Syphilis and Gonorrhea: Old-Fashioned VD Still Flourishing
Media attention has focused lately on such new sexually transmitted diseases as chlamydia, herpes and, of course, AIDS. But two old "standbys" are still thriving, too, afflicting hundreds of millions worldwide.

Enzymes—The Movers and Shakers of Our Body Chemistry
Enzymes are the catalysts of countless body functions, from digesting food to breaking down drugs and other "foreign" substances. Serious problems can occur when our bodies lack certain enzymes.

A Closer Look at Dairy Safety
In the wake of several food poisoning outbreaks involving milk and cheese, FDA is calling for stepped-up surveillance of the nation's dairies.

The Centuries-Old Struggle Against Infectious Diseases
AIDS is the latest chapter in the chronicle of medicine's struggle against infectious diseases. A look at the suffering of earlier generations from tuberculosis, diphtheria and other scourges—and what it has taken to bring them under control—helps put the battle against AIDS into perspective.

The Bugs That Bug FDA Inspectors the Most
They're sneaky. They're mean. They destroy more food supplies than any other insect. They're called flour beetles and, for FDA, they're public pest number one.

DES Update
A government task force has found reason for greater concern about the risk of breast cancer in women given DES years ago while they were pregnant. And their daughters may be at increased risk of a precancerous condition of the cervix and vagina.

Support Groups: When Going It Alone Is Going Nowhere
From cancer to alcoholism, from heart disease to mental illness, victims of countless afflictions are turning to support groups for aid in coping with their problems. These groups offer a kind of help beyond what regular medical therapy can provide.

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All over the country, people who share common health problems or who have experienced similar grief have been drawn together in mutual support groups. Through such organizations, they gain strength and can assist each other and, by helping one another, help themselves. How these groups were formed and how they go about their business is described in Support Groups: When Going It Alone Is Going Nowhere, beginning on page 29.
FDA's Enforcement Scorecard

The number of recalls of FDA-regulated products for fiscal year 1985 was the highest in recent years, due mainly to a large number of recalls of foods containing undeclared sulfites and Yellow Dye No. 5. (Sulfites, which are used as preservatives in some foods, and the food color Yellow Dye No. 5 can cause allergic reactions in some people. FDA requires that their use be noted on food labels to alert those at risk.)

There were 2,085 recalls in 1985, compared to 1,408 in 1984 and 915 in 1983.

Voluntary corrections were also up from 3,467 in 1984 to 4,036 in 1985. A manufacturer or distributor "voluntarily corrects" a product by relabeling, reconditioning or destroying it in the presence of an FDA investigator during an investigation. Products were destroyed in 751 of the 1985 field corrections, making FDA action to seize the products or prevent further distribution unnecessary.

There were fewer regulatory letters and inspections in 1985 than in 1984. A regulatory letter is a notice from FDA warning that unless certain illegal practices are corrected, the agency will take legal action against the company. Although the number of inspections has steadily decreased from a high of 36,258 in 1981 to 24,164 in 1985, the number of regulatory letters fluctuates widely from year to year. (In 1982, 507 were sent; in 1983—254; 1984—721; 1985—501.)

The figures for other enforcement actions were:

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Record Drug Approvals

The first gold-containing oral drug for rheumatoid arthritis and an antihistamine that does not usually cause drowsiness were two of a record number of new drugs FDA approved in 1985.

The 1985 approvals totaled 30 new drugs that were chemically different from any previously approved by FDA. This represented eight more approvals than in 1984 and the largest number of such approvals since 1962 legislation required that drugs be reviewed for effectiveness as well as safety.

The approvals included Seldane, the first antihistamine considered effective without the associated undesirable side effects of sleepiness and reduced mental alertness; Ridaura, the first gold-containing drug for rheumatoid arthritis that has proved effective in an oral dose; and Marinol, or THC, for treatment of severe nausea and vomiting associated with cancer chemotherapy.

Another new drug approved in 1985 was Protropin, the first genetically engineered human growth hormone and only the second genetically engineered drug approved by the agency. (The first was human insulin, approved in 1982.) Human growth hormone permits children with pituitary deficiencies to grow to near-normal height.


Congressional Report on Animal Drugs

FDA is already eliminating deficiencies in its animal drug program that were found in congressional hearings last year, and so the agency believes a recently issued report on those hearings may need some clarification.

The report, "Human Food Safety and the Regulation of Animal Drugs," is the most detailed congressional evaluation in 15 years of the agency's ability to oversee and regulate the nation's $2 billion-a-year animal drug industry. It was based on hearings held in July 1985 by the House Government Operations Subcommittee on Intergovernmental Relations and...
Human Resources and was issued on Jan. 13, 1986.

The report alleges that 90 percent or more of the 20,000 to 30,000 veterinary drugs on the market are without FDA approval for safety and effectiveness. But the report fails to mention that FDA-approved veterinary drugs—some 1,500—account for 90 percent of all marketed drugs used in food animals. The remaining “unapproved” products, which FDA has not sought to remove from the market, include vitamins, minerals and substances such as animal liniments that have no known risk to humans, as well as some products for pets and some medications that have been on the market for many years.

The report also maintained that, while FDA and the U.S. Department of Agriculture are supposed to monitor beef, poultry, pork and milk for animal drug residues, FDA has not developed the chemistry techniques necessary to detect the residues of many of these substances.

While FDA acknowledges that it needs to do further work on residue detection methods, the agency says that nitrofurans, dimetridazole, gentian violet, and thiabendazole are the only substances for which methods have proved difficult or impossible to develop. There are adequate methods for drugs approved for food animal use since 1972. Manufacturers must provide tests for residues of new drugs, and FDA is looking at ways to require manufacturers to develop such tests for older drugs as a condition of their continued marketing.

The subcommittee also concluded that illegal sales of prescription veterinary drugs may expose consumers to unsafe residues in meat and dairy products.

In response to this problem, FDA and state governments are working together to crack down on such illegal sales. The agency authorized 25 new field investigators for its Center for Veterinary Medicine in early 1985. Regulatory actions have increased from 81 in 1983 to 263 in 1985.

The subcommittee also questioned FDA’s permitting albendazole to be used on an emergency basis to treat liver flukes in cattle, replacing hexachloroethane, which was found to be highly carcinogenic. The subcommittee pointed out that albendazole itself was taken off the market in January 1985. However, whether albendazole is carcinogenic is disputed—and it temporarily replaced a drug of more serious, known dangers. Clorsulon was recently approved for this treatment (and is the only drug currently available for this use).

The report also faulted FDA for not having an inventory of all marketed animal drugs, as required by the Drug Listing Act of 1972. However, FDA field personnel now gather all animal drug labeling during inspections of manufacturing facilities. With that information and a recently purchased new data system, FDA should have a total veterinary drug inventory by the end of 1986.

The misuse of chloramphenicol in food animals, a potent antibacterial drug approved for use only in dogs and cats, was another one of the committee’s findings. In those susceptible to the drug (one in 40,000 people), chloramphenicol, in any amount, can induce a fatal type of anemia. On Jan. 23, 1986, FDA withdrew approval for chloramphenicol oral solutions, the type most commonly misused.

While FDA is responsible for drugs for pets as well as those for animals destined for slaughter for human food, the states regulate the practice of veterinary medicine. Thus, state laws and enforcement are essential to fully ensure that products intended for pets and other non-food animals are not misused in food animals.

While the agency continues to work to correct the shortcomings in its animal drug program noted in the congressional report, it notes that America’s food supply is the safest in the world.

**Orphan Drug Research**

FDA awarded 21 grants to researchers working with treatments for orphan diseases in 1985, more than in 1983 and 1984 combined.

The grants awarded included research on potential therapies for premature sexual development, a
chronic liver inflammation, cystic fibrosis, narcolepsy (frequent or uncontrollable desire for sleep), methanol poisoning, long-term insomnia experienced by abstinent alcoholics, respiratory distress syndrome in infants, and infection in patients with AIDS.

FDA funded 70 percent of the grant applications it approved plus one contract; total funding was $2.4 million.

Orphan diseases are rare conditions (afflicting less than 200,000 people in the United States), for which it is not profitable for companies to develop treatments.

Two promising research projects were funded for their second year: the study of a chelating agent (a chemical to remove toxic substances from the blood) for childhood lead poisoning and work on a treatment for iron deficiency anemia.

The FDA-solicited contract was for a literature search and summary of published data concerning the use of certain drugs in newborn infants. These drugs, such as the antibiotic ampicillin, lack directions for treating newborns. However, physicians use them to treat life-threatening conditions in newborns when no other therapy exists. The drugs were identified with assistance from the American Academy of Pediatrics Committee on Drugs. FDA will determine whether any of these drugs should be used for newborns.


(A copy of the list of all designated orphan drugs and biological products through December 1985 is available from the Dockets Management Branch (HFA-305), Food and Drug Administration, Room 4-62, 5600 Fishers Lane, Rockville, Md. 20857.)

**Antidepressant Withdrawn from Market**

Because of an increase in serious adverse reactions, the manufacturer of the antidepressant drug Merital (nomifensine maleate) has withdrawn the drug from the market worldwide.

In a letter to doctors and pharmacists, Hoechst-Roussel Pharmaceuticals Inc. of Somerville, N.J., explained that an increase in the number of adverse reactions, notably hemolytic anemia, had been reported in England and other countries last year. (Hemolytic anemia results from the destruction of red blood cells.) In addition, some reactions that were previously considered to be reversible, especially hemolytic anemia, were fatal in some cases.

Domestic product labeling was modified to reflect these new findings, most recently in November 1985, but the company decided to withdraw Merital as a precautionary measure.

Merital had been marketed in England since 1977. When the drug was approved in the United States in 1984, its association with adverse reactions such as hemolytic anemia was already known.

No deaths in this country known to be attributable to hypersensitivity reactions had been reported to FDA at the time of the product’s withdrawal on Jan. 21, 1986.

**Searle Stops Selling IUDs**

G. D. Searle & Company has voluntarily discontinued sales of its Cu-7 (also known as the “copper-seven”) and Tatum-T copper-containing intrauterine devices in the United States.

The company said its decision was based on the rising cost of defending its products in lawsuits brought by women who claim they were made sterile or were otherwise injured by the IUDs. Searle said that it had successfully defended the Cu-7 in jury trials at a cost of more than $1.5 million, but “future product liability insurance [is] virtually unobtainable.”

FDA did not pressure or encourage Searle to stop marketing the IUDs. The agency believes that the current professional and patient labeling is adequate to inform physicians and patients of the potential risks of the products. FDA approved the Cu-7 and the Tatum-T for use as contraceptives in 1974 and 1979, respectively.

Under FDA regulations, prospective users of any IUD must receive a leaflet that explains the risk, benefits and proper use of that IUD before it is inserted. FDA has further recommended that women considering any IUD discuss with their physicians the risks of infection and possible permanent infertility associated with IUD use.

Women who are currently using the Cu-7 or Tatum-T do not need to have their IUDs removed as a result of the company’s discontinuing the U.S. sale of these products. The FDA-approved labeling says these IUDs may be worn up to three years after insertion. FDA recommends that women with questions about their IUDs should contact their physicians or health clinic.

The decision by Searle, announced in January, leaves only one IUD on the U.S. market—the Progestasert, a hormone-containing device made by Alza Corporation in Palo Alto, Calif.
Syphilis and Gonorrhea: 
Old-Fashioned VD Still Flourishing

Not everyone who is exposed to syphilis or gonorrhea gets the disease, but some very famous people have been among the unlucky ones. Some of the unfortunate include (clockwise from upper right) Napoleon Bonaparte, Benito Mussolini, Adolph Hitler, Mary Tudor, Vincent van Gogh, Henry VIII of England, and his son, Edward VI.
Syphilis and Gonorrhea: Old-Fashioned VD Still Flourishing

by Evelyn Zamula

After penicillin was discovered in 1943, it was soon found to be effective against the age-old venereal diseases, syphilis and gonorrhea. Doctors were hopeful that in time both diseases would be as unknown to future generations as smallpox is to ours.

It hasn't happened yet. Though the last few years have seen a drop in the number of cases, syphilis and gonorrhea have not disappeared; they are, in fact, still flourishing.

In 1984, gonorrhea had the dubious distinction of being No. 1 among diseases reported to the U.S. Public Health Service's Centers for Disease Control, with 878,000 cases among civilians. (State and local health departments have been required to report cases of both syphilis and gonorrhea to the Public Health Service since 1919.) CDC estimates that there are probably another million unreported cases. Syphilis was No. 3, with 69,886 cases reported in 1984. CDC believes the actual count is nearer 90,000.

The World Health Organization estimates that each year there are about 250 million new cases of gonorrhea and 50 million new cases of syphilis worldwide. These diseases are not as lethal as the newest sexually transmitted diseases, AIDS, which is so far incurable. But they still present staggering health problems.

Of the two, syphilis is the more complex and variable. A case may go on for years, involving a progression of symptoms that have been divided into three stages. This doesn't necessarily mean the disease goes from bad to worse—it often doesn't—but it does go from an infectious to a noninfectious state, often with an elusivc now-you-see-it, now-you-don't quality. The first stage, which includes primary and secondary syphilis, is the most infectious and may last up to two years. After that, the disease becomes less and less contagious.

Syphilis is acquired chiefly by direct contact—almost always sexual—with the infectious lesions of someone with the disease. The lesion in primary syphilis is a small, firm, button-like sore (chancre) that appears most commonly on the genital organs, though it may appear on any mucous membranes that have been exposed to the syphilis bacterium. In secondary syphilis the lesions may take the form of an all-over body rash, or a peculiar rash only on the hands and feet, or patches of eroded tissue in the mucous membranes of the mouth and the genital organs. When the lesions are disturbed, as during intercourse, they exude a clear serum containing the corkscrew-shaped bacteria (Treponema pallidium), or spirochetes, that cause syphilis.

The disease can also be contracted by kissing, biting, or exposing an open area of the skin to the lesions. Because the bacteria live only a short time outside the body, syphilis is not usually transmitted from contaminated towels or toilet seats.

If the sexual partner of a person infected with syphilis is one of the unlucky 30 percent who go on to develop the disease, that person, in turn, will develop his or her own chancre in about 10 days to three months after exposure, in the part of the body where the infection was introduced. The chancre usually lasts from two to four weeks and then disappears without treatment, leaving a small scar. But rejoicing is not in order, because the disease marches on into the next phase.

In secondary syphilis, which occurs about six weeks after the chancre emerged, more symptoms appear as the spirochetes multiply in the body. Besides the characteristic rash and mucous patches, the untreated patient may feel generally unwell and may experience poor appetite, fever, swollen lymph glands, headaches and aching bones. (Sometimes the sole symptom of secondary syphilis is patchy loss of hair on the scalp—described as "moth-eaten" alopecia—or a distinctive loss of the outer half of the eyebrows, eyelashes and beard.) The disease can affect any organ of the body during this stage.

At this point in the disease, it would seem that the symptoms would be telling the sufferer to seek treatment, and most people do. But the symptoms are not always that obvious. Sometimes the chancre can't be seen because it occurs deep in the vagina on the cervix (or, as a result of other sex practices, in the throat or rectum). It eventually clears up by itself anyway so even if it was visible, medical help may not be sought.

The rash of secondary syphilis may be difficult to diagnose because it's often atypical, meaning it may be mistaken for a rash due to some other condition, such as German measles, infectious mononucleosis, or a drug reaction. So it may be incorrectly treated. (This ability to mimic other diseases is why syphilis was known in days gone by as the "great masquerader." Sir William Osler, a superb physician and one of the founders of Johns Hopkins Medical School, said, "He who knows syphilis, knows medicine.")

Even without treatment, though, the rash also vanishes, followed by the disappearance of the rest of the secondary symptoms. From here on, untreated syphilis victims involuntarily participate in a game of medical Russian roulette. When the disease enters the latent stage, a lucky 25 percent are spontaneously cured; another 25 percent, while not cured, never show any further signs of the disease. About the same number backslide into the secondary stage and become infectious again, and so are subject to a rerun of the process.

The remaining unlucky ones—from 15 to 40 percent according to three large studies—go on to develop late (or tertiary) syphilis, the final stage, which can occur so many years later that the victims can't even remember when they were first infected. Here the bacteria insidiously work their way through the body, taking a heavy toll on the central nervous system and the heart and blood vessels. Insanity, blindness, deafness, heart disease, inflammation of the bones, ulcerous skin tumors (gummas), and more are the disease's legacy.

Fewer cases of latent or late syphilis are being seen today because the disease is usually identified and cured in the early infectious stage. In fact, many doctors are unfamiliar with the later forms of syphilis. In the decade between 1969 and 1979, reported cases of late or latent syphilis declined 30 percent.

Doctors can diagnose syphilis by the symptoms and history of exposure, along with positive blood tests and iden-
tification of the spirochetes taken from the lesions and examined under a microscope. In late syphilis, the spinal fluid will also show evidence of syphilis.

In days gone by, rather heroic measures were taken to cure syphilis. During the Middle Ages, mercury salts were taken by mouth or rubbed on syphilitic lesions. Mercury induced excessive salivation, sometimes as much as four pints a day. But it didn't cure the disease and often poisoned the patient. The first drug effective against syphilis was discovered in 1906 by the German physician Paul Ehrlich. His "magic bullet," or preparation 606, an arsenic compound known as salvarsan (later as neosalvarsan), was the most widely used anti-syphilis drug until just a few decades ago.

Today, penicillin via injection cures all stages of syphilis. A single large dose (millions of units) will knock out the disease in the early stages. Later stages of syphilis need even larger doses and longer therapy. The antibiotics tetracycline and erythromycin may be used for those allergic to penicillin.

Pregnant women may be treated with penicillin—which is 98 percent effective in preventing congenital syphilis in babies—or erythromycin. (Tetracycline shouldn't be used because it causes permanent discoloration of the baby's teeth.)

If a pregnant woman in the early stages of syphilis is not treated, she may miscarry or have a stillborn baby. (In 1917, Osler claimed that 20 percent of all stillbirths and 18 to 22 percent of infant deaths in the United States were due to syphilis.) An untreated pregnant mother in the later stages of syphilis may give birth to a baby with congenital syphilis. In one major study conducted in Oslo, Norway, from 1890 to 1910, about 50 percent of babies born to untreated mothers had some signs of the disease, among them deformities such as abnormal teeth, misshapen leg bones, an unusually shaped "saddle" nose, and highly contagious skin lesions. Babies with congenital syphilis can be treated with penicillin, although the deformities remain.

Use of condoms is one way to lessen exposure to syphilis, though this is not necessarily foolproof. It is perfectly possible to get syphilis from—or give syphilis to—someone from an area not covered by the condom. Diaphragms and other contraceptives do not offer any protection. One bout of the disease doesn't confer immunity, so it is possible to become infected again and again.

People in the early infectious stage of syphilis should avoid sexual relations until they're cured. In preventing the spread of the disease it is essential that all sexual contacts of the individual with the disease be notified and report for testing and, if necessary, treatment. Premarital blood tests, testing during pregnancy, and testing the blood in the umbilical cord in newborns have helped stem the spread of syphilis.

Syphilis may be a big-league disease because of its serious complications, but gonorrhea is more widespread. Dr.
The Legacy of 'VD'

Unlike AIDS, both syphilis and gonorrhea have been around a long time and have afflicted many prominent people throughout history. A disease of the genital organs that included many syphilis symptoms was described in Chinese medical writings as far back as 2637 B.C. The Old Testament also refers to a disease or diseases that may have been a form of syphilis.

What has been described in some ancient and medieval texts as leprosy was probably syphilis in many cases. That's not hard to understand, because syphilis in late stages may attack the tissues in the nose, causing it to "disappear," as with a nasal deformity caused by leprosy.

Gonorrhea has the honor of being the first bacterial infection to be specifically documented—the disease was accurately described in the papyrus scrolls of ancient Egypt. Because syphilis and gonorrhea were known to be sexually transmitted, many physicians of long ago believed they were the same disease, much as syphilis and leprosy were confused.

In 1767, John Hunter, a famous British physician, conducted an experiment daring for his day—and ours, too. To determine whether the "poison" that produced gonorrhea was the same that produced syphilis, he inoculated himself through the urethra with pus from a gonorrhea patient. Hunter developed the usual gonorrhea symptoms and the classic chancre and copper-colored rash that go with syphilis, leading him to incorrectly conclude that they were one and the same disease. What Hunter didn't know was that the patient had syphilis as well as gonorrhea.

This misconception continued until 1838, when Philip Ricord, the great French syphilologist, concluded that they were different diseases. Definitive proof was furnished by Albert Neisser's discovery in 1879 of the organism that causes gonorrhea, Neisseria gonorrhoeae, and with the identification of the bacterium that causes syphilis in 1905 by Fritz Shaudinn and Erik Hoffmann.

The names of people who have contracted either disease in the past reads like a Who's Who. Because syphilis—with its long-term effects on the brain—affected so many great leaders, it can be said with certainty that the disease has had considerable impact on world history. Syphilis also has influenced the lives of artists, writers and musicians.

Among sufferers from the "great pox" was Henry VIII of England. In spite of his well-known amorous proclivities, Henry hypocritically blamed his syphilis on Cardinal Wolsey, another syphillic who was supposed to have transmitted it to the king by blowing upon him with his "perilous and most infectious breath." At least that's what Henry said when he indicted Wolsey for conspiring with the pope against him. (Lucky Wolsey died of natural causes before the king could behead him.)

Leg ulcers caused Henry horrible pain, and when they acted up he sentenced hundreds of people to death. In his last years, when syphilis affected his brain, he became even more murderous. He is said to have executed 3 percent of the British population during his lifetime. It is also thought that his son Edward VI and daughter Mary Tudor—"Bloody Mary"—had congenital syphilis. Edward was frail and died at 15, while Mary had the prematurely wrinkled skin and thin, moth-eaten hair characteristic of syphilis.

The English poet John Donne, who in his youth was a "great visitor" of ladies, regretted his indiscretions in his later years, when the late symptoms of syphilis appeared. Arthur Schopenhauer, the famous philosopher, became a confirmed woman-hater as a result of contracting syphilis in his university days. His gloomy views on life were no doubt influenced by his long battle with the disease. Guy de Maupassant, the famous French short story writer, died at the age of 43 of general paralysis and insanity due to syphilis. Vincent van Gogh's removal of his own ear and his subsequent suicide were probably prompted by the artist's insanity caused by late syphilis.

Napoleon is said to have suffered from both syphilis and gonorrhea. It is certain that as a young lieutenant he contracted gonorrhea, which left him with a stricture of the urethra that made urination difficult. In more recent times, Benito Mussolini contracted both diseases, while Adolf Hitler had gonorrhea as a young man. Thanks to penicillin, which arrived on the scene during World War II, the names of more recent notables who have had these diseases can remain hidden in their doctors' files.

Stephen H. Zinner, author of STD's: Sexually Transmitted Diseases, believes that CDC's figures do not reflect the true incidence of gonorrhea in this country, which he estimates at around 3 or 4 million cases each year. Cases are almost evenly divided between the sexes, says CDC's Dr. William Darrow. (Cases of syphilis occur in a ratio of about three males to one female; about 50 percent of cases of infectious syphilis occur in homosexual males.)

Gonorrheal infections occur from sexual contact with the mucous membranes of someone who has the disease—most frequently with the urethra (the canal that carries urine from the bladder to the outside of the body) or the female's endocervix (the lining of the neck of the uterus). The male may also contract gonorrhea from infected tissue in the vagina. Just as in syphilis, one exposure to an infected person doesn't guarantee gonorrhea, but the odds get better with repeated tries. The risk of a male acquiring gonorrhea following a single (vaginal) exposure to an infected female is 20 percent, but after four exposures it increases to between 60 and 80 percent.

Females probably catch the disease from infected males more readily than vice versa, with an estimated 90 percent of females with infected partners usually contracting the disease. Infection from inanimate objects is extremely unlikely, as the gonorrhea bacterium is fragile and dies quickly outside the body. It is not transmitted by kissing. When children get gonorrhea, it is from sexual contact.

The initial symptoms show up quickly in males, usually within one to 14 days after exposure. A tingling sensation in the urethra may be the first sign, followed by pain and burning upon urination and a discharge of pus—the "drip"—from the urethra. In women the incubation period
may be a little longer—from seven to 21 days. Most women have mild symptoms, though some develop an inflamed cervix with a discharge from the vaginal canal and inflammation of the urethra, causing painful urination.

Many men and women have no symptoms at all and don't realize they are infected—one reason why the disease is so difficult to control. In any case, even in those who know they have the disease, symptoms eventually go away.

As Dr. Jonathan Zenilman, a CDC expert on sexually transmitted diseases (now preferred to the old term "venereal diseases"), notes: "The symptoms of gonorrhea do dissipate after several weeks, but people can become asymptomatic carriers of the disease. Besides being able to transmit the disease to others, these people run a risk of developing some problems of their own. A long-term complication of chronic infection in males is urethral stricture, a narrowing of the urethra that can make urination difficult and produce urinary blockages. Females can acquire pelvic inflammatory disease, an inflammation of the Fallopian tubes that may lead to infertility and ectopic pregnancies [pregnancies, sometimes life-threatening, that take place outside the uterus]."

In both sexes, the bacteria may infect the joints, causing arthritis. The bacteria may also get into the bloodstream, leading to several potentially fatal complications.

Premature births and stillbirths are common among infected pregnant women. Babies rarely get gonorrhea from their mothers while in the uterus, but they may contract a gonococcal eye infection while passing through the birth canal. As a precaution, hospital nurseries routinely treat babies' eyes with various medications shortly after birth.

The disease is diagnosed by examining specimens of the discharge under a microscope for presence of the gonococcal bacteria, or by culturing infected material from any other suspected sites. The culture test usually takes a few days but is considered more reliable than the discharge "smear," especially for females. The search for a faster test goes on. Under study is a test using horseshoe crab blood, which forms a clot within 30 minutes in the presence of the type of bacteria that cause gonorrhea. Other tests using monoclonal antibodies, a product of DNA technology, are also under investigation.

A rapid, accurate test would be immensely helpful, especially in public health settings, where doctors prefer to be cautious and treat suspected cases right on the spot—without waiting for culture results—to stop possible transmission of the disease. This means that in a few cases people who do not have gonorrhea are treated unnecessarily.

Some bacteria can outsmart people, and the gonococcal bacterium is one of them. Gonococci have mutated so that some drugs are no longer effective against them. So far they have managed to outwit the sulfonamides, introduced in 1937, and have proved so adept at building up resistance to penicillin that the present dose is 100 times greater than when the drug was introduced in the 1940s.

Today—for uncomplicated infections in adults—CDC recommends 4.8 million units of penicillin, injected into the muscle, or oral amoxicillin or ampicillin, all taken with a tablet of probenecid, which increases the effectiveness of the other drugs. Since more than one sexually transmitted disease can occur in the same patient, CDC also recommends oral tetracycline in addition to the above drugs because it is effective against Chlamydia trachomatis, which coexists with gonorrhea in up to 45 percent of cases, and against some strains of Ureaplasma urealyticum. (See "The VD That Many Have, Few Know" in the June 1983 FDA Consumer.)

New strains of gonorrhea introduced from the Far East in 1976 have proved resistant to penicillin, tetracycline, and even to the antibiotic spectinomycin, which is usually reserved for cases where nothing else works. Other new antibiotics known as third-generation cephalosporins are effective against the bacteria, but they are expensive and more apt to be used by private doctors than in clinics or other public settings. Cases of one type of penicillin-resistant gonorrhea (penicillinase-producing N. gonorrhoeae) doubled in the United States in 1985, accounting for over 6,000 cases in the first nine months of the year.

Though there's evidence that the body builds up some antibodies to the bacteria, it's possible to get the infection again and again. (This is amply proved by James Boswell, Samuel Johnson's famed biographer, who loved not wisely but too well, contracting the disease 12 times.)

Condom use helps prevent transmission of the disease; use of barrier contraceptives by women, such as the diaphragm with spermicide or the cervical cap, may offer some protection but can't be depended on completely. As in syphilis, attempts should be made to reach and treat recent partners of infected persons, although the asymptomatic nature of the disease in many people makes that difficult.

A vaccine to control gonorrhea would be a boon, but that's easier said than done, as experience has proved in the search for a genital herpes vaccine. One way to reduce incidence of both syphilis and gonorrhea may be by limiting, or being more selective about, sexual contacts—as is increasingly occurring in the male homosexual population as a result of AIDS fears. Another alternative, advanced by experts in the field, is a return to old-fashioned monogamy. Whatever the approach, public health efforts need to include an increasing emphasis on education to the consequences of syphilis, gonorrhea and other sexually transmitted diseases.

Evelyn Zamula is a member of FDA's public affairs staff.
Enzymes —

The Movers
And
Shakers
Of Our
Body
Chemistry
Enzymes are protein-like substances found in plant and animal cells, including human cells. Enzymes play a number of important roles by acting as catalysts in starting or speeding up chemical reactions. In fact, the value of enzymes outside the body has led to their use not only in custard, but in other everyday products as well.

For example, papain—derived from papaya fruit—is used in meat tenderizers to partially digest, or break down, meat protein, thus softening it. Enzymes are also used in laundry detergents to help dissolve grease and other difficult stains.

In order to understand the actions of enzymes, it is important to know that most of the chemicals in food are simply too large and complex for the human body to use "as is." Proteins, for example, are long chains of amino acids, and even common sugars and starches can be highly complex chemicals. Just as you cannot swallow large chunks whole, but must chew on bite-size pieces, most chemicals entering the body must be broken down before they can be put to use. Enzymes rearrange or split these chemicals into smaller "bite-size" pieces ready for further chemical reaction. For example, table sugar (sucrose) is really two simple sugars, chemically linked, that are separated by the enzyme sucrase during digestion. The resulting simple sugars, glucose and fructose, can then be used by the body.

Besides sucrase, other common digestive enzymes are amylase, pepsin, trypsin and lipase. Amylase is present in saliva and begins digestion of starches into simple sugars right in the mouth. That's why plain crackers will begin to taste a bit sweet after a few minutes of chewing.

Pepsin, found in gastric juice in the stomach, begins the job of splitting food proteins into smaller chemical units called "peptones." This task is continued in the small intestine with the addition of trypsin produced by the pancreas. Lipase, which is also produced by the pancreas, helps break up fat. Without these and other digestive enzymes, it would be difficult or impossible to absorb nutrients from many foods.

The human body does not produce enzymes to act on all substances. That's why humans can't digest cellulose. In fact, neither can termites, although they do eat wood, which is mostly cellulose. But in the case of termites, protozoa (one-celled animals) living inside the insects produce the necessary enzymes that split cellulose into digestible "pieces."

The duties of enzymes, however, go beyond digestion. An enzyme named renin (not to be confused with the milk-curdling rennin) is involved in regulating blood pressure. Other enzymes are the foundation of our detoxification systems, helping to metabolize (break down) most "foreign" chemicals, such as drugs. There are entire systems of enzymes, each able to metabolize certain chemical groupings. For example, the liver produces an enzyme system capable of metabolizing barbiturate sedatives.

People who have impaired liver function may have difficulty eliminating some drugs. On the other hand, the barbiturates, as well as certain other drugs, stimulate production of enzymes that otherwise would not occur. These drugs are called "enzyme inducers," and the enzymes they induce may interfere with medical therapy by speeding the drug's own metabolism or that of other drugs a patient is taking at the same time. In fact, the longer an enzyme inducer is taken, the faster the body may eliminate it.

Knowledge of the way enzymes work has enabled advances in medical therapy. One such advance is Augmentin, an antibiotic recently approved by FDA. Augmentin is made of two chemicals, amoxicillin and clavulenate potassium, but only the first one is active against bacteria. The other is a compound specifically designed to block the kidney enzyme beta-lactamase from metabolizing the antibiotic portion, thus prolonging the drug's stay in the body and improving its effectiveness.

Often, bacteria that are present in the body have their own enzyme systems that may complicate drug treatment. For example, some bacteria produce an enzyme called penicillinase that is capable of destroying penicillin. The mechanism can interfere with treatment of infections such as strep throat. To counter this problem, scientists have designed new members of the penicillin family that have some degree of resistance to penicillinase.

As with drugs, the body's processing of foods can also be hampered by certain enzyme deficiencies. One such deficiency that affects a fairly large proportion of the population is lactose intolerance. Lactose is a complex sugar found in milk. Milk is a highly complex food composed of fats, proteins, sugars and other nutrients. It requires considerable enzyme activity for proper digestion. But many people lack the enzyme lactase, which breaks lactose into simple sugars the
Enzymes rearrange the chemicals in foods into smaller pieces so that they can be used by the body.
body can use. When these lactase-lacking people consume products that contain milk, the result can be mild to severe indigestion. The deficiency is found less often among Caucasian than non-Caucasian people. (See “Sweet Milk and Sour Stomachs” in the March 1984 FDA Consumer.)

Fortunately, lactase supplements that can be added to milk are available. Also, fermented milk products such as yogurt, aged cheeses and cottage cheese, in which some lactose is converted to other substances, may be better tolerated than non-fermented milk products.

Other enzyme deficiencies pose a more serious threat to health and well-being. One of these conditions, a deficiency in an enzyme known as glucose-6-phosphate dehydrogenase (G-6-P-D), was mentioned in a “M*A*S*H” television episode. In that segment, Corporal Maxwell Klinger became seriously ill when he was given a drug used to fight malaria. His sickness was due to a genetic absence of this enzyme—a deficiency common in persons of Mediterranean descent. Klinger’s body simply could not metabolize the drug.

Klinger’s particular problem is an example of a characteristic of many enzyme deficiencies. Generally, these deficiencies are distributed fairly evenly throughout the population. However, some deficiencies, such as G-6-P-D and lactose intolerance, may be concentrated in certain families, races, or even geographic areas due to evolutionary effects. G-6-P-D and lactose intolerance are both common in persons of Mediterranean descent.

Of the many such conditions, one of the earliest and best known—and most widely feared—is Tay-Sachs disease. This hereditary condition is mainly limited to persons of Eastern European Jewish descent, although there is also a noticeable incidence among Italian Catholics and a group of non-Jewish Canadians. Tay-Sachs disease is caused by a genetic disorder resulting in the absence of a vital enzyme called hexosaminidase A. This enzyme is necessary for the normal metabolism of a certain fatty substance. Without the enzyme, the substance builds up to toxic levels, particularly in the brain. At present no cure is known, and the disease leads to death.

Science has been able to control some other enzyme deficiencies that formerly were as catastrophic as Tay-Sachs. Phenylketonuria, or PKU for short, is one such condition. PKU was once a significant cause of mental retardation. It is caused by the absence of the enzyme phenylalanine hydroxylase, needed to metabolize phenylalanine, one of the essential amino acids, the building blocks of proteins. Lack of the enzyme results in toxic accumulations of a substance normally beneficial to the body.

Most states routinely screen infants for PKU. Once identified, this problem is controlled through careful nutrition. Phenylalanine is omitted from the diets, preventing any toxic build-up. Until science finds a permanent cure, this vigilance must be continued throughout the patient’s life. It is particularly important for those with PKU to know that Nutra-Sweet (aspartame) contains phenylalanine. Products that contain aspartame must carry a warning to alert PKU patients.

Enzyme deficiencies can be accidentally induced through poisoning. For example, heavy metals, such as lead and mercury, are toxic, in part because they inactivate vital enzyme systems.

Medical science has long used certain enzymes with beneficial results. Fibrinolytic enzymes—which help dissolve blood clots—have been used to clean wounds that have dried and clotted under unsanitary conditions. This job was once done by physical scraping or application of maggots to the wound. Some of these same enzymes are now being used experimentally to dissolve blood clots in coronary arteries immediately following heart attacks. It is hoped that the enzymes will safely dissolve the clots in time to prevent significant damage to the heart.

Enzymes are also used as an alternative to spinal surgery to repair the leakage of a ruptured disk. In this treatment, the material that has “leaked” out of the disk is dissolved by action of the enzyme chymopapain. While no surgery is required, very precise injection of the enzyme is necessary, and the procedure can involve serious risks. (See “Drug for Slipped Disks” in the Updates section of the February 1983 FDA Consumer.)

Enzymes are also important indicators of body function. Two notable examples are known by their acronyms SGOT and SGPT (serum glutamic oxaloacetic transaminase and serum glutamic pyruvic transaminase). Destruction of certain body tissues due to injury results in release of large quantities of SGOT and SGPT into the bloodstream, generally proportionate to the damage. Measurement of SGOT and SGPT levels thus provides an estimate of the extent of the injury, which helps doctors plan proper treatment.

From digesting foods to metabolizing drugs, enzymes are a vital part of our bodies. And with genetic engineering and recombinant DNA technologies currently under development, it seems likely that many of the recognized enzyme deficiency diseases will become controllable if not curable.

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A Closer Look at Dairy Safety

by Chris W. Lecos

Confronted with a recent flurry of food poisoning outbreaks involving contaminated milk and cheese, FDA has called for increased surveillance of the nation's dairy industry.

Two major outbreaks in the Midwest and in California in 1985 and several other incidents in recent years led FDA to conclude that greater efforts by industry and federal and state regulators are needed to make sure such incidents don't continue.

More intensive training programs for federal and state inspectors, educational programs for dairy industry personnel on the potential dangers to milk products from pathogenic (disease-causing) organisms, and more thorough inspections of the country's dairy plants and other dairy operations were urged by FDA in a five-page memorandum sent to state regulatory and dairy officials in late December.

Although many food safety and adulteration provisions found in federal law apply to milk and other dairy products, the day-to-day responsibility for monitoring the industry—from the dairy farm to the finished product—rests primarily with state and local public health and regulatory agencies.

Agency officials said a main objective of the new federal initiative was to work with and to encourage state regulatory agencies and the industry in identifying and eliminating any unknown problems in the production of dairy products to prevent new food poisoning outbreaks.

Should people be concerned about the continued safety of the milk supply? According to Jerome J. Kozak, chief of FDA's milk safety branch in Washington, D.C., "The answer, unequivocally, is no. I am not at all concerned about the integrity of the nation's milk supply, but I am concerned about the unknown—what we don't know.

"FDA is not saying there is a major crisis in the dairy industry," he added. "These initiatives are not being undertaken because there is a known, serious problem in the industry. The agency's purpose is to identify problems that may exist. We need to understand whether there is a pattern developing or whether these outbreaks were isolated incidents. We don't have as much information as we should have, and we need to make intelligent decisions based on good data."

FDA officials also emphasize that, despite the recent outbreaks, milk is one of the safest foods consumed by Americans. In 1938, for example, milk caused about one-fourth of all illnesses due to contaminated foods and water. Today, milk and fluid milk products are associated with less than 1 percent of all such outbreaks.

Milk is probably more closely regulated at the federal and state levels than any other food. But, occasional outbreaks of illness do occur. The most serious of recent years occurred last spring and summer. Contaminated low-fat milk produced by a Chicago-area dairy in March and April of 1985 resulted in the worst *Salmonella* outbreak in U.S. history. More than 16,000 persons in six midwestern states—most of them in Illinois—were stricken. The
Salmonella organism caused the deaths of two persons and probably contributed to the deaths of four or five others, according to officials (see “Of Microbes and Milk: Probing America’s Worst Salmonella Outbreak” in the February 1986 FDA Consumer).

An outbreak of another bacterial disease, listeriosis, was blamed for the deaths of 84 people and more than 150 illnesses in California last year. Most of those who died were unborn and newborn babies of Hispanic mothers. The epidemic, investigators said, was linked to the consumption of a soft, Mexican-style cheese. The outbreak prompted FDA to undertake a national survey and product sampling program of soft cheese manufacturers throughout the country.

In February 1986, six brands of imported French Brie soft cheese were recalled after FDA found that they were contaminated with Listeria monocytogenes, the bacteria that cause listeriosis. Although some illnesses were reported, the agency couldn’t be sure they were caused by the cheese. As of mid-February, FDA also was testing other brands of imported French Brie to see if any more were contaminated.

FDA’s memorandum also mentions several other incidents: a listeriosis outbreak in Massachusetts in 1983 in which some 49 illnesses and 14 deaths were linked to pasteurized whole or 2 percent milk; a yersiniosis outbreak involving pasteurized milk that affected some 172 people in Tennessee, Arkansas and Mississippi in July 1982; staphylococcal enterotoxin contamination of chocolate milk in 1985 that caused at least 860 pupils in the Meade County, Kentucky, school system to become ill; and contamination of milk with cleaning solutions in Florida and California, also in 1985. The numbers of those who became ill are based on cases reported to health authorities and where the contaminating organisms are identified through laboratory analysis. The actual number who became ill probably was higher, since many people don’t report their food-borne illnesses.

The exact causes of the contamination in Illinois, California and Massachusetts were never firmly established. The principal theory in the Illinois case is that unpasteurized, possibly contaminated, milk was able to inadvertently get into the pipes that carried pasteurized skim milk and thus contaminated the low-fat milk that was being produced. The most likely source for the contamination, investigators said, was a small length of pipe—called a cross-connection—that linked piping carrying unpasteurized milk on one side to pipes carrying pasteurized skim milk on the other. The cross-connection had been installed by the dairy some years after the plant was built.

The Chicago-area dairy produced low-fat milk by blending pasteurized whole milk with pasteurized skim milk. The process is known as post-pasteurization blending because no further pasteurization is done after the blending occurs. A number of dairies use this method of processing, and FDA has not questioned it as long as proper safety procedures are followed.

In discussing the various outbreaks, Kozak pointed out: “We did not discover any common denominators from a technology standpoint. One purpose of our latest initiative is to find out if there are any common patterns or factors that may pose a potential public health problem.”

The monitoring of the nation’s milk and dairy products, to a great extent, is done through a memorandum of understanding between FDA and the National Conference on Interstate Milk Shipments, an organization in which all
**Food Poisonings from Tainted Dairy Products**

The dairy industry has a generally excellent safety record. Its products are among the most closely regulated in the nation’s food supply. Yet, occasional outbreaks of food poisoning due to contaminated milk products do occur. The map below shows the extent of several outbreaks within the last few years. Such incidents have led FDA to call for increased surveillance of dairy products by the government and the dairy industry itself.

- **Illinois, Indiana, Wisconsin, Michigan, Iowa, Minnesota:**
  - 1985—Low-fat milk—16,000 illnesses, at least 2 deaths

- **California:** 1985—Mexican-style cheese—150 illnesses, 84 deaths

- **Massachusetts:** 1983—Whole and low-fat milk—49 illnesses, 14 deaths

- **Tennessee, Arkansas and Mississippi:**
  - 1982—Milk—172 illnesses

- **Kentucky:** 1985—Chocolate milk—860 illnesses
FDA is urging the states to be alert to modifications in dairy processing plans, in cooperation with FDA and industry. There is an emphasis on evaluating the dairy operations technology. The FDA's latest initiative reflects the agency's concern about the need for more training programs for federal and state dairy investigators as well as for dairy industry personnel. Major emphasis would be on familiarizing them with the complex and changing technology used in dairy processing and of the potential for contamination of milk products after they have been pasteurized.

FDA already has completed one training program for some 40 of its investigators on dairy product safety, with emphasis on evaluating the dairy operations technology. The training sessions were held at Utah State University in Logan, one of the leading dairy science schools in the country. Another training session for some two dozen FDA milk specialists was held in February in Lexington, Ky., where some of the classes were conducted in a large, modern dairy there.

The states are also encouraged to undertake their own training programs, in cooperation with FDA and industry. FDA is urging the states to be alert to modifications dairies make to their original plant designs. Such changes are common because of changing market demands for dairy products. In its memorandum, FDA notes that "major changes have been made in the dairy industry regarding the handling of milk after pasteurization and before packaging." Calling for a "comprehensive review and evaluation of critical control points and possible routes of contamination" of post-pasteurization blending operations, the memorandum adds:

"There has been a proliferation of pipelines connecting raw unpasteurized and pasteurized storage and holding tanks in dairy plants. These connecting lines present easy by-passes around the pasteurizer [the unit in which unpasteurized milk is heat-treated to kill any harmful organisms], thus permitting post-pasteurization contamination in the event of equipment failure or operator error. The existing equipment controls and operating procedures need to be closely examined to ensure that any potential opportunities are completely eliminated."

The need for regulatory agencies to have up-to-date diagrams of dairy operations also was stressed in the FDA memorandum.

"In many cases," it pointed out, "up-to-date diagrams of all operations within the plant are not available. In addition, it is unclear whether all modifications to existing systems and renovations are being submitted to the state or local regulatory agency for evaluation as to their effect on the entire plant system. It is also unclear whether adequate plan review is being provided to assure that the design of plants incorporates no 'cross-connections' between pasteurized product equipment and raw product equipment and piping. . . ."

The agency noted that its inspections of soft cheese manufacturers after the California illness outbreaks have revealed "similar problems with respect to potential bypasses around the pasteurizer, post-pasteurization blending, and the lack of education and training [of dairy employees]." FDA said that its cheese plant inspections also had disclosed other contributing factors that were not found during its inspection of plants producing Grade A milk products. These included defects in the pasteurization process, the presence of pathogenic organisms on surfaces in the processing and storage areas, and discrepancies in pasteurization charts and other records.

FDA said dairy industry personnel also should receive more training. "The lack of awareness of dairy plant employees concerning the public health consequences of improper pasteurization or post-pasteurization contamination has sometimes contributed to conditions leading to dairy plant processing problems," the memorandum declared.

Although state and local regulatory agencies are primarily responsible for inspecting all phases of dairy operations within a state, FDA also conducts its own so-called "check ratings." In effect, FDA sends its own milk specialists to evaluate a plant and the rating that state inspectors have given it. Dairy plants must pass the state rating in order to ship products interstate.

In the memorandum, FDA also announced it would:

- Conduct more "intensified inspections" of non-Grade A dairy processing firms over the next few years.
- Obtain samples for possible pathogenic contaminants in finished products when it makes its own inspections and check ratings.
- Make its own evaluations of key equipment, including pasteurizing equipment, pipes, cleaning and sanitizing procedures, and required records of daily operations and production.

Acknowledging that the dairy industry was deeply concerned that the outbreaks in recent years could have a negative effect on the public's confidence in the safety of milk products, several industry spokesmen have stressed—as did FDA's Kozak—that the safety record of the nation's dairies, and particularly its milk producers, was still an excellent one. But the outbreaks, industry spokesmen say, cannot be ignored.

"These were important outbreaks that caused great concern not only within the industry but outside of it," said John Adams, director of milk regulatory and animal health affairs for the National Milk Producers Federation in Washington, D.C. "We realize that we have a pretty good track record when you consider that we process an awful lot of product every day. But milk also is a very perishable product, and I would say that the attitude of industry now is—and always has been—that we must stay on guard and try to stay on top of any potential problems."

Expressing concern over possible cutbacks by the federal and state governments in carrying out their inspectional and training activities, Adams stressed that maintaining the safety of milk and milk products required an "active force of people out there doing the job . . . . The dairy industry cannot be held totally responsible for regulating itself. In many cases we are put in a position of having to regulate our own people, and that is not always easy.

"The public demands more than just responding to a crisis. I think what the public wants us to do is to be out there monitoring and being on top of these problems and, like these new [FDA] initiatives demonstrate, we are going to be."

Chris W. Lecos is a member of FDA's public affairs staff.
The Centuries-Old Struggle Against Infectious Diseases

by Egon Weck

In the 75-year sweep of her best-selling novel, And Ladies of the Club, Helen Hooven Santmyer describes life in a small Ohio town in the decades, following the Civil War. Though the account is fictional, the lives of Santmyer's characters typify those of millions of real people of that earlier time, including the suffering inflicted by four major infectious diseases—tuberculosis, influenza, diphtheria and polio.

In the following article, free-lance writer Egon Weck draws on Santmyer's story to provide a comparison with the suffering experienced today by victims of a newer disease, AIDS (acquired immunodeficiency syndrome). A cure for AIDS has yet to be found, and victims despair of the frustrating pace of research. Yet, a look back at some of the dreaded scourges of the past illustrates the lengthy and painstaking work that must be done—even with the advantages of today's medical knowledge and sophisticated research technology—to win the battle against infectious diseases.
Dr. Gordon described Mrs. McCune's condition...as an "advanced case of phthisis [a wasting away of the body, in this case the lungs] complicated by pregnancy." He held out not the least shred of hope for her survival.

In 1875, when Dr. John Gordon saw Mrs. Mary McCune, wife of Waynesboro, Ohio's Presbyterian minister, at a Christmas celebration, it was evident that she was pregnant. It was also obvious that she was suffering. While others attributed her misery solely to her terror of her stern husband, Dr. Gordon was all but certain that she was also sick with tuberculosis.

A few months later, when Mary's neighbor Mrs. Reid went to visit her, she found Mary practically bedridden. She was so weak and wracked by spells of "half wretching, half coughing" she could hardly speak. Author Santmyer describes Mary's appearance:

"The sick woman was half-sitting, half-lying in a deep armchair with her head back against a crumpled pillow. Her skin was yellow, with a tallowy shine, and drawn tight; the flesh had been burnt away from under it, so that the knifelike ridge of her nose and her narrow jaw looked as if they might cut through it. Under the tallow on her cheekbones burnt an ugly dark flush of fever. Her hands, folded above the great lump of unborn child, were like claws."

Plagued by perpetual nausea, Mary McCune could not eat the "floating island" dessert that her neighbor had brought because she "couldn't keep anything down." Mrs. Reid found that the towel Mary used, presumably to mask her cough, was spotted with blood.

Dr. Gordon describes Mrs. McCune's condition to his wife Anne as an "advanced case of phthisis [a wasting away of the body, in this case the lungs] complicated by pregnancy." He held out not the least shred of hope for her survival. Had they lived a century later, Dr. Gordon would probably have been able to arrest Mary's TB with several very effective drugs. But in the 1870s, medical science was virtually powerless against the infectious lung disease. The doctor could only watch and wait as the woman weakened and died.

By the 1870s, tuberculosis had already been known for centuries. Louis Pasteur had already proposed microbes as the cause of infectious diseases such as tuberculosis. But it was not until 1882 that Robert Koch was able to identify the TB bacillus, Mycobacterium tuberculosis, under a microscope after developing a staining technique that made it visible. Koch followed up with experiments that proved his finding, in the process giving the science of microbiology basic techniques that are still in use today.

But the road from such basic findings to a cure for a disease is a long and difficult one. It took three more generations before medical researchers developed a series of drugs, beginning with Selman Waxman's streptomycin, that were effective against TB.

Through persistent, painstaking research, medical science has conquered many of the infectious diseases that once ravaged humanity. Today, most of us have no recollection of what scourges some of those diseases have been. A whole generation of Americans has now grown up without experiencing the thousands of deaths and crippled bodies caused by polio epidemics, for example.

Polioymelitis struck in Waynesboro, Ohio, Santmyer's fictional town, in August 1909. The Waynesboro children who came down with it had one thing in common: They had all enjoyed the fun and food at the county fair.

In the early 1900s, when Dr. Gordon's son John Jr. was practicing medicine, it was suspected that polio was infectious. But the route of infection was not known. So the three cases that the younger Dr. Gordon treated were carefully isolated in a ward at Waynesboro's new hospital. And while the younger Gordon longed to see his own son Tucker—who was living with his divorced mother in California—he was relieved that Tucker had not been in Waynesboro to be exposed to the virus.

Polioymelitis was first described in 1789 by Michael Underwood in a book on childhood diseases. By the late 1800s, polio epidemics began hitting the United States and Sweden. In 1916 there were 30,000 cases in the United States, and thousands died.

Today, even with the vast resources of modern medical
technology, once children contract paralytic polio, physicians can do little more for them—other than providing respiratory support such as iron lungs—than Dr. John Gordon Jr. could for the children of Waynesboro some three generations ago.

By the 1930s, researchers had learned that polio is caused by a virus. Dr. Simon Flexner, working in laboratories at the Rockefeller Institute, had succeeded in transmitting the disease to monkeys. It was one of a series of arduous and yet elegant laboratory feats that microbiologists and immunologists had to master in their battle against the disease.

The scientists of the 1930s believed that infection came about when the polio virus entered the body through the nose. But ultimately it was found that the polio virus most commonly is spread via direct contact or from food or water contaminated from human feces, and enters the body through the mouth and throat.

Medical science of the '30s lacked almost all of the wondrous anti-infective "magic bullet" drugs that have since been discovered to treat many bacterial infections. The first of them, the sulfa drugs, were just being developed. And magic bullets against most viral diseases, such as polio, have continued to elude medical researchers even down to our time.

Fortunately, preventive measures against viral diseases have been far more successful. So it wasn't surprising that immunologists in the '30s were intent on making a vaccine against polio. But before they could succeed, a great deal more research had to be done.

Vaccines fight off viruses by mobilizing the body's own immune system. Typically, viral vaccines are made of viruses that have either been killed or at least rendered incapable of producing disease yet are still able to provoke the immune system to produce antibodies to destroy any virus that enters the body in the future.

Two attempts were made in the '30s to develop a polio vaccine patterned on Pasteur's methods for making rabies vaccine 50 years earlier. But in 1935, in trials with both killed and live virus versions, the vaccines were found to be unsafe. Meanwhile, by the late '30s, polio had killed tens of thousands of children and young adults and crippled hundreds of thousands more. Moreover, polio epidemics were becoming more severe and more widespread.

To make a polio vaccine, scientists first had to identify the virus that caused the disease. Then they had to find a way of growing the virus outside the body—a difficult task since viruses will grow only on selected types of living tissue that are suitable for producing vaccine.

These two great hurdles were overcome in 1949. In that year, Dr. John Enders succeeded in growing polio viruses in monkey kidney cells grown in test tubes. And, after lengthy research using this new tool, investigators found that there were three strains of polio viruses. These key advances made it possible to develop a vaccine. It hardly surprised the medical research community when Enders and his younger colleagues, Thomas Weller and Frederick Robbins, were awarded the Nobel Prize in medicine for this accomplishment.

Enders' basic research was one of the key elements that made it possible for Drs. Jonas Salk and Albert Sabin to develop safe vaccines that could be mass-produced and administered to large populations. Mass inoculation of U.S. children with Salk's killed virus vaccine began in the 1950s, and a live virus vaccine developed by Sabin in the 1950s, and a live virus vaccine developed by Sabin was proven safe and effective in clinical trials, the largest of which were in the Soviet Union. Before long, the Sabin vaccine came to be used almost exclusively in the United States. By 1965 the
In 1940, Sir Frank Macfarlane Burnett succeeded in growing the flu virus in the chick embryos of fertilized eggs. Flu vaccines continue to be made from viruses grown this way. The viruses are harvested from the egg fluid and then inactivated.

The first line of defense against influenza continues to be the vaccine, which is estimated to be 70 to 90 percent effective. By exercising vigilance, public health authorities can catch mutations of known viral strains. Then vaccines can be produced to protect persons at high risk during flu epidemics.

The fruits of such vigilance were demonstrated in the United States in 1957. On April 17 of that year, a dispatch in The New York Times was spotted by a virologist in Washington, D.C. In Hong Kong, the dispatch said, mothers by the thousands were taking children with high fevers to dispensaries. A virologist, Dr. Maurice Hilleman, then at the Walter Reed Army Institute of Research, recognized from the dispatch that there had been an outbreak of influenza in Hong Kong.

One of Hilleman's jobs at Walter Reed was to keep an eye on flu outbreaks around the world so that the medical community could act in time to make a vaccine. From the dispatch in the Times, he speculated that the severity of the outbreak in Hong Kong could mean a new variety of flu bug. Hilleman cabled Army authorities in Hong Kong asking them to send him swabblings from the throats of flu victims. Within a month after he had spotted the news item from Hong Kong, the virus specimens arrived in Hilleman's lab, and in five days he isolated a new virulent flu virus, designated type A2.

Pharmaceutical manufacturers quickly responded and rushed into production a vaccine that would protect against the A2 flu virus in time for the start of the autumn flu season in the United States. Although in 1957 alone nearly 19,000 Americans died of what was dubbed the Asian flu, the vaccine greatly reduced the severity of the pandemic and prevented a major health catastrophe.

In addition to vaccines, the drug amantadine is useful in preventing influenza. And although there is no magic bullet...
against the flu, antibiotics can be given to treat bacterial infections that often accompany the flu during epidemics. When left untreated, they contribute substantially to the mortality. Despite the progress that has been made, we can expect the flu to continue to take a toll—a reduced one at best—in sickness and death.

Modern medicine has had more success against a major child-killer of years gone by, diphtheria. In 1875, Dr. John Gordon could do little to help children with diphtheria, with its obstructive membranes in the throat, fever, weakness of the heart, anemia and extreme prostration. So he tried as best he could to prevent its spread. Gordon was aware of the discoveries of Joseph Lister and Ignaz Semmelweiss in controlling the spread of infections. He felt that the procedures of disinfection and cleanliness they had extended to the care of wounds and childbirth could be used to deal with diphtheria. So he recommended liberal use of carbolic acid and tried to get mothers to hang a sheet dampened with the disinfectant in the doorway of the sickroom. He also urged them to change their clothes before entering another part of the house. (Strict isolation of diphtheria patients continues to be recommended as an essential part of current medical practice.)

A little more than a decade later, the fictional Dr. Gordon and his real-life counterparts were able to employ much more effective treatment against diphtheria. It was in 1883 that a Swiss physician, Theodor Klebs, first described the diphtheria bacterium. Five years later Pierre Roux and Alexandre Yersin demonstrated that it was a toxin secreted by the bacillus that caused the disease. They did so by filtering out the bacteria, injecting the remaining material into animals, and finding that it made the animals sick.

In the decade that followed, use of an antitoxin to treat diphtheria victims cut deaths by 50 percent.

In 1912, Emil von Behring developed a diphtheria toxoid-antitoxin mixture to induce immunity to the disease. An improved diphtheria toxoid (toxin treated to render it harmless) has since been developed and is now routinely administered to infants and children as part of a DTP (diphtheria, tetanus and pertussis) vaccine. The success of immunization is evidenced by the fact that only two cases of diphtheria were reported in the United States in 1985.

Despite the use of antitoxins and antibiotic drugs that are available in the rare instances when diphtheria infections do occur, death still claims 5 to 10 percent of diphtheria victims. So immunologists and pediatricians continue to stress the need for immunization.

All four of the infectious diseases that threatened the lives of the characters in Santmyer’s novel are still with us. Although none has been eradicated, medical science has been successful in reducing the threat they pose to human health and life. And with programs of worldwide vaccination, public health officials hope to conquer them as completely as they have smallpox, one of the oldest viral scourges, finally eradicated from the world in 1980.

While we can trace the infectious diseases in Santmyer’s novel back for centuries, if not millennia, AIDS has been recognized as a new disease only since 1981 (although epidemiologists are now beginning to trace its existence back to the 1960s in Africa). The AIDS story began in May 1981 when the U.S. Centers for Disease Control received a report of five cases of a rare lung infection called pneumocystis pneumonia in Los Angeles.

A few days later the CDC researchers learned of several cases of Kaposis sarcoma in gay men from San Francisco. Kaposis’s sarcoma is a rare form of skin cancer usually seen in elderly men. Like pneumocystis, it also occurs in organ transplant patients and others whose immune systems have been suppressed.

Soon, reports of homosexual patients with Kaposis’s sarcoma and pneumocystis pneumonia were coming from New York. By the end of 1981, in the United States alone,
Right now, medicine has far to go in its battle against AIDS. But when viewed from the historical perspective—with infectious diseases so overshadowing people’s lives—medical researchers seem to be advancing against AIDS at an unprecedented pace.

100 cases of what was soon to be referred to as acquired immunodeficiency syndrome (AIDS) had been identified. AIDS also was turning up in recent Haitian immigrants to the United States, in hemophiliacs, in people who had undergone transfusions, and in intravenous drug users. By 1982, investigators were hypothesizing that the cause of AIDS was a certain type of virus known as a retrovirus. Medical scientists had already identified one such virus—known as HTLV-I.

Initially, when scientists tried to isolate the AIDS virus from the blood cells of AIDS patients, they met with failure. Later, however, scientists in the United States and France were able to isolate the AIDS virus, and a group at the National Cancer Institute photographed the virus using an electron microscope.

By mid-1983, researchers established the fact that the AIDS virus, named HTLV-III, destroys certain cells in the immune system called helper T-cells that are essential to the immune response. Once disarmed by the AIDS virus, the immune system is defenseless against opportunistic infections such as pneumocystis pneumonia and Kaposi’s sarcoma.

Despite the great difficulties involved, scientists were successful in growing the AIDS virus in the laboratory. Once that was accomplished, scientists developed a blood test to detect exposure to the virus. And the stage has been set for the development of a preventive vaccine and drugs that might kill or inhibit the spread of the disease.

Other physicians and scientists, meanwhile, were learning more about how AIDS is transmitted and which groups in the population are at greatest risk. Hardly a month passes without the announcement of a new finding or advance that adds to our knowledge of this modern scourge. Nevertheless, today’s counterparts of Dr. John Gordon, when confronted with an advanced case of AIDS, are as helpless as he was while trying to treat Mary McCune’s tuberculosis. Of the more than 16,458 patients diagnosed with AIDS between June 1981 and December 1985, at least 8,361 have died.

But centuries elapsed between the time diseases such as tuberculosis and diphtheria were first detected and means of control were found. By comparison, the progress against AIDS is truly remarkable. The fact remains, however, that despite the sophistication of modern medical science and technology, researchers have found it much harder to deal with viruses—particularly retroviruses—and the work ahead promises to be much more difficult and time-consuming before ways can be found to prevent or cure AIDS.

Right now, medicine has far to go in its battle against AIDS. But, when viewed from the historical perspective—with infectious diseases so overshadowing people’s lives—medical researchers seem to be advancing against AIDS at an unprecedented pace.

Fortunately, AIDS is far less easily transmitted than tuberculosis, diphtheria, polio or influenza. And public health authorities have acted to block its spread through the supply of blood and blood products, such as those used by hemophiliacs. Science’s progress on AIDS was summed up in the October 1985 issue of the FDA Drug Bulletin. The publication included recommendations for personal and public health measures to protect against the disease, measures that could halt or drastically slow transmission of AIDS while scientists continue to work toward ways to prevent or cure this latest of history’s incurable infectious diseases.

Egon Weck, a free-lance writer, has written extensively on health and medical issues.
The Bugs That Bug
FDA Inspectors the Most

One thing you can say about flour beetles: They know their nutrition. When they go after stored wheat, for example, they eat only the germ portion where all the nutrients are and leave behind the kernels.

And they're clever in other ways. They have functional wings that they use judiciously, preferring not to expose themselves needlessly. They burrow down into flour so they cannot be seen and, with food particles clinging to the hair on their little (one-seventh of an inch long) bodies, look just like what they are hiding in. Even their eggs have a sticky surface that catches food particles, adding to their camouflage.

And are those beetles ever mean. If they find that a food they want is already claimed by other insects, they will drive out or destroy the homesteaders and take over the entire supply for themselves. In fact, macaroni is one of the few foods where the flour beetles' competitors can survive: Smaller insects crawl inside the tubes of pasta where the beetles are too large to pursue them.

With traits like this, it's no wonder they have survived since prehistoric times to be the most prevalent insect pest in our basic food supplies.

There are more than 150 different kinds of insects that infest food after it has been harvested, causing the loss of at least 10 percent of the world's food supply every year, usually in developing countries that can least afford such losses. Flour beetles are the most abundant and destructive of these insects and are the insects most often found by FDA inspectors in food manufacturing plants and warehouses.

Wherever they are found, flour beetles cause serious damage. They prefer to eat flour and other grain products, such as bread, noodles and cereals, but they will also devour whole grains such as wheat, oats and barley. If no grain is available, almost any dry vegetable material will do. They have been known to infest nuts, beans, dried fruits, cocoa, yeast, spices, tobacco and marijuana. They can even live and breed in the fiery and seemingly hostile environment of pure paprika.

Flour beetles even engage in chemical warfare. They give off noxious chemicals called quinones when they are disturbed or startled, to drive away predators or other competing insects. Quinones are responsible for the characteristic musty odor of beetle-infested flour and can even affect the taste of foods made from the flour. (The cricket-size penacate beetle of the southwestern desert, a close relative of the flour beetle, has a similar defense. It stands on its head when disturbed and emits a foul-smelling cloud that can rival a skunk's scent.)

Besides eating and spoiling food, flour beetles may also be carriers of bacteria, molds and parasites. They are an intermediate host for the dwarf tapeworm, a parasite found in rats and mice that live off beetle-infested foods. Humans can become infected with the tapeworms by unwittingly eating infected beetles hiding in contaminated food.

Because flour beetles are masters of camouflage and concealment, it is not easy to detect an infestation in food. They are shy of light and will hide under food or in cracks and crevices when a room light is switched on. And, while other insects give themselves away by the droppings (pellets) they leave behind, flour beetles provide no such clue. Their excreta is often the same color as the food they're eating. But nature did not create a perfect predator. The beetles do leave a telltale sign when they periodically shed their outer skins. These gold-colored skins stand out readily in the infested flour or other food.

A single beetle may shed its skin as many as 10 times. Such shedding is necessary for the four-stage growth from egg through larva to pupa and then adult. Shedding happens most often during the larva stage, when main growth occurs. The resting (pupa) stage—when the wormlike larva becomes an adult beetle—is the last time for shedding, or molt. One pair of adult beetles may live for two years and produce as many as 900 offspring, so it's not surprising that a large number of skins (and pellets) accumulate in infested food in a relatively short time.

To detect and measure flour beetle contamination, FDA scientists have developed several methods for separating the insects from the food they contaminate.

An insect's body shell will repel water but not petroleum solvents, such as kerosene. By mixing test samples of infested foods, water and solvent
together, the beetles become saturated with solvent and the foods with water. Then the solvent floats to the top, bringing with it the beetles, to be skimmed off, identified and counted.

When whole beetles and parts aren't detected in the examined samples, FDA scientists use a blue cloth filter and special washing techniques to find and count beetle eggs. If the grain—with beetles and all—has been ground into flour, the fragments can still be identified and counted, even though they are microscopic in size. FDA scientists have photographed and catalogued all body parts of the flour beetle larva and adult to help identify beetle fragments.

Out on inspection sites, such as food warehouses and grain elevators, FDA relies on the sharp eyes and experience of its field investigators to detect flour beetle infestations. The beetles manage to hide in all kinds of places, including corrugated cardboard packing, in the gear boxes of machinery where grain is ground into flour, and even in bait set out to control rodents. An FDA inspector with an eye for beetles can recognize unsanitary practices that permit beetle infestation and will see that the problems are corrected.

Flour, grain and other food products contaminated with beetles may not be sold for human consumption. Stored grain can sometimes be reconditioned by sifting and processing, but most often it and other contaminated foods must be converted to animal food or destroyed.

A good word for the thus-far pilloried flour beetle: For many scientists it is a valuable and useful insect. The structure of flour beetle genes is easily mapped and observed, which makes the bugs useful in genetic research. They are easy to raise in laboratory cultures and have a number of mutant genetic traits useful in cross-breeding experiments. But away from the laboratory—in the warehouses and granaries of the world—the flour beetle is seen as the dreadful little pest that it is.

A World Class Pest

Flour beetles (also known as "bran bugs") belong to the darkling beetle family, along with mealworms and some 15,000 other species of beetles. They first appeared during the Cretaceous Period, about 100 million years ago, sharing the Earth with the last of the dinosaurs. They probably lived under the bark of fallen trees where dry and decomposed wood was about the consistency of coarsely ground flour. They can be found today in similar locales in their ancestral territories of India and the Middle East.

Flour beetles came into their own when early civilizations began systematically producing and storing grains and flour. The beetles moved right in. By the time of the Egyptian and Roman Empires they were traveling with soldiers and traders in cereals and other foods until they became the major granary pest of the ancient world.

Yet, for all the thousands of years they have plagued mankind, it was not until the 18th century that they were actually "discovered" and given a name by the natural history scientists.

In 1792, entomologist J.F. Herbst in Berlin found some reddish-brown beetles feeding on specimens in a museum cabinet. They were unknown to him and did not appear in the scientific literature, so he entered them there as Tribolium castaneum, the rust-red flour beetle. Other scientists soon realized that these overlooked little bran bugs were everywhere. By 1835 they were reported spreading across North America in the flour barrels and saddlebags of the pioneers. In 1891 they appeared as "wee flour beetles" in Michigan grain bins; by 1906 they had reached Hawaii.

At about this time, the French scientist Jacquelin du Val noticed that some flour beetles he was studying were not identical to Herbst's castaneum. These were a different species, which he named confusum since he had often confused them for castaneum in the past. Other entomologists admitted to the same error and realized that for years the confusum beetles had managed to confuse 'em.

Although both species range worldwide, they have different distribution patterns. The rust-red beetle prefers warmer climates, possibly because its ancestral range included subtropical India. The confusum beetles are more cold hardy and thrive in Northern Europe and Canada. But both can flourish at room temperatures comfortable for humans, so modern commercial transport of beetle-infested foods between climate-controlled buildings allows them to move into each other's territories.
Diethylstilbestrol (DES)
Studies over the past seven years increase the concern that pregnant women who used the synthetic hormone DES may have an increased risk of breast cancer, according to a recent report of a task force convened by the Department of Health and Human Services. However, a cause-effect relationship is still unproven, and the excess risk is similar to that for a number of other breast cancer risk factors.

The report also stated that the daughters born to the women as a result of those pregnancies—who thus were exposed to the drug before birth—may have an increased risk of dysplasia, a condition of the cervix and vagina that sometimes may lead to cancer. However, whether this actually increases the risk of cancer in “DES daughters” is still unclear, the task force cautioned.

The report recommended that information about the risks of DES exposure should continue to be sent to all physicians and to DES mothers and their daughters.

The DES Task Force was convened in 1985 to review the results of studies on the effects of the drug published since an earlier task force investigated the problem in 1978.

DES is a synthetic hormone with the tongue-twisting chemical name diethylstilbestrol. It was developed in England in 1938. During the 1940s, 50s, and 60s and even into the 1970s, perhaps 2 million pregnant women were given DES to prevent miscarriage. In some cases, the drug was given even in normal pregnancies, where there was no special risk of miscarriage.

In 1971, FDA ordered drug manufacturers to include a warning in the labeling of DES and other estrogens that these products were not to be used during pregnancy. The warning was added after studies revealed an apparent increase in the risk of vaginal adenocarcinoma—a type of cancer—in young girls exposed to DES before birth. A special FDA Drug Bulletin was issued to alert physicians to the possible toxic effects of DES.

In 1978, the first DES task force, established by the then Department of Health, Education, and Welfare, reviewed the data on the risk of adenocarcinoma in DES daughters. Subsequent reports indicated that the risk wasn't as great as originally feared. Similarly, fewer daughters than expected had adenosis, a benign (noncancerous) abnormality of the vagina.

What was known about breast cancer in DES mothers at the time of the 1978 task force was based on a study of women who, while they were pregnant, had participated in a clinical trial of DES at the University of Chicago in 1951. The study reported 32 breast cancers in a group of 693 women exposed to DES, compared to 21 cancers among 668 women who did not take the drug. Though the numbers were too small to rule out the possibility of chance or coincidence, the excess risk and the fact that the cancers appeared to develop earlier in the DES-exposed women did raise concerns.

The 1985 DES Task Force reviewed a 1980 update of the Chicago study, which showed that the total number of breast cancers detected in DES-exposed women had increased by two, to 34, but the number in the unexposed women had increased by seven, to 28. Thus, said the 1985 task force, “the excess risk of breast cancer noted during the first 20 years of followup was somewhat diminished with additional followup beyond that time.”

In addition, four new studies were reviewed by the 1985 task force. Two were follow-ups of randomized trials of DES use in pregnancy. The larger of the two showed little or no excess risk of breast cancer among exposed vs. non-exposed women. However, in the smaller trial, involving diabetic women, four breast cancers developed among the 50 women given DES, while none developed in the 96 women not given the drug.

The task force looked at two observational studies in which the records of women who took DES during pregnancy were compared to those of a group of unexposed women of similar age and race who had given birth at about the same time. These studies showed a 50 percent greater risk of breast cancer associated with DES exposure. The risk increased with duration of follow-up, rising approximately twofold for those followed for 20 years or more.

The 1985 task force concluded that there is now greater cause for concern than there was in 1978, although a causal relationship has not been established.

The task force members cited a number of factors affecting their conclusions, including the difficulty of assessing whether the excess risks are due to the drug or to spontaneous abortion and other known risk factors. The group also questioned whether the DES mothers were more likely to have intensive medical attention and thus higher rates of cancer diagnosis. They noted as well that the risks related to length of follow-up were not consistent among the four studies.

As for the health of DES daughters, the 1978 report
Physicians who prescribed DES between 1940 and 1972 should inform their patients about the possible increased risk of breast cancer.

focused on the increased risk of clear cell adenocarcinoma of the vagina. Concerning another form of cancer, squamous cell cancer of the cervix, the 1978 report said the risk was the same in exposed and unexposed women. This conclusion was based partially on results of the initial screening examination of DES daughters in the National Cooperative Diethylstilbestrol Adenosis (DESAD) Project, a large collaborative study involving four groups of DES-exposed women.

The 1985 task force reviewed a report of the first seven years of follow-up of these women, which showed that DES-exposed women experienced a significantly higher incidence of dysplasia—a growth of abnormal tissue that may or may not progress to squamous cell cancer. Although the relationship between DES exposure before birth and the risk of subsequent development of squamous cell cancer is not proven, the new DESAD findings indicate this is a possibility that requires further study, the task force said.

However, the task force cautioned that these conclusions are based on only one study and that issues related to the clinical findings, epidemiology and pathology need to be studied further. "Because of these issues, the implications of these results for the development of squamous cell cancer remain unclear," the task force said.

The task force urged physicians who prescribed DES and other estrogens to prevent pregnancy complications between 1940 and 1972 to inform their patients about the possible increased risk of breast cancer.

Women should be encouraged to question their physicians about their own risk for developing breast cancer and ask for advice about the need for follow-up care for their offspring. Those who know they were given DES in the past should tell their present physicians in order to assist in their follow-up and management, the 1985 report stated.

DES daughters with dysplasia should have careful medical follow-up since in some women this condition may evolve into cancer.

The screening recommendations for DES mothers are the same as the National Cancer Institute's recommendations for all women. They include monthly breast self-examination and a physical examination of the breasts by a physician at suitable intervals, usually annually.

Mammography (X-ray examination of the breasts) may be considered for women 35 or older with a personal history of breast cancer; for women 40 or over with a family history of breast cancer; and for all women over 49. Mammography would be indicated for any women with a lump or other symptom suggesting breast cancer.

The 1978 recommendations for screening DES daughters are still appropriate, the 1985 task force said. In addition to initial screening at age 14, these women should be examined periodically by a physician who can detect subtle changes in the cervix and vagina. They should have a yearly pelvic examination, Pap smear and, if necessary, a biopsy. Should any abnormalities be found, they should be seen promptly by a physician experienced in use of a colposcope, an instrument for examination of vaginal and cervical tissues by means of magnifying lenses.

The 1985 task force did not review the literature related to DES-exposed sons, in which some studies have reported an increased risk of certain genital abnormalities. However, the report said the general recommendations made in 1978 still appear appropriate—that is, for a careful history and thorough medical examination to detect abnormalities.

Follow-up studies of DES-exposed women and their offspring should continue to be carried out and supported by the Department of Health and Human Services, the task force said. In addition, the group suggested investigations among the DES-exposed of factors such as exposure to other estrogens, radiation and smoking and possible interactions of these factors with the DES exposure. Hormonal and reproductive problems in both daughters and sons should also be studied, as should viral infections such as herpes.

Results of research projects recommended by the task force may not be available for several years. However, many of the group's recommendations relating to the dissemination of information to physicians and the public have already been implemented, including an article in FDA's December 1985 Drug Bulletin, which is sent to 1 million health professionals in the United States, including virtually all physicians.

In the meantime, DES mothers and their daughters and sons can get information through the National Cancer Institute's Cancer Information Service via a toll-free telephone service. The number is 1-800-4-Cancer.

—Annabel Hecht

28 / April 1986 / FDA Consumer
Support Groups:
When Going It Alone Is Going Nowhere

by Annabel Hecht

Name a handicap, a medical condition, or other life-disrupting problem and you'll probably find a support group ready to help the victims of that problem to cope. There are groups for such widespread afflictions as heart disease and cancer. There are groups for relatively unknown conditions, such as sarcoidosis (a chronic skin disease) and Ehlers-Danlos syndrome (a connective tissue disorder).

There are groups for those who have addictions such as alcoholism or gambling. There are numerous groups for those who eat too much, as well as for those who don't want to eat at all.

Some groups help individuals cope with their own problems; others provide support for family and friends of those who are ill. Candlelighters, for instance, is a support group for parents of children with leukemia. Pil-Anon offers aid to families of persons addicted to mood-altering drugs. There are support groups for parents who have lost a child and for adults who have lost a spouse.

There are an estimated 500,000 support groups in the United States serving upwards of 15 million people. That includes branches and chapters of national organizations, as well as strictly local groups.

Support groups, also known as self-help and mutual-aid groups, take a variety of forms. Some are highly structured, like Alcoholics Anonymous. Others are informal. Some groups meet on a regular basis—once a week, once a month—sometimes in the homes of members. Others do not have regular meetings but provide support in other ways, such as visiting breast cancer patients in the hospital.

Some groups work closely with health professionals; others go it alone. But however they differ in their structure, self-help groups share a common goal—the bringing together of people with similar experiences who, by sharing, can gain strength and support from each other. Some focus their efforts on one particular problem-solving approach. Counted among the support groups, for example, are organizations whose function is primarily fund raising to support research and education; those whose function is political action to change public attitudes; and consumer advocacy groups, such as Mothers Against Drunk Drivers.

Keeping tabs on the burgeoning number of support groups are 38 state and regional clearinghouses, the Self-Help Center in Evanston, Ill., and the National Self-Help Clearinghouse in New York City. Clearinghouses provide directories of existing groups, publish newsletters and books, hold workshops, and help people find an appropriate group or get a group started.

Mutual aid is hardly a novel concept. In fact, the idea may well have its roots millions of years ago in the Middle Pleistocene Age, according to one anthropologist. Mankind learned early on that survival of the clan, village or colony depended on the members working cooperatively to provide food and protection against common enemies.

Through the centuries, mutual aid has been provided by a variety of organizations, such as the guilds of medieval times, the "Friendly Societies" that developed out of the Industrial Revolution in England, the grange movement of rural America, and churches.

But the modern mutual support movement began in the United States in the 1930s with two groups that still rank among the largest: Alcoholics Anonymous and Recovery, Inc., a group to prevent relapses in former mental patients. Both represent populations that have been stigmatized by society. Both were started because of the unwillingness or inability of professional organizations to deal with the problems of their members.

Alcoholics Anonymous was started in 1935 by two recovered alcoholics: a doctor, Dr. Bob, and a stockbroker,
**SUPPORT GROUPS & MEETINGS**

**Families** Families and Children in Trouble seeks volunteers to serve as hotline counselors on their 24-hour crisis and referral hotline. Call: 628-FACT.

**High Blood Pressure** Cardiovascular Institute seeks persons with high blood pressure to participate in a hypertension study. Fee paid to participants. Call Tuesday or Wednesday, 1 to 4 p.m.: 686-0600.

**Infant Development** Infant Research Center of George Washington University seeks mothers and babies, 12 to 14 months old, in the Columbia area to participate in a study of intellectual development. Call: (301) 649-5767.

**Legal Volunteers** Montgomery County Community Crisis Center seeks volunteers with a legal educational background and familiarity with the court system to serve as companions in the Abused Persons Program. A nine-month commitment is required. Call Loretta Muller: 656-9526.

**Lesbian and Gay Over 60** Howard University Researcher seeks black and white lesbians and gay men over 60 to participate in a minority aging study. Participants fill out an anonymous and confidential questionnaire. Call Joseph Izzo: 526-2471.

**Panic Disorders** National Institute on Alcohol Abuse and Alcoholism seeks individuals who suffer from anxiety and panic attacks. Participants must be an offspring of an alcoholic parent or alcoholic themselves. Call Dr. Ted George: 496-7515.

**Planned Parenthood** Planned Parenthood of Metropolitan Washington seeks volunteers to help with educational programs. Call Ilene Spera: 347-8500.

**Platelet Donors** Plateletpheresis Center at the National Institutes of Health seeks volunteer blood platelet donors, between 18 and 66, who are in good health. Platelets will be used to help persons with leukemia, cancer and aplastic anemia. 499-2022.

**Respite Care** Fairfax County Department of Social Services seeks respite care volunteers to provide in-home care to abused and neglected children during a family crisis. Participants must be mature parents at least 25 years of age. Providers are reimbursed $10 per day. Call: 385-8883, ext. 270.

**Tutors** Connections seeks volunteers to tutor refugee youths living in the Alexandria and Reston areas in English and math. Volunteers must be patient and willing to make a several-month commitment. Mileage is reimbursed. Call: 385-8883.

**Working Mothers** Researcher at Catholic University seeks women attorneys who will deliver their first baby between Jan. 1 and April 30 with no delivery or post-partum complications, to participate in a study examining the transition of new mothers and their reentry to the work force. Call Dorothy De Moya: 659-0694.

**FITNESS**

**Self-Defense** Feb 4 to Feb. 27, Tuesdays and Thursdays, 7 to 9:30 p.m. D.C. Rape Crisis Center and D.C. Self-Defense Karate Association sponsor self-defense classes for men and women. All Soul's Church, 16th and Harvard streets NW. Donations accepted. 333-RAPE.

**SUPPORT GROUPS & MEETINGS**

**Depressives** Feb. 6, 7:30 to 9:30 p.m. A Depressive/Manic Depressive support group meets. Parish Hall Library, St. John's Episcopal Church, 3240 0 St. NW. 354-0495.

**Short of Breath** Feb. 6, 7:30 p.m. Arlington Hospital's Short of Breath Club meets to discuss traveling with oxygen. John T. Hazel Conference Center, 1701 N. George Mason Dr., Arlington. Free. 558-6354.

**Family of Stroke Patients** Feb. 7, 1:30 to 3 p.m. Easter Seal Rehabilitation Center's support group for Family and Friends of Stroke Patients meets. 2425 N. Glebe Rd., Arlington. 522-2777.

**Ex-Smokers** Feb. 11, 7 to 8 p.m. American Cancer Society's support group for ex-smokers meets. Chevy Chase Community Center, 3601 Connecticut Ave. NW, 483-2600.

**Post-Polio** Feb. 9, 1 to 3 p.m. Post-Polio National support group meets. First floor meeting room, Fairfax City Library, 3915 Chain Bridge Rd., Fairfax. Free. 273-8171.

**Surgical Menopause** Feb. 11, 7 to 8 p.m. American Cancer Society's support group for ex-smokers meets. Chevy Chase Community Center, 3601 Connecticut Ave. NW, 483-2600.

**Breast-Feeding** Feb. 12, 10 a.m. College Park La Leche League meets to discuss nutrition and weaning. Call Lily Werbos: 333-7472.

**Learning Disabilities** Feb. 12, 7:30 p.m. Prince George's County Association for Children and Adults with Learning Disabilities meets. New Carrollton Library, 7414 Riverdale Rd., New Carrollton. 464-1205.

**Sjogren's Syndrome** Feb. 12, 7:30 p.m. Sjogren's Syndrome support group meets. Clinical Center, Building 10, Room 2C-310, National Institutes of Health. 474-1062.

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**LECTURES & COLLOQUIA**

**Hospital System** Feb. 9. Newborns from maternity centers present "How to Make the Hospital Smooth" to new parents. Call 587-8466.

**Vegitarianism** Feb. 9. Society sponsors a lecture on the heart. Capital Memorial Church, 3150 Clifton St. NW. Free registration: 949-8349.

**Diabetes** Feb. 13, 7 p.m. A support and educational group for diabetics meets. Salvation Army, 2225 Wisconsin Ave. NW, D.C. 20007 or call 373-5300.

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**RESOURCES & SERVICES**

**Organ Donors** National offers a free brochure, "The Donation Process," which addresses people who have about organ donation. Call 223 Wisconsin Ave. NW, D.C. 20007 or call 373-5300.

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**Calendar Guidelines**

To have a listing considered, please send a summary or before publication of the Health Calendar, the 1150 15th St. NW. Washington. Material must include event, description, address, date, time, registration, fee, and phone number.
Bill W. Both had participated in the Oxford Group, a religious movement founded in Oxford, England, in the early 1920s. Anonymity is one of the foundations of the group, and the full names of members, like those of the founders, are never revealed. There are now more than 53,000 AA groups worldwide with over 1 million members.

The success of AA has led to the creation of a host of similar groups to help gamblers, debtors, parents who abuse their children (Parents Anonymous), men who abuse women (Batterers Anonymous), people who are overweight, drug abusers, and families of drug abusers, to name just a few.

Recovery, Inc., was founded in 1937 by Dr. Abraham Low, a psychiatrist, to prevent relapses in former mental patients. Recovery provides self-help training developed by Low and described in his book Mental Health Through Will Training.

There are a number of ways to describe the multitude of mutual-help groups that have evolved since the 1930s. They can be classified according to the nature of the problem facing their members (for example, mental illness or heart disease) or by the population group or groups involved (such as women, parents or children).

The National Institute of Mental Health, in its publication Mutual Help Groups: A Guide for Mental Health Workers, suggests three classifications, based on the factors that influenced the group's development. The first classification includes groups that developed in response to professional failure to effectively treat a condition, such as Alcoholics Anonymous and Recovery, Inc.

The second classification includes groups that evolved to help victims of an illness or a handicap who have also received medical treatment but need help in coping with the physical, social and psychological problems that result from their condition. Members of these groups include people with such diverse conditions as brain injuries, genetic defects, chronic metabolic diseases, burn injuries, heart disease, cancer, colitis, and diabetes.

The names often are symbolic: Make Today Count (adult cancer victims), Reach for Recovery (women who have had mastectomies), Mended Hearts (people who have had heart surgery), and Phoenix Society (burn victims).

All of these groups focus on helping members live with their illness or altered body image. Unlike the "anonymous" groups, the illness-oriented groups don't have a fixed formula for coping: They depend more on a sharing of experiences. They are more likely to have a professional person to help structure meetings and provide experts on the particular illness as speakers. Many groups are sponsored by voluntary health organizations such as the American Heart Association and the American Cancer Society.

The third classification includes mutual-aid groups that developed in reaction to normal life events, such as birth and death. For instance, there is the Association for Childbirth Education, formed to seek alternative approaches to childbirth (other than what the group perceives as the impersonal hospital setting), and the La Leche League, which provides education and support for new mothers who wish to nurse their babies.

Parents who have lost a baby may find comfort by joining such groups as AMEND (Aiding a Mother Experiencing Neonatal Death), Empty Cradle, Kinder Mourn, SAND (Support After Neonatal Death), HAND (Help After Neonatal Death), and Compassionate Friends.

For those who have lost a spouse through divorce or death, there are Parents Without Partners, Coping With Grief, and Widow-to-Widow.

This list of support groups is, of course, just a sampling of the organizations that have developed to help people with problems help themselves. No list can ever be complete, since new groups form continually as new needs surface, while some may break up because they were designed with a specific time limit.

According to most reports in the popular press and medical literature, support groups are generally doing a good job. Articles frequently describe the relief felt by members when they found they were not alone, that someone else had a similar illness or had experienced a similar loss.

Support group members not only learn about their own illness through discussions and speakers, but they also have an opportunity to make new contacts and exchange information on how to deal with common problems. "I had a chance to ask questions that I probably wouldn't have thought about asking my doctor," said one patient after his first visit to a support group for victims of Crohn's disease, a chronic intestinal condition. Listening to the other members of the group brought up questions that were in the back of his mind, he explained.

While most groups are helpful, there are limitations. Some patients may feel uncomfortable in a group where others are more seriously ill, for instance. In group discussions where there is no professional advisor to serve as a reference, misinformation may increase, rather than decrease, anxieties. Another concern, expressed by the patient quoted above, is that at the next meeting some of the members will be missing, leaving the others to wonder if their condition has worsened and they have perhaps been rehospitalized.

Such limitations notwithstanding, support groups are a powerful and constructive means of helping people help themselves and others. Individuals who are interested in joining or forming a support group should first determine if there is a self-help clearinghouse in their area or state. The phone book is a good place to start. A local hospital or social service agency will probably be able to help, as will local and state chapters of the appropriate national voluntary health association. Meetings of support groups are often listed in the community bulletin board sections of local newspapers.

The two national clearinghouse organizations can also provide information about local groups, as well as books and pamphlets that tell what to look for in a group before joining and suggestions on how to start new groups. Write to:

Self-Help Center
1600 Dodge Ave.
Evanston, Ill. 60201

or

The National Self-Help Clearinghouse
Dept. N85
CUNY Graduate Center
33 W. 42nd St.
Room 1227
New York, N.Y. 10036.

Annabel Hecht is a member of FDA's public affairs staff.
The Notebook: a potpourri of items of interest gathered from FDA news releases, other news sources, and the Federal Register (designated FR, with date of publication). The Federal Register is available in many large public libraries.

- The recent FDA approval of generic versions of Valium should add $15 million to $25 million in 1986 sales to the U.S. generic drug market, according to a study by Frost & Sullivan, Inc., a New York market research organization. The study, "Generic Drugs," projects generic sales totaling $8.3 billion in 1989, up from $3.6 billion in 1984. While generic sales are increasing, the study notes that only 60 percent of the U.S. population is aware of them; of people over 60 years, this figure drops to 26 percent. Seventy percent of the population never price-shops to get lower cost generic drugs, the study said.

- FDA's food additive regulations have been amended to allow the use of polyhydric alcohol diesters of oxidatively refined (Gersthofen process) montan wax acids as a component of coatings on fresh citrus fruit (FR Jan. 21).

- Food manufacturers whose product formulas change because of seasonal variations in minor raw materials will have a new ingredient labeling option under a tentative final rule issued by FDA. Ingredients present at levels of 2 percent or less by weight won't have to be listed in descending order of predominance; instead, they can be included at the end of the ingredient list preceded by a quantifying statement such as "Contains 2% or less of _______." The proposal originated with petitions from the bakery industry (FR Jan. 16).

- Technical reports from the National Toxicology Program (NTP) are available on toxicology and carcinogenesis studies of chlorobenzene, a solvent in dyes, pesticides and perfumes; o-dichlorobenzene, used in the synthesis of herbicides; diallylphthalate, used in plasticizers; dimethyl hydrogen phosphate, used in insecticides and herbicides; and propylene, used in plastics. Write to NTP Public Information Office, MD B2-04, P.O. Box 12233, Research Triangle Park, N.C. 27709 (FR Jan. 10).

- April 30 is the new deadline for comments to FDA on the need for an amendment of U.S. standards for chocolate to make them consistent with international Codex standards (FR Jan. 30).

- December 1985 actions of the National Advertising Division (NAD) of the Council of Better Business Bureaus include the referral to the National Advertising Review Board of unresolved challenges to advertising claims that Stri-Dex acne medication is superior to Clearasil cream and more effective than Oxy-5 and Oxy-10 lotions. . . . Defending a challenge that slim models in advertising for the Slim-Fast diet plan were not typical dieters, Thompson Medical Co., Inc., said the ad was aimed at those who wished to counteract a slight temporary weight gain without the use of drugs. NAD agreed the advertising claims were substantiated. . . . Beecham Products agreed to modify ads and labeling for Geritol after a competitor advised NAD that the tablet formulation was incomplete. . . . Claims that Lavilin Foot Deodorant works for seven to 15 days will be withdrawn from advertising and Lavilin Long Life Deodorant is undergoing reformulation after NAD noted the lack of substantiation for the product's claims.

- Joseph Weider and Weider Health and Fitness, Inc., Woodland Hills, Calif., must make refunds to purchasers of "Anabolic Mega-Pak" or "Dynamic Life Essence" and must stop making claims that these products promote muscular development, under a final consent agreement with the Federal Trade Commission (FR Jan. 29).

- Funds are available from the U.S. Centers for Disease Control for state and community AIDS health education and risk reduction programs (FR Jan. 27).
Cracking the Code on Illegal Animal Drug Sales

by Carol Ballentine

It was like Sherlock Holmes, "Miami Vice," and "Hee-Haw" all rolled into one: secret codes, undercover drug buys, and a farm supply and veterinary drug wholesaler who thought he could pull the wool over FDA's eyes. The wholesaler ended up with the dubious distinction of sharing in a "first" for FDA: His firm was the first to be ordered by a court to pay restitution to the agency for the costs of its investigation into his illegal sales of prescription animal drugs.

The firm was Vernon Agri Service in Vernon Center, N.Y. The investigation into its illegal activities began in May 1984 with a call from the U.S. Department of Agriculture to FDA's Buffalo district staff.

USD A said that inspectors had found chloramphenicol residues in the meat of a slaughtered calf. Chloramphenicol is a potent prescription veterinary drug. It should not be given to food-producing animals because exposure to residues of the drug can cause aplastic anemia in people sensitive to it. Aplastic anemia is often fatal.

USD A said the calf had been sold by Di Nitto Farms in Marcy, N.Y. When Buffalo district investigator William Chilton visited the farm, he learned that the chloramphenicol had been purchased from Vernon Agri Service without a veterinarian's prescription. So Chilton went to Vernon Agri Service.

The Vernon Center firm was a family affair, run by Roman J. Wilczak and his wife and son. The firm sells veterinary products and farm supplies, such as drugs, vaccines, detergents, sanitizers, milking-machine parts, and insecticides. It is licensed by New York State as a wholesaler of prescription veterinary drugs but is not licensed to sell drugs to individual users, even those with prescriptions.

Roman Wilczak admitted to Chilton that he had been routinely selling prescription veterinary drugs to dairy farmers without prescriptions.

The Buffalo district director then sent a letter to Wilczak warning that this illegal sale of prescription veterinary drugs must stop. Wilczak's lawyer wrote back, saying that Vernon Agri Service had stopped selling prescription veterinary drugs.

To see if Vernon Agri was doing as it said, another Buffalo district investigator, David McNew, began ordering prescription veterinary drugs by mail from the firm. The investigator, of course, did not mention that he worked for FDA. He received what he ordered, including Hetacillin potassium and oxytocin. Hetacillin potassium is a semisynthetic penicillin; it should not be used by lay persons because excessive use could lead to the development of antibiotic-resistant strains of Staphylococcus bacteria in humans. Oxytocin is used to induce labor; if not administered properly to an animal, the fetus or mother could die. The drugs were clearly labeled, "CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian."

Buffalo district investigators also inspected a large veterinary prescription drug firm that had supplied Vernon Agri. The president of the firm admitted that he used a coding system on the invoices to conceal the true identities of the drugs and the fact that they were prescription. For instance, oxytocin was listed as "Penn G" and Hetacin-K (Hetacillin potassium) as "Mastitis Treatment." The records showed that Vernon Agri had recently purchased a number of prescription veterinary drugs, which had been shipped with invoices using the code names.

The investigators also questioned the owner of a farm in Higginsville, N.Y., and found that he had recently purchased some prescription drugs from Vernon Agri. He had not needed a prescription to do so.

Investigator Chilton, accompanied by a second investigator, returned to inspect Vernon Agri Service. Wilczak told the two that he was not engaged in buying or selling prescription drugs. He showed them records of purchases, including those from the firm using the code names and claimed that the encoded prescription drugs were really over-the-counter drugs. There were no prescription drugs in evidence, and Wilczak said he did not have any other storage facility.

During a break in the inspection, Investigator McNew arrived. Posing as a customer, he said he wanted to buy more Hetacin-K and oxytocin. Wilczak explained, out of the other investigators' hearing, that he had moved all the prescription drugs off the premises until the FDA inspection was over. McNew asked why, and Wilczak told him it was illegal to sell...
Ironclad Case Against Gerovital

Painting supplies and anti-aging drugs may seem an unlikely combination, but to FDA investigators nothing is surprising. This is the story of how a paint supplier got out of the drug business, fast.

It started with a newspaper ad seen by a vacationing FDAer in Hawaii. The ad promoted a drug called Gerovital as a cure-all for various symptoms associated with aging. Gerovital, or GH3, has been around for some 20 years and is well known to the agency. It has never been approved by FDA and, therefore, cannot be sold in interstate commerce.

In this instance, the Gerovital was being sold by Peak Health International. Because the firm had a Colorado address, the ad was sent to supervising the terms of the injunction. In addition, Wilczak was ordered to reimburse FDA $7,000 for the costs of the inspections that led up to the injunction. This is the first time FDA has sought and obtained restitution for pre-injunction costs.

Carol Ballentine is a member of FDA’s public affairs staff.
FDA's Denver office. An investigator ordered a sample of the product by mail and received several bottles of GH3 plus promotional literature replete with promises that the product would control the signs of aging. Even if Gerovital could slow the inevitable march of time, Peak Health's compound wouldn't have been much good. Laboratory analysis revealed that it did not contain the procaine hydrochloride that was supposed to be in it. Thus, in addition to being an unapproved new drug, the product was also misbranded.

Besides the bottles of GH3 and literature, the FDA investigator received an application to be a "counselor" (read, salesperson) for Gerovital. For a $20 membership fee, the applicant could become a part of the marketing scheme, recruit more salespeople, and get a percentage of their orders.

FDA's efforts to locate the firm at first drew a blank. The shipping address in Englewood, Colo., a Denver suburb, was just a mail drop. The orders were picked up, filled at another location, and the packages brought back for shipping via United Parcel Service. Because this was a cash transaction, UPS didn't need to have information on where the product originated.

The next step involved some research in the capitol building in Denver. The FDA investigator checked the names listed in Peak Health's literature against businesses registered in the state. The search paid off, for he found the same names associated with a paint supplier in Colorado Springs.

The investigator paid the firm a visit and gave notice that he was going to conduct an investigation. At first the owners of the firm denied having anything to do with Gerovital or any other drugs. But they changed their tune after the investigator spotted boxes not only of Gerovital but of other products of the Peak Health line, including Peak Oil of Mink Complex, Peak Night Repair Cellular Recovery Complex, Peak Performing Extract, Peak Age Controlling Cream, Peak Non-oily Skin Supplement, and Peak Hair and Scalp Treatment. Literature for these other products also contained drug claims.

FDA sent the firm a letter instructing it to cease the illegal activities. When no response was forthcoming, FDA requested Colorado health authorities to place the products under embargo. Once a seizure was approved, the paint suppliers suddenly decided to stick to their trade and voluntarily destroyed the lot under FDA supervision. Their loss was $10,000.

**Keeping Resuscitators Safe**

By forcing air or oxygen into the lungs, a resuscitator gives the very breath of life to some patients. But one firm's resuscitators could have choked the very patients it was trying to save. The outmoded—and defective—models were recalled.

FDA learned in June 1985 that there was a problem with the Laerdal Silicone Infant and Child Resuscitator from a hospital in Oklahoma. The hospital reported to FDA's Medical Device Reporting program that tabs connecting the breathing hose to the pressure regulator of several Laerdal resuscitators had broken off during use. Although no injuries occurred, the broken tabs could have been forced into a patient's esophagus and might have caused asphyxiation, particularly in the case of an infant.

An investigator from FDA's Brooklyn district office visited the device's importer, Laerdal Medical Corporation, in Armonk, N.Y. The firm was unsure what was causing the problem because the hospital had not yet provided full details nor returned the defective devices. A call to the device's Norwegian manufacturer, Asmund S. Laerdal, revealed that a similar complaint had been made by a hospital in France six months earlier. The manufacturer also had not been able to pinpoint the problem but had redesigned the tabs from a square to a triangular shape. The manufacturer had not, however, told its subsidiaries about the change.

During the investigation, the defec-
tive units arrived from the hospital. All three had the older square tab design, and on all three the tabs were broken. This indicated that the square shape was causing the problem.

The manufacturer and importer arranged to recall the older models and change the tabs on them. The recall and correction of 15,974 devices was monitored by the Brooklyn district office.

**Acid Test for Tomatoes**

Tomato growers are constantly developing new varieties that are meatier or withstand frost better. In their quest for the perfect tomato, they are producing less acid varieties as well. This has caught the attention of FDA's Baltimore and San Francisco districts, where there are many tomato canneries. FDA is concerned, not because eating a less acidic tomato is a danger to consumers but because inadequate processing is.

The acidity of a product is measured in terms of its pH. This is a chemical term related to the concentration of hydrogen ions in a solution. The pH level is measured on a scale of 1 to 14. A pH of 7 is neutral, while solutions that are basic (or alkaline) are above 7 and those that are acidic fall below 7. The lower the pH level, the less likely it is that harmful bacteria such as *Clostridium botulinum*—the cause of botulism—will grow.

Most canned tomatoes and tomato products have a pH between 3.9 and 4.4. Canned tomatoes and tomato products with a pH of 4.7 or above are considered "low-acid" foods and thus are subject to strict processing controls and careful monitoring.

In 1981, a suspected case of botulism in California was traced to whole, peeled, canned tomatoes produced in that state. An investigation by FDA's San Francisco office found that certain varieties of tomatoes grown in the region had high pH levels. In a limited pH check of tomatoes used by area canners in 1983, the FDA office uncovered enough tomatoes with low acidity to warrant a detailed investigation of the 1984 pack. A survey of 12 central and northern California tomato canneries packing whole, peeled, canned tomatoes showed that all knew the importance of pH control and used effective methods to achieve it.

In the Baltimore district, one regulated firm recalled its 1982 pack, distributed throughout the East Coast, after high pH levels were discovered. The same year, a consumer's complaint about a swollen can indicated another East Coast packer may also have had difficulty controlling the pH of its canned tomatoes.

A 1983 finished product review indicated that most producers in the Baltimore district were not controlling their products' pH levels. A 1984 survey of all plants in the district revealed higher pH levels in finished products and a lack of adequate pH monitoring. FDA investigators concluded that three factors contributed to higher-than-expected pH levels: use of very ripe, high-pH tomatoes; caustic carry-over from lye peeling agents used to remove the skin from tomatoes; and the absence of added acid to reduce the pH of final products and to remove the lye carry-over. Any of these factors could result in a product hazardous to consumers.

As a result of the survey, the Baltimore office and the National Food Processors Association conducted a seminar in June 1985 on pH control, attended by representatives of 17 processing firms. Two months later, follow-up inspections of plants with potential problems showed that modifications designed to decrease pH levels were either being planned or were already made. Several firms had begun pH checks and purchased meters to measure pH levels. One chemical company made a small, portable pH meter available to them at a reduced rate. Follow-up inspections will continue to be conducted to ensure continued compliance with FDA regulations.

—This small sample of reports from the field was prepared by Annabel Hecht, Carol Ballentine, Dixie Farley, Herman Janiger, and Elvin Smith.
Summaries of Court Actions

Summaries of Court Actions are given pursuant to section 705 of the Federal Food, Drug, and Cosmetic Act. Summaries of Court Actions report cases involving seizure proceedings, criminal proceedings, and injunction proceedings. Seizure proceedings are civil actions taken against goods alleged to be in violation, and criminal and injunction proceedings are against firms or individuals charged to be responsible for violations. The cases generally involve foods, drugs, devices or cosmetics which were alleged to be adulterated or misbranded or otherwise violative of the law when introduced into and while in interstate commerce, or while held for sale after shipment in interstate commerce.

Summaries of Court Actions are prepared by Food and Drug Division, Office of the General Counsel, HHS. Published by direction of the Secretary of Health and Human Services.

SEIZURE ACTIONS

Foods/Poisonous and Deleterious Substances

PRODUCT: Sardines in tomato sauce, at Montebello, C. Dist. Calif.; Civil No. CV 85-2522-MRP (Px).
CHARGED 4-16-85: When shipped by Alimentos Concentrados de Guaymas, S.A. de C.V., Guaymas, Mexico, the articles (labeled "Crown-Prince [or "Royal Crown Seafoods"] Sardines in Tomato Sauce . . . Product of Mexico ") contained the poisonous and deleterious substance histamine in such quantity as ordinarily rendered them injurious to health—402(a)(1); and the articles contained decomposed fish—402(a)(3).
DISPOSITION: Default—ordered destroyed. (F.D.C. No. 64586; S. No. 85-379-642; S.J. No. 1)

PRODUCT: Selenium tablets, at Deer Park, E. Dist. N.Y.; Civil No. 84-2496.
CHARGED 6-7-84: When returned to the manufacturer, Superior Health Foods, Deer Park, N.Y., the article (some of which was unlabeled and some of which was labeled "Brite Years The Natural One Selenium . . . Brite Years Vitamins, Inc. . . . Tempe, Arizona") contained the added poisonous and deleterious substance selenium, in a quantity which might render it injurious to health—402(a)(1); and the labeling of the article was false and misleading because the quantity of selenium contained in the article exceeded the labeled amount (approximately 18,000 percent of the declared amount)—403(a)(1).
DISPOSITION: Default—destruction. (F.D.C. No. 64271; S. No. 84-359-362 et al.; S.J. No. 2)

Foods/Contamination, Spoilage, Insanitary Handling

PRODUCT: Flavorings, lemon, orange, almond, and imitation butter, and other flavorings, Happy Home, at Bedford, W. Dist. Va.; Civil No. 85-0125-L.
CHARGED 7-19-85: While held by Southern Flavoring Co., Inc., Bedford, Va., who had manufactured the articles using interstate components, the articles were unfit for food due to the presence of processed wood fibers (similar to those found in paper or cardboard) and (in one lot of orange flavoring) pieces of wood—402(a)(3).
DISPOSITION: Default—ordered destroyed. (F.D.C. No. 64663; S. No. 85-468-585 et al.; S.J. No. 3)

PRODUCT: Mushroom pieces and stems, canned, at Hurricane, W. Va.; Civil No. 84-2423.
CHARGED 11-2-84: While held for sale, the article was unfit for food because it was held in leaking and dented cans—402(a)(3).
DISPOSITION: Consent—authorized release to Universal Foods Corp., Milwaukee, Wis., for salvaging. (F.D.C. No. 64404; S. No. 84-395-774; S.J. No. 4)

PRODUCT: Mushroom pieces and stems, canned, at Milwaukee, E. Dist. Wis.; Civil No. 84-C-1594.
CHARGED 12-21-84: When shipped by Beltrade PVBA, Borgerhout, Belgium, the article (labeled "Gaglianello Mushrooms Pieces & Stems Distributed By Gaglianello Distributors, Inc. Milwaukee, Wisconsin . . . Product of Belgium ") was unfit for food because of swollen and leaking containers—402(a)(3).
DISPOSITION: Default—ordered destroyed. (F.D.C. No. 64457; S. No. 85-295-838; S.J. No. 5)

PRODUCT: Mushroom pieces and stems, canned, at Northlake, N. Dist. Ill.; Civil No. 84 C 10333.
CHARGED 11-30-84: While held for sale, the article was unfit for food because it was held in swollen and leaking cans—402(a)(3).
DISPOSITION: Consent—authorized release to Universal Foods Corp., Milwaukee, Wis., for salvaging. However, salvaging was not economically feasible, and the article was, in fact, destroyed. (F.D.C. No. 64440; S. No. 84-386-707; S.J. No. 6)
PRODUCT: Peppers, chili, dried, at Los Angeles, C. Dist. Calif.; Civil No. 85-3752 ER (Tx).
CHARGED 6-6-85: While held for sale, the article had been held under insanitary conditions, and one lot of the article contained rodent and insect filth—402(a)(3), 402(a)(4).
DISPOSITION: Default—ordered destroyed. (F.D.C. No. 64641; S. No. 85-355-120; S.J. No. 7)

PRODUCT: Popcorn, variously flavored, Confetti, at Northlake, N. Dist. Ill.; Civil No. 85-C-2139.
CHARGED 3-14-85: When shipped by Concession Specialties, Cincinnati, Ohio, the article had been prepared and packed under insanitary conditions —402(a)(4).
DISPOSITION: Default — ordered destroyed. (F.D.C. No. 64528; S. No. 85-357-658; S.J. No. 8)

PRODUCT: Sardines in oil, canned, Acadia, at Salt Lake City, Dist. Utah; Civil No. C-85-310W.
CHARGED 3-14-85: When shipped by Jasper Wyman & Son, Cherryfield, Maine, the article had been packed and held under insanitary conditions —402(a)(4).
DISPOSITION: Default—ordered destroyed. (F.D.C. No. 64510; S. No. 85-485-775; S.J. No. 9)

Food Additives


CHARGED 6-29-82: When shipped by, and while held for the account of, Delaware Valley Fish Co. Corp., Philadelphia, Pa., the article (some of which was from a Chaumont, N.Y., tank of fresh live eels which had been subsequently commingled with Chesapeake Bay eels and which had been processed and packed by the shipper) contained the nonconforming food additive mirex—402(a)(2)(C).
DISPOSITION: The article was claimed by the shipper. Pursuant to stipulation of the parties, post-seizure sampling of the article was ordered by the court. The claimant's time to answer the complaint was extended several times, but the claimant failed to file an answer, and the time to file any answer expired. Accordingly, the government moved for the entry of a default. Ultimately, a consent decree of condemnation authorized release of the article to the claimant for salvaging. (F.D.C. No. 63734; S. No. 82-285-120; S.J. No. 10)

Drugs/Human Use

PRODUCT: Aminobrain PT pentylenetetrazol elixir, at Miami, S. Dist. Fla.; Civil No. 82-2080-Civ-JKL.
DISPOSITION: Default—disposal in accordance with the law. (F.D.C. No. 63806; S. No. 82-268-770; S.J. No. 11)

PRODUCT: Counterfeit black capsules, counterfeit yellow capsules, and capsule imprint rollers, at Bohemia, E. Dist. N.Y.; Civil No. 85-C-4021.
CHARGED 12-11-81: That the capsules, which were empty and which were held by Pharmadose, Inc., Bohemia, N.Y., bore (without authorization) the initials and other identifying marks of drug firms other than the firm which in fact manufactured, processed, packed or distributed the capsules—201(g)(2); and the offset rollers, which were engraved with the above counterfeit initials and identifying marks, were used or designed for use in making counterfeit drugs—304(a)(2).
DISPOSITION: Default—ordered destroyed. (F.D.C. No. 63611; S. No. 82-376-914; S.J. No. 12)

PRODUCT: Equipment for making counterfeit drugs, at Amityville, E. Dist. N.Y.; Civil No. 82-2803.
CHARGED 9-23-82: While held by Ketchum Laboratories, Inc., Amityville, N.Y., the equipment (a Ross blender and Elanco capsule-filling machines) was used in making a counterfeit drug resembling “lomamin,” and was, therefore, liable to seizure—304(a)(2).
DISPOSITION: The equipment was claimed by the possessor. A consent decree authorized the release of the equipment to the possessor, who was permanently enjoined from producing, packing, labeling, distributing or promoting the sale of any counterfeit control drug. (F.D.C. No. 63816; S. No. 82-376-917; S.J. No. 13)

PRODUCT: Metronidazole tablets, at City of Industry, C. Dist. Calif.; Civil No. 81-1170-Kn(TX).
CHARGED 3-10-81: When shipped by Premo Pharmaceutical Laboratories, Inc., South Hackensack, N.J., the article was a new drug without an effective approved New Drug Application—505(a); and the article's labeling lacked adequate directions for use, and the article was not exempted due to its new drug status—502(f)(1).
DISPOSITION: The article was claimed by the shipper. Upon
motion of the parties, the action was transferred to the District of New Jersey for consolidation with a similar action. Ultimately, a consent decree ordered destruction. (F.D.C. No. 63374; S. No. 81-258-741 et al.; S.J. No. 14)

PRODUCT: Metronidazole tablets, betamethasone valerate cream, and thioridazine HCl tablets, at Chicago, N. Dist. Ill.; Civil No. 81-C-1687.
CHARGED 4-25-81: When shipped by Premo Pharmaceutical laboratories, Inc., South Hackensack, N.J., the articles were new drugs without effective approved New Drug Applications—505(a); and the articles' labeling lacked adequate directions for use, and the articles were not exempted due to their new drug status—502(f)(1).
DISPOSITION: The articles were claimed by the shipper. Upon motion of the parties, the action was transferred to the District of New Jersey for consolidation with a similar action. Ultimately, a consent decree ordered destruction. (F.D.C. No. 63398; S. No. 81-249-174; S.J. No. 15)

CHARGED 3-18-81: When shipped by Premo Pharmaceutical Laboratories, Inc., South Hackensack, N.J., the articles were new drugs without effective approved New Drug Applications—505(a); and the articles' labeling lacked adequate directions for use, and the articles were not exempted due to their new drug status—502(f)(1).
DISPOSITION: The articles were claimed by the shipper. Upon motion of the parties, the action was transferred to the District of New Jersey for consolidation with a similar action. Ultimately, a consent decree ordered destruction. (F.D.C. No. 63398; S. No. 81-249-174; S.J. No. 15)

PRODUCT: Thioridazine hydrochloride tablets, at City of Industry, C. Dist. Calif.; Civil No. 81-1147 CBM (Kx).
CHARGED 3-9-81: When shipped by Premo Pharmaceutical Laboratories, Inc., South Hackensack, N.J., the article was a new drug without an effective approved New Drug Application—505(a); and the article's labeling lacked adequate directions for use, and the article was not exempted due to its new drug status—502(f)(1).
DISPOSITION: The articles were claimed by the shipper. Upon motion of the parties, the action was transferred to the District of New Jersey for consolidation with a similar action. Ultimately, a consent decree ordered destruction. (F.D.C. No. 63398; S. No. 81-249-174; S.J. No. 15)

CHARGED 6-13-83: While stored (to the account of the New York, N.Y., shipper) by I.D. Russell Co. Laboratories, Kansas City, Mo., who had intended the article for use in the manufacture of “Oxytet Soluble,” the article was intended to be used or was used to manufacture a new animal drug, which was unsafe since no approval of a New Animal Drug Application was in effect with respect to its use or intended use and no notice of claimed investigational exemption was on file for the drug—501(a)(5).
DISPOSITION: The article was claimed by I. D. Russell Co. Laboratories. The action was consolidated with a seizure action involving Oxytet Soluble in the same judicial district. Subsequently, a consent decree specified that the article remain under seizure until the claimant satisfied a number of conditions. The claimant then obtained an approval of a New Animal Drug Application for use of oxytetracycline HCl soluble powder for treating specific bacterial infection in poultry and also obtained laboratory assays that showed the bulk oxytetracycline HCl met the specified requirements, so as to obtain release of the article from seizure. (F.D.C. No. 64029; S. No. 83-382-123; S.J. No. 18)

PRODUCT: Oxytet-Neo Soluble and Oxytet Soluble oxytetracycline HCl mixes, at Marshville, W. Dist. N.C.; Civil No. C-C-83-0361-M.
CHARGED 6-8-83: When shipped by I.D. Russell Co. Laboratories, Kansas City, Mo., the articles were new animal drugs and no New Animal Drug Application was in effect with respect to the articles' use or intended use—501(a)(5).
DISPOSITION: The article was claimed by the shipper, but the claim was not served on the United States Attorney, who moved for a default decree. However, that motion was withdrawn and the action was removed to the Western District of Missouri for consolidation with a similar action. Ultimately, a consent decree ordered the articles destroyed. (F.D.C. No. 64032; S. No. 83-403-216 et al.; S.J. No. 19)

PRODUCT: Figure-Tron II electrical vibrator, at Springfield Gardens, E. Dist. N.Y.; Civil No. CV-83-1670.
CHARGED 4-27-83: The article, which had been shipped by Stonebridge House, Inc., Roslyn Heights, N.Y. (and which was labeled [device] “Figure-Tron II” and [accompanying instruction sheet] “Figure-Tron II Directions For Use . . . ”) was not a drug but was an approved Class II medical device under the Medical Devices Amendments to the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. §§ 351 et seq., and was in violation of § 515 of the Act, 21 U.S.C. § 360d, because it was not adequately labeled to indicate its intended use. The article was ordered destroyed. (F.D.C. No. 63365; S. No. 81-258-741 et al.; S.J. No. 17)
tone”), lacked labeling bearing adequate directions for use for the article’s intended purposes; since the article was not effective for its intended uses (e.g., “figure-toning wonders of 3,000 sit-ups without moving an inch,” “10 miles of jogging lying flat on your back,” as advertised in the National Enquirer and The New York Post) and was not exempted from such requirements—502(f)(1); the article’s labeling (instruction sheet) contained the false and misleading claim for toning any area of the body—502(a); the article was processed in an unregistered establishment, was not included in a required list, and lacked required notice and information—502(o)(1, 2 and 3); and the article’s label lacked the name and place of business of the manufacturer, packer or distributor—502(b)(1).

DISPOSITION: The article was claimed by the shipper, who denied the charges. The government served written interrogatories on the claimant. Subsequently, a consent decree of condemnation ordered the article destroyed. The consent decree also enjoined the claimant from the interstate receipt or shipment of any such device labeled or promoted in a specified manner unless it could be shown that FDA had approved the prohibited claims. (F.D.C. No. 64011; S. No. 83-200-899; S.J. No. 20)

CRIMINAL ACTIONS

DEFENDANT: Howard Kinsbrunner, a/k/a Woody Kinsbrunner, owner of a Florida veterinary supply products business, at E. Dist. N.Y.; Criminal No. 83-00225(S).

CHARGED on or about 4-15-83 by grand jury: (Counts 1 and 2) That on two occasions the defendant knowingly received, sold and facilitated the transportation after importation of Circulon (an Australian brand of veterinary product for horses containing isoxsuprine HCl), which he knew had been imported illegally—18 U.S.C. 545; and (Counts 3 to 17) that the defendant, on 15 occasions, delivered into interstate commerce to Uniondale, Great Neck, Westbury, Syossett, or Bohemia, N.Y., the adulterated and misbranded drug Klott (a veterinary drug labeled with the name of a fictitious Canadian manufacturer but not with the name of the drug’s active ingredient, estrone)—301(a), 303.

DISPOSITION: The defendant pleaded not guilty and asserted a “good faith” defense to the charges based on 301(a). The defendant came on for trial by the court. On the first day of the trial, Count 3 (a shipment of Klott to Uniondale, N.Y.) was dismissed with the consent of the government. Although the court found that Circulon was not approved by FDA as a drug for use in animals, the court found that Klott was not a “new animal drug” and that there was no presumption that Klott was adulterated. Despite the clearance of U.S. Customs and the Department of Agriculture of the Circulon labeled as “veterinary supplies,” the court found the defendant guilty of Counts 1 and 2. The court also found the defendant guilty of the charge of misbranding in Counts 4 to 17. The defendant was sentenced on each count (except Count 3) to concurrent five-year terms of probation.

The defendant appealed, asserting the following: that the government failed to establish that the defendant knowingly distributed a misbranded drug; that there was insufficient evidence to establish that the defendant knew Circulon had been illegally imported; and that the defendant was the victim of selective prosecution. The Court of Appeals affirmed the defendant’s conviction. (F.D.C. No. 64237; S.J. No. 21)

INJUNCTION ACTIONS


CHARGED 12-11-79 in a complaint for injunction: That the defendants, at their Erlanger, Ky., plant, manufactured, packaged, labeled, held for sale after interstate shipment of drug components, and distributed in interstate commerce a number of drugs for human and veterinary use, including phenobarbital and atropine tablets; ox bile extract, magnesium sulfate and atropine sulfate tablets; butobarbital sodium tablets; sodium nitrate and veratum viride tablets; sodium nitrite, veratum viride, bile extract, and cascara sagrada extract tablets; and potassium nitrate, extract viscum album, veratum viride, and hyoscyamine sulfate tablets; that some of the defendants’ drugs, including the drugs specified above, were new drugs without effective approved New Drug Applications—505(a); that FDA inspections revealed a number of specified deviations from current good manufacturing practice; that the circumstances used for the manufacture, processing, packing and holding of all the defendants’ drugs failed to conform with current good manufacturing practice; that the defendants had recalled two specified drugs because the drugs were subpotent; and that the defendants were well aware that their activities were in violation of the law—505(a), 501(a)(2)(B), 501(c).

DISPOSITION: A consent decree of permanent injunction was entered which enjoined specified acts with respect to the interstate shipment of any drugs from the defendants’ plant, which were new drugs without an effective approved New Drug Application, or which had been prepared, packed, labeled or held at the defendants’ plant before specified current good manufacturing practices had been established. Meanwhile, the corporation resolved to go out of business; and all of the equipment and furnishings of the corporation were sold. (Inj. No. 906; S. No. 79-131-881; S.J. No. 22)
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