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HOMAGE TO JÜRGEN STOCK

D. J. MacConnell[1]

RESUMEN

Jürgen Stock (1923-2004) tuvo una fascinante y fructífera vida, contribuyendo a muchas ramas de la astronomía y otras ciencias y al desarrollo de la astronomía en América Latina. Será recordado por su devoción a la ciencia y a su familia y colegas, por su ingenio, y por el papel clave que desempeñó en establecer dos importantes observatorios en América del Sur.

ABSTRACT

Jürgen Stock (1923-2004) lived a fascinating and fruitful life, contributing to many areas of astronomy and other sciences and to the development of astronomy in Latin America. He will be remembered for his devotion to science and to his family and colleagues, for his wit, and for the key role he played in establishing two major observatories in South America.

Key Words: **OBITUARIES, BIOGRAPHIES — SITE TESTING**

1. THE EARLY YEARS

Jürgen Stock was born on July 8th., 1923 in Hamburg, Germany, the middle of three children, and spent his early childhood there and in México City where his parents had a business. When he was of school age, he was sent back to Hamburg to be raised by his grandfather. He was enrolled in the public schools and developed a natural inclination toward the physical sciences. After his Arbitur, he was conscripted into the German Army and spent the last year of WWII on the eastern front. He did not dwell on his war experiences, but sometimes told the story of becoming separated from his unit and how Russian peasants fed and housed him – this formed the basis of his lifelong affection and trust for laboring people and his anti-military feelings. With the defeat of Nazi Germany, he found his way back to Hamburg by foot(!) and matriculated at Hamburg University working part-time as a roust-a-bout on the docks. This decidedly non-intellectual experience would prove useful 25 years later and a continent away.

In 1951, Stock presented his doctoral dissertation, "Photographic Photometry of the Coma Berenices Cluster in three Spectral Regions with a Special Photometric Objective" under the direction of Prof. Otto Heckmann, another connection that would prove important a decade later. During this period, he made the acquaintance of Dr. Eduardo Röhl, a wealthy German-Venezuelan and Director of the Cagigal Naval Observatory in Caracas, sent by the Venezuelan government to consult with Prof. Heckmann and arrange the purchase of telescopes and other instruments to 'reproduce' the Hamburg Observatory but with all dimensions 50% larger. Contracts were signed, and the equipment was shipped to Caracas in the late 1950s. This was yet another connection that became important later in Stock's life story.

2. THE CLEVELAND YEARS. I. 1953-1955

With few prospects for an academic post in Germany at that time, Stock accepted a two-year fellowship offered by the Cleveland Astronomical Society to work at the Warner and Swasey Observatory of Case Institute of Technology (now Case Western Reserve University) in Cleveland, Ohio. He arrived 1 March 1953 and came under the guidance of Prof. Jason J. Nassau, director of the Observatory and head of the Astronomy Department. Stock's experience with the Schmidt telescope, developed at the Hamburg Observatory, was valued since the primary research instrument of Warner and Swasey was also a Schmidt. He attended several meetings of the American Astronomical Society and gave papers on photographic photometry of open clusters, photometry of stars in the North Polar Sequence, and the discovery of 21 sparse clusters in the northern Milky Way, well known since as the Stock clusters. His co-authors in those years were, J. Nassau, William Wehlau, and Victor Blanco. He also worked on the early application of photoelectric photometry and comparison with photographic measures. In October 1955, after a short extension of his fellowship, he returned to Hamburg. (Personal Note 1: I started undergraduate studies at Case a month earlier and was fortunate

[1]Computer Sciences Corp./STScI, Baltimore, MD, USA.

to have a work-study stipendium permitting me to work 7 hours per week at the observatory. On my first day, Prof. Nassau handed me over to Dr. Stock, and the first dollar I earned in astronomy was to proof-read a manuscript of his own to be submitted before he left Cleveland.)

3. HAMBURG AGAIN AND SOUTH AFRICA

Back in Hamburg, he began an important collaboration with Arne Slettebak on sabbatical leave from Ohio State University whom he had met in the US as well as Johannes Hardorp. They showed that Schmidt objective-prism plates of low dispersion covering the near-UV could be used to distinguish OB stars and supergiants. This work led to the Luminous Stars survey series, a joint effort of the Hamburg and Warner and Swasey Observatories that eventually covered the full galactic circle and catalogued about 12,500 stars.

Prof. Heckmann sent him in December 1956 to Bloemfontein to be the caretaker/director of the Boyden Observatory, founded by Harvard University but, by that time, funded by Harvard and four European countries and which was the forerunner to ESO. During his brief stay there, he used the ADH Schmidt to extend his studies of open clusters to southern ones, and he also voluntarily collaborated with a group of Europeans (F. Bertiau, K. Rohlfs, and J. Tripp) conducting the site survey for the nascent European Southern Observatory. Stock made a number of suggestions regarding observing techniques and instruments (using a double-beam telescope) which influenced the survey but got him into trouble with Prof. Heckmann who wanted him not 'to interfere' with the expedition. He returned to Hamburg in August 1957, but soon was on his way to Cleveland again.

4. THE CLEVELAND YEARS. II. 1958-1959

By spring 1958, a teaching position had been opened at Case, and Stock was invited to return as assistant professor of astronomy. His appointment began 1 April, and he gave courses in practical astronomy and observational techniques starting in September. This was his first teaching experience, but he was a natural teacher, and students liked his lectures and informal style. During this time, he came to know graduate student Arthur R. Upgren, Jr. with whom he formed a lifelong friendship and served as thesis advisor. Prof. Gerard P. Kuiper, Director of the combined Yerkes and McDonald Observatories, asked Stock and A. D. Williams of the observatory staff to write a chapter on photographic photometry for his University

Fig. 1. Stock climbing girders for a CIDA dome in 1972. The girders for three domes were intermingled without markings and had to be assigned to their domes by trial and error. He called it his biggest ever 'rompecabezas'. Photo by A. G. D. Philip.

of Chicago Compendium series and got to know Stock's ideas on observatory site testing. Through an amendment to a U. S. Air Force contract of Prof. W. Albert Hiltner of the Yerkes staff, Kuiper had received funding to locate a 1.0-meter telescope (later increased to 1.5 meters) at a good site in Chile. He had little trouble convincing Stock to lead the effort, and in the middle of the spring semester of 1959, Stock left for three weeks to investigate sites near Santiago. (Personal Note 2: I was a last-semester undergraduate in his techniques course at this time. We students were upset that Prof. Kuiper was 'robbing' us of one of our best teachers even if for just three weeks. Graduate students did their best to fill in.) Soon after his return to Cleveland, it was announced that he would be leaving Case July 1 to direct Kuiper's survey.

5. THE CHILE YEARS. 1959-1970

During the next three years, Stock was to become intimate with the mountains of north-central Chile. It had been known since at least the middle of the 19th century that this region offered exceptional conditions for observing the sky, and the 'U.S. Naval Expedition to the Southern Hemisphere', led by Lt. James M. Gilliss in 1849-1852, established the first permanent observatory in Chile on Santa Lucía Hill in the then-outskirts of Santiago. Shortly before Gilliss left to return to Washington, the buildings and instruments were bought by the Chilean government to form the Observatorio Nacional which later came under control of La Universidad de Chile. This early development is well documented in Keenan, Pinto, and Alvarez (1985) and in Duerbeck (2002).

Stock's first contact was with Prof. Federico Rutt-lant, director of the Observatorio and head of the department of astronomy, who had initiated these activities by visiting Kuiper at Yerkes in June 1958 and proposing a cooperative venture for a 1-meter telescope. With the agreement of his dean, Dr. Ruttlant made personnel, principally Hugo Moreno, Carlos Torres, Guillermo Romero, and Herbert Wroblewski, and incorporated equipment, including vehicles available to Stock. Teams were formed and carried out observations of seeing and weather conditions following Stock's precepts on three mountains close to Santiago, but by the start of 1960, sites further north in the Elqui valley were being tested. Stock first saw Tololo from the valley floor near Vicuña in early April 1960 and thought it looked ideal although it would take a few days to get there. The first ascent was on April 13th, and it became the primary site to which all other places would be compared. A few days later, Stock left for Caracas for two weeks to advise on site testing for the Venezuelan National Observatory, and he made a second trip in late January 1961, visits that would be prophetic.

Stock was heavily involved in all aspects of the work: observing and analyzing the data, arranging for pack animals and their food, buying and distributing supplies, and keeping a detailed diary of events. In mid 1960, the project came under the direction of the U. S. National Science Foundation and its contractor, AURA, and Stock's boss became Dr. C. Donald Shane, President of the Board, and Director of the Lick Observatory. When Stock was in a town, he would send a packet of hand-written reports to Dr. Shane whose secretary would type them and make a few copies. These became known simply as the Stock Reports and are fascinating to read. During this period, Stock was also in contact with his "Doktorvater", Prof. Heckmann, extolling the virtues of the Chilean skies. He wrote so enthusiastically that Heckmann, now the Director General of the European Southern Observatory and ready to sign an agreement with the South African government to build ESO there, decided to hold off and sent an experienced team (A. B. Muller and P. McSharry) to Chile in November 1962 to test sites suggested by Stock. Thus, Stock was in large part responsible for the establishment of both the major U. S. and European observatories in Chile. The Tololo site was chosen by the AURA board meeting in Santiago on 23 November 1962. Stock was named the first director at this time. The AURA board president at the time was Prof. Frank Edmondson whose 1997 book recounts these early years well and with extensive documentation.

Fig. 2. Stock was able to derive complex trigonometric expressions and transformation equations from first principles without consulting reference material. He was a prodigious programmer. Photo taken by Dr. A. G. D. Philip, the first astronomer-visitor to CIDA, in 1972.

Stock lived on Tololo with his young family overseeing all aspects of the growing pains of the new observatory and took delight in laying out the road, blasting the outcrop of rock on the summit, preparing the site for the major telescopes to come, etc. He was in all aspects a "hands on" director. As it would be expected, his publication record during this period is somewhat sparse, but he managed to publish articles on extinction measures from Tololo, procedures for location of observatory sites, and observations of luminescence in the December 1964 lunar eclipse. His first U. S.-hired astronomer was Nicholas Sanduleak whom he had known as a student back in Cleveland. Sanduleak was based in Tucson from the start of his employment in September 1964 through the end of 1965, where he oversaw shipments of scientific and electronic equipment to Chile. He then was at Tololo in 1966 and 1967.

At the end of 1965, there was a falling out between Stock and some members of the AURA Board, and he resigned to take up a faculty position in the Departamento de Astronomía in the Universidad de Chile. He had been collaborating scientifically for some time with several on the staff and knew them well from the site survey period, so the transition was natural. He taught classes on positional astronomy and observational techniques; among his students were Santiago Tapia, María Teresa Ruiz, and Eduardo Hardy. Earlier, Stock had become a U. S. citizen and retained it during his time at the UdeCh which was unfortunate because, after the election of Dr. Salvador Allende as President of Chile in

September 1970, foreign nationals holding positions at national universities were suspended pending review. He found this out when going for his December pay check. Stock would joke 30-plus years later that he was still awaiting the outcome of his review. Without an income and benefits and with a family of four, it became necessary to leave Chile. (Personal Note 3: I was making regular trips to CTIO during this period and would write ahead to him, and he would pick me up at the airport. When I arrived in Santiago 22 January 1971, he was not there, so I took a taxi to the Cerro Calán Observatory expecting to see him. I was shocked when told he was no longer in Chile and that no one could tell me where he was. Some months later, I received a letter from him postmarked Caracas.)

6. THE VENEZUELA YEARS. 1971-FINALE

The Stocks left Chile for México where Jürgen had a close friend, the astronomer Eugenio Mendoza V. of the UNAM, who offered to help him find a position. Stock had also helped the Mexican astronomers with their site survey in Baja California and was well known to them. Meanwhile in Venezuela, the National Scientific and Technological Research Council (CONICIT) was formed in 1969, and one of its early tasks was to get the observatory project going again which had been stalled for a decade. The executive secretary of CONICIT contacted Dr. Sabatino Sofia, who had grown up in Caracas and by now was professor of astronomy at the University of South Florida in Tampa, asking if he would head the project. He demurred but was eager to help find an appropriate person. On 14 May 1971, he received a telephone call from Prof. Arcadio Poveda, head of the astronomy group at UNAM, saying that Stock was in his office and looking for a job. Sofia immediately realized that Stock was the ideal person for the enormous task and called the executive secretary the next morning urging him to contact Stock. Arrangements were made, and he and his family flew to Florida where his mother was living, and he went on to Caracas.

The site, a 3600m peak in the central Andes in the State of Mérida near the contintental divide, which Stock had helped find a decade earlier, had been purchased by then, and the road to it was in place. But the job facing him was daunting: oversee the 600-km movement of 500 tons of equipment consisting of four major telescopes, domes for three of them, and an aluminizing chamber, clean and refurbish pieces that had been in packing 12 or more years, get the four telescope buildings constructed, get it all working, hire technical, scientific, and support staff, start a library, interact smoothly with government and university officials, establish an academic presence, and attract young Venezuelans to the profession. It is a great tribute to this man that he accomplished all this and more and with seldom a complaint or negative word.

The Centro de Investigaciones de Astronomía, CIDA, was created by presidential decree in November 1973, and Stock became its first director. The history and development up to 1978 was published by Alvarez and MacConnell (1978).

During the years left to him, he measured thousands of stars to get positions and radial velocities from objective-prism plates, developed the block adjustment technique for rigorous reduction of overlapping plates, participated in many international conferences and hosted one, published a book with Arthur Upgren, Jr. on weather, and authored many papers with a wide variety of collaborators on astrometry, spectroscopy, galactic structure, asteroids, geodesy, and light pollution. He was especially proud of working on quantitative stellar classification he was doing with his daughter, M. Jeanette, who became a professor at La Universidad del Zulia, Maracaibo. Beyond this, he found time to be a member of Rotary International for most of his adult life and served as president of the Mérida chapter for several years, appeared regularly on local radio to talk about new discoveries in astronomy and earth sciences, advised a team of geodesists surveying the Boconó fault zone, and gave generously of his time to anyone who asked for help or advice. He was a great promoter of astronomy throughout Latin America through his considerable physical and intellectual efforts.

Those who knew him well will always remember his legendary wit and love of practical jokes. A few of these that he liked to tell concerned the outhouse in the early Tololo days. One morning, after a night of observing, he hung a jacket outside it and placed a pair of boots inside so they could be seen below the cut-off door. Then he found a secluded place to watch how, worker after worker, came and left and returned in increasing frustration. His laughter revealed his hiding place.

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