

0456 HUMAN WHOLE-BODY EXPOSURE TO INFRASOUND.
(E.) Slarve, R. N. (Aerosp. Med. Res. Lab., Wright-Patterson Air Force Base, Ohio), and D. L. Johnson. *Aviat., Space, Environ. Med.* 46(4): 428-431, 1975.

Recent reports have attributed serious psychophysiological effects to infrasound, low frequency sound in which pressure variations are below 20 Hz. Levels of infrasound which are of practical concern should be determined so that humans may be protected from unnecessary routine exposure. A dynamic pressure chamber (DPC) was constructed in which human whole-body exposure experiments were run. Four normal subjects were chosen for a series of 8 min runs at 120-144 dB and 1-30 Hz. Prior to the run, pre-exposure audiograms were performed and state of health was checked. Three electrodes were placed on the chest, respiration rate was measured and an ECG was obtained. Heart and respiration rate were continuously monitored, and visual and audio contact was maintained. The subject remained seated but performed simple tasks. Post-exposure otoscopic examinations and audiograms were performed. There were no significant changes in hearing threshold levels. Painless pressure buildup was consistently reported, as well as 34/55 observations of chest and/or abdomen vibrations, probably due to direct transmission from DPC surfaces. Voice modulation, which correlated with the vibratory phenomena of the chest, occurred frequently; however, there was no interference with speech understanding. A few episodes of decreased ability to concentrate, drowsiness and time contraction were reported although there was no objective evidence of the primacy of infrasound in this type of response. None of the effects consistently observed would indicate that infrasound exposures as high as 144 dB are harmful to healthy subjects. (4 references)

0554 LOW ENERGY ELECTROMAGNETIC PERTURBATION OF AN ENZYME SUBSTRATE. (E.) Goodwin, B. C. (Sch. Biol. Sci., Univ. Sussex, Brighton, England) and S. Vieru. *Physiol. Chem. Phys.* 7(1):89-90, 1975

Irradiation of enzyme substrates in crystalline form with light from either a mercury or tungsten lamp at particular radiation time intervals causes an increase in the initial velocity of the enzyme catalyzed reaction. Aliquots of urease were evaporated to dryness and irradiated for 0, 20, 25, or 30 sec with light from a high-pressure Hg lamp. Urease activity was measured by a modified Nessler procedure. Previous experiments had shown that crystals irradiated for 25, 55, 85, 115, 145, and 175 sec showed increased reaction velocity. A significant increase in the reaction velocity (0.255 mean OD/5 min reaction time) was observed only after the 25 sec irradiation, with other radiation times giving no detectable response (0.236, 0.234, and 0.235 mean OD/5 min for 0, 20, and 30 sec, resp.). Preliminary experiments have also confirmed the effect with glucose-6-phosphate dehydrogenase and a yeast auxotroph. (7 references)

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0573 OBSERVATIONAL EVIDENCE THAT SHORTWAVE RADIATION GIVES ORIENTATION TO VARIOUS INSECTS MOVING ACROSS HARD-SURFACE ROADS. (E.) Gunter, G. (Gulf Coast Res. Lab., Ocean Springs, Miss.) *Am. Nat.* 109(965):104-107, 1975.

The relationship of various insects to hard surface roads which form part of the environment over much of the earth has been observed. The salt-marsh caterpillar, the larva of the moth *Estigmene acrea*, always goes straight across the road no matter what direction the road runs. On curves, they bisect a symmetrical pattern of the road. At the edge the caterpillar resumes a meandering path. The rove beetle Staphylinidae and the beetle *Pasimachus* cross in the same manner. Butterflies singly and in large groups fly straight across the road. A common southern Texas grasshopper spends the night on paved roads in the fall in search of warmth. All the grasshoppers are turned by morning so the long axis of their bodies was perpendicular to the long axis of the road. They thus present a symmetrical placement with respect to the radiant energy coming from the road. All these insects balance themselves with respect to a symmetrical source of SW radiant energy outside the range of light. They cross hard surface roads by the shortest possible route in a tropistic response to the symmetry of radiant energy coming from the road. This response has survival value for insects as they cross bare spots of the earth in the shortest possible time. (4 references)

0583

THE α BYS OF BIOELECTRIC MEASUREMENTS. (E.)
Electr. Des. 23(16):68-72, 1975.

There are many problems associated with trying to extract a bioelectric signal from the human body. A low level voltage is being pulled from high level noise while protecting both the patient and the instrumentation. Bioelectric signals are usually in the low millivolt range while the noise level is about 10 volts. To discard unwanted noise ideally, a differential scanner, which takes the difference between two input signals and multiplies by the gain, is used. However, different currents may flow through different parts of the body, unbalancing the impedance. This results from unequal capacitances to ground and unequal electrode impedances. At high input impedances, the susceptibility to capacitive coupling from outside sources is increased. The problem may be avoided by grounding the patient's right leg, but dangerous alternating currents may then flow directly through to the ground. New devices such as pacemakers, catheters, electrodes, intracardiac thermistors and intracardiac microphones all provide direct electric paths to the heart and tiny currents through these may cause ventricular fibrillation. Other more subtle obstacles also exist. (3 references)

0661 A CASE OF PROLONGED, REVERSIBLE DEMENTIA ASSOCIATED WITH ABUSE OF ELECTROCONVULSIVE THERAPY. (E.) Regestein, Q. R. (Div. Psychiatr., Dep. Med., Peter Bent Brigham Hosp., Boston, Mass.), B. J. Murawski, and R. P. Engle. *J. Nerv. Ment. Dis.* 161(3):200-203, 1975.

Confusion and amnesia following electroconvulsive therapy (ECT) usually lasts only a few weeks and clears completely thereafter. However, in some cases, memory disturbances may persist more than a year, particularly when large numbers of treatments are administered. There is much diversity of opinion about the number of ECT treatments indicated for psychiatric patients. A 57-yr-old housewife complained of abdominal and epigastric discomfort and insomnia. Her initiative deteriorated and she became inadequate at housework. Medical examination of the abdomen and upper GI tract were unrevealing and she was referred to a psychiatrist. ECT was given 3 times a wk for 2 mon, then 2 times a wk for 1 mon. She was discharged on amobarbitone and given ECT once a wk for 2 yr. She did no housework, slept, ate, and watched television all the time, had no initiative or spontaneity, and showed a profound memory deficit. Eventually an independent assessment was done despite warnings from her first psychiatrist, and ECT was stopped. She was reassessed monthly and drugs were gradually withdrawn. Over a period of months she began to converse, sensorium proved clearer, and fitful sleeping and pain returned. Eleven mon after cessation of ECT antidepressants were administered which relieved the remaining symptoms. Weekly ECT had caused a dense impairment in memory although lack of a clear history and mental status at the time of first presentation makes careful diagnosis of the original condition impossible. (18 references)

0701 DORSAL COLUMN STIMULATION. ITS EFFECT ON THE SOMATOSENSORY EVOKED RESPONSE. (E.) Blair, R. D. G. (Div. Neurol. Neurosurg., Toronto Western Hosp., Ontario, Canada), R. G. Lee, and G. Vanderlinden. *Arch. Neurol.* 32(12):826-829, 1975.

The physiological mechanisms by which dorsal column stimulation (DCS) relieves pain are not known. The effects of varying frequency, duration, and intensity of DCS in the individual components of the somatosensory evoked response (SER) are investigated. Six patients had been selected to receive implantation of a dorsal column stimulator to relieve chronic pain. The SER obtained by stimulating the tibial nerve at the ankle consisted of a series of positive and negative deflections beginning approximately 30 msec after the stimulus and lasting for more than 400 msec. Four subjects showed well defined responses of this type. During DCS there was a consistent reduction in amplitude of the late components of the SER. When the intensity of DCS was maintained at levels adequate to relieve pain, little change in the early components of the SER occurred during the first 100 msec. With higher voltage levels of DCS, there was some suppression of all components of the response. Most patients reported best relief with DCS at frequencies around 100 Hz. The relief lasted several hours after a period of DCS. (11 references)