ralism for support sources might concentrate too much power in a single large department, and the political visibility of such a large DST might become a liability.

Such problems must be weighed against the need to amalgamate the federal R&D effort to solve the problems of administrative inefficiency. But perhaps the plethora of the federal R&D effort has not resulted in duplication, waste and administrative inefficiency—and the creation of a super science agency in the name of administrative efficiency would only create a plethora of problems resulting in a deterioration of American science and technology. The burden of proof that the present system is best—though not without its faults—must rest with the science and technology community.

A. MICHAEL NOLL
Stirling, New Jersey
7/12/77

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The author was a staff member of the Office of Science and Technology from 1971 to 1973 and personally witnessed the disbandment of the White House science-advisory mechanism by the Nixon administration. This letter is based upon testimony submitted by the author to the Committee on Science and Technology, US House of Representatives, for consideration during its deliberations on re-establishing the mechanism.

Philippine repression

I have just recently returned from Manila where I visited a Filipino priest friend of mine incarcerated in the military stockade at Camp Crame for almost a year now without any formal charge against him. His cellmate was Roger Posudas, a physics professor at the University of the Philippines (PhD, University of Pennsylvania, 1970).

Posudas has been in prison for a year and a half as a political prisoner, although he told me that he is accused of being a demolition expert for the New People's Army. His field is general relativity. Some of the reprints he receives are rather formidable looking and have been held up for quite a while, while his jailers scrutinized the equations for hidden messages.

I do not know him well. I only know him from some pleasant conversations I had with him during my visits to the stockade. But I do know very many innocent people here who have suffered imprisonment and much worse for the sole crime of trying to defend human rights. So I promised him I'd write this letter.

The physics community can be proud of itself for the many letters from all over the world sent to President Ferdinand Marcos on the behalf of Posudas. I saw a stack of these letters, but he is still in the stockade. It is very frustrating when both courts and private appeal are of hardly any help. However, public outcry and letters do have their effect. The jailers will sometimes release their victims, not so much out of a respect for human rights or due process of law but simply out of embarrassment.

RALPH S. KROES
Maryknoll Fathers
Davao City, Philippines
10/18/77

Misapplications of uncertainty

Although careless applications of the quantum-mechanical uncertainty principle are not rare, the recent article on ultracold neutrons (June 1977, page 42) contains one that is too gross to ignore. The argument begins with the relation $\Delta E \Delta t \approx \hbar$. It is then asserted that $\Delta E = D\epsilon$, where D is the neutron's electric dipole moment and ϵ is the external electric field. Taking $\Delta t = T$ (the neutron storage time) then yields the result that the smallest electric dipole moment detectable in an experiment on a single neutron is $D \approx \hbar/(\epsilon T)$.

But the uncertainty in the neutron energy is not $D\epsilon$, but rather $D\Delta\epsilon$ where $\Delta\epsilon$ is the rms fluctuation in the electric field (due to spatial or temporal variations). One can regard $D\epsilon$ as the uncertainty in E only in the purely subjective sense that D is a totally unknown magnitude. But purely subjective uncertainties are irrelevant. For example, my own subjective ΔE for a cold neutron is very large at this moment because I do not remember its rest mass, but one would be foolish to hope that one could use this large ΔE to reduce Δt.

In fact, the above estimate of the minimum detectable electric moment is correct, but the derivation quoted is unsound. The experiment consists of measuring the shift of the free-neutron nuclear magnetic resonance frequency that is produced by the application of an electric field. The uncertainty in any frequency measurement is of the order of the reciprocal of the duration of the measurement. Thus $\delta\omega \approx 1/T$, where T is the neutron storage time. The frequency shift due to the electric field ϵ is $2D\epsilon/\hbar$. Omitting numerical factors, we obtain the uncertainty in the electric dipole moment to be $\delta D \approx \hbar/(\epsilon T)$, which is also the minimum detectable dipole moment.

We can now see that $\hbar$ does not enter the answer through the quantum-mechanical uncertainty principle, which plays no role in the argument. The uncertainty in measuring a frequency during a finite time interval is entirely classical, so my conclusion does not depend upon any particular (or potentially controversial) interpretation of quantum mechanics. Finally, I note that F. L. Shapiro,