

many having proven their creativity in diverse fields.

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I have a few things to add to Lee Smolin's reasons why no new Einsteins are coming forth today. Today's scientists are jet-setting, grant-swinging, favor-trading hustlers looking for civil servants who will provide them with a pipeline into the US Treasury. Not only do they get peer pressure to behave this way, they also get arm-twisting from the academic bureaucracy that wants to get its 50% to pay for its bloated overhead. You can't be a used-car salesman and have deep thoughts about the structure of the universe at the same time. You've got to move product—in the case of scientists it's reports and journal publications—and keep moving it even after tenure removes some of the pressure. As for the assorted Beltway Bandits (private industries fulfilling government contract work), some of whom are quite talented, there is no tenure, only the next contract.

Big Al Einstein was not like that. His personal life may have left some things to be desired, but he had professional integrity. Even Ezra Pound had something good to say about him. These days Einstein would be teaching at a third-rate local college in a lower-echelon state university system, if he got an academic position at all. Or he might wind up in a cubicle at some agency that serves as the employer-of-last-resort for physics PhDs. He might even be selling minivans.

One thing I regret about my career at the National Geodetic Survey is that I did not have my hand on the spigot of a pipe leading to the Treasury. Those who did had lots of friends doing them lots of favors, and got to see the world at taxpayers' expense. Everyone else counted the days until retirement.

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Lee Smolin's Opinion piece is wonderfully exciting and long overdue. His section on creativity and independence should be inspirational to all who believe that a university science program should be more than a sorcerer's apprenticeship.

My only disappointment, however, is his proposal for a source of fund-

ing for creative and independent researchers. That proposal misses the point that Einstein's research during his patent-office tenure must have been unfunded. Important questions might include the following: What was Einstein's relationship with his bosses? Did he have to do his research on the sly, as a "weekend problem"? Or did his bosses, like the Medici, encourage or even require that he pursue an independent research program, perhaps because Einstein and his bosses lived in a world as yet unconquered by cost accounting?

If Einstein's bosses were Medicean, then the funding for his research was his patent-office salary. Let's suppose his duties there were the equivalent of a full teaching load. That load would not have been increased as punishment if he had failed to pay for his research from outside sources. Neither would his job have been at risk. Apparently there existed no artificial barrier between teaching (or a teaching equivalency) and research. Until contaminated by federal and corporate dollars this must have been how most research was funded in major universities—and it may be how most research in the humanities is funded today, namely by university administrators who recognize that research is teaching.

Today we have the sorry situation that research must be funded either internally by committee decision or externally. If the researcher fails to pay for his research, then the teaching load (or teaching-equivalency load) is increased or he may lose his job. This state of affairs is accompanied by strong propaganda, to which the young researcher is likely to succumb, that unfunded research, to use the language of sport or business, is not competitive. Other language is used to suggest the worthlessness of unfunded research: It is "personal," or a "hobbyhorse," or a "sandbox."

The concept that research is teaching has vanished from the modern scene. In fact the successful grantee may eventually be coaxed away from research and teaching into administration, which is the apotheosis of all human endeavor whose worth, methods, performance, accomplishments, and *raison d'être* are beyond the reach of peer review. The highest risk in a research laboratory attaches to the research itself; one should do as little of it as possible and what is done should be sup-

ported with infinite protocol, planning, and caution. This requires administration.

It may surprise some to learn that this cost accounting of a researcher's university training and intellectual gift has paradoxically increased that researcher's level of idleness as a scientist. For example, at some of the national laboratories, a PhD-level scientist might be encouraged to occupy what I will call a technical sinecure—a job that is technical but not scientific, one that a person trained at a lower level could perform—in return for certain abstract quantities such as reputation as a scientist and the quality of degree in order to window-dress the laboratory without requiring a commitment to fund any research. Who could possibly take the responsibility for funding research? One obtains a glimpse of the erroneous research philosophy in play here. Anything for pay must be for real work. The *quid pro quo* is some free time and the use of the facilities to do some "personal" research. The paradox is that the cost of one's full-time equivalent does not buy the use of his or her training and talent in any meaningful way to carry out the mission of the laboratory.

Working for the Medici could also be hard. Giorgio Vasari, a biographer of some of the early Renaissance painters, has told how Lippo Lippi was locked in his room in a Medici palace to complete some pictures but escaped by knotting together his bedclothes and letting himself down to the street. Robert Browning imagines in "Fra Lippo Lippi" that the painter, on returning after a night's entertainment, was detained by the police just steps away from the palace. Lippi says to the police,

I am poor brother Lippo, by your leave!

You need not clap your torches to my face.

And here you catch me at an alley's end

Where sportive ladies leave their doors ajar.

Aha, you know your betters? Then you'll take

Your hand away that's fiddling on my throat,

And please to know me likewise.

Who am I?

Why, one, sir, who is lodging with a friend

Three streets off—he's certain . . . how d'ye call?

Master—a . . . Comiso of the Medici.

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