

Noise Menace Threatens Man

The constant whine of jet planes and the blare of sirens, as great a menace as air pollution, threaten "civilized" man's hearing and sanity

By Barbara J. Culliton

➤ NOISE, forever bombarding urban and suburban man, is becoming an increasing menace to his psychological and physical well being.

Little cars with oversized engines, enormous trucks, sirens, construction projects and jet planes are exacting high prices in frazzled nerves, fatigue and poor hearing as well as in cold cash.

There is, it seems, no quiet place one can go.

Undiscovered tropic isles are becoming as rare as black diamonds as planes and Conrad Hilton invade every corner of the world. Suburbia is no more peaceful these days than the heart of the city, with motorcycles and screeching tires and miles of super-highways stretching into residential communities and the endless drone of air conditioners and power mowers.

Every man, the Constitution says, has a right to life, liberty and the pursuit of happiness. For some this means the right to make noise. Quiet, it seems, is considered passé by the insensitive moderns who believe in technological progress at any cost and that noise is a necessary companion to advancement.

Test of Patriotism

Technological progress aside, the Veterans of Foreign Wars have even declared the right to make noise a test of patriotism. Complaining Fifth Avenue residents who were awakened by a V.F.W. brass and drum parade one midnight were rebuked for their objections. Vice Adm. Leland P. Levett (U.S.N. Ret.), according to *The New Yorker* (Sept. 10, 1966), felt constrained to point out to New York's nonsleepers that Julia Ward Howe was awakened one night by the din of Federal troops marching into Washington during the Civil War. But she, fair lady, did not complain to City Hall. Instead, she wrote the "Battle Hymn of the Republic."

Thus, if we were all potential song writers this noisy world might be just the thing to set creativity stirring. But alas, we are not. Ordinary types are left to suffer real and serious distress from the effects of too much noise.

Excessive noise can cause permanent or temporary loss of hearing and may be a factor in reduced sharpness of hearing in the elderly. It limits efficiency, interrupts the minimum re-



Fremont Davis

DEAFENING DESTRUCTION—The insufferable sound of drills commonly used to dig up the pavement may damage worker's hearing over a period of time and try the patience of persons in its range. Muffled construction equipment would mark an important contribution to winning the battle against "noise pollution" in our cities.

quirements of sleep, severely strains the nervous system, can cause accidents and has been linked to heart disease.

Dr. Julius Buchwald of the Downstate Division, New York Medical Center, pointed out recently to a New York State mental hygiene committee that everyone dreams at least five times during the night. If these dreams are broken by intruding sounds, a person may suffer from paranoid delusions, psychoses, hallucinations, suicidal and homicidal impulses and nightmarish memories.

On the other side of the world,

studies of the Mabaan tribe in south-east Sudan show hearing is acute in individuals from 10 to 70 years of age. Hearing loss is not a common phenomenon of old age among the Mabaans, who seem generally to age more slowly and exhibit no evidence of coronary disease. Dr. Samuel Rosen, consulting otologist for New York's Mount Sinai Hospital and the New York Eye and Ear Infirmary, and Dr. Pekka Olin of the University of Helsinki, Finland, said that for the Mabaans acute hearing is necessary tool of survival.

In their environment, where man-

made disturbances are few, people have learned since childhood to listen for sounds of approaching danger.

Somehow the din of the cities must be quieted. To this end, a bill aimed at tackling noise problems on a national scale has been introduced by Congressman Theodore R. Kupferman (R-N.Y.). Called the Noise Control Act of 1966, H.R. 14602 would establish an Office of Noise Control within the Office of the Surgeon General. This office would provide grants to states and local governments to research ways and means of controlling or preventing excessive noise. The new Government office would work with existing Federal agencies studying the possibilities of jet noise abatement and would prepare and distribute information on all aspects of noise prevention.

Unwanted Sound

Noise is defined simply as unwanted sound. In that regard it is a subjective thing. Technically speaking, it is a form of energy that travels through space, strikes the ear and is converted into identifiable sound.

Noise, for general purposes, is measured in decibels—units that describe levels of acoustic pressure, power and intensity. A scale of acceptable noise levels is valuable in judging varying degrees of sound. About 35 decibels (db) is an acceptable level for a courtroom or classroom, 55db is all right for a restaurant, and 60 db for a sports arena. This is also the point at which use of the telephone becomes difficult; at 80 db it becomes virtually impossible. In any situation 90 db can be tolerated only for short periods of time and 100 db levels cause acute physical discomfort. A jet revving its engines at takeoff registers somewhere in the neighborhood of 130 db, which is considered the maximum allowable for humans.

Everyday sounds have been studied by Dr. Lee E. Farr of the University of Texas Graduate School of Biomedical Sciences, Houston, who considers noise deafness one of the most serious and measurable effects of exposure to too much noise too long. However, Dr. Farr points out, this fact does not lessen the reality of other, less tangible ill effects such as loss of sleep, excessive nervous fatigue and emotional disturbances.

The psychological trauma caused or aggravated by noise is difficult to pin down because blame usually rests with prolonged and diffuse exposure rather than with a single dramatic incidence.

Noise-induced psychological traumas may manifest themselves physically as gastro-intestinal disturbances, altered response to allergens, migraine headaches or an exaggeration of an illness related to a duodenal ulcer or colitis.

Physiological noise deafness similarly develops over a period of several months or years in most cases. Noise hazards, like those from radiation or

polluted air or pesticide residues, are obscured by time.

To get a picture of just how loud the everyday world is, noise levels were measured in a test apartment in Houston. The living room was initially a satisfactory 50 decibels. Running a vacuum cleaner raised the level to 73 db when the nozzle was on the rug. When the nozzle was raised, the level rose another eight db. And 60 db is considered tolerable for a sports arena.

The kitchen, the Houston tests found, can be the noisiest room in the home, generating 100 db or more when a fan, dishwasher and garbage disposal are all going at once.

President Lyndon B. Johnson received a report from his Science Advisory Committee's Environmental Pollution Panel that dealt with problems of household noises. "We recommend," they said, "that the Federal Government encourage the development and adoption of codes governing noise insulation in apartment buildings. Pollution of apartments by noise from either adjacent tenants or outside sources is a national commonplace. At least two countries (France and Germany) have effective codes regulating this problem. Local governments should have access to codes which they can adopt with adequate reliance on both their effectiveness and their reasonableness."

The roar of jets and the impending threat of their 30-mile wide sonic booms are rather foreboding enemies of anyone who lives or works anywhere near an air route or flight lane. However, some investigators have concluded that the solution lies with city planners rather than with industry because there is at present no economically feasible way of significantly reducing the lion's roar without compromising aircraft safety. Equipment to really quiet planes is costly itself, and heavy, thus reducing space on planes for fare-paying passengers or cargo. Exchanging weight for noise now or in the near future would mean increased costs to both industry and consumer.

Little Success to Date

So-called city planning has not had much success to date. Communities still spring up near airports, and jet airports are such a source of noise that none has yet been located far enough away from any community to satisfy people.

Dulles International Airport serving Washington, D.C., was designed, however, with its neighbors in mind. The airport itself is isolated from the surrounding territory by land extending a mile and a half beyond the runway limits. Furthermore, it is set off by a grove of trees extending 1,000 feet in from the airport boundary and by 1.5 million new seedlings that were added to the existing timber belt to form a sound barrier 1,000 feet wide all around Dulles' perimeter.

In spite of all these precautions, which required considerable funds, a

100 db noise level still penetrates a mile beyond the airport limits.

Dr. Donald F. Hornig, special advisor to President Johnson on science and technology, recently urged a Federal study of the pressing noise problems around Kennedy, O'Hare and Los Angeles airports. In view of the conflicting economic interests involved in community-airport relations, a Federal investigation may help lead eventually to a satisfactory solution.

Reactions to sonic booms, the explosive sound made by the shock wave of a plane flying faster than sound, were studied by the National Opinion Research Center at the University of Chicago during six months of tests in the Oklahoma City area from February to July, 1964. More than 2,000 residents were interviewed during the period when they were exposed to eight deliberate sonic booms per day.

Nearly all those questioned reported some interferences or interruptions with ordinary living activities, mainly from house rattles and vibrations. "More than a little" annoyance with sonic booms was reported by a minority of the residents during the first and second interviews but more than half were complaining by the end of the tests.

Limits of Tolerance

As far as tolerating booms indefinitely, the researchers rated persons in two groups: those favorably disposed to sonic booms and those opposed. In the first category were men and women who believe that sonic booms are unavoidable, that they do not cause property damage, and/or that supersonic transports are absolutely essential to the welfare of the United States.

At the end of the six-month experiment, 92% of the people in this group felt they could stand sonic booms indefinitely.

However, only 57% of those with least favorable attitudes felt, by the end of the study, that they could bear to live with sonic booms. These people did not feel a supersonic transport vital to the United States, but they did believe vibrations from the constant booms cause property and personal damage.

One unusual characteristic of the Oklahoma City area, the study pointed out, is that a large majority of the population is employed by or economically connected with the aircraft industry in some way or other and was therefore considered a somewhat favorably biased sample.

Automobile, truck and construction noise is probably the most aggravating, the most conspicuous, the most taken for granted and the least necessary of all annoying and nerve wracking city sounds.

Police and ambulance sirens, necessary as they are to alert traffic of their approach, gain nothing in safety or speed by being of such intensity that they awaken sleeping masses for blocks and blocks. An adjustable siren that

could screech at rush hour to be heard above the din of horns, but be somewhat subdued for quiet evening streets might be a reasonable compromise.

In an effort to restore quiet neighborhoods in New York suburbs lining the New York Thruway, citizens under the leadership of Mrs. Christine Helwig, chairman of the Thruway Noise Abatement Committee (TNAC) and town councilwoman of Mamaroneck, N.Y., succeeded this year in getting the New York State legislature to set limits for traffic noise and to provide specific, measurable standards for judging violations. TNAC was supported with money, material and personnel by automotive associations in its efforts to establish satisfactory, reasonable criteria for maximum allowable noise.

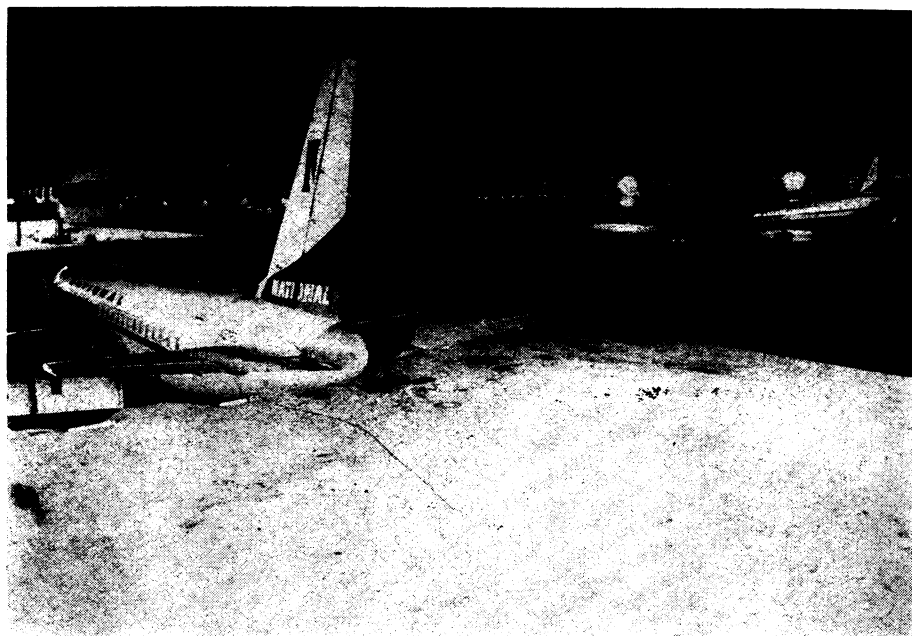
In a report reprinted in the Congressional Record, May 2, 1966, Stannard M. Potter, president of United Acoustics Consultants, concluded that "while new techniques and standards providing greater discrimination are desirable (efforts should continue along these lines), it is both reasonable and feasible to design legislation aimed at trucks which create noise levels at a 50-foot distance of 87 db or more, as creating unnecessarily loud noise."

As moves are made to quiet traffic, similar efforts are being made by some building contractors.

A New York skyscraper, completed this spring, stands on Broadway as proof that buildings can be constructed quietly and more or less unobtrusively. Neighbors of the 52-story office building reported that power lawn mowers buzzing around their suburban homes were more disturbing than the construction job completed by the Diesel Construction Company, Inc., New York. Blasting was muffled by special steel mesh blankets weighing several tons each. Spread over the blast site by cranes, they absorbed most of the sounds of the explosions, and also kept flying debris safely within a confined area. All the joints in the 14,000 tons of steel in the frame were welded silently to eliminate the hideous, shattering racket of conventional riveting or bolting.

In other construction operations a simple device called a "residential quality silencer," costing no more than \$200, can be attached to air compressor units, Congressman Kupferman has been told. They are not used, apparently, simply because no one has ever demanded an end to unnecessary building noise or pressured construction companies into using silencers as standard equipment.

Congressman Kupferman was accused by at least one newspaper of "finding a new cause to champion." Considering the actual physical damage excessive noise causes to hearing (industry has paid an estimated \$15 million in loss-of-hearing suits just in the last 15 years) and the real psychological strain excessive noise causes nearly everyone, the cause is hardly just a paper tiger.



Velsicol Chemical Corporation

NIGHT LIGHT—An airport with a green apron over its runway is a boon to airline maintenance crews who often work after dark. A pale pastel green swath of a paving binder having several times the reflective power of black asphalt increases visibility, especially under aircraft wings. Being tested by National Airlines crewmen at Miami's International Airport, the light apron (foreground) is made with Wyton, a product of Velsicol Chemical Corporation, Washington, D.C.

CHEMISTRY

Plastic Airplanes Possible

A new family of incredibly strong plastics may prove lighter and more lasting than metal plane parts

➤ A SUPERSONIC airliner made out of plastics?

Or one built of titanium metal glued together with the same plastic material?

Such methods of fabricating future aircraft and missiles are within the realm of possibility, according to chemists at the Westinghouse Research Laboratories.

In fact, such structures may prove to be stronger, lighter and more durable than the metal variety.

As a step in this direction, Westinghouse research chemists have developed a new family of strong, high-temperature plastics that retain much of their strength at temperatures up to 650 degrees Fahrenheit—higher than the melting point of lead — even after 1000 hours of continuous exposure in air.

Reinforced with glass cloth and pressed into sheets, or laminates, the plastics at such temperatures are stronger than aircraft aluminum and compare favorably with stainless steel and titanium alloys.

Used as an adhesive under the same conditions of time and temperature, they bond together sheets of titanium

and stainless steel with hot strengths in excess of 1000 pounds per square inch.

In addition—as laminates, films, enamels and coatings—the materials have outstanding electrical insulating properties that are not degraded by this very hot, long-time exposure to air.

In reporting the new family of plastics Dr. W. E. Shoupp, Westinghouse vice president-research said:

"These materials give evidence that organic structural compounds can be designed to survive the environment created by supersonic flight, where the skin temperatures of an aircraft may rise several hundred degrees due to friction with the air.

"They further demonstrate the feasibility of the adhesive bonding of difficult-to-join structural metals for such service temperatures, including those likely to be encountered by the supersonic transport plane.

"Finally, the materials allow us to consider the design and construction of electrical equipment that will take advantage of higher operating temperatures, beyond the limitations now imposed by available organic insulators."