

letters

A new trial for Galileo

The decision in October of Pope John Paul II to give Galileo a new trial must be welcomed as a means of clarifying the historic relation of the church to scientific advance.

The church's original trial of Galileo has long been a butt of critics and a favored show-piece of anti-clerical zealots, who have used it to obscure the long history of splendid contributions to science by men of the church and by scientists with strong religious convictions. The episode has been particularly exploited by those who regard the church as a political enemy.

Late in the day as it is, it should still be useful to rehearse the events of more than three centuries ago, and lay bare the misconceptions which that earlier trial has fostered about the role of the church in relation to science generally. That role has been far more positive than those whose educations have been almost entirely secular have been led to believe. We physicists have perhaps been as remiss as any for the way in which the conflict between Galileo and the church has been represented and interpreted in our secular schools and colleges.

For example, in Holton and Roller's influential and generally admirable text for non-scientists, "Fundamentals of Modern Physical Science," the persecution of Galileo by the church is described at some length in a chapter entitled "Science and Freedom," in which reference is made in similar terms to the later persecutions of scientists in Soviet Russia and Nazi Germany.

It would strike a more equitable balance if cognizance were taken of the fact that historically the church has been far more forward-looking than such juxtapositions would lead one to believe.

For example, the eminent lay Dutch scholar, E. J. Dijksterhuis, in his superb book *The Mechanization of the World Picture*, has amply documented the many contributions to mechanics made by churchmen who were Galileo's predecessors, and whose work paved the way for his. The work of Copernicus is, of course, the most notable example. Galileo himself claimed to be a

loyal son of the church, and there is no more reason to question his religious sincerity than that of Newton or Pascal.

If we look at the role of the church in advancing scientific knowledge beyond the narrow confines of mechanics, the picture is a dazzling one. Church missionaries have almost certainly been the most effective single group in bringing the population of the globe as a whole within the orbit of modern science. They have done the basic spade work of breaking down language barriers and spreading scientific teaching into classrooms in all corners of the world. And at the same time the medical missionaries have been the first to bring the benefits of modern medical science and technology to all the races of Mankind.

If the church has been less than kind to an occasional scientific dissident, the scientific community has been much less than appreciative of the role of the church in spreading the benefits of science around the globe. We can hope that with the new trial of Galileo, old scores will be wiped clean, and the stage will be set for renewing the symbiotic relationship which historically has been the relationship between science and religion.

LAWRENCE CRANBERG
Austin, Texas

12/80

Overhead for all?

I would not be quite as suspicious of the indirect cost policies of major universities as is John Cramer in his guest comment (January, page 9); but I would agree with his central point: We overhead-paying sponsored researchers do need a representative responsible to (and paid by) us alone, through whom we can aggressively negotiate with our universities over just which indirect-cost services we wish to purchase and at what levels and rates.

I'm convinced, however, that a more fundamental change in university accounting is essential before the "overhead problem" can get better. If indirect costs are real (as of course they are), their reality applies to all activi-

A RARE FIND

It's in BNC's new pulser catalog



BNC pulse generators offer shaping rate, and amplitude features rarely found elsewhere. Find out the whole story by requesting your free copy of BNC's Catalog 81. NIM Power Supplies also included.



Berkeley Nucleonics Corp.

1198 Tenth Street
Berkeley, CA 94710
Telephone (415) 527-1121

Circle No. 9 on Reader Service Card

gamma-XTM

PHOTON DETECTOR



**alone
at the top**

EG&G ORTEC has always been a step ahead in nuclear radiation detection. But our Gamma-X truly stands all alone with its unique capabilities. No other detector even comes close.

25 times more resistant to neutron radiation damage.

Gamma-X is quite different from other photon detectors. The innovative use of our own high-quality n-type germanium and reversed electrode geometry creates a unique new kind of detector. Gamma-X can withstand neutron radiation damage over 25 times better than its predecessors, the p-type Ge(Li) and HPGe detectors. Repair expense and downtime are reduced dramatically.

Detects both gamma and X-rays from 5 KeV to 10 MeV.

Exclusive on the Gamma-X is the ion-implanted boron window completely surrounding the external surfaces. This implanted window is 300 times thinner than windows found on other conventional coaxial detectors. Together with a thin beryllium end cap window, the Gamma-X is capable of low energy X-ray, as well as medium to high energy gamma-ray, spectroscopy. Thus two detectors in one.

Streamline cryostat for easy shielding.

Our exclusive technology makes it possible to tuck preamplifier, HV filter and detector into a cylinder 8" long and less than 3" diameter. Without the obstructing electronic boxes found on other coaxial detectors, the streamline Gamma-X is ideal for applications requiring lead, steel, or anti-Compton shielding.

Fully cyclable to room temperature.

Gamma-X can be safely thermally cycled to room temperature without damage to the detector. Any number of times. No more worries about detector warm-ups. Gamma-X can even be stored without LN².

Want full details? Use our Hot Line: 800/251-9750.
Or write EG&G ORTEC, 100 Midland Rd., Oak Ridge, TN 37830.

 **EG&G ORTEC**

ties in a university, externally sponsored or not; and this reality should be directly felt by every actor on the university stage, whether externally sponsored or not.

What is needed is an "overhead for all" policy, in which every expenditure of funds on a university campus either bears overhead or is part of the overhead. Each academic department, for example, should receive a departmental budget enlarged over its present budget by approximately the current indirect cost rate. It should then pay overhead at the appropriate rate as it expends its funds for faculty salaries, teaching assistants, office supplies or whatever, exactly as we sponsored researchers now do. When I pay a research assistant from contract funds, I pay overhead; when the History Department pays a graduate assistant from a foundation grant, it should explicitly pay overhead on those expenditures also. (It's of course irrelevant to argue that "foundations won't pay overhead." Somebody pays those indirect costs, somehow.) Note that I call for no necessary change in allocation of resources within the university, only for a change in how this is accomplished.

Perhaps the most important virtue of this scheme would be to make the reality of indirect costs apparent to all, and to give all of us an equal motive for reducing them. The motivation of faculty members to keep university costs down becomes far stronger when they realize that overhead cuts directly into their spendable funds than when their indirect costs are simply covered by the university without their explicitly knowing about it.

A second advantage would be to increase the perceived fairness of the system. Those of us in heavily outside-sponsored engineering and science, and those in the nonsponsored humanities, would visibly all be in the same boat together. Universities frequently claim that government contracts do not in fact pay all their real indirect costs. The university might thus have a "university overhead rate" even higher than the federally allowed rate. Those of us in science and engineering, and in humanities, would equally have to negotiate for university funds or make other arrangements to cover the excess indirect costs.

Finally, it should be emphasized that this proposal would not involve extensive new accounting and record-keeping costs. To justify their indirect cost rates on government-sponsored projects now, universities must carefully record all indirect costs, and then make a complex allocation of these between sponsored and nonsponsored activi-

ties. "Overhead for all" is already being calculated. What we need to do is make it explicitly visible, and visibly fair—and then all set about reducing it.

ANTHONY E. SIEGMAN
Stanford University
Stanford, California

1/81

Hampered participation

The American Physical Society Committee on Opportunities in Physics would like to determine the dimensions of a problem that has come to its attention—a problem which can make it very difficult for physicists employed in certain government agencies and laboratories to participate in professional activities of the Society. The Committee has learned of several instances in which local management has imposed complex, limiting and time-consuming regulations in situations where the employee would normally be reimbursed in whole or in part by the American Physical Society for travel and living expenses while on Society business. Taking part in Society affairs on personal time does not appear to ameliorate the situation. It is even necessary for an officer of the Society to write a letter of invitation and justification for each instance of participation.

If the problem is sufficiently widespread, the Committee would prefer to appeal more generally for relief to an appropriate federal agency or official, rather than to deal with individual cases. To this end, the Committee asks that those physicists whose participation in Society affairs has been hampered seriously by such regulations write to the undersigned at 2159 Orchard Park Drive, Schenectady, New York 12309. Replies will be kept confidential if those writing so desire.

RALPH A. ALPHER
Chairman APS Committee on
Opportunities in Physics

1/81

Anonymous refereeing

Having been an author and referee for American Physical Society journals for more than 30 years, having served as a member of the Publication Committee of the Society, having served as Associate Editor of the *Physical Review*, and now in my third year as Editor of *Physical Review Letters*, I found a certain antic charm in Christopher Sherman's description (January, page 15) of the editorial judgment of papers in APS journals as roughly parallel to the judgment of heretics by the Spanish Inquisition and, especially, in Sherman's assurance that all of the refereeing problems of the journals can be solved with simple procedural changes which Sherman will explain to us—if we will

500 Watts of H.F. Power

ENI A-500
broadband
power amplifier
delivers 500 W
0.3 to 35 MHz



Here is the biggest, toughest, ruggedest, solid state Class A linear amplifier we make. It's designed to stand up in hostile environments, yet it's easy to field service because all major subassemblies are "plug in" replaceable. Designed for use in HF transmitters, RFI/EMI applications, linear accelerators, and gas plasma equipment, the ENI Model A-500 broadband power amplifier is capable of delivering more than 500 watts of output over the frequency range of 0.3 to 35 MHz. And like all ENI power amplifiers, the A-500 features unconditional stability, instantaneous failsafe provisions, and absolute protection from overloads. For more information, a demonstration, or a full line catalog, please contact us at ENI, 3000 Winton Road South, Rochester, N.Y. 14623. Call 716/473-6900 or telex 97-8283 ENI ROC.

ENI



The advanced design line of power amplifiers