

gines are designed particularly for its use.

The 80-octane gasoline will be available for all vehicles taking part in maneuvers in which battle conditions are simulated, so that troops may know the powers and limitations of their equipment under the same operating conditions they will encounter in actual combat.

However, all ordinary-purpose Army vehicles from now on will use 72-octane gasoline, the gasoline used in many if not most civilian cars and trucks. The new Army limitations, of course, do not apply to aviation fuels.

The octane number of a gasoline indicates its detonation or fuel-knock rating. It is a scale suggested by a petroleum engineer in 1926 and later adopted by the Society of American Engineers. It is now almost universally used.

The octane number of any particular fuel is determined by matching its anti-

knock value with that of a mixture of normal heptane and isooctane, both petroleum derivatives. Heptane detonates even at low compression ratios; isooctane does not detonate except at high compression. By trial, a mixture of these two can be found which duplicates the detonation of the fuel under test. The percentage of the isooctane in the mixture is the octane number of the fuel.

Fuels with an octane number higher than 100, as in the well-known aviation 100-octane fuel, are possible and are being produced with the aid of tetraethyl lead. The 100-octane aviation fuel used in warplanes is not a gasoline in the ordinary sense, but is a super-fuel produced by rearranging the petroleum hydrocarbon molecules through use of catalysts. Commercial airplanes use 91-octane aviation fuel, which is satisfactory even for the largest commercial airliners.

Science News Letter, March 25, 1944

PUBLIC HEALTH

Mosquitoes Suspected

Transmission of infantile paralysis may be due to the same insect which spreads malaria, studies in the Chicago area epidemic of last fall indicate.

➤ SIGNS pointing to mosquitoes as spreaders of infantile paralysis were reported by J. Lyell Clarke, sanitary engineer of the Des Plaines Valley, Ill., Mosquito Abatement District, at the Atlantic City meeting of the New Jersey Mosquito Extermination Association.

Mosquito transmission is only one of the possible ways in which the disease can spread, Mr. Clarke emphasized, although to him infantile paralysis has "all the earmarks" of a mosquito-borne disease.

He and his associates trapped mosquitoes in the backyards of infantile paralysis cases in the Chicago area during the August-September, 1943, epidemic, which, Mr. Clarke said, was the worst the city has ever suffered.

He found infantile paralysis as "rampant" in dirty as in clean, in rich as in poor areas of the city and suburbs. While tending the mosquito traps he noted that factors such as water, milk, sewage, food, fish, birds, rats, mice and flies varied considerably from place to place. Mosquitoes, however, were everywhere, "almost as constant as the air." The next most common factor was the English sparrow.

Laboratory experiments were made to determine whether evidence could be found to show that one or more of the 32 different species of mosquitoes found in the Chicago area had served as the transmitting agent of the infantile paralysis virus. Although 5,000 mosquitoes were caught in 67 backyards of the city, efforts to see whether the mosquitoes could give the disease to monkeys were apparently unsuccessful.

One difficulty was that instead of the mosquitoes biting the monkeys, the monkeys caught and ate the mosquitoes. Mr. Clarke has a plan for overcoming this difficulty in mass experiments next season. He did not reveal the plan, hoping that some of his colleagues might devise a better one.

Science News Letter, March 25, 1944

War on Mosquito Urged

➤ INCREASED war on mosquitoes must be waged, regardless of money and manpower shortages, if we are to save ourselves after the present world conflict from the disastrous fate of ancient Greece and Rome, Prof. Thurlow C. Nelson, of Rutgers University, warned at the meeting.

"The very good evidence that malaria brought home by returning soldiers was an important contributing factor" to the fall of these ancient civilizations should be remembered, he urged.

Malaria is spread by mosquitoes which get the disease-causing parasites from the infected blood of patients or recovered patients. Hospitals, homes and public buildings can be screened to keep out mosquitoes but, Prof. Nelson pointed out, we are not likely to insist that our returned service men spend their lives behind screens. Nor are we likely to deny them the pleasures of picnicking, camping, canoeing, or even strolling the

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"paths about the hospital in the gathering twilight."

The weapon for protection against the spread of malaria by returning service men is to destroy the mosquitoes, in his opinion.

A warning against the danger of cocktail parties and blackwater fever, a disease which may follow attacks of one kind of malaria, was also sounded by Prof. Nelson.

"This strange malady with a mortality of approximately one out of three adults strikes with the speed of a rattlesnake and with much the same effect on the red corpuscles," he declared. "Predisposing causes to attack are chilling and overindulgence in alcohol.

"If your boy from overseas has had tropical malaria, don't celebrate his return with a cocktail party: there is a good chance that the party would be followed by a funeral."

"Grave danger" is involved, Prof. Nelson continued, in using as blood donors returned service men who have at any time suffered from malaria. He cited the record of the transmission of malaria during a blood transfusion from a father to his daughter 35 years after the father had suffered his last attack of malaria.

"Infections acquired through blood donations," he pointed out, "rise quickly, rapidly override the body's defense mechanisms and frequently end in death."

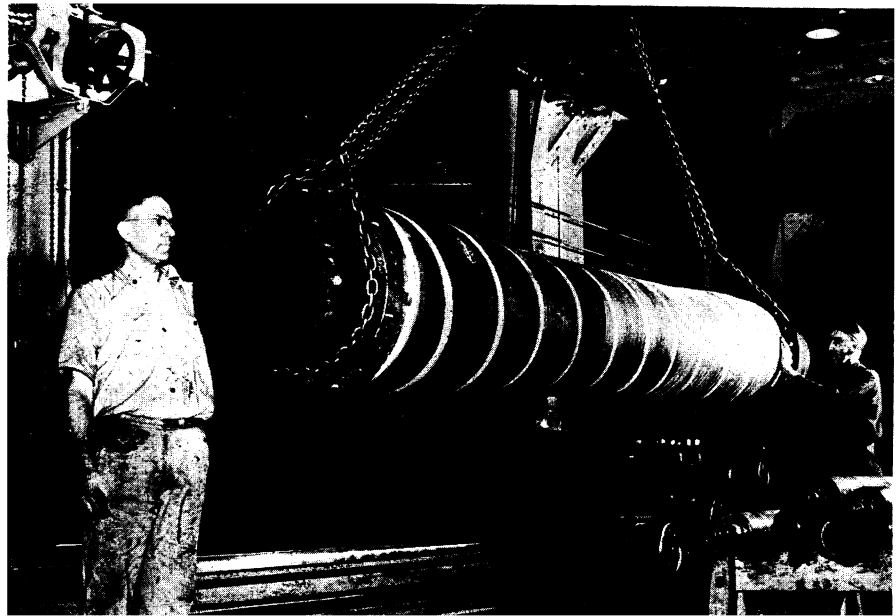
Science News Letter, March 25, 1944

Testing Repellents

➤ MORE accurate ratings of the munitions used in protecting our fighting men in Italy and the jungle islands of the South seas against disease-carrying mosquitoes can be obtained by paired testings of the chemicals that make the pests zoom off without stopping to bite. Details of the new technique, known as paired product testing, were explained by Dr. Philip Granett of Rutgers University, speaking before the meeting.

Involving the simultaneous testing of a pair of repellents on two arms or two legs of the same individual in order to determine the relative merit of the two products tested under the same conditions, this method is, in Dr. Granett's opinion, far superior to the old system of making absolute evaluations, which varied widely among the different laboratories conducting experiments on identical repellents.

Comparison of repellents under similar conditions minimizes such disturbing variables as kind and number of insects present, nature of the test indi-



TUBULATED—Though it looks as rigid as a ramrod, this section of hydraulic hose, built by the B. F. Goodrich Co. at Akron, Ohio, is flexible. It is made of 14 plies of heavy duck fabric, coated with synthetic rubber and reinforced with two coils of heavy wire, and weighs 2,200 pounds. It will be used in mining rock phosphate, which is used in making fertilizers, phosphorus and medicines.

vidual, perspiration or skin conditions, amount of repellent used, light, temperature and humidity conditions, and insect desire for a blood meal.

The recently discovered fact that a superior repellent for one insect is an inferior repellent for another is giving rise to much entomological speculation. It has been shown that this reversal of relative merit has occurred between two related families of insects, as in the case of the yellow-fever mosquito and the stable biting fly; and even between the more closely allied genera, such as *Aedes* and *Anopheles* mosquitoes.

But entomologists would like to know, will a given repellent be selective for species; that is, will a repellent given top rating for warding off harmless mosquitoes also guard against the malaria-carrying species with the same success? Until that query is answered, there can be no fool-proof mosquito check for use in malarious overseas war sectors.

Protection afforded by a repellent is measured in terms of the time interval from time of application until the insect actually bites, and by comparing extent of biting under influence of repellent with that incurred without benefit of repellent.

Uniformity of application is of the greatest importance in testing, Dr.

Granett insisted, for undertreated areas are likely to experience the first bite prematurely. When the test insect is in an unmixed population, protection time extends to the time of the first bite; when mixed species are used, tests must be continued until a bite is received on the treated area by the insect for which the repellent was primarily designed, with some approximation given as to the percentages of the different species present.

Science News Letter, March 25, 1944

PUBLIC HEALTH

Plywood Chamber Devised For Fumigating Clothes

➤ DEMOUNTABLE plywood chambers have been developed for fumigating the clothes of soldiers and prisoners at the front. The light-weight chamber can be erected and put into operation by a crew of six men 15 minutes after it is unloaded.

The war against the louse, notorious carrier of typhus fever, can thus be taken close to the fighting line. Tired men returning from the line of fire can be freed of vermin immediately and prisoners cleaned up before they pass to the rear.

The plywood chamber, devised by