new Mexico. Ten years earlier, in the middle 1920's, Erro was exiled to Cuba, from where he smuggled arms to Veracruz to support the Mexican revolution, then in progress. He returned to Mexico after the revolution and became an important advicer to President Cárdenas in matter of Public Education. As a congressman he helped to revise and enforce "Artículo Tercero" of the Mexican Constitution, the article which states the basic principle of the separation of church and state.

Erro had a severe limiting infirmity: his deafness. President Cárdenas was very concerned about this and, in part to assist Erro in obtaining the best hearing aid then available, he made Erro his ambassador to France. In Paris, Erro obtained the good hearing aid which he was using when I first met him at Harvard College Observatory.

There is a nice story about that hearing aid. A similar one was used by Annie J. Cannon, of Henry Draper Catalogue fame. During parties at the Shapley residence at Harvard Observatory both Erro and Annie Cannon heard whistles in their hearing aids when they approached each other. It was a classical exchange based on induction at work. Miss Cannon was not sure that it was really nice of the handsome, moustached, slender Mexican diplomat to constantly whistle at her during the party!

Erro told me early in our friendship about a critical meeting for the future of astronomy

in Mexico between him and Cárdenas. The President felt the time had come to reward Erro for his services to the revolution and to the young revolutionary government. So he asked Luis Enrique what he wanted for himself. The reply was: "Un Observatorio Nacional para Mexico". Cardenas agreed, but he asked Erro right away how he was going to achieve this goal in his country without technical expertise and where there was only one very traditional major observatory, Tacubaya Observatory, directed by Joaquín Gallo. Tacubaya Observatory's principal activities were keeping the time for Mexico and working toward the completion of the Mexican zone of the Carte du Ciel, the Astrographic Catalogue. Erro replied that he had good contacts at Harvard Observatory, where he had come to know, via Leon Campbell and the AAVSO, the great Harlow Shapley. And so it came about that Erro turned up at Harvard Observatory, first alone in 1939, then with his selected associate, Carlos Graef, in 1940. Shapley called together at Harvard Observatory several informal meetings to which Cecilia Payne-Gaposchkin, Fred Whipple, Donald Menzel, George Dimitroff and I were invited and there slowly emerged a basic plan that later on led to the founding of Tonantzintla Observatory.

In the couple of years that had elapsed since the conversation between Erro and Cárdenas, there had been changes in Mexico. Presidente Cárdenas had nationalized the oil industry and the social revolution in Mexico had come of age. Cárdenas was succeeded in the planned progression of Mexican presidents by Manuel Avila Camacho,a native of the State of Puebla and a long-time friend of Erro. President Camacho expressed himself as very much in favor of Erro's plan for a new National Observatory, but he urged that the new observatory be built inside the State of Puebla. In this aim he was strongly supported by Dr. (medical) Gonzalo Baustista, the very competent Governor of the State of Puebla. It was a pity that Bautista died young. He was clearly of presidential timber.

Erro, in consultation with Camacho and Bautista, selected a hill near the village of Tonantzintla, 8 miles from the city of Puebla, as the proper site. It was a fine site at the time of its selection, but 10 years after the observatory was built, light and industrial dust pollution had taken their toll and the site had become a mediocre one at best. From Observatory Hill one has a magnificent view of Popocateptl and Ixtaccihuatl, of Cortés Pass, of the Pyramid of Cholula and of Malinche. One has also a sweeping view of the Valley of Cholula with its 366 churches -one for every day of the year and an extra one for leap years. Tonantzintla Observatory is now the Headquarters for the Institute of Astronomy, Optics and Electronics, directed by Haro. It is no longer a place to mount new telescopes. The Observatory is easy to find from Puebla, one takes the Pan-American Highway toward Atlixco and Oaxaca and one turns right at Tonantzintla, where soon one reaches the Avenida Annie J. Cannon, which carries one directly to the Observatory. The place is well worth a visit.

I came to Tonantzintla Observatory twice during the early 1940's -one in August, 1941 when the construction was in full swing, and again in February, 1942, at the time of the dedication ceremonies (a few weeks after Pearl Harbor!).

It may be of interest to note here that U.S. Vice President Henry Wallace transmitted a

message to Harlow Shapley which indicated that Franklin D. Roosevelt and the White House would appreciate if the U.S. astronomers invited to the Dedication would all go to México for the occasion, war or no war.

President Camacho had appointed Erro as Director of the new Observatory. Erro, in turn, appointed Carlos Graef as his Assistant Director. Graef, who holds an M.I.T. Ph. D. in mathematics, had been a pupil of Manuel Sandoval Vallarta, the late well-known cosmic ray physicist. Professors Alva, Urquijo and Recillas were the first staff members at Tonantzintla. Juan Presno acted as Librarian and Administrator.

The principal instrument for the new Observatory was a 27-31 Schmidt reflector, optics from Perkin-Elmer, mechanics from the Harvard Observatory workshop. It was not an easy matter to finish a telescope at the start of general mobilization for World War II, but it was accomplished - and in a great hurry. The new telescope had teething troubles, which did not stop operation and which were finally straightened out after World War II ended in 1945. The most important subsequent addition to the telescope was the acquisition of a 4° full aperture objective prism that helped produce new research opportunities throughout Haro's later directorship.

A 12-inch visual refractor and several 3 to 5 inch cameras of the Harvard patrol variety rounded out the Observatory's initial telescope equipment. The research emphasis was at first on studies of stellar colors, magnitudes and spectra for the Southern Milky Way. Plans for solar studies were later developed. The initial research work was for fields in Puppis and Vela, for the Galactic Center Region and for the South Galactic Pole. Heroic efforts were made to push farther south, but (from Latitude 19°N) the opportunities for the taking of photographs in Carina, the Southern Cross and the Magellanic Clouds were at best very limited.

The Dedication of the Tonantzintla Observatory (February 17, 1942) was a magnificent and festive affair. President Camacho and Governor Bautista -with Erro presiding over it all- did the honors. The audience of more than 1000 was assembled outdoors. It was composed of many government officials of high distinction, representatives of Mexico's universities, students, peasants, soldiers and business men, not to forget the press! And then there were about 30 leading U.S. and Canadian astronomers and, of course, also were present practically all professional and leading amateur astronomers of México. Because of war-time conditions no astronomers from Europe and the USSR were able to attend.

The birth and dedication of Tonantzintla Observatory is firmly recorded in reports written by Menzel, Payne-Gaposchkin and Bok in the December, 1942 and March, 1943 issues of *Sky and Telescope*, Volume 1.

I remember one incident with special pleasure. There was a terrific crowd of Important Persons assembled in the Schmidt Reflector Building to witness President Camacho and Governor Bautista pushing the buttons to make the telescope move. I stayed behind when the official party left and in flocked a large group of white pajama-clad peasants from Tonantzintla and surroundings.

They greeted me and one said with pride: "Señor Profesor, ese es *nuestro* telescopio".

Following the dedication, there was the Inter-American Scientific Conference, which began at the University of Puebla and continued at the Autonomous University of Mexico, then in the heart of Mexico City. The *Sky and Telescope Report* by Payne-Gaposchkin covers this phase of the great tour -which ended with four honorary degrees being awarded on our visit to the University of Morelia: Vallarta, H.N. Russell, W.S. Adams and Shapley were the recipients.

Following the exciting days of the Dedication and the Conference, Erro settled down to the building up of modern astrophysics and astronomy in Mexico. The first years were not easy ones for Erro. He had a dream that some of the best of Mexico's physicists would glady come to Tonantzintla to become astrophysicists. This did not work out as planned. The story has been told beautifully, and with love and sympathy, in an essay entitled: "Luis Enrique Erro and the Dawn of Astrophysics in Mexico", written by Paris Pismis. Paris was present at the Dedication and joined the staff of Tonantzintla Observatory soon afterwards. When she wrote the story Erro had died and she was at the University of Mexico -where she still is a highly successful staff member in the astronomy group and recently received the *Emeritus Status*.

However, Erro persuaded Agustín Prieto and Octavio Cano to come to Tonantzintla, both excellent men, and he had found a young recruit, Guillermo Haro. I met Haro first in Mexico City under circumstances that he may have forgotten. Freshly graduated as a student of the Faculty of Philosophy of the University of Mexico, he became for a while a reporter for the daily "Excélsior" in Mexico City. Erro indicated that he had arranged for Haro to interview me and thus Haro and I became first acquainted. Haro accepted Erro's offer of a Tonantzintla position. In 1943 Haro came to Harvard on a special fellowship and stayed with us for about a year, principally to acquaint himself with the variety of telescopes at the Oak Ridge Station. This was for me (and Priscilla and our children) a rewarding year, for all of us got to know Guillermo very well. He wrote his first scientific paper during the Harvard time; (see *Proceedings National Academy of Sciences*, 30, 247, 1944). From the start of his stay at Harvard, Guillermo showed a great interest in the discovery of very red and very blue faint stars. He applied at first the Tikhov method (see *Astron. Nachr.*, 218, 145, 1922) of discovery on our 8-inch Ross Refractor. The lens of the 8-inch had a suitable steep color curve for his work. Later he shifted to multiple image plates exposed through three successive filters on 103eE and IN emulsions. His skill and perseverance in hunting down extremely faint objects paid off already during his long Harvard stay. It persists right to the present and has brought him great fame as an observer and discoverer over the past 40 years.

Carlos Graef, a mathematician and physicist at heart, did not really feel at home in the atmosphere of Tonantzintla Observatory. He decided to return to physics in Mexico City. After his departure, Guillermo Haro became Erro's right-hand man. Contacts with the University of Mexico had become gradually closer and in 1948 the rector of that University appointed Haro to become Director and take charge of the re-organization of the Observatory at Tacubaya. Joaquín Gallo became Director *Emeritus* in 1946. It was Guillermo Haro who saw to it that the budding young astronomers

of México would go to major foreign universities to obtain their doctorates. And it was he who directed the establishment of the new Observatorio Astronómico Nacional in the Sierra de San Pedro Mártir in Northern Baja California, after Eugenio Mendoza's report on several sites in the República Mexicana.

From 1953 up to the present time, Haro has produced a vertiable flood of scientific papers. Manuel Peimbert gives a summary of Haro's contributions to science, I need not duplicate Manuel's effort. Suffice it to say that Guillermo's name is firmly ensconced in the annals of astronomy. The Herbig-Haro Objects and a class of blue galaxies carry his name and one thinks of his name, and those of my good friends at Byurakan Observatory, when one refers to Flare Stars. Haro's intelligent and far-sighted perseverance has led to the discovery of blue stars near the galactic poles, of new planetary nebulae, of high-luminosity stars and of new southern star clusters. His collaboration with people like Braulio Iriarte and Enrique Chavira has produced several lists of novae, supernovae and emission-line objects. Guillermo, together with Eugenio Mendoza, was directly responsible for bringing infrared astronomy to México. Guillermo truly made our galactic and extragalactic horizons recede.

In concluding my story of Guillermo Haro, I should make at least a passing reference to his long list of honors and awards. I mention here only two awards -one very well known, the other not often mentioned. The first is his serving from 1961 to 1967 as the first Latin-American Vice-President of the International Astronomical Union, a world-wide testimonial to his scientific accomplishments. I note that last August at Patras, Manuel Peimbert was elected the third Latin-American Vice-President of the IAU. And, next, I still feel grateful to my long-deceased friend Jason Nassau for having arranged an honorary D. Sc. to be awarded to Guillermo Haro by Case Western University.

The young revolutionary who interviewed me for Excélsior back in 1941 has sure come a long way. I never thought that he and I would see the day when he would be considered the Dean of Mexican Astronomers.

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