I must express some confusion regarding the back-to-back obituaries, in the October 2001 issue, of Clifford Glenwood Shull (page 86, written by Ralph Moon and Robert J. Birgeneau) and Louis Néel (page 88, written by Jacques Friedel). When one reads both obituaries at the same sitting, it becomes clear that the scientific paths of these two men crossed during the course of their lives, but one is left confused as to the specifics.

The Shull obituary explains that among Cliff's accomplishments with neutron diffraction were that the "first direct evidence of antiferromagnetism came from determining the magnetic structure of manganese oxide" and that the "Néel model of ferrimagnetism was confirmed for magnetite." The ensuing Néel obituary describes how Néel in fact "developed the concept of antiferromagnetism" along with predicting susceptibility peaks at the "Néel temperature." Then, a somewhat confusing paragraph mentions contributions from Lev Landau and Cornelius Gorter to the theory of "antiferromagnetism," but these are apparently irrelevant for certain materials that involve a "magnetic wall of high energy." Without further clarification, that paragraph ends with this: "Using neutron diffraction, Harry Shull confirmed (in 1950) Néel's model."

First, who is Harry Shull? Second, just what did he confirm in 1950? The proposals about the Néel temperature were "made in 1936 . . . [and] confirmed in 1938 on manganese oxide," according to Néel's obituary. Shull's obituary, in which he is consistently called "Cliff," says that Shull confirmed antiferromagnetism in manganese oxide, presumably after 1938 (after the "war ended") and confirmed the Néel model for ferrimagnetism for magnetite, probably around 1950, as I interpret it.

I hope you can you see my confusion. Maybe people used to call Cliff "Harry." Maybe the development of the theory of "antiferromagnetism" for manganese oxide is so related to the theory of "ferrimagnetism" for magnetite that distinctions about what "Harry" confirmed, and when and how, are not so important. I wish I knew.

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FRIEDEL AND MOON REPLY: The reference to Harry Shull in the Louis Néel obituary was an unfortunate error. It was Clifford Shull who did the first neutron diffraction experiments confirming Néel's ideas on antiferromagnetism and ferrimagnetism.

Néel[1] originated the name antiferromagnetism in developing a theory of systems in which the magnetic interaction between atoms on crystallographically equivalent sites favored opposite orientation of the

Probability of Good Beer in Denmark

While attending a conference in Copenhagen, I noticed an interesting advertisement for the Carlsberg brewery on the side of a building facing Raadhuspladsen, (City Hall Square). Knowing that Carlsberg profits have supported the Niels Bohr Institute for Astronomy, Physics and Geophysics in Copenhagen, I'm wondering if the qualifying adjective "probably" is a subtle nod to the probabilistic nature of quantum mechanics!

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magnetic moments on nearest neighbors. This orientation could result in ordered magnetic structures in which the net magnetization vanished because of exact cancellation of moments in opposite directions. Néel's prediction of the behavior of the magnetic susceptibility of such systems was confirmed in 1938 in experiments on manganese oxide. The first determination of such a structure by neutron diffraction was reported by Shull and colleagues in their work on manganese oxide.[2]

Ferrimagnetic materials have magnetic atoms on two inequivalent sites, or two interpenetrating sublattices, with ferromagnetic interactions between atoms on the same sublattice and antiferromagnetic interactions between atoms on different sublattices. Interactions of this type can result in ordered structures in which all the moments on one sublattice are parallel to each other but antiparallel to the moments on the other sublattice. The first prediction and theoretical description of ferrimagnetism was given by Néel;[3] he also provided a specific model for the magnetic structure of magnetite to explain its magnetic properties. This model was confirmed in the neutron diffraction work of Shull, Ernie Wollan and Wally Koehler.[4] Ferrimagnets exhibit a partial cancellation of moments in opposite directions, resulting in a net magnetization.

We hope these comments have clarified for Robert Mulkern the distinct but related contributions made by these two great scientists.

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3. L. Néel, *Ann. Phys. (Paris)* **3**, 137 (1948).
4. C. G. Shull, E. O. Wollan, W. C. Koehler, *Phys. Rev.* **84**, 912 (1951).

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Numerus Clausus Led to Hungarian Exodus in 1920s

Maria Ronay is mistaken when she asserts that "there was no anti-Semitism in Hungary" in 1926 (PHYSICS TODAY, March 2002, page 11). She must be, fortunately, too young to remember those days.

After the disintegration of the Austro-Hungarian Empire at the end of World War I, two opposite-colored terror regimes followed (the "red" communist and the "white" rightist), and anti-Semitism in Hungary in the 1920s reached a peak. Although no comprehensive, explicit laws against Hungarian Jews were yet enacted, Jews were barred from practically all government jobs, university positions, and various aspects of public life, and were often harassed. It is true, they still held a prominent role in intellectual life, business, commerce, journalism, the medical profession, and law; nevertheless, they were second-class citizens. Most telling was the Numerus Clausus Act of 1920, which severely restricted admittance of Jewish students to universities. Moreover, Jewish people already admitted to institutions of higher learning frequently were prevented by their right-extremist colleagues from attending classes, and sometimes were even physically assaulted.

Ronay's "proof" that there was no anti-Semitism because the Budapest synagogue "is the largest and most beautiful" in Europe is pointless. As she herself says, that synagogue was built in the 19th century, during the moderate and civil empire.

Hans Bethe is correct in writing that Edward Teller "did not have to leave Hungary in 1926." But Teller was an intelligent and thoughtful man; he must have seen the trouble ahead. Hungarian anti-Semitism eventually led, in 1944, to the extermination—under German Nazi orders but with the enthusiastic support of Hungarian fascists and a considerable portion of the population—of about half a million Hungarian Jews.

Although I lost many friends and relatives to Hungarian anti-Semitism, and although I have been a US citizen for many decades, I still proudly consider Hungary the country of my roots. But history must not be rewritten.

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I disagree with Maria Ronay and Hans Bethe about whether Edward Teller was forced to leave Hungary in 1926. After World War I, Hungary was vastly more repressive of Jews than Germany was. In 1920, the Numerus Clausus Act was passed, which limited the number of Jews who could attend higher education to their proportion of the popu-

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