additive that is carcinogenic in test animals to be banned.

Moreover, industry observers looked on uneasily as EPA moved to adopt the new regulations that would establish a presumption against new or continued registration of any pesticide producing evidence in laboratory or field tests of oncogenicity or teratogenicity. Although the presumption would be "rebuttable," the applicant for registration would have to show either that the risk was not so great as initially indicated or that it was outweighed by potential economic benefits.

The lobbyists' major aim was to amend the pesticide act in such a way as to give the Secretary of Agriculture a veto over the EPA administrator's decisions on which pesticide uses should be allowed or banned. Train denounced this veto proposal as an "administrative nightmare," and,

Penicillin G: Suddenly a Shortage

On Friday evening, 27 February, the Johns Hopkins Hospital almost ran out of intravenous penicillin G. Hopkins was not alone. No one is certain of the scope of the problem, but at scattered hospitals throughout the country, pharmacists were informing startled physicians that they were out of, or almost out of, one of the most widely used antibiotics. It is not the sort of thing one expects, yet queries to the Food and Drug Administration (FDA) and the Pharmaceutical Manufacturers Association (PMA) revealed that spot shortages of fairly common drugs are not all that uncommon. During the past 2 or 3 years, there have been passing shortages of ampicillin (another common antibiotic), quinidine (a heart regulator), heparin (an anticoagulant), and insulin. So far, none of the shortages has been extensive enough or prolonged enough to constitute a major health hazard, but certainly the possibility is there and the phenomenon of even temporary shortages poses difficult questions. Paul Lietman, a clinical pharmacologist at Hopkins, recounted what happened at his hospital, which buys most of its intravenous penicillin G from E. R. Squibb & Sons of Princeton, New Jersey. Squibb's pipelines had run dry, and Hopkins, which realized the shortage was coming 3 weeks in advance, began looking around for another supplier. It found one that could sell it enough penicillin G to last a couple of weeks, no more. So, Lietman explained, when it became apparent that the hospital really was virtually out, they put aside a small stockpile for the rare patient (someone with bacterial endocarditis, for instance) for whom intravenous penicillin G is essential and began using a substitute antibiotic for most patients. "Fortunately," says Lietman, "because we have so many substitutes, this shortage has not caused serious health problems."

What happened to the supply of penicillin G? It seems it has to do with a proposed FDA regulation and a Squibb plan to move some facilities from New Jersey to Maryland that did not go smoothly. The FDA, which requires drug companies to operate in compliance with Good Manufacturing Practices (GMP), is proposing a regulation that says there can be, as bureau of drugs director Richard Crout put it, "zero" penicillin contamination of other drugs. On the face of it, it certainly sounds sensible. After all, who wants penicillin contaminating his tetracycline, or his vitamin C? But keeping penicillin in its place apparently is not that simple. As Crout notes, it gets into the air with the greatest of ease and, therefore, can travel around a manufacturing plant. Furthermore, assays for detecting penicillin are good; even the tiniest bit of it where it does not belong can be discovered. With FDA proposing to tighten its GMP standards from a low tolerance of penicillin contamination to "zero" tolerance, industry faces new demands on its engineering capabilities.

One solution to the FDA proposal is to fight it, as being too costly and unnecessary to the public health. Crout expects some firms will take that course. Another is to consider redesigning plants, installing new air filtering systems, and the like. A third—the one Squibb seems to have taken in anticipation of the regulation—is to process penicillin in a facility that is physically separate from places where other drugs are prepared. Now, although Squibb will continue to maintain its fermentation vats in New Jersey, it will handle other aspects of production in Maryland, where a subcontractor will package penicillin G under sterile conditions.

Squibb shut down its New Jersey penicillin operation, without announcing this to its competitors who might well have increased their own production, and moved to Maryland. Problems in maintaining usual supplies arose when the company encountered unanticipated difficulties in resuming operation. Meanwhile, hospitals were ordering the drug as usual from distributors, whose stock became depleted. By now, the Maryland plant is in operation and the FDA has begun certifying batches of penicillin G there, but it will be a couple of more weeks before the pipeline is full again. And, as one FDA staffer noted, buyers may not be aware that the shortage is over and may be living still with "psychological panic."

Production lapses at U.S. plants are not the only reason for drug shortages. For quinidine, for example, we are dependent upon good trade relations with Indonesia, home of the Cinchona tree, from whose bark the drug is extracted. For drug production in general, we are dependent, at least in part, upon the Middle East, as Crout points out. He recalls that during the gasoline shortage a couple of years ago, FDA and PMA officials contemplated large-scale and very serious shortages if pharmaceutical companies were unable to get acetone, alcohol, and other solvents essential to drug manufacture, or plastics necessary for packaging, intravenous tubes, and such. With no answer at hand, the issue went away with the normalization of the oil supply. But it could come up again.

There is no body in the United States that systematically monitors the drug supply to anticipate shortages, although there has been talk about one. However, the Department of Commerce has looked into the drug supply question in light of pending proposals for National Health Insurance. Last summer, the department's domestic business policy analysis staff asked Booz, Allen & Hamilton, management consultants, to study the matter. They did so in just 4 weeks and turned in their report on 2 September. Among their conclusions was this: "There do not appear to be any major barriers to meeting national health insurance induced demands for prescription drugs." Booz, Allen & Hamilton told Commerce that there is no reason to anticipate shortages created by increased demand as long as the current cost-price relationships between production and sales are allowed to continue. They said that, with available production capacity, pharmaceutical manufacturers could probably increase their production by 10 percent in a normal year.

But we still have shortages.—B.J.C.