letters

The boojum returns

I never thought the time would come when I would write a fan letter to PHYSICS TODAY, but that is what this is. I have not met David Mermin, nor read his funniest book on solid-state physics, nor seen his Lorentz invariant Elizabethan drama, but each is now on my list of things to do. "E Pluribus Boojum" (April, page 46) was the most interesting and enjoyable article I have read in a very long time. I especially liked the episode with Physical Review Letters, but the Slavic boojum was also wonderful—if the instrumental singular "budzhumon" is good, the plural "budzhumami" is out of sight. As I am sure Mermin knows, none other than Nabokov himself translated *Alice in Wonderland* into Russian.

Thanks to the author for writing it and to the editors for publishing it. May the author's neologistic efforts continue.

LEE G. PONDROM
University of Wisconsin
5/81 *Madison, Wisconsin*

•

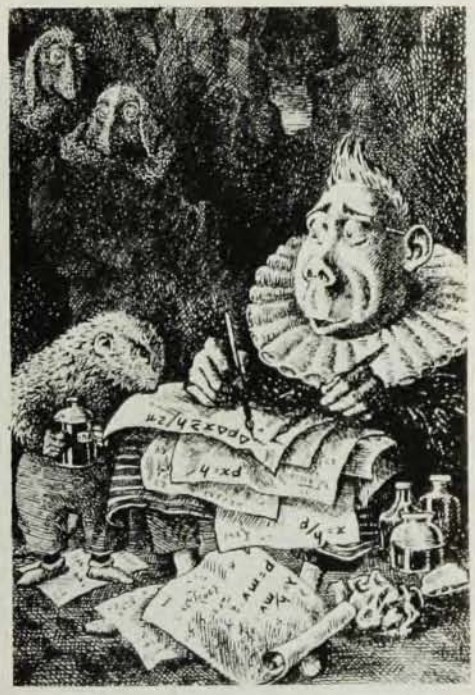
In view of the length, erudition, and detailed documentation of David Mermin's article describing his application of the word "boojum," I was disappointed that no mention was made of the circumstances of the earlier use of the same word to describe the whimsical looking boojum tree. The boojum tree was named by Godfrey Sykes the instant he first saw one—through binoculars—on a trip to Baja California. Sykes, trained as an engineer in England, immigrated to the US and lived many years in Tucson and Flagstaff, Arizona. Details of his remarkable life and naming of the boojum tree can be found in his autobiography "A Westerly Trend," now unfortunately out of print.

PETER PESCH
Director Warner & Swasey Observatory
4/81 *East Cleveland, Ohio*

•

David Mermin's entertaining account of his struggles to establish boojum as a scientific term and to retain credit for it contained a lapse in the credits. It was an oversight characteristic of someone who can be excited more by words than by pictures. The illustrations "from The Annotated Snark by Martin Gardner" used in the article were by Henry Holiday. They are from the 1876 edition of Carroll's "The Hunting of the Snark," Macmillan & Co. Not mentioning Holiday was akin to the New York Times crediting Anderson with boojum. For Boojumophiles it might be worth mentioning that Holiday had a good mental grasp of Snarks. ("He didn't draw any!" "Yes, but look at everything else he drew."). Mervyn Peake (Chatto and Windus, 1953) had a better grasp of the Hunters (see photo).

I am happy with Mermin's boojum, but would like to say a word on behalf of the gentler Boojum (properly capitalized by Carroll). To our knowledge, only Snark hunters softly and suddenly vanish away if they encounter a Boojum. Apparently a boojum is less selec-



Butcher explaining to the doubting Beaver that the Heisenberg Ignorance Principle and the de Broglie wavelength equation are related. Illustration by Mervyn Peake from Lewis Carroll's "The Hunting of the Snark" (Chatto and Windus, 1953), fractionally altered by Gordon Freeman, 1974.

tive and will catalyze the decay of a supercurrent whether the latter was hunting or not. I like to think that a Boojum uses its awful power only in self-defense.

Mermin's boojum is one of a large family. For example, an acknowledgement of a rare scientific/personal nature recently vanished from a *Physical Review* article when it encountered a boojum in the editorial office. Supplications were to no avail, even though I like Boojums. ("Like as in friend, or like as in to eat?" "You know what happened to the Baker? Don't even *think* about eating a Boojum!")

GORDON R. FREEMAN
The University of Alberta
6/81 *Edmonton, Alberta, Canada*

•

Only after reading Mermin's account of his heroic efforts to legitimize the term "Boojum" in the scientific liturgy have I come to realize how fortunate I have been as a scientific neologist. A few years ago I published an article in the *Journal of the Optical Society of America* dealing with the angular scattering behavior of near-spherical water drops (J. Opt. Soc. Amer. **60**, 1083). Being rather fond of antiquated theoretical approaches to natural phenomena, detailed laser scattering patterns were obtained in the angular regions of the rainbows in order to compare the findings with the 1838 predictions of Sir George Airy. However, in preparing the manuscript I was soon confronted with a dilemma: Rainbows in nature are inherently polychromatic, so how could I justify the use of this word to describe the chromatic pureness of the laser-generated variety? It was time to coin a new word:

> Moreover, van de Hulst's estimate of the limit of validity of Airy's theory ($X > 5000$) is also satisfied in the experiments, which have been performed with monochromatic light according to the formulation of Airy. Interestingly, the experimental testing of Airy's rainbow or, more accurately, "monochrombow" theory has awaited a century and a half until made possible by the development of the laser.

Note that I also felt obliged to encumber the new *monochrombow* in quotation marks in anticipation of editorial uproar, but my neologistic paranoia proved to be just that, as not a single mention of my new word was to be found among the otherwise comprehensive tabulations of the reviewers' comments. I had succeeded.

I recall agonizing over the spelling of this word, as the neologist has a solemn obligation to provide possible future users with a term of exquisite appropriateness and clarity which must be balanced against the exhilarating freedom of playing word-creator. The derivation of this word is obvious, actually self-explanatory, but I vacillated between monochrombow and monochromebow to the point of delaying the manuscript submittal. I can't recall exactly why I chose the former rendition, but I confess that the intended phonetic similarity with the medieval monotoned *Krummhorn* was influential in my selection. Such are the deliberations of word-gods.

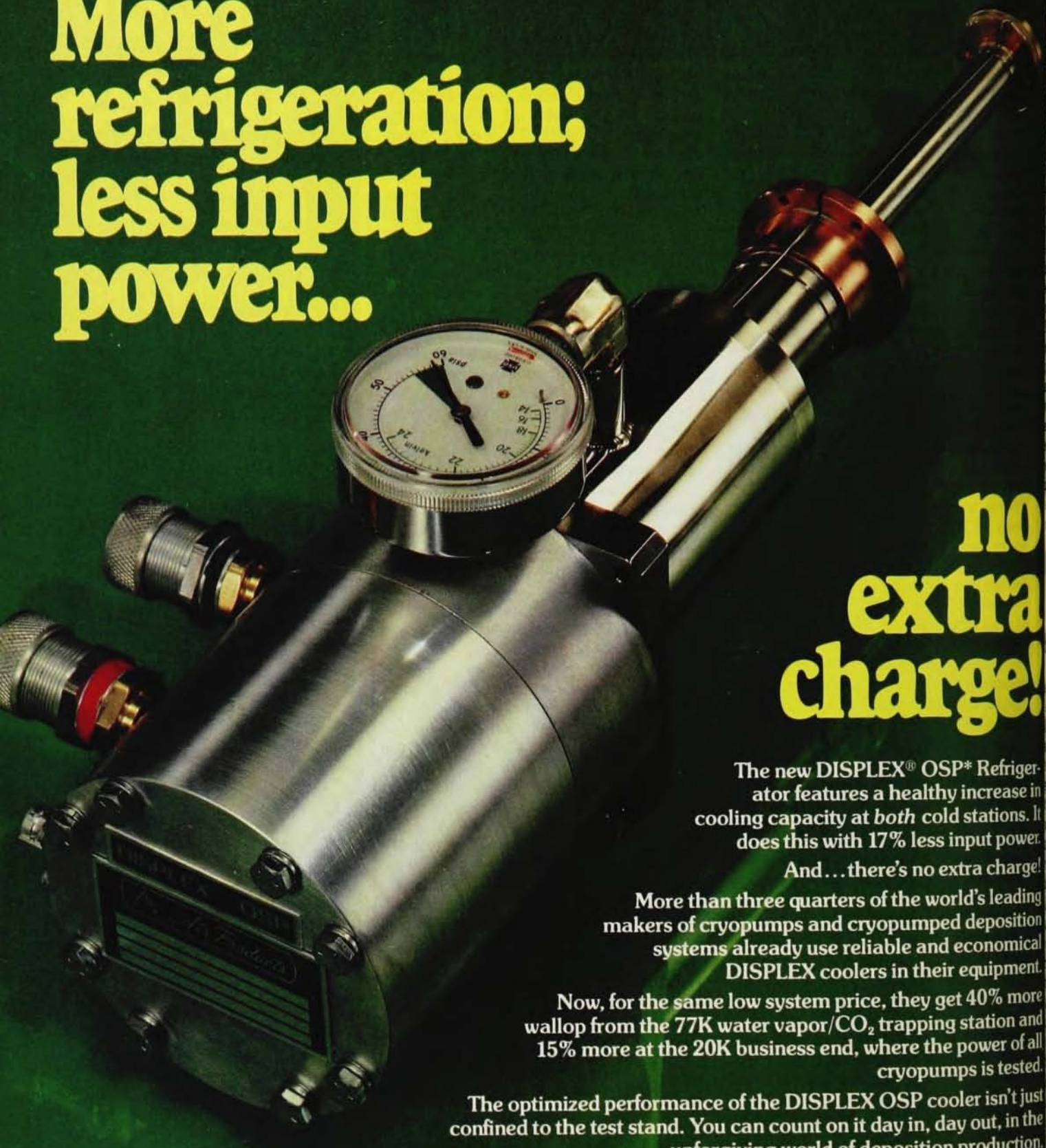
Although, to be perfectly honest, Mermin's title is somewhat misleading in that Carroll's neologistic genius has been exploited by a physicist in this instance, his tale unfolds as a generally well-executed campaign against the conservative nature of science. If we accept that within the realm of scientific inquiry the need for new words is a direct consequence of new conceptions, and that our dictionaries are full of scientific jargon gone popular, then I think it only appropriate that as scientific writers we attempt to slip a new or archaic word in here and there. (Even with today's page charges, must we be so boringly concise and unadventurous?) Who knows, such a subversive attempt may go unnoticed by the reviewers, editors, and finally, the typesetters, and once in print our creation will have gained a measure of legitimization that may eventually lead to the ultimate glory, dictionaryization.

KENNETH SASSEN
University of Utah
6/81 *Salt Lake City, Utah*

THE AUTHOR COMMENTS: I look forward to meeting Lee Pondrom, who will be pleased to learn that "budzhumami" (and the less spectacular but rather elegant prepositional plural, "budzhumakh") can be found in a recent Russian topology book. I appreciate his wishes for successful future neologisms, but I am honor bound to abandon that line of endeavor. His proposed reading list is admirable, though he should be warned that the solid-state physics text is not a genre noted for tickling the ribs. Aside from half a dozen one-liners in the index, Ashcroft and Mermin might provoke the flicker of a smile every fifty pages or so, thereby winning the title more or less by default. However my Elizabathan drama (Chapter 11 of "Space and Time in Special Relativity"—get it now, before McGraw-Hill decides to shred the inventory) *is* explicitly Lorentz invariant, not merely the best of an unimpressive lot.

In response to Peter Pesch, the story of how *Indria columnaris* acquired its common name is a fascinating one, belonging to the annals of the botanist as neologist, a vast field which my carefully chosen title freed me from

More refrigeration; less input power...



no extra charge!

The new DISPLEX® OSP* Refrigerator features a healthy increase in cooling capacity at *both* cold stations. It does this with 17% less input power.

And...there's no extra charge!

More than three quarters of the world's leading makers of cryopumps and cryopumped deposition systems already use reliable and economical DISPLEX coolers in their equipment.

Now, for the same low system price, they get 40% more wallop from the 77K water vapor/CO_2 trapping station and 15% more at the 20K business end, where the power of all cryopumps is tested.

The optimized performance of the DISPLEX OSP cooler isn't just confined to the test stand. You can count on it day in, day out, in the unforgiving world of deposition production.

That's one more reason why you should specify a DISPLEX Refrigerator in your vacuum system.

Write for details.

Air Products

APD CRYOGENICS

Air Products and Chemicals, Inc.

*Optimized System Performance

1919 Vultee Street, Allentown, PA 18103 (215) 398-8419 Telex: 84-7416

Service Card

having to explore.

Giving Martin Gardner credit for the 1876 work of Henry Holiday is an example of the retarded or strong coupling Matthew effect, and as such it is roundly to be condemned. I must insist, however, that it was not my fault. I merely told the editors of PHYSICS TODAY where to find some good pictures—they then did the Matthew on poor Holiday. Having myself been a victim of the more common static or weak coupling Matthew effect, I applaud Gordon Freeman for his diligence in setting the record straight.

There are many kinds of neologism. Type I gives a new word an old meaning; type II gives an old word a new meaning; type III gives a new word a new meaning. Kenneth Sassen is confused about my title because his was a type I neologism, while mine was of type IIC, a less common variety in which the old word is itself the fruit of an earlier neologism, in this case (as the notation clearly reveals) of type III.

N. DAVID MERMIN
Cornell University
Ithaca, New York

6/81

More on mass versus weight

The letters on NBS and metrification in December (page 11) were interesting and have inspired me to offer suggestions to resolve the issue via compromise. I would also like to offer a few suggestions on the introduction of new unit terminology. I write on the basis of over 45 years of familiarity with (portions of) the metric system, and over 40 years as a physics teacher at Columbia University.

The confusion over mass and weight would be eased if the NBS and physics teachers included in discussions extra comments along the following lines. "In the metric system the unit of mass is the kilogram for which a primary standard exists in an international standards lab, with secondary standards in other standards laboratories. When comparing masses, or evaluating an unknown mass, in practice this is done by *weighing* using equal or unequal arm balances in a uniform non-zero gravitational field, usually that at the earth's surface. The term weight is then generally used in practice to mean that an object with a *weight* of X kilograms experiences the same gravitation force as a mass of X kilograms, or X times the gravitational force which the international standard kilogram would experience in the same gravitational field. It is believed that Einstein's equivalence principle applies so that such gravitational force is the same as the inertial force required to accelerate the mass in the absence of gravity with acceleration $a = g$, where g is the free fall acceleration of the mass in the gravitational field. For weighing evaluations at the earth's surface, the gravity *force*, mg in Newtons per kilogram, varies slightly with position on the earth's surface due to the earth's rotation, non-uniform mass distribution, and height above sea level. The term weight is also frequently used to denote the gravity force on a mass, usually implying in some mean earth surface position, where $g \approx 9.8$ meters sec^{-2}. The magnitude of the force in Newtons is mg where m is mass."

I too have lived through teaching in non-metric units involving slugs or poundal and am unhappy with the various pound, ounce, penny-weight, grain, hands, stone, dram, and so on of the non-metric system. I am a strong believer in a "humane" introduction of the metric system. I have been very annoyed when international commissions decide on a change of naming to honor some historic scientist without adequate warning. Thus, the abrupt change by vacuum system manufacturers to the torr rather than mm Hg without explanation had me asking, "what is a torr?" Years-old libraries were no help. The sudden change from cps to "Hertz" for a while left me with a desire to substitute "Avis" in annoyance. Similarly, after preferring magnetic fields in non-rationalized cgs-emu units of Gauss (also metric), I finally became reconciled to Webers/m^2 and then, suddenly I was confronted with a changed name where I could only guess at the meaning. When I first learned metric units, the cgs non-rationalized esu and emu defined quantities in terms of mass, length, and time with $E = D$ and $B = H$ in vacuum so $\epsilon_0 \equiv \mu_0 = 1$, with no real need for a confusing array of labels. The present trend seems to be away from that approach.

In view of the above considerations, I strongly recommend that when new labels are introduced for old concepts, there be a period of ~5 years where a footnote translates the new name into more familiar terms (for scientific publications and equipment specifications). Similarly, if we wish to introduce the metric system in the US, similar footnotes or parentheses should also give the value in customary units. This would possibly aid in public acceptance.

JAMES RAINWATER
Columbia University
New York, New York

1/81

•

I wish to record my strong support for the position of AAPT with respect to SI

continued on page 98