

On closer examination, the Miller brief reveals that tannic acid in beer may not be so poisonous an additive as a quick reading might suggest. It does not say that the concentration of tannic acid in AB beers is higher than in other beers, nor that it has increased over the years. The report cited by Miller in raising the health alarm is informative in this matter. It states: "There is no evidence in the available information on tannic acid . . . that demonstrates or suggests reasonable grounds to suspect a hazard to the public when it is used at levels that are now current and in the manner now practiced [1977]."

George Irving, Jr., chairman of the committee at the Federation of American Sciences for Experimental Biology which wrote this report for the FDA, said that the conclusions on tannic acid were written in the "standard boilerplate" used on such occasions. In this instance, tannic acid was given the rating known as "number two," slightly less than the perfect bill of health—number one—which implies that no future health risks are envisioned. Examples of additives that have received the lowest rating—number four—are salt and caffeine, both considered more hazardous than tannic acid. Incidentally, a mug of tea is likely to contain much more tannic acid than a glass of beer.

Miller's brief goes into great detail on the chemistry of brewing, the doctoring done to adjust the acidity of water with calcium sulfate and sulfuric acid, and the use of heavy machinery to prepare and

cook the brew. All this detail is meant to demonstrate that beer making is industrial and not a natural process.

At first, AB issued a terse response, calling the Miller complaint a "publicity ploy without substance." About a week later, AB sent wholesalers a pamphlet titled, *Beer, the Natural Question*, in which it attempted to refute Miller's charges in detail. In this propaganda booklet, AB claims that the tannic acid used in its beers is a "natural material," that its beechwood "chips" are not a marketing gimmick but a "generations-old and extremely costly" natural catalyst used in the fermentation process, and that the chemicals added to the brewing water are the same as those used by municipal water companies. "Anheuser-Busch generally brews with the same water that comes from the tap in peoples' homes," the pamphlet says, but in some plants AB "further purifies and adjusts its water" using the "same materials and methods" used by water companies. Next, the pamphlet offers a sharp critique of the competition, including a list of "man-made" compounds allegedly found in Miller beers.

Like all good quarrels, this one has a long history. It was preceded more than a year ago by a similar attack on Miller in a brief filed at the FTC by Anheuser-Busch. In this challenge of November 1977, AB accused Miller of deceiving the public by packaging its American-made Lowenbrau beer in containers that were virtually indistinguishable from those used for the German beer called Low-

enbrau. Miller bought the right to use the German name, the labels, and the recipe, but it marketed a beer that many consider to be a distinctly inferior doppelgänger of the European beer. Anheuser thought consumers were being tricked into believing that Lowenbrau was German, and it asked the FTC to investigate.

In its petition, AB pointed out that the American Lowenbrau was artificially carbonated, produced from a malt of 28 percent corn grits, and doctored with "at least two non-natural additives" to produce clarity and good foam. The original beer is made of 100 percent barley malt, contains no additives, and is carbonated by natural fermentation, according to AB. The FTC declined to investigate these charges, but the petition had its desired effect. Miller suffered a bout of bad publicity and modified its advertising to make it plain that Lowenbrau is made in America.

The FTC thus far has shown no interest in becoming the referee in this name-calling contest because disputes over labeling of alcoholic beverages falls within the jurisdiction of the Treasury Department's Bureau of Alcohol, Tobacco, and Firearms. But the FTC may be compelled to take an active role. Miller spokesman Guy Smith said it is a "very serious matter," and "not at all a reprisal" for the earlier AB brief against Lowenbrau. Since the FTC has ruled on naturalness in other products, it may have no alternative but to define, once and for all, what is natural and unnatural in brewing.—ELIOT MARSHALL

Scientists Quit Antibiotics Panel at CAST

Academics and animal feeds do not mix

It is difficult to bundle scientific objectivity and public advocacy into the same package, and few people even try to do it. One group that does try recently met with a spectacular failure. It is the Council for Agricultural Science and Technology (CAST), an association of industrialists, farmers, and agricultural scientists.

CAST devotes much of its time to showing the federal government why chemicals used on the farm are less dangerous than someone has claimed them to be. It often presents its arguments in the form of neutral scientific reviews. Because of the inherent tension in its work, CAST lives and breathes con-

troversy, but seems not to thrive on it.

In December seven academic scientists resigned from a CAST task force planning a report on the risks of feeding livestock large but less than therapeutic quantities of antibiotics to promote growth. The Food and Drug Administration (FDA) found in 1972 that the unregulated use of drugs in feeds posed a significant health hazard because it creates an "ideal environment" for the generation of antibiotic-resistant strains of bacteria that may infect humans. Since 1972 the FDA has been trying to regulate the use of antibiotics in animal feed, and up until now, agricultural lobbyists have argued successfully against

regulation. FDA Commissioner Donald Kennedy revived the campaign to control drugs in feed in 1977, but Congress intervened in September 1978, ordering the FDA to delay its decision until new hearings and studies have been completed, one of which will be conducted by the National Academy of Sciences. The CAST report was intended for use in these hearings, in congressional debates, and in news briefings, as an objective summary of costs and benefits.

In quitting CAST, six of the scientists signed a sharp letter of protest on 13 December accusing CAST of omitting unfavorable evidence on the risks of drug use from a draft final report, stressing favor-

able evidence on the benefits, and generally bending science to fit the public relations aims of the organization. Those who signed the letter were Roy Curtiss III, a microbiologist at the University of Alabama and creator of the disabled bacterium used in gene-splicing experiments; Raul Goldschmidt, a colleague of Curtiss at Alabama; Richard Novick, a microbiologist at the Public Health Research Institute of the City of New York; Julian Davies and Michael Haas, biochemists at the University of Wisconsin; and Vickers Hershfield, a microbiologist at the Duke University Medical School. A seventh member of the task force, microbiologist Marvin Bryant of the University of Illinois, resigned in January, joining the protest.

"The microbiological aspects were the whole crux of the problem," said Virgil Hays, chairman of the task force and a professor in the animal sciences department at the University of Kentucky at Lexington. Hays and CAST's executive vice president, Charles Black, recruited the seven experts in antibiotics in 1977 in order to give CAST's work more depth and credibility. As Black put it, "These people were invited to participate because they were specialists in microbiology. We wanted them so that the whole story would be told. We're going to try to keep them in there." When they left, the scientists asked that neither their names nor their research be included in the report, possibly a fatal blow to the paper and to CAST's reputation.

CAST, based at Iowa State University in Ames, was organized in 1972 "to advance the understanding and use of agricultural science and technology in the public interest" and to provide information on disputed issues in agriculture. The group is governed by the members of the 25 scientific societies that belong to it, and it finances nearly two-thirds of its \$265,000 annual budget with donations from industrial "supporting members" such as Dow Chemical, American Cyanamid, Eli Lilly, Mobil Chemical, and others. In its policy reports, it maintains a strictly neutral stance, although the conclusions often seem to favor the benefits of using chemicals over the risks. CAST supported the use of the herbicide 2,4,5-T and the use in animal feed of the hormone diethylstilbestrol, for example.

When Black wrote to the scientists who agreed to serve on the antibiotics task force in May 1977, he made it clear that he wanted them to be dispassionate, even bland, in presenting the facts: "You should recognize the arguments on both sides and should keep them in due

perspective without leaning too far one way or the other." Black also instructed the experts *not* to make recommendations: "If we write our educational material properly, the persons who read it will be able to appreciate the points we wish to make." Furthermore, he added, if the policy-makers "have reasons for adopting a policy other than the one for which some of us have a personal preference, our subsequent relations with them will be far better than if we had clearly recommended something they did not adopt." Hinting at one's convictions is more politic than stating them plainly.

There is a difference between blandness and objectivity, the microbiologists say, and they feel that their expertise was trampled in the rush to write an "even handed" report favoring the use of antibiotics. Two things annoyed them in particular. One was an impromptu rebuttal to an ABC news documentary on animal feed, given in the summer of 1978 by a CAST task force headed by the same man who headed their own group—Virgil Hays. The rebuttal disparaged the remarks of a microbiologist who appeared in the documentary—Stanley Falkow of the University of Washington—and whom CAST's microbiologists respect. According to Roy Curtiss, "We were confused. Some of us even thought the rebuttal was submitted by the task force we were members of and that we were in part responsible for it." Only later, "in a roundabout way," Curtiss said, they learned that no member of their group had been asked to comment on the ABC documentary, and in fact CAST never consulted any microbiologist—just a few veterinarians. Black commented: "That was a separate project. They had nothing to do with it. They aren't the people who decide what is done" at CAST.

The other complaint was that CAST failed to give the microbiologists' views adequate weight in the preliminary report filed with the FDA in 1977, or in the final draft sent out for a last reading on 4 December 1978. The final draft, according to the letter of resignation, failed to include information presented to the group in November "which we believe is pertinent," and it included other controversial sections "never presented nor discussed by the task force." The paper "contains numerous inaccuracies and is misleading," the letter charged. Curtiss gave an example. In the economic analysis section, CAST calculated that if antibiotics were banned outright it would cost farmers and consumers between \$500 million and \$2 billion a year. But this estimate is misleading, Curtiss be-

lieves, because it does not correspond to what the FDA has proposed. The FDA has approved more than 50 drugs for use in feeds as alternatives to penicillin and tetracyclines, Curtiss claimed, but CAST never considered what it would cost to switch to these. Presumably it would cost less than using no drugs at all.

Black said that Curtiss and the others were not invited to write the whole report—economics and all—just the section on microbiology. He mentioned that the microbiologists had been sent on several trips at CAST's expense to gather evidence supporting their views, that no one had told them what to write, and that, as editor, he had done all that he could to accommodate their late additions to the report. The heavy editing was necessary, he said, because "time was marching on" and overlapping segments had to be cut by someone. He insisted that there is still time for revision, and cited a letter dated 22 January, in which he asked the dissidents to rejoin the group. In the letter, Black offered several enticements, including a trip to Europe for one of the microbiologists to gather more data. Black's most generous proposal was to allow the dissidents to remain members of the task force, but to print their names only under the section of the report they wrote. In addition, he offered to publish their criticism of other sections.

The microbiologists seem in no mood to accept. Curtiss said the likelihood of his changing his mind was "very remote." Novick said he "absolutely would not" rejoin. Others, including Hershfield and Davies, said they were disillusioned and discouraged. "It left a bitter taste," Hershfield said, "They were trying to refute our arguments with what we considered to be fallacious statements." Like others, she was put off by what seemed a dull, inflexible bias in favor of industry in the meetings. When asked why they had agreed to work for CAST in the first place, the scientists gave a common answer. We were naïve, they said.

This is a plausible explanation, but problematic. CAST has been accused of bias before, as it was when members of the Entomological Society of America waged a losing campaign against joining CAST 3 years ago (*Science*, 20 August 1976). The news of that quarrel must never have reached the seven microbiologists. Although CAST's reputation for scientific integrity apparently survived that earlier embarrassment, it will have a hard time surviving the present one.—ELIOT MARSHALL