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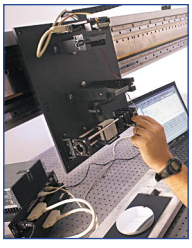

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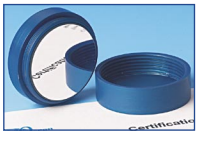

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One of many strengths of Osterbrock's historical work is his ability to probe behind the published record. He traced the *New York Times* article to a press release written by *Sky & Telescope* editor Charles Federer Jr, whose offices were at the Harvard College Observatory. According to Osterbrock, Federer got the story from Shapley, who based it on his oral presentation at the American Astronomical Society (AAS) meeting a few days earlier. Furthermore, Osterbrock cited exchanges of letters between astronomers, including staff members at Harvard, that deplored Shapley's perceived attempt to steal Baade's idea, work, and results.

Osterbrock also found correspondence to and from Otto Struve, then president of the International Astronomical Union, discussing whether Shapley should be censured by the IAU and the AAS. Another letter Osterbrock found was from Ira Bowen, director of the Mount Wilson and Palomar observatories, asking Donald Menzel, acting director at Harvard, to make sure that no more popular articles or news releases were issued crediting Baade's discovery to Shapley. Readers of Osterbrock's fascinating history can study the extensive and carefully documented factual material and judge for themselves Shapley's behavior in this matter.

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Karl Brown's Role in TRANSPORT

Wolfgang Panofsky has done a thorough job of documenting the many and varied accomplishments of his former student Karl Brown (see the obituary in PHYSICS TODAY, March 2003, page 99). However, one item requires clarification.

Brown contributed to, but did not originate, the computer program TRANSPORT. The originators of that program were Charles Moore, Hal Butler, and Sam Howry, all from SLAC. Brown had been using ray-tracing methods, but he liked the way the new program worked and adopted it for his own use.

A major strength of Brown's was in recognizing the potential of a new idea and then investing the effort to develop that idea. So it was with TRANSPORT. Brown and Howry continued to develop the program, adding the capability of calculating second-order matrix elements. Brown also worked with Barbara Kear (SLAC) to develop a free-field data-reading package. Brown, Howry, and Kear put together a TRANSPORT manual that, for a generation of physicists, also served as an introduction to the science of charged-particle optics.

Brown continued to be involved in the development of TRANSPORT, working with a somewhat international family that included Christoph Iselin (CERN), Frank Rothacker (SLAC), and me (Fermilab). Progress in charged-particle optics will continue, but will be missing the personal guidance of a founder of the field.

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Group Velocity Is Not Signal Velocity

Recently, I have seen an increasing number of papers in which scientists claim to have proven extraordinary phenomena by applying the concept of group velocity to the anomalous dispersion of waves. Two of the greatest wave theorists of all time, Arnold Sommerfeld and Léon Brillouin, have dealt with the subject.

In separate papers, Sommerfeld and Brillouin wrote that, in anomalous dispersion, the group velocity cannot be the signal velocity.[1] Indeed, in anomalous dispersion, the group velocity goes through both negative and positive infinite values. It also goes through values greater than the speed of light[2] (as does the phase velocity).

References

1. A. Sommerfeld, *Annalen der Physik* **44**, 177 (1914); L. Brillouin, *Annalen der Physik* **44**, 203 (1914). For a lucid English-language digest of the two papers, see ref. 2, p. 334.
2. J. A. Stratton, *Electromagnetic Theory*, McGraw-Hill, New York (1941), p. 339, fig. 63.

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Correction

July 2003, page 55—Reference 2 at bottom of first column should read: Y. Tokura, N. Nagaosa, *Science* **288**, 462 (2000). ■