

Let Us Now Praise Famous Boojums

Neologistic particle physicists have given the world quarks, gluons, color, flavor, charm, and bare bottom. Not to be outdone, their brethren from the realm of superfluidity offer the . . . *boojum*?

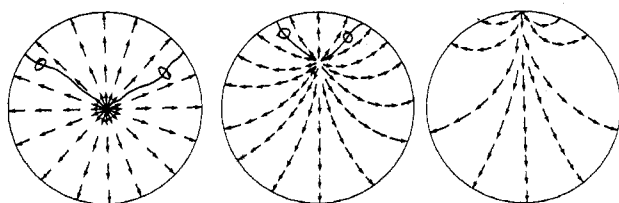
Boojum. In the April issue of *Physics Today*, Cornell physicist N. David Mermin recounts the tale of his 5-year struggle to give the word "boojum" scientific respectability.

According to the Reverend Charles Dodgson, a.k.a. Lewis Carroll, the boojum is an insidious species of snark, the hunters of which "softly and suddenly vanish away." Mermin, clearly a soul mate of Carroll, was the first to recognize the boojumish nature of a certain phenomenon in superfluid helium-3. The inherent anisotropy of this liquid is most pronounced in a phase known as helium-3-A, he explains. The local axes of anisotropy, taken as a whole, form a network of lines that weave and twist throughout the fluid. It is conceivable that a singular point might form in the pattern, he says, with lines radiating outward like the quills of a hedgehog. But in 1976 Mermin and a number of colleagues realized that tiny vortices in the liquid would inevitably pull such a confluence of lines to the surface, where the pattern would more closely resemble a fountain than a hedgehog. The singularity would softly and suddenly vanish away; clearly, Mermin realized, this fountain-shaped pattern was a boojum. "I resolved then and there to get the word into the literature," he writes.

His first move was to include a liberal sprinkling of "boojums" in his lectures and at conferences. Then, in the fall of 1976, Mermin's nomenclatural impulse acquired the character of a prophetic vision when he realized that a boojum on the surface might actually damp out the superfluid flow in the body of the liquid. "It was the most fundamental property of the liquid . . . whose soft and sudden vanishing could be triggered by a well-placed boojum," he reports.

Thus emboldened, he set out to get the word into print in an established scientific journal. Two alarming developments intervened, however. First, a fellow boojum enthusiast, Chia-Ren Hu, submitted a paper using "boojum" in its title to the *Journal of Low Temperature Physics*. An excellent piece of work, said reviewers and editors all. But "boojum" had to go. Mermin sprang to Hu's defense with a fierce volley of letters. But it was for naught. Circumlocutions prevailed.

The second alarming development was the arrival of the



To softly and suddenly vanish away.

Lines of anisotropy try to form a "hedgehog" pattern in a droplet of helium-3-A, but a pair of vortices pulls the point of convergence to the surface—forming a boojum. [Adapted from *Physics Today*]



"But oh, beamish nephew, beware of the day,
If your Snark be a Boojum! For then
You will softly and suddenly vanish away,
And never be met with again!"

manuscript of a review of recent progress in superfluidity, written by two physicists from Bell Laboratories. Flipping to the section of greatest interest, Mermin found a knowing reference to "boogums." A boogum, he was aghast to learn, is a spiny, arching tree native to lower California. The tree might even be said to resemble, in a vague sort of way, a real boojum. Yet again, Mermin's most anguished and strenuous efforts failed to stamp out the heresy before the misbegotten word reached print.

Yet Mermin's day of triumph did come, with the acceptance of a boojum article by *Physical Review Letters* in 1977. The battle was not won easily. The editors of that prestigious journal are a skeptical lot, not given to the casual acceptance of neologisms. Their cross-examination was grueling. If they were to let him get away with "boojum," they asked, would he soon be back to them with "snark"?

Never, Mermin swore.

And then there was the matter of the plural. "Booja"? No way, said the editors. "Boojums" it became, despite Mermin's conviction that that was a common name for a fluffy kind of beribboned cat.

Still, with the appearance of boojum in *Physical Review Letters*, Mermin's triumph seemed complete. Other papers by other authors have followed, some even with "boojum" in their titles. Yet recently, he reports, a sour note intervened in the form of a phrase in the 3 June 1980 *New York Times*: "Boojums found their way into science thanks to Philip W. Anderson, a 1977 Nobel Prize winner. . . ."

A clear case of the Matthew effect, writes Mermin: "To him that hath shall be given, etc." He takes comfort in the phrase he once found in a preprint from the Landau Institute: *Mermin nazval budzhum*—"Mermin called it boojum."—M. MITCHELL WALDROP