Scientifically Speaking

Apricot pits and cancer

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Washington, DC—"These are bad times for reason, all around. Suddenly all of the major ills are being coped with by acupuncture. If not acupuncture, it is apricot pits. . . ." (Lewis Thomas).

Thomas has a point. Apricot-pit cultists are gaining ground. Since the early 1970s, the Laetrile movement has accelerated astonishingly in the United States. It is estimated that 75 000 or more Americans have taken the apricot-pit derivative in the belief that it will cure cancer. During the past three years the substance, which is banned from interstate commerce by the federal Government, has been legalised in 17 states. In several states that have not sanctioned Laetrile, the issue is before the courts. Recently, the parents of a 3-year-old boy with lymphocytic leukaemia fled to Mexico rather than abide by a Massachusetts court order to stop giving him Laetrile and vitamin A. And, late in January, the Laetrile issue reached the United States Supreme Court. The justices agreed to review a lower-court ruling that the federal Government has no authority to regulate the use of Laetrile by patients who are terminally ill with cancer, because the standards of "safety and efficacy" that underlie the food and drug laws cannot be applied to someone who is about to die.

Laetrile also has insinuated itself into the research community as never before. Long the subject of animal studies, Laetrile is just now being put to the clinical test by the National Cancer Institute, which is conducting a trial in 150-300 terminally ill patients. Institute director Arthur C Upton admits that political pressure rather than scientific evidence is the principal reason for undertaking the trial. Laetrile supporters, gathered under the banner of "freedom of choice" and unanimous in their view that the doctor does not always know best, have succeeded in pressuring the medical establishment into doing things it would otherwise never consider. By all conventional scientific standards there is no evidence that Laetrile works.

The cancer institute and clinical trials

The idea that the National Cancer Institute should sponsor a clinical trial of Laetrile has been around, but successfully resisted, for at least 15 years. The institute's rationale really was quite simple. Drugs are not to be tested in man unless there are data from animal or in-vitro studies that suggest appropriate biological activity. Over and over again, the NCI, along with the US Food and Drug Administration, the American Medical Association, the American Cancer Society and others, have concluded that such data do not exist. A clinical trial would therefore violate traditional standards and would, in fact, be downright unethical. One cannot give even a terminally ill patient an agent one believes to be utterly worthless.

The Laetrile faithful, of course, were not impressed and chose to see conspiracy, not reason, in the medical establishment's refusal to test the substance in patients. The depth of their feeling became apparent a couple of years ago when the Food and Drug Administration held a public hearing on Laetrile, when Emil J Freireich of the University of Texas Medical School at Houston asked increduously, "You surely cannot believe that a quarter of a million of American physicians are sitting on a cancer cure just so they can get rich?" Laetrile cultists shouted, "Yes."

Faced with the fact that thousands of Americans were turning to Laetrile, National Cancer Institute officials felt obliged to "do something," but could not agree just what. Throughout the early winter of 1978, they debated the pros and cons of going ahead with a clinical trial. Unable to reach a consensus, they devised an ingenious, but doomed, plan to get around the ethical dilemma by conducting a retrospective study of cancer patients who were taking Laetrile, legally or not, in what NCI deputy director Guy R Newell called a "kind of clinical trial going on in the community." On the assumption that Laetrile believers, given the opportunity, would come forward with medical evidence to support their claims, the NCI decided to try to collect the case records of 200-300 individuals who had documentable cancer, who had been taking the drug, and who also had documentable evidence of remission or tumour regression. With the co-operation of the Committee for Freedom of Choice in Cancer Therapy—the largest of America's pro-Laetrile lobbies with about 60 000 active and inactive members—NCI sent out thousands of letters soliciting data. They expected to be inundated with patients' records; instead, they received only 93. Most of them had far too little information to be useful. In all, only 22 cases could be evaluated, and of them only six validated the claim that the patient's cancer improved while taking Laetrile. Whether improvement was *because* of Laetrile is impossible to judge. Statistically, the retrospective study was a bust. Moreover, it did not even provide enough anecdotal data to ease objections to a clinical trial on ethical grounds. Nevertheless, NCI took it to mean just that, saying that the six cases "could not be ignored."

In September, NCI director Upton decided to go ahead with a clinical trial in an attempt to resolve the controversy "once and for all." Preliminary data may be available some time this summer, but, unless they are clearly positive, Laetrile supporters are not likely to be impressed.

Cancer as a metabolic disease

As part of the strategy to make Laetrile acceptable, leaders of the movement have evolved a theory of cancer as a metabolic disease that must be treated (and even prevented) by a regimen

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that includes not only Laetrile but also vitamin A, enzymes, and a vegetarian diet. In this "natural" cure context, Laetrile is called a natural vitamin, B-17 (not a drug), and is promoted as a product that ought to be available at health-food stores. In addition to passing Laetrile off as an ordinary vitamin, the faithful also maintain that it is non-toxic. Much has been made of the latter point.

As long as it does no harm, the Government has no right to stop people from taking it, supporters argue, unconvinced by the reply that patients taking Laetrile may be depriving themselves of conventional, efficacious therapy. The assumption that Laetrile is non-toxic helped persuade many State legislators that it should be legalised. Nevertheless, recent data indicate that Laetrile is not as harmless as it is purported to be, especially when taken orally. In fact, one of the reasons for the Massachusetts court ruling that the 3-year-old boy with leukaemia should stop taking Laetrile tablets was that he was showing signs of low-level cyanide poisoning (apricot pits contain cyanide).

Laetrile in court

The case that has landed Laetrile in the Supreme Court began four years ago in Oklahoma, where a group of cancer patients sued to prevent the Government from interfering with the distribution of the drug. The plaintiffs, each terminally ill, filed a class action on behalf of themselves and others who were dying from cancer. In December 1977 the court ruled in their favour, citing two reasons for its decision. Firstly, the judge ruled that Laetrile, having been around a long time, cannot be classified as a "new drug" under the 1962 amendments to the US food and drug Act that says drugs must be proved to be "safe" and "efficacious." Secondly, he said, "by denying the right to use a non-toxic substance in connection with one's own personal health care, [the Food and Drug Administration] has offended the constitutional right of privacy."

That ruling was promptly appealed to the 10th US Circuit Court of Appeals in Colorado, which also came down against the government and on the side of those who would take Laetrile. Nevertheless, the appeals court, which issued its opinion last summer, ignored the constitutional right of privacy issue that swayed the Oklahoma court and struck out into a new area. The appeals court took the view that questions of "safety" and "efficacy" do not apply to the terminally ill; hence the Food and Drug Administration has no jurisdiction with respect to drugs for the dying. The court said simply that all a dying person needs is a letter from his doctor certifying terminal illness, and there you are free to take all the Laetrile you want, so long as you take it intravenously. In an odd aside that is being construed as a concession that oral Laetrile may be toxic, the court upheld the ban on Laetrile tablets.

It is this appeals court decision that will be reviewed by the US Supreme Court. Government lawyers who have taken the case to the Supreme Court on behalf of the Food and Drug Administration are furious about the appeals court ruling which, they believe, has no basis in law or common sense. There is nothing in the legislative history of the 1962 FDA law that exempts the terminally ill from protection from unsafe or ineffective drugs; quite the contrary, they argue. Furthermore, they contend that the appeals court ruling, which is not limited to terminally ill cancer patients, but to all those who may be dying, ". . . would make it difficult if not impossible for the [Food and Drug] Commissioner to discharge his statutory responsibility to keep unproven drugs out of the marketplace." The case has ramifications that go far beyond the Laetrile question.

Although one could construe the Oklahoma court's right of privacy decision as a case of "freedom of choice" run amok, it looks good in light of the appeals court's bizarre judgment that the terminally ill are exempt from the law. It may yet turn out that Laetrile is therapeutic, but this is not the way to prove it.

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Is polio immunisation advisable for a middle-aged tourist visiting Tunisia? Is a previous attack of "Royal Free encephalitis" any contraindication?

There is a greatly increased incidence of poliomyelitis in recently arrived Westerners to the poorer countries of the world. Oral poliomyelitis immunisation is therefore strongly advised for such travellers, including the middle-aged, and a full course of three doses should be given for adequate protection. A previous attack of the Royal Free encephalitis would not constitute a contraindication to poliomyelitis vaccination.

Is permanent nerve damage found after electrocution?

Electrocution actually means, according to the *Oxford Dictionary*, killing by electricity. I suspect the questioner would like to know the answer as to what happens after a severe or mild electric shock. For an electric current to flow there must be a closed pathway or circuit, and the difference in potential or voltage must exist between two points in this completed circuit. After this Ohm's law comes into its own. The end result in electric shock is always uncertain as many factors influence the outcome. Body tissues vary considerably in their resistance to the flow of current conductivity, being roughly proportional to the water content. Alternating current is more dangerous than direct current, partly because of its ability to produce tetanic muscular contractions, therefore making it difficult to let go. In severe electric shocks there is extensive destruction of tissue occurring instantly, and in addition injury from ischaemia produced by oedema. This is accompanied by severe metabolic acidosis. If there is no immediate damage and permanent damage to nerves by the heat produced, which may be as high as 10 000°C in big shocks, there are late features in the nervous system such as visual disturbances, peripheral neuropathies, incomplete trans-section of the spinal cord, and reflex sympathetic dystrophies. Occasionally epilepsy develops after electric shocks and certainly intractable headaches. Damage to patients who die immediately is limited to burns and generalised petechial haemorrhages. If the patients survive for longer there may be focal areas of necrosis of bone, large blood vessels, muscle, peripheral nerves, the spinal cord, and brain. Renal tubular necrosis also may be seen when acute renal failure follows extensive tissue destruction.

Apfelberg, D B, *et al*, *Journal of Trauma*, 1974, **14**, 453.
Artz, C P, *American Journal of Surgery*, 1974, **128**, 600.

Do adhesions between prepuce and glans penis in 4- or 5-year-old children warrant surgical treatment?

In the newborn boy the visceral surface of the prepuce is adherent to the glans penis and these adhesions usually resolve spontaneously during infancy. Accumulation of smegma from the preputial glands mixed with retained urine may produce chemical irritation or permit secondary infection in those children in whom these adhesions persist. Adhesions persisting between the prepuce and the glans penis in a 4- or 5-year-old require no surgical treatment in the absence of symptoms. Parents of these children should be advised on the correct methods of hygiene.[1] The adhesions will normally break down with time and allow full retraction of the prepuce.[2] Surgical treatment should be considered only when chemical irritation or secondary infections develop and is either simple division of the adhesions under general anaesthesia or, when phimosis has developed, circumcision.

[1] Hunt, D, *The Medical Journal of Australia*, 1967, **1**, 1100.
[2] Allen, J S, Summers, J L, Wilkerson, J E, *Journal of Urology*, 1972, **107**, 498.