

The nondefinitive report

More fuel is being added to the controversy over the chemicals being sprayed in Vietnam to destroy vegetation, and reduce Viet Cong hiding places. The new fuel-source is the Midwest Research Institute's report to the Department of Defense: Assessment of Ecological Effects of Extensive or Repeated Use of Herbicides."

In effect, the conclusions of the MRI report are so hedged, or so little relevant information is available, that the report can be used to support those arguing that defoliation is irrevocably upsetting the natural balance in Vietnam or those who seek to bolster the view that no irreparable harm is being done.

The Washington Post account of the report said: "Defoliation Threatening Viet Wildlife," while The New York Times account of the same report stated: "Defoliation Study Casts Doubt on Long-Term Damage in Vietnam."

The 370-page report was commissioned by DOD's Advanced Research Projects Agency after several scientific groups had expressed concern over the impact of large-scale use of herbicides, especially in Vietnam (SN: 11/25/67 p. 511). The report is based on a review of more than 1,500 articles in the scientific literature, supplemented by interviews with some 140 specialists.

In a letter transmitting a National Academy of Sciences committee's review of the report, Dr. Frederick Seitz, NAS president, says:

"It is clear that the compilation of this report is only a first step."

Dr. A. Geoffrey Norman, vice president for research at the University of Michigan and chairman of the National Research Council's biology and agriculture division, submitted the review, noting that the "title of the report is more comprehensive than the contents."

It is only within the last 20 years that herbicides have become a major tool used to control or destroy vegetation—rapidly, economically and over large areas. Herbicides differ from other types of vegetation control agents in that they enter into biological systems, are selective and persistent.

Military use is of particular interest to the scientific community and the public because enormous amounts of herbicides are being applied to large areas, partly to render the movements of the enemy more conspicuous and partly to reduce his food resources.

Shortages of key herbicides started to develop in 1967, most critically in the weed killers 2,4-D and 2,4,5-T, both of which are used in Vietnam. Military demand for the latter is so great



Three months earlier this was jungle.

that the Government has pre-empted all production until further notice, a total of about 20 million pounds a year. Normal agricultural use in this country is about 7.5 million pounds a year.

Many scientists are concerned about the effects of herbicides on endangered species of wildlife as well as on the entire ecological system. There are a

CHLORAMPHENICOL

The lid comes down

The 19-year history of chloramphenicol has been anything but uneventful. Introduced in late 1948, the broad-spectrum antibiotic quickly earned the name wonder drug. It proved to be highly effective against a large number of virulent organisms. Resistant strains of organisms are few and short-lived. Few antibiotics are as potent or fight as broad a spectrum of diseases. New uses for the drug are still being found.

Three years of clinical experience with chloramphenicol, however, indicated that the wonder drug is a destroyer as well as a saver of lives. Physicians had prescribed the substance ever more widely, in many instances for trivial maladies over which, as it turns out, chloramphenicol has little control. And reports had been coming in of serious side effects, among them fatal aplastic anemia due to depression of the activity of the bone marrow.

By July 1952 Dr. William Dameshek, a National Academy of Science's consultant, warned that "real danger exists in the uncritical use of this drug by the medical profession."

The warning was repeated when Dr. Dameshek and Dr. William R. Best of the Veterans Administration, Dr. Mark Lepper, vice president of Chicago's

number of endangered species in Southeast Asia, including the Douc Langur, a vegetarian monkey. The *Pygathrix nemaeus*, described as the "most colorful of all mammals," has been on the critical list for a long time.

Also on the endangered list is the crested, or Indochinese gibbon, a species rarely seen on the ground.

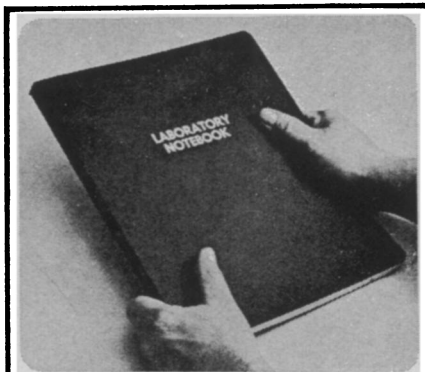
The rare Kouprey, a cow that was not even discovered until 1936, is limited to 800 individuals or less in central Cambodia. Very little is known about this strange species, *Bos sauveli*, and much of its habitat has already been eliminated through forest destruction. Another rare bovine, the Gaur, is down to 300 individuals.

Although holding that defoliation may in some cases be helpful, the MRI report notes that rare species, unfortunately, "usually need cover as badly as food production and that while some grasses and browse species may increase, the net effect of jungle destruction will be negative as far as the rare forest animals" are concerned. The amount of leaf defoliation and tree kill through herbicides is the critical factor, and the elimination of jungle habitat in large blocks can be expected to affect such leaf eaters as the langurs and the somewhat more omnivorous gibbons.

Presbyterian-St. Luke's Hospital, and other witnesses testified before the Monopoly Subcommittee of the Senate Small Business Committee, now holding hearings on the prescription drug industry. They say 90 percent of the chloramphenicol prescriptions are written for conditions which the drug will not help, or for which there are safer drugs of equal effectiveness.

Dr. Lepper estimates that fewer than 10,000 Americans a year should receive the drug; 3.5 million get it. Often the prescription calls for doses too small to be effective but large enough to be lethal, the testimony claims. While drug-caused aplastic anemia is very infrequent, it nevertheless accounts for an estimated 500 deaths a year.

The widespread use of chloramphenicol is hard to understand in view of the efforts made to warn physicians about its dangers. Since the time of Dr. Dameshek's early warning, the American Medical Association and other groups have urged caution on the medical profession. The literature has reported aplastic anemia and other side effects, and editorials have pointed to the danger. Since 1961 the Food and Drug Administration has required a warning in strong language on the label



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and brochure accompanying the product. Now the FDA plans to go even further, in the wake of the subcommittee testimony, by requiring on the label specific risk-of-death figures, citation of leukemia cases, and a warning against use during pregnancy. Also planned is an FDA "Dear Doctor" letter urging caution in the use of the drug.

In defense of the drug it is being said that despite its dangers chloramphenicol is highly effective. Even now it is being found to be a potent anti-cholera drug in the Middle East. Most of the physicians prescribing it, furthermore, have had 15 years of unbroken happy experiences with chloramphenicol and are loath to part with a tool of their trade which has been so helpful and seemingly so harmless.

Statistically 20,000 to 40,000 courses of therapy with the drug must be given before a death occurs; the average physician has given fewer than 5,000 courses during his entire practice. The feeling that "it can't happen to me" has fostered a prescribing habit that is proving tough to break.

HEMOPHILIA

Cautious reports

Sir Isaac Newton suggested that for every action there should be an equal and opposite reaction. The law seems true, even apart from the computations of physicists. At the February meeting of the Society of University Surgeons in New York, doctors were chary of announcing advances — apparently in reaction to the immense publicity that attended the world's first heart human transplants—none of which have been decorously reported in medical journals.

In fact, heart transplant was never mentioned openly although at least one pioneer in the technique presented a paper (which did not bear on it).

Dr. Adrian Kantrowitz, who has performed two heart transplants (both unsuccessful) presented a paper on heart assist devices.

A pioneer in spleen transplant to cure hemophilia refused to make any headlines; Dr. John C. Norman of Harvard University would give only the barest outlines of his work pending publication in the journal SURGERY.

In the November 24, 1967, issue of SCIENCE, Dr. Norman published his preliminary findings. Now he has done what he said he expected to do.

"Proof that we have cured hemophilia in dogs has extended over three months," he explains. "We have checked six hemophilic animals 2,000 times."

Dr. Norman found that if their dogs' deficient spleens were replaced with normal ones, Factor VIII solved the

bleeding problem. Several of the six animals used have stayed alive as long as three months.

Dr. Norman had previously reported that the spleen is a major site of Factor VIII synthesis and/or storage. Factor VIII is antihemophilic globulin, whose symbol is AHF. There is a circulating Factor VIII substance in the plasma of human hemophiliacs to which the animal spleen is receptive.

In his November report, the Harvard surgeon and his co-workers said, "The data suggest that splenic homotransplantation might alleviate the symptoms of hemophilia." He would go no further.

Another Harvard graduate who is working on a similar problem at the University of North Carolina in Chapel Hill, Dr. Erle E. Peacock Jr., challenges Dr. Norman's proof that synthesized Factor VIII takes care of the bleeding problem. He believes further proof is needed through angiograms that would show continued acceptance of the transplanted spleens.

"I suspect that Dr. Norman is right," he admits, "but I want more proof."

There are approximately 10,000 hemophiliacs in America today.

MINI-PROGRAM FOR MARS

NASA settles for less

Something old, something new, something borrowed, something blue—and all at cut rate prices. That's the story of the space agency's proposed new mini-program for Mars.

The something old is the Mariner design, dating from the early part of the decade, which is evolving into a spacecraft capable not only of flying rings around the Red Planet, but of dropping off a passenger.

The something new is the passenger, a 150-pound ball of instruments packed in balsa wood, aluminum honeycomb or some other such material and equipped with parachutes to help it survive a rough landing on the surface.

Something borrowed is a compact propulsion system, lifted from the Lunar Orbiter program to turn the Mariner spacecraft from a flyby vehicle, which would just zip past Mars and on into space, into an orbiting vehicle capable of circling the planet for more than six months.

Something blue? The officials of the National Aeronautics and Space Administration who had hoped to have, instead of this economy effort, the luxurious Voyager program, replete with clusters of 10-ton space probes and a scientific wonderland of instruments with which to study everything from Martian weather to Martian life.

But money's tight. So instead of