the original telescope tube is part of the exhibit, “Explore the universe”, curated by David DeVorkin. William is shown observing at the telescope while Caroline sits at the open window of the house recording the observations that he calls to her in this multi-media reconstruction. The exhibit captures the feeling that you are really witnessing their observations, and this will be especially so for any who have had the pleasure of reading The Herschel partnership and Caroline Herschel’s autobiographies before the visit.

U.S. Naval Observatory

BRENDA CORBIN

BAADE AND HIS INFLUENCE


A dozen years ago Donald Osterbrock presented Pauper and prince, a scientific double-biography of delicate psychological insight and painstaking scholarship, full of life and colour. Here we have another biography from the same author: Walter Baade: A life in astrophysics — a very apt title indeed, since Baade did not live for astrophysics, rather astrophysics really was his life. Walter Baade is one of those towering figures of twentieth-century astronomy whose achievements stand out much clearer now at some distance in time, just as it is with the highest mountains standing out at a distance. He made discoveries epochal in many fields, from our planetary system up to supernovae; he wrote very short but seminal papers, and he changed the scale of the universe — yet the deepest impact he made was to introduce the concept of stellar populations, which translated the abstract idea of stellar evolution and stellar age into an observational science, opening new avenues to all sorts of galactic and extragalactic research. Well educated for the task, trained at Germany’s then largest telescope, he eventually decided to go to the world’s largest telescopes in California. He asked the right questions, solved the problems with painstaking diligence, and dispersed new insights with wit and inspiration, stimulating the whole post-war generation of astronomers and thus becoming “arguably the most influential astronomer of the twentieth century”. This is, in short, is the message of the book.

Osterbrock’s book is meticulously researched and extensively documented by letters, annual reports, sketch-books, and documents from all pertinent archives — not an easy task since Baade, like Einstein, did not keep letters. The basis for the book was laid in four long articles in the IHA. But this is not just a scholarly book without any serious flaw. It also makes beautiful and exciting reading. But is there something I have missed? What more would I like to see?

It is the colourful personality of Baade as a scientist in permanent, dynamic dialogue. Those who met him will remember his engaging amiability, his all-pervading
humour and sparkling wit, his brilliant art of presentation and, sometimes, caustic criticism, his free outflow of ideas, counsel, inspiration and stimulus. Anecdotes can reflect that. At the same time they would represent a sort of Baade’s Wirkungsgeschichte [Baade’s influence], which for the history of astronomy is possibly even more important than his achievements. Though he formally had only one Ph.D. student, H. C. Arp, the number and names of those who are mentioned in Osterbrock’s book to have received suggestions and stimulation from Baade reads like a directory of the leading American astronomers of the ’seventies. The list is, however, far from being exhaustive. As an example, let me quote here what Aden Meinel learned from Baade as an 18-year-old apprentice optician in 1940 (letter of 31 December 2001):

The third night was Baade’s turn at the 100-inch. The telescope was reconfigured for direct photography. When I got up to the dome I found Baade quite excited. In his rather heavy accent he exclaimed “the seeing’s better than I’ve ever seen — but the optical figure the poorest! I want to see if Nova Her (1934) shows an emission envelope.” He hurried down to the dome floor and had the night assistant turn the telescope to the zenith. Then, muttering some profanities about that telescope, he banged on the 100-inch primary mirror edge supports and back supports, one at a time in rapid succession. As he climbed back to the focus he remarked that his apparently rough treatment was something “I’ve had to do before. Adams has told me not to do this again! He told me in his polite way that freeing-up the mirror supports was something for Don Hendrix to do — not for an astronomer. But when the seeing is this good I do what I’ve got to do!” I’ve cleaned up his language a bit, but you get the picture.

The mirror figure did improve significantly so Baade proceeded to take several direct images of Nova Her using different filters. I followed him down to the darkroom that was located just below the floor of the telescope. I stood behind him as he took the dripping plates one by one out of the wash water, peering at each one illuminated by a viewing box. “Yes, there it is!” He handed me the H-alpha plate, telling me to be very careful. Using Baade’s 10x loupe I could see that the H-alpha image was distinctly fuzzy while the UV image was crisp.

I asked about the filters that he used. He said that he had broken his Schott UG-1 last month and was using a UG-2. He had tried to order a new UG-1 but found that the War had already made ordering a new one from Schott impossible. His RG-2 H-alpha filter was still good, but he wanted larger ones of both types so that he could search M31 for cepheids and try to resolve the high-luminosity stars.

I asked him why he didn’t use infra-red N-plates. He told me that they fogged too quickly. At first he thought that he was hypersensitizing them improperly, but after some experiments he said that it must be the light of the night sky in the infrared.

Baade’s comments about the filters that he wanted and the infrared night sky remained with me. So, four years later, when I was at Jena I remembered that
night on the mountain and asked if the manager of Schott could get me two 15×15 pieces of UG-1 and RG-2 filter glass. He did, and I carried them back to Pasadena after the war ended and presented them to Baade. Don Hendrix cut two filters out of each block, presenting me one of each as my reward.

His comment about the infrared night sky also stayed with me. While at Jena I saw a fast prism spectrograph at the Zeiss factory that had just been completed. Navy Lt. Cmdr. Dimitroff, a Harvard astronomer and also member, as I was, of the Naval Technical Mission in Europe latched onto it and had it sent to Harvard.

Back in Pasadena in 1946 I encountered Polydor Swings at the MWO [Mount Wilson Observatory] offices and we started talking about the light of the night sky and Baade’s observations. Swings said that someone should build a grating spectrograph for the infrared and see exactly what was there. That started me on the pathway to building the grating spectrograph that enabled me to identify these infrared emissions as being due to OH, and also find a new band system in the aurora.

Another optician, Bernhard Schmidt, was also inspired by Baade. I am convinced that Baade (who wrote the famous paper for Schmidt) also conceived much of that paper. Baade never cared much for publication; as soon as he himself knew the answer, he made the next stride. For the astronomers who came home to their observatories after the war, Baade’s papers with titles about resolving galaxies seemed out of the mainstream, something very strange to realize today. There is only one book by Baade (written up from lecture records), but that was guiding many, if not most astronomers for decades: *Evolution of stars and galaxies* (1963).

Baade’s character and ethics are largely explained by his origin and religious conviction. Born with a congenital hip defect in Westphalia where that province (which he loved with all his heart) borders to lower Saxony, he was determined to become a Lutheran pastor. So he learned Latin, Greek and Hebrew perfectly at school. Those school excursions “zu Hermann”, that is, to Arminius’s monument in the Teutoburg forest, belonged to his most cherished recollections from youth, and Hölderlin’s feelings were not at all strange to him as that poet wrote on 4 December 1801 to his friend: “Es hat mich bittere Tränen gekostet, da ich mich entschloß, mein Vaterland noch jetzt zu verlassen, vielleicht auf immer. Denn was hab inch Lieberes auf der Welt.”

Baade’s life and work at Mt Wilson, as Osterbrock presents it in this book, appears as part of the greater story of Mt Wilson and Palomar Observatories at their summit in the history of astronomy, and of the able and unselfish leadership of Walter S. Adams and Ira S. Brown. To sum up my review: this biography will be indispensable for scholars of the history of astronomy.

Ruhr Universität

Theodor Schmidt-Kaler