business." Todd says the question of descent was moot and that the radiobiological literature is full of examples where possible HeLa descent in relation to other cell lines is mentioned. In their *Science* report there is no such mention, and the cells are called "cultured human kidney (T-1)." There is nothing in the text to indicate to the reader that the cells are malignant; on the other hand, the report nowhere states that the cells are normal.

The nub of the scientific issue is whether use of cancerous cells in place of what were thought to be normal cells makes any difference. Todd maintains that it does not. Others say it does. "I found it devastating that Todd knew they were tumor cells and did not say that in the [*Science*] article," says Elizabeth L. Lloyd, a biophysicist at Argonne National Laboratory. "That fact is so vital, I think, to any understanding of what's going on."

Lloyd says work in her laboratory shows that, at least in some cases, cancerous human cells in culture are less sensitive to radiation than normal cells. For Todd's experiment, she says, this might change the relationship between radiation dose and cell death—a key parameter that Todd was investigating.

Todd, on the other hand, holds that changes in cell type do not alter the outcome. "When you get right down to it," he says, "the radiobiological conclusions are independent of cell type. The linear relationship [between radiation dose and cell death] applies to every cell type that has been investigated. The use of HeLa as T-1 might have affected the slope of the line slightly, but not the general conclusions."

Such speculations are precisely why the results of Todd's experiments are up in the air, according to Robert E. Stevenson, director of the ATCC. The most important part of Todd's report concerned not the relationship between radiation dose and cell death (the so-called linear hypothesis) but whether or not there was a threshhold at which no observable cell death occurred—an independent parameter that may have been changed by the slope of the line. In any event, says Stevenson, the burden of proof is on Todd. It is not enough to assume that there would be no differences or that observed differences would not affect the conclusions. These assertions need to be proved. "You've got to study the results, not speculate," he says. "I just don't buy [Todd's] assertions that irradiating transformed cells has the same result as regular materials."

Though Todd now makes little of the malignant nature of the T-1 cells, 3 years ago, when he first learned of the possible inadvertent substitution of HeLa descendants for T-1, he was apparently worried. He tried to warn editors and readers in his research reports.

Not wanting to muddy the waters of radiobiology, journal editors frowned on full disclosure. Todd in at least two manuscripts tried to point out the suspected problem, but reviewers and editors recommended that the references be cut, one anonymous reviewer saying that "details of cell culture folk lore are out of place in this journal." The first incident occurred in 1977, soon after Todd had received evidence from the ATCC of the probable HeLa origin of the T-1 cell line. An anonymous reviewer for the *International Journal of Radiation: Oncology-Biology-Physics* wrote that "if you [Todd] really want the punchline to reach the therapists, the manuscript needs to be simplified and detail omitted." The reviewer suggested that the paragraph concerning possible HeLa descent be cut, and Todd subsequently struck it.

The second incident occurred in 1979, when *Photochemistry and Photobiology* published a report by Todd from which a full page of speculations about HeLa descent (that Todd in manuscript called "potentially troublesome") had been deleted. In August 1980, responding to accusations by ATCC director Stevenson of "shoddy" scientific practice, Todd in reply referred to these attempts at disclosure, saying that the incidents indicated that "not all attempts by scientists to be honest and thorough are accommodated by journal editorial policies." To Nelson-Rees, who originally made the problem public, these attempts at full disclosure are only half-heartening. "I don't think that they [Todd *et al.*] swallowed the whistle," he says, "But they certainly didn't blow it."

To Stevenson, such incidents could be avoided in the future if journals demanded proof of cell line authenticity. *In Vitro*, he notes, the Journal of the Tissue Culture Association, demands that specific tests used by authors for verification of purported cell line origins be explicitly stated. If the tests have not been done, *In Vitro* demands that this be stated in the materials-and-methods section. Another possibility that Stevenson foresees is that the ATCC will set up an exhibit at the next national meeting of radiobiologists. "I think we'll have some cell cultures on display and hand out some catalogs," he says. "I think we need to do a little missionary work."

—WILLIAM J. BROAD

For the Weapons Labs, a Countdown of Regents?

Like the Roman general Quintus Fabius Maximus, who won few victories against the Carthaginians but finally wore them down, critics of the University of California's management of the Livermore and Los Alamos nuclear weapons laboratories seem to be counting on outlasting the opposition.

The critics lost again in September when the UC board of regents voted by a two to one margin to open talks with the Department of Energy on renewal of the UC contract to manage the labs. And on 21 November the regents voted for creation of new oversight arrangements for the labs on lines favored by UC President David Saxon. The critics of UC management prefer an alternative proposed by Governor Jerry Brown.

The critics, nevertheless, have taken heart from Brown's opposition last year to UC involvement with weapons work and from his power to appoint regents. Some see a successful strategy of keeping the pressure on and waiting for the balance of opinion and power to tip as Brown appoints new regents who are likely to be less sympathetic to the UC link with the laboratories.

Meanwhile, the critics are also taking direct action. They filed a suit charging conflict of interest against seven members of the board of regents. The suit contends that the regents named stand to benefit financially from their various associations with companies doing business with the labs. The suit asks that the seven be enjoined from voting on matters involving the lab and that the UC management contract, which expires in September 1982, be nullified. Several months of legal argumentation are expected before the court decides whether the suit should go to trial.

Saxon's proposal on oversight has antecedants in a debate over management of the labs that dates back at least to the late 1960's. This September, Brown put forward his own proposals for oversight. An effort was made to reconcile the Brown and UC administration approaches, but Brown declined to endorse the compromise version favored by Saxon.

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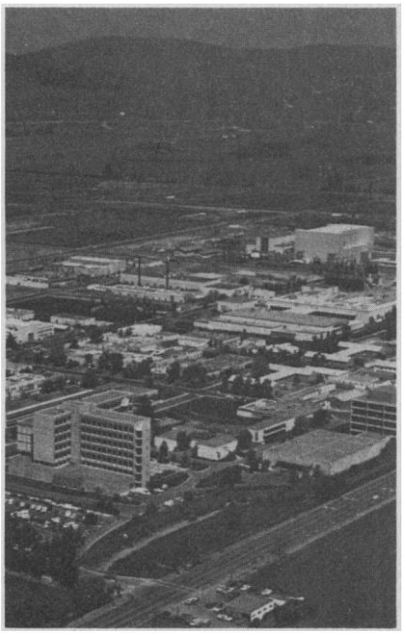

Livermore Laboratory

Saxon's formula emphasizes a "three tiered" mechanism. A regents' committee dealing with the labs is to be strengthened; a new "office of laboratory policy" is to be created in Saxon's office; and two new advisory committees are to be set up, one to evaluate research efforts at the lab, the other to oversee health and safety matters. Not surprisingly, the critics favored Brown's alternative proposal in which he advocated a much more direct and vigorous UC influence on policy for the labs.

The critics say they are encouraged by Brown's sustained interest in the issue and his expressed intention to seek votes on the board to support his views. The critics see the outlook improving for a shift away from the present majority for the status quo as the number of Brown appointees rises. Four Brown appointees recently joined the board and there are now nine Brown-appointed regents. Seven remain from Ronald Reagan's two terms as governor and two were appointed by the present governor's father, Edmund G. Brown. Jerry Brown will have two more appointments to make in March when the number of appointive regents is increased to 20. Other vacancies could open if some present regents are called to join the Reagan Administration. William French Smith, a leading prospect for Attorney General, is a regent, and three or four other regents are cited as possible appointees.

Straight arithmetic may be misleading, however. Not all Brown appointees will necessarily vote as assumed. And, of course, Brown's second term as governor ends in 1982, the same year that the UC contract with the labs is up for renewal.

Should N.Y. Accredit Foreign Medical Schools?

How to handle American students who attend foreign medical schools and then seek admission to practice in the United States is a controversial question in American medicine that sometimes spills over into the larger political arena. Lately, the discussion has shifted to the issue of accreditation of foreign medical schools.

The New York State Board of Regents recently proposed that the state accredit certain foreign medical schools. The principal effect would be to enable U.S. students in such schools to return to take clinical training at hospitals with programs approved by the state.

A General Accounting Office report* to Congress, released on 21 November, recommends as one option that a system of national standards be established for foreign medical schools.

The problem of returning medical students is a significant one; an estimated 10,000 to 12,000 Americans are enrolled in medical schools abroad. Their interests are championed by an effective lobby formed mainly of parents and relatives of students.

The climate now is less favorable to the lobby's cause. Forecasts of a prospective surplus of physicians, such as that in a recent report by the federal Graduate Medical Education Advisory Committee (*Science*, 14 November), undercut an argument that was effective for advocates in the past, namely, that it was in the national interest for U.S. students from foreign medical schools to practice here. Questioning of educational quality has grown more frequent as increasing numbers of Americans enrolled in schools in Mexico and the Caribbean. Some of these schools specialize in recruiting American students.

The major criticism of these "offshore" schools is that they offer only limited clinical training. The New York regents' proposal would make it easier for American students to return to the United States for the required 2 years of clinical training after their first 2 years in foreign medical schools accredited by the state.

Accreditation would be carried out on the basis of questionnaires completed by the schools. Onsite evaluations, an essential part of the accreditation process for U.S. medical schools, would be done only at the request and at the expense of the foreign schools.

Regents staff say that the board's proposal was prompted by concern that present laws and regulations do not adequately cover students from foreign medical schools who come to the United States for undergraduate clinical training. The number of such students is increasing rapidly and the regents' proposal is aimed at ensuring that they receive training under proper supervision.

The regents' proposal is strongly opposed by state and national medical school organizations. Spokesmen for New York schools say that the accreditation methods proposed are inadequate and that a parallel system of medical education would be created that would be out of control. The assembly of the Association of American Medical Colleges in October passed a resolution calling the proposed system "an inducement to many students to seek a less than adequate professional educational experience."

A final decision on the plan by the regents will be made after the state's department of education has formulated regulations and hearings on them are held.

No direct action by Congress on accreditation seems likely since authority on the issue resides, de jure, with state licensing authorities and, to a large extent, de facto, with the medical profession.

The regents' proposal, however, seems to be acting as a catalyst for attention. And, while accreditation is the current focus, the fundamental issue, as the GAO report indicates, is the growing number of medical students using U.S. hospitals for clinical training.

*"Policies on U.S. Citizens Studying Medicine Abroad Need Review and Reappraisal."

John Walsh