foreign patents, will be looked on with favor.

A major advantage to the treaty proposal is that it leaves untouched the basic features of the various national patent systems. This is important in view of the opposition in this country to the Administration's bill to reform the Patent Office (SN: 5/27). The treaty would fit the present system as well as the reformed system.

One item in the proposed treaty, a requirement that all applications be published within 18 to 24 months after they were filed, is bound to come in for criticism.

The same provision is in the Patent Reform law before Congress now. U.S. patent lawyers object to the idea because they feel the inventor should retain his right to keep his invention secret unless he patents it.

Other problems involve the varying amounts of disclosure and examination which different countries presently require. Some countries, like the U.S., require a full description of the invention, while others, such as Germany, ask only the germ of the invention. Similarly, some countries require a careful examination of prior inventions before granting a patent, while others have no examination at all.

Patent Office spokesmen say this will be no problem because the requirements of the international application are likely to be more stringent than those of any individual country. An inventor in a country with lesser requirements needn't file the more stringent application unless he wants foreign patent rights.

The treaty is looked on by all sides as a first step toward an international patent, which means that the requirements of the application will probably be extended at a later date to the granting of patents. For this reason, the provisions of this first-step treaty are likely to get a rigorous investigation by all the countries concerned.

Fungicide Danger

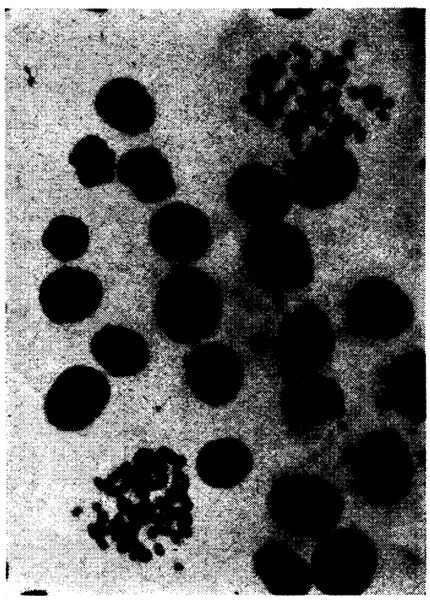
The chemical, Captan, has been used for more than 17 years to protect seeds against fungus which rots them.

Measured by ordinary toxic effects, Captan is mild. Food and Drug Administration regulations allow a residue of 100 parts per million to be left on raw agricultural products, a limit set in 1958 after experiments with dogs, cattle and poultry showed no toxic effects from much higher concentrations.

In contrast, the residue limit for an insecticide such as chlordane is only three-tenths of a part per million.

But the widely-used seed-treatment chemical, long considered to be relatively harmless, has serious genetic effects on animals, an FDA researcher reports.

Captan's effect on the reproduction of cells is disastrous, according to recent experiments by Dr. Marvin Legator of

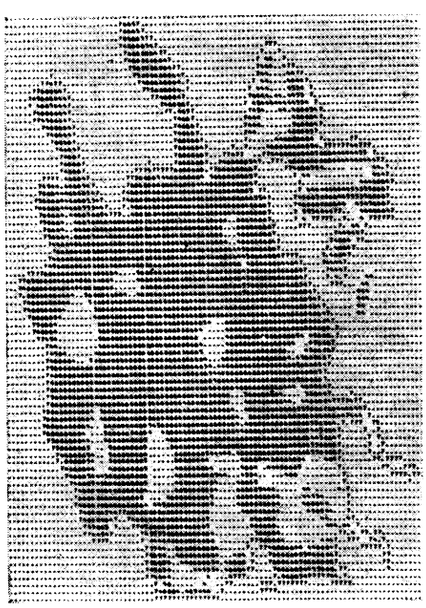


FDA

Cells dividing; optical view . . .

FDA's cell biology research branch. The chemical inhibits the production of DNA, the basic genetic stuff of life and breaks up cell chromosomes.

Dr. Legator, reporting to a symposium in Washington, said that Captan is only one of a number of chemicals formerly considered harmless that are now suspected of causing genetic damage.



FDA

. . . and what the computer sees.

Genetic effects are hard to determine because they take a long time to appear and are hard to trace to their source.

A breakthrough in genetic effect analysis, which led to the Captan discovery, came in 1962 when techniques were developed to make visual displays of cell chromosomes. These chromosomes have a regular pattern. When this pattern is broken, it is a sign that DNA has been modified.

Production of DNA is measured by a radioactive tracing. A small amount of radioactive material is introduced into the cell culture and is incorporated into the newly formed DNA molecules. Analysts measure the amount of radioactivity present and compute the amount of DNA formed.

Another indicator of genetic damage is a slowing down of the rate of cell splitting, called the mitotic index, after mitosis, the division of cells. Researchers have developed a technique of stopping the splitting process at a point where a dividing cell can easily be distinguished from one that isn't splitting. By counting the two kinds of cells, the researcher determines the mitotic index.

The Captan experiments show that chromosomes are damaged and production of DNA is inhibited. Other experiments with chick embryos, carried out by Dr. Jaqueline Verette of the FDA, show that the chemical caused abnormalities of the same type produced in human babies by thalidomide.

Because of the new results, tolerance limits on Captan may have to be revised. But since tolerances have already been issued, the burden of proof will be on the Government in any attempt to change them.

With studies of genetic damage booming, the laborious chore of counting broken chromosomes and mitotic cells are being turned over to computers. Dr. Legator and Dr. Frank Ruddle of Yale University report that computer techniques have been developed to identify mitotic cells and to trace broken chromosomes, even on displays where one chromosome overlaps another. The computer analysis is both quicker and more accurate than manual counting, report the researchers.

Delinquency: Fresh Wind

After a half-century of stagnation in the juvenile court system, the nation is gearing up for a fresh attack on delinquency and youth crime.

There is no guarantee the new approaches will work but the abysmal failure of the present system, either to dispense justice to juveniles or to offset delinquency, is evident.

Youth is apparently responsible for a "substantial and disproportionate" amount of U.S. crime and juvenile courts have not stemmed the tide, the President's Crime Commission points out.

In its fifth task force report, released last week, the Commission estimates that if present arrest rates continue, 40 percent of all male children living in the United States today will be arrested for a non-traffic offense sometime in their lives. "For boys living in cities," says the Commission, "the figure is on the order of 60 percent; for Negro boys living in cities, it is about 90 percent."

The figures are heavily weighted by high arrest rates for such offenses as drunkenness and car theft. Nevertheless, the Commission believes the best hope for reducing overall crime is to reduce juvenile delinquency and youth crime.

A step in that direction was taken last week when some 200 professionals met in Washington to exchange ideas for using new money that would be available under the Juvenile Delinquency Act of 1967.

That Act, now pending in Congress, authorizes spending $475 million over five years for new local and state programs aimed at preventing delinquency and rehabilitating young people already in trouble. It follows six years and $47 milion worth of demonstration projects, developed under the Federal delinquency act of 1961.

The new tack on delinquency bears close resemblance to War on Poverty programs, and, in fact, those in the delinquency field claim credit for many concepts central to poverty programs.

A key concept is youth participation. The idea is to prevent delinquency by rerouting teenage energies into community action and using young people in the planning of recreation and training programs. When adults forget youth participation, the young are reminding them of its importance, as the Washington conference made clear.

"Get back to your area and talk to the kids. They have something to tell you. Ask them what they need to stay out of jail," Leroy Washington, a young Negro from the District of Columbia, told the conference. Washington was one of 50 young people invited to join the professionals in the exchange of ideas. That they were there at all indicate the changes that have taken place in delinquency treatment over the past six years.

A second concept is treatment within the community instead of incarceration. Though the juvenile court system was designed to keep delinquents out of jails, it has often failed to do so. Of 400,000 juveniles detained in 1965, two-thirds were held for an average of 12 days, usually in the local lock-up for want of a better place. Moreover the promise of rehabilitation was left largely unfulfilled, generally for lack of money and facilities.

The 1967 Act calls for new juvenile facilities and community centers for handling the large number of young people detained for offenses that are not crime in the adult sense—truancy and minor types of misbehavior.

Also, research has generally established the advantage of treating even hardcore delinquents in the community, rather than in institutions.

Not all the conference participants, however, struck an optimistic note. Milton Rector, director of the independent, nonprofit National Council on Crime and Delinquency in New York, lamented the unfairness of the system of juvenile justice.

A juvenile may be institutionalized for acts that are not crimes. Moreover he can be transferred from a juvenile facility to an adult prison without trial or due process, said Rector. Referrals to juvenile court depend on the whims of police officers. Some refer 90 to 95 percent of their cases; others only five percent.

Rector, whose group did much of the delinquency research for the Crime Commission, warned the conference that without major changes in juvenile justice, "what we're trying to do at the community level will be for naught."

Protein Polices Genes

The mechanism that controls gene activity in living cells long has been a major biological puzzle.

Scientists have known genes transmit hereditary characteristics by dividing. Instructions to cells to become skin, bone, muscle, or other tissue cells, come from dividing genes. But when a gene divides, it make an exact replica of itself.

The question scientists asked themselves was, how, since every cell gets the same genes, can self-replicating genes from a single fertilized egg produce so many different kinds of cells.

In 1961 a Nobel Prize was awarded to two French scientists who proposed an answer. Drs. Francois Jacob and Jacques Monod, in studies with bacterial cells, discovered a set of genes which, they theorized, produced molecules that control the activity of other genes by turning them off.

Up to six months ago, scientists were conducting numerous experiments to prove or disprove this hypothesis—all without success.

Now, however, isolation of a protein that controls gene functioning by switching it off is proof of the Jacob-Monod theory.

The newly identified regulator protein, known as a repressor, probably represents a new class of molecules, according to Dr. Mark Ptashne of Harvard University, who isolated a repressor in experiments with common E. coli bacteria. His experiment has been called "an elegant proof" of theories advanced by Drs. Walter Gilbert and Benno Müller-Hill of Harvard. "The repressor acts quite simply by turning off single target genes," Dr. Ptashne says.

In order to turn off a specific gene, the repressor attaches itself directly to the DNA at a position adjacent to the target gene. Explaining the probable mode of action, Dr. Ptashne says the repressor blocks the transcription of DNA into RNA and thereby prevents the gene from complete functioning.

Anti-evolution Upheld

Among the many state laws forbidding the teaching of evolution passed during the 1920's, the law in Arkansas was unique—the issue was decided by the general electorate rather than the state legislature.

The anti-evolution law was overwhelmingly approved by Arkansas voters, 108,991 to 63,406, on Oct. 6, 1928.

Last week, the Arkansas Supreme Court upheld the law, terming it a "valid exercise of the state's power to specify the curriculum in its public schools."

The ruling which reversed the 1966 decision of a lower court, resulted from the first serious challenge to the Arkansas law, initiated in December 1965 by Mrs. Susan Epperson, then a 24-year-old biology teacher at Little Rock's Central High School.

The State Supreme Court ruling will be appealed immediately to the U.S. Supreme Court, and the Epperson case could become as well known as the Scopes case in Tennessee in 1925. In that trial, Clarence Darrow defended a Tennessee school teacher's right to teach evolution. The biology teacher, John Thomas Scopes, who was then 24 years old, was convicted and the law upheld, although he later won an appeal on a technicality.

Ironically, the Tennessee law under which Scopes was convicted was repealed by the Tennessee legislature less than two weeks before the Arkansas high court handed down its decision.

If the U.S. Supreme Court overturns the decision of the Arkansas court, it would affect not only Arkansas but also Mississippi, the only other state that still forbids the teaching of evolution.