

found that stress resulted in the inhibition of growth of mouse mammary tumors.

Paradox, as Weiss notes, is really an indicator of another level of complexity. Such experiments demonstrate that the pathways linking psychological or behavioral factors to disease states are far more tortuous, branch in many more ways, and are influenced by far more factors than had been previously imagined.

Researchers are now trying to map

some of the connections that have been observed for centuries but never understood. Saul Schanberg of Duke University, for example, has nailed down a chemical indicator of "maternal deprivation syndrome," the phenomenon of stunted physical and emotional development in babies deprived of handling. He has located a particular fast-action enzyme (ODC or ornithine decarboxylase) involved in growth, development, and differentiation, which varied widely in in-

fant mice depending on how much time they were deprived of their mothers.

Behavioral medicine has tackled only a limited assortment of disorders so far. It ultimately could affect treatment of any disease, however, including those whose causes are clearly external (such as bacterial diseases), because it takes into account the wealth of factors that influence an organism's susceptibility, ability to fight, and ability to respond to medication.—CONSTANCE HOLDEN

Health Committee Investigates Farm Drugs

Proposed legislation would enable FDA to ban the use of antibiotics in animal feeds

Although pigs are at center stage in this controversy, the National Pork Producers Council decided not to speak at hearings on the farm use of antibiotics held 12 and 24 June by Representatives Henry Waxman (D-Calif.) and John Dingell (D-Mich.). The congressmen were laying out the case for their bill (H.R. 7285), which would give the Food and Drug Administration (FDA) more power to carry out its intention of banning the use of penicillin and tetracycline as feed additives. The FDA has been blocked for 2 years now in this campaign by agricultural committees in Congress. They have insisted that the question needs more study, not action (see *Science*, 25 April). Dingell and Waxman are trying to break the logjam.

"We're dealing with raggedy science," said Dingell's aide, who explained that Dingell decided to push for new legislation because he thinks the experts are not likely to resolve the issue soon. A panel at the National Academy of Sciences concluded this spring that for technical reasons it may be impossible to prove what many people suspect—that using antibiotics in the barnyard helps create drug-resistant bacteria which will infect humans.

The Pork Council stayed away from the hearings, according to a letter from its president, "mainly because we do not consider it to be a good use of our time or [of that of] the members on the subcommittee"—Waxman's health and environment subcommittee of the House Interstate and Foreign Commerce Committee. The pork people may not have

liked the idea that their farm issue was being turned into a health issue. They declared it a boring scene, and kept their distance.

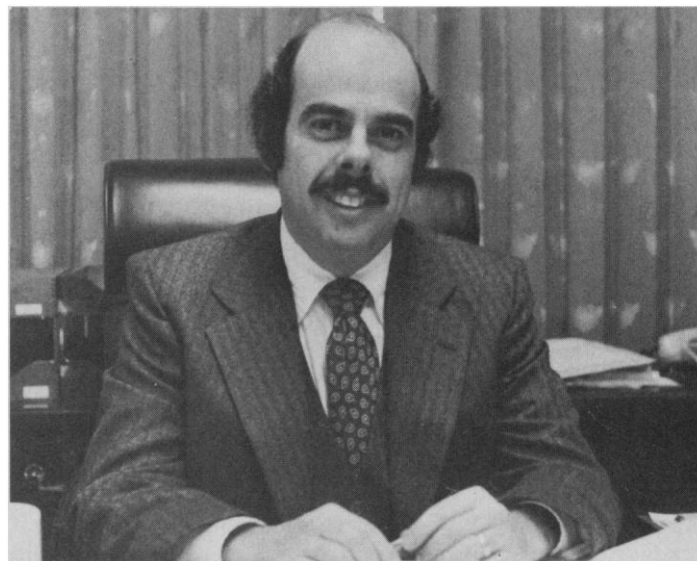
An aide to Dingell speculated that the Pork Council really stayed away out of embarrassment. Its chief lobbyist and regular Washington spokesman, C. D. Van Houweling, retired 2 years ago from the directorship of the bureau of veterinary medicine at the FDA. This office is directly responsible for animal drug policy, and it is being pressured mightily by the drug and meat producers to say that it is all right to mix penicillin and tetracycline in feeds as a growth promoter.

Van Houweling left office before the new bureaucrats' ethics code went into effect, and so he is not prevented from

engaging in what the new code would call a conflict of interest. A year from the day of his retirement, he was free to lobby Congress and his old colleagues to see things the way the pork producers do. According to his own interpretation, however, he was free to act as he pleased on the "generic issue" involving antibiotics "the day after I walked out of the office." Yet it may still prove a bit hard for him to execute this change of roles with grace.

Van Houweling's situation contrasts, incidentally, with that of his successor, Lester Crawford. The latter will retire on 1 August to return to the faculty of the University of Georgia. Crawford told *Science* that the reformed ethics code, which does affect him, will mean that

Representative Henry A. Waxman, chairman of the House health subcommittee, supports the FDA's attempt to curtail the use of penicillin and tetracycline in feeds.





Representative John Dingell, sponsor of the bill to cut back antibiotic use, says it is time for the politicians to settle an issue which the scientists have been unable to resolve.

during his lifetime he will never be able to go before the FDA to argue his position—that the pork producers are wrong. He thinks that penicillin and tetracycline are so valuable as human medicines that their potency should not be compromised, which he thinks is happening today, by allowing them to be used as animal fatteners.

Had Van Houweling or his associates from the Pork Council shown up to speak, Dingell would have given them a hard time. No doubt the pork people knew this. In the event, Dingell dished out his invective to the Animal Health Institute, which he referred to as the "Animal Hypocrisy Institute." Its members (52 large drug makers) produce 90 percent of the veterinary pharmaceuticals used in this country each year. It too favors the use of penicillin and tetracycline in feeds. Dingell said, "Such groups are always eager to use science as a shill, and seek comfort in, and profit from uncertainties." This sort of language, Van Houweling said, is incredibly unfair, since every interest group has the right to organize under however fancy a name it chooses to make its views known.

The pork producers themselves gave a fairly good explanation for their absence. In the letter to the subcommittee, they said that this issue had already been reviewed by the Senate and House agriculture committees, and by the agriculture appropriations subcommittee in the House (all of which sided with the meat producers and drug companies against the FDA). The letter hinted that Waxman and Dingell were interfering in other peoples' business. It pointed out that there is no rock-solid proof that human health is being endangered by the use of

antibiotics in feeds. And it chided the subcommittee for diverting its staff from attacking "the many pressing, critically important national problems facing this nation and Congress," among which is *not* the feed question.

Lastly, the pork people wrote, "Unfavorable publicity for our products, just when we are trying desperately to encourage the consumption of pork . . . is the last thing we need. Providing a public platform for misguided activists to make unfounded charges is a distinct disservice to not only the pork producers but all animal food producers in the U.S., and the U.S. consumer."

The pork producers' spokesman, C. D. Van Houweling, saw it as a case of "the wrong bill in the wrong committee at the wrong time."

Van Houweling saw it as a case of "the wrong bill in the wrong committee at the wrong time." The cattlemen also stayed away, he pointed out. And he was baffled by Dingell's decision to intervene in a matter already being handled by other committees. "I don't see how he can push this as a health issue," Van Houweling said.

Where does the misguided activism come from? Thomas O'Brien comes from the Harvard Medical school, where he is associate professor of medicine and director of the microbiology laboratory at the Peter Bent Brigham Hospital. He

told the subcommittee on 12 June that his concern about animal feeding practices stems not from a "theoretical" worry, but from what is already known about the behavior of bacteria. By creating an environment in which bacteria do battle over a long period with antibiotics, man is forcing the bacteria to remold themselves by evolutionary processes into strains which are invulnerable to the antibiotics used against them. The ability to resist antibiotics is carried in genes, and it can be passed from one generation to another. O'Brien thus described the problem as a cumulative one: the more we expose bacteria to antibiotics, the more we will have to contend with resistant strains.

None of this would affect animal feeds if animal bacteria were distinct from human bacteria, but they are not. Some strains inhabit both realms, and genes for resistance can pass freely from animal to human bacteria. O'Brien suggested that there may be a finite number of types of antibiotic to be discovered. He saw an ominous sign in the fact that there has been a declining rate of discovery of new types since 1960. In view of this, he said, it would be prudent to use our most valuable antibiotics—penicillin and tetracycline—most sparingly.

William Hewitt, chief of the division of infectious diseases at the University of California at Los Angeles, challenged the notion that antibiotics are a depleting resource, but agreed that penicillin and tetracycline are becoming obsolete for

some illnesses because they have been so broadly administered over the last three decades. There is no evidence that feeding drugs to animals has contributed to this phenomenon, he said. He thought it would make more sense to restrict the human use of these drugs than to attack the farm problem.

Yet because 40 percent of the antibiotics used in this country are used in feeds, and because there are 18 substitutes for penicillin and tetracycline available at little extra cost, attacking the farm problem is the easiest thing to do.

—ELIOT MARSHALL

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