LETTERS

Let's invite children

May I commend you for the interesting and refreshing article on children's books in your December issue. I have long deplored the "ivory-tower" attitude of many writers of science books purporting to be for the average child.

From many years of experience with youngsters, I have seen how frustrating it is to them to try to wade through books full of professional jargon and high-sounding scientific phrases. More power to Mrs Freeman for seeing through this kind of writing, which only masks an author's lack of understanding of children.

Let's invite children into science and not frighten them away from it!

A. Pastornak
North Hollywood, California

Values in a vacuum

The December editorial on the "value vacuum" proposes "an interest in science" as a possible remedy. Unfortunately for this hypothesis, studies of current science and engineering students and graduates indicate great concern for personal status, advancement and income contrasted to indifference to welfare of others, at best, grading into outright contempt for the less fortunate. Academic disciplines, including the natural sciences, do not teach values. The way to teach values is to teach values. There are no shortcuts. **Michael G. Saslow**
University of Washington

Other ways to do it

Friedrich Hund, in his very interesting article "Paths to Quantum Theory Historically Viewed" (PHYSICS TODAY, August 1966, page 23), has made some entertaining speculations as to how modern physics might have developed into its present form if it had not developed in the way that it did. Another question that he did not consider is whether the present formal structure of physics is the only possible one that will accommodate the experimental facts.

One of the main building blocks of modern physics is quantum mechanics. This could have been formulated once two basic principles had been grasped. One of these is that waves and particles are complementary views of the same thing; the logical connection, as distinct from Albert Einstein's 1905 speculation, was first demonstrated by Walter Ritz in 1908. The other is the uncertainty principle, which was known to radio engineers in about 1915 in the form of the gain-bandwidth product of an aerial. If attention had been paid to Ritz's work and to the common knowledge of radio engineers, modern quantum theory might have developed a decade earlier than it actually did.

The other main building block is relativity theory, which can be regarded as the resolution in James Clerk Maxwell's favor of the incompatibility between Isaac Newton's mechanics and Maxwell's electromagnetic theory. The experimental evidence did not necessitate this choice, however; it is equally possible to retain Newtonian mechanics and modify Maxwellian theory. I have recently given an account of a physics built on this basis (*Electronics and Power*, November 1966). Hund's last sentence, "And understanding is no longer pure physics," does not apply to this new physics, which is very understandable. **R. A. Waldron**
The Marconi Company Limited

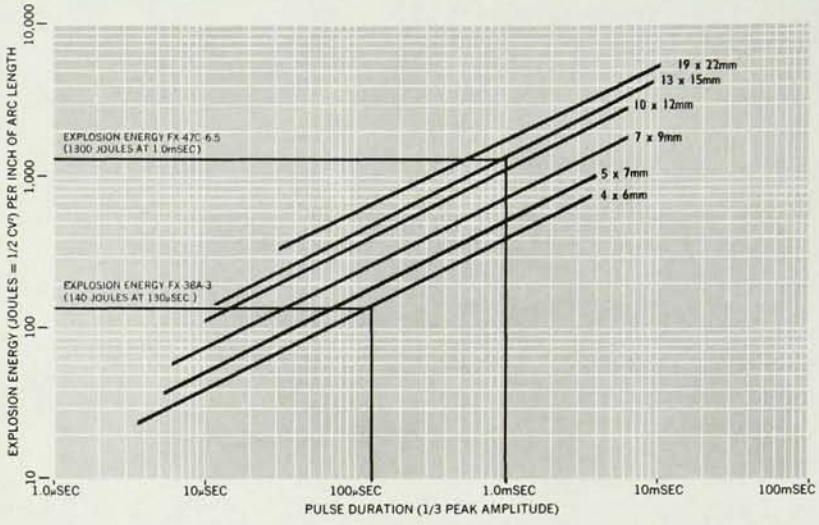
Prejudice is where you find it

On the subject of Negro physicists, Tannie Stovall's letter (PHYSICS TODAY, December, page 11) suggests that racial prejudice may be stronger in France than in the United States—a startling departure from our ordinary beliefs. I have worked at a major government laboratory in Washington, D.C., where I knew well a Negro physicist and also had a Negro secretary. In the small industrial research laboratory in California where I now work, there is a Negro chemist. In neither case did I notice signs of prejudice.

There may, of course, be signs of prejudice which are missed by naïve

ONCE OVER LIGHTLY

Vol. 1, No. 3 PRODUCTS TO GENERATE, DETECT & MEASURE LIGHT



LOADING (JOULES PER INCH) AT WHICH LINEAR (QUARTZ ENVELOPE) FLASHTUBES EXPLODE

FLASHTUBE LOADING CHART

As determined experimentally by our staff, the above chart indicates (in joules per inch of arc length) the loading at which linear quartz flashtubes will explode. For a flashtube with a specific bore size and arc length, this explosion point is a function not only of the energy input per flash but also of flash duration. For optimum performance in free air at a given pulse duration, it is recommended that the energy per flash into a flashtube not exceed 70% of the explosion level. By operating below the 70% level, the life of a flashtube is increased substantially. For flashtube operation in a cavity, the energy input per flash should not exceed 40% of the explosion point. A copy of the chart can be found in Data Sheet 1002-B, Linear Xenon Flashtubes.

WITH AN EYE TOWARD SAFETY

More industrial firms, government and university laboratories are using Model 580 Radiometer and Model 580/585 Spectroradiometer System to detect, measure and monitor hazardous levels of ultraviolet, visible, infrared and laser radiation. These systems offer a convenient means for detecting and measuring both continuous and pulsed radiation over the spectral range from 0.2 to 1.2 microns (ultraviolet to near infrared). Safety engineers can then issue precautionary procedures and equipment to protect personnel operating in the area.

The Model 580 Radiometer, designed primarily for use with monochromatic sources such as lasers, has a wide dynamic range for measuring both low-level diode lasers as well as high-power solid-state lasers with peak powers as high as 10 GW. The Model 580/585 Spectroradiometer measures broad-band (chromatic) light sources. With a monochromator grating system, the power and energy of a source at a given wavelength can be measured and then repeated at various wavelength settings over the spectral band of interest. The 580/585 can also operate into an external X-Y recorder for a direct plot of output vs. wavelength.

Write for data sheets and application notes on these two systems. You may find them enlightening.

SGD-444 PHOTODIODES ARE BETTER THAN EVER

Our engineers have once again proven their mettle by coming up with significantly improved versions of our popular SGD-444 series of photodiodes. Thus, we have been able to eliminate the confusing ABC suffixes which previously characterized the diodes with varying levels of response time, maximum voltage, NEP and D*. Now all SGD-444 diodes have capabilities and parameters equal to, or better than, the previous top-grade A-suffix diode.

The major improved SGD-444 specs for this large-area, 1.0cm² photodiode include a reduced maximum operating voltage of 150 volts (we determined higher operating bias levels are not required in 95% of the applications), a 10-nanosecond rise time, typical leakage current of 0.5 microamps at 100 volts, NEP equal to 5.9×10^{-13} watts, and quantum efficiency greater than 70% over a range from 0.6 to 0.9 microns. Take pen in hand, if you're interested, and request a copy of the new SGD-444 Series data sheet and detailed applications note.

FLASHTUBE NEWS FLASH!

Six new tube types have been added to the standard line of high quality EG&G linear xenon flashtubes. They are: FX-98-3 (5mm bore, 3" arc length, 400 joules); FX-81-4 (10mm bore, 4" arc length, 3000 joules); FX-47C-3 (13mm bore, 3" arc length, 2250 joules); FX-47C-12 (13mm bore, 12" arc length, 9200 joules); FX-77-4 (19mm bore, 4" arc length, 7700 joules); and FX-77-8 (19mm bore, 4" arc length, 15400 joules).

Complete ratings on these types as well as updated information on older linear types are given in the recently data sheet 1002-B, Linear Xenon Flashtubes. It's yours for the writing.

ON COOLING PMT'S

Temperatures as low as −30°C can be achieved with our new, completely self-contained, Photomultiplier Tube Cooling Chamber, reports our man icily. It requires no pumps or dry ice, yet can effect very cold temperatures for minimizing dark current and the resultant shot noise.

Standard temperature controllers are available for stabilizing the temperature of the PMT from ± 0.5°C down to a proportionally controlled ± 0.01°C. The standard EG&G chamber, which is 7¾" square by 12½" long, is adaptable to any end-on PMT with a tube envelope up to 2" in diameter and up to 6" in length. All chambers have magnetic shielding around the tube, interchangeable tube sockets, dynode resistors, a double window to eliminate fogging, and a thermal limit switch for automatic power cutoff.

Applications include scintillation counting, star-tracking systems, photometry, flying spot generators, Cerenkov radiation measurement, laser detection, industrial controls, colorimetry and timing measurements.

All models of the standard chamber are available for delivery within four weeks.

eyes, and perhaps mine are naïve. We must, however, be aware that there is a substantial fraction of the human race that will almost automatically show prejudice against anyone who is *different*. Race, creed, and color are not the only criteria. One sees prejudice against the poor, the rich, the members of certain clubs and the nonmembers; against physicists by engineers and against engineers by physicists and against both by the so called "nontechnical" people; against drinkers by teetotallers and vice versa. There is prejudice by the young against the old and by the old against the young.

There is no end to the list. Employees often consider their employers as oppressors, and employers have been known to regard their employees as cattle. One must, therefore, suggest that race and religion are not the causes of prejudice, but merely convenient handles on which to hang hate by those who are so predisposed. It is the predisposition to prejudice that we need to eradicate, and very little seems to be known about this particular type of neurosis. A Chicagoan says that everyone living west of the Rocky Mountains is stupid; a resident of New Jersey alleges that all residents of Virginia are bigoted devotees of slavery. Some Californians think that all residents of Alabama and Mississippi are subhuman. My wife was once criticized by neighbors for not watching daytime television, and I have been treated coldly for such diverse characteristics as not playing bridge, having an engineering degree, reading detective stories, being fat, writing letters to editors and not being a member of the bar.

Again, the disease is the predisposition to prejudice, not its manifestation against a particular object. For those so disposed can *always* find an object. We should study the disease, rather than the symptoms.

Lawrence Fleming
Pasadena, California

Reviewers and anonymity

In a recent letter (PHYSICS TODAY, November, page 12) Moody L. Coffman suggested that objectivity would be enhanced in the reviewing of submitted manuscripts if either the author's name would be concealed from the reviewer or the reviewer's name would be revealed to the author. In response to this letter, Samuel A. Goudsmit commented (January, page 12) that Coffman's suggestion about concealment of the author's name was excellent but that "unfortunately, it is impossible." (Goudsmit did not comment on the second possibility of revealing the reviewer's name to the author.)

I assume that Goudsmit's comment refers to the impossibility of enhancing objectivity by following Coffman's first suggestion because of the impossibility of concealing an author's name from the reviewer. If it would, indeed, not be possible to conceal the author's name *in all cases*, then certainly nothing would be gained by attempting to do so (neither would anything be lost!). However, I find it very hard to believe that this assertion is true. Of course the reviewer could guess the identity of an author with some degree of certainty in those cases when the subject of a manuscript is a part of a series of research papers on a program that is uniquely the author's—that is, where very few (or no) others have joined in with his program of research. On the other hand, from glancing over the literature for the past ten years or so, it is clear that such cases occur only a (disappointingly!) small fraction of the time. We are living in an age of "bandwagon physics." When, for example, 80 people are all doing active research in the study of the representation of internal symmetry groups to describe elementary particles, I would have serious doubts about any reviewer's ability to pinpoint, with certainty, the identity of the unnamed author. In many instances the reviewer might have a strong feeling about the possible identity of the author; yet, so long as he is *not certain*, the objectivity of his review is bound to be enhanced, as contended by Coffman.

Along with any advantages of the "bandwagon" approach to physics research, a definite accompanying ill, which is hard to ignore, is the strangulating effect on science that is induced by some loss of objectivity. Anything