PHYSICS-PHYSIOLOGY

Danger of Unheard Noise

Assessment of the extent of possible bodily damage from airborne ultrasonics must be made. Scientist warns against wild rumors which might hamper progress.

➤ THE danger to pilots from unheard noise and vibrations of faster-than-sound planes are matters of "grave concern," Dr. Hallowell Davis, director of research at the Central Institute for the Deaf, St. Louis, warned at the meeting in Washington of the Acoustical Society of America.

Dr. Davis warned at the same time against rumors, "weird stories" and "wild observations" of damage from sound that the human ear can't hear. These can arouse public fear, he charged, and seriously hamper progress.

It is possible, for example, that ultrasonic sound encountered in jet or turbojet planes could burst the blood vessels in the brain without any warning discomfort or pain. But there is no proof of such danger, he stated.

Small animals, he stated, may be literally cooked to death by the heating caused by high-intensity ultrasonics. But this does not happen without warning. Their sense organs give them correct information as to the immediate situation, through the heating of their fur, though they do not know the cause of the danger.

Injuries to the lungs reported as resulting from "blast" from explosions and from sustained very high intensity sound are examples, Dr. Davis said, of supersonic damage to bodily structures.

Disruption of the wings of insects is another example of ultrasonic damage.

The energy of inaudible sound can cause chemical and colloidal effects such as underlie the killing of bacteria, the aging of whisky and the homogenization of milk. These effects may also be produced in the human body. But these possibilities, Dr. Davis said, have not yet been assessed. Man may be protected from any such effects from airborne ultrasonics by their effective reflection from his skin.

Both the discomfort threshold and the danger zone for man for the sound frequency spectrum up to at least 200,000 cycles per second need to be determined, Dr. Davis said. Engineers need this information for the safe design of high-performance aircraft and other mechanisms that produce high-intensity vibratory energy.

Ultrasonic sound is the kind of vibration that the human ear can not hear. It is the range of vibration between 15,000 and 500,000,000 cycles per second. Supersonics is sometimes the name given to such high-rate vibrations, but due to the increase in speeds beyond the speed of sound (about 760 miles per hour) the term supersonics is now being applied to those speeds rather than the high rate of sound vibrations, which are called ultrasonics.

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CHEMISTRY

Secret of Gasoline Jelly

➤ THE war-time secret of what makes gasoline thicken into a jelly for use as a liquid incendiary in flame-throwers or fire bombs was revealed.

It is a soap made with aluminum instead of the usual chemicals used in ordinary soap, Dr. Walter H. C. Rueggeberg of the Army Chemical Center, Edgewood, Md., told the American Chemical Society meeting in Chicago.

Existence of jellied or thickened gasoline was known during the war, particularly in the Pacific and especially to the Japs in dug-outs who learned the hard, flaming-hot way. But it was not told just how the scientists thickened the fuel and made it so jelly-like that it stuck to things it was thrown against.

Aluminum soap thickeners consist of three kinds of chemicals: 1. an aluminum salt of the soap-forming saturated, fatty acids. 2. an unsaturated soap-forming fatty acid. 3. naphthenic acid. These are used separately or as a mixture. Napalm, one of the most successful of the incendiary gels, is an aluminum soap of an oleic, naphthenic and coconut fatty acid mixture.

These aluminum soaps have interesting and unusual properties that no other similar group of compounds possess. They become thick and viscous when shaken. They make the gasoline "set" when mixed with it. Chemists call this property "thixotropic."

Under cloak of post-war secrecy, it is known that experiments are being pushed vigorously to make even thicker and more solid gasoline so that fuel can be stored and handled somewhat like a solid instead of a liquid. This present military research is probably based on the war-time successes, although it was not discussed at the meeting.

Dr. Rueggeberg did make known that natural and synthetic rubbers as well as plastic resins such as the polyacrylates can be used as fuel thickeners. These produce jellies that are somewhat different from the soap-thickened fuels.

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CHEMISTRY

Whisky of the Future Can Be Made from Wood

➤ WHISKY of the future can be made from wood, instead of being merely aged in the wood. Science is ready to substitute sawdust for grain in ethyl alcohol manufacture and save huge quantities of wheat, corn and other grain for feeding a hungry world. Only federal regulations prevent this from happening now.

Dr. Robert S. Aries of the Brooklyn Polytechnic Institute told the American Chemical Society meeting in Chicago that a $3,000,000 alcohol plant already built could produce 10,000,000 gallons or enough to make over 25,000,000 gallons of whisky. A ton of sawdust now wasted can yield about 50 gallons of drinkable alcohol.

Natural gas and petroleum refinery wastes can also be made into alcohol as good as grain alcohol, Dr. Aries claimed. The cost of alcohol from wood waste is a third of that from grain and the synthetic alcohol from oil and gas costs even less.

The drinker might not be able to tell the difference, Dr. Aries said. Slogans such as "Made from wood, aged in the wood" might win public approval for the new kind of whisky.

If the regulations of the Treasury Department controlling liquor manufacture were changed, the labels on the bottles might read "sawdust neutral spirits" and "petroleum neutral spirits" where they now read "grain neutral spirits."

The more than 10,000,000 tons of sawdust wasted annually could supply more than three times the demand for whisky. Every ton turned into alcohol would replace 20 bushels of corn or wheat.

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