

Large air samples

The U.S. Army Biological Laboratories and the U.S. Army Walter Reed Institute for Research jointly demonstrated the feasibility of using a Large Volume Air Sampler (LVAS) to recover small numbers of bacteria and viruses from large air samples. Meningococcal meningitis and respiratory diseases of adenoviral origin, in military recruits in barracks and hospitals were studied.

Supercharged engines

The U.S. Army Mobility Equipment R&D Laboratory conducted studies to determine if greater power and altitude capacity could be obtained from 10 and 20 HP military standard engines by utilizing the turbo supercharger principle. This work led to the proposal that a turbocharged "10 HP" engine (20 HP output) be used on the CHAPARRAL missile system in an application where the standard 10 HP military engine would not produce the required specific output (HP/FT³).

Stratospheric tides

The U.S. Army Atmospheric Sciences Laboratory investigated Stratospheric Tides on a Seasonal Basis. Analysis of rocket soundings verified the existence of a significant year-round diurnal oscillation. A qualitative description was made of the phase and amplitude of the oscillation during the summer season. Certain recommendations were postulated on how the tide affects meteorological rocket network climatological data. The discovery of atmospheric tides in the stratosphere has led to new concepts of the atmospheric electrification process and the origin of large-scale electrical fields in the atmosphere. These findings will have an impact on the photochemistry of the upper atmosphere and the structure of the ionosphere with attendant effects on the propagation of electromagnetic energy.

Microwave food preparation systems

The U.S. Army Natick Laboratories, in 1965, initiated a study to determine the feasibility of developing an ultra rapid, lightweight food preparation system which would utilize microwaves, thermoelectric units, ultrasonic fuel vaporizers and multipurpose plastic packages which could also function as heating and serving vessels. A two-year study proved the feasibility and overall potential advantages to the military of microwave cooking in the field. As a direct result of this work a development project, in the regular budget, was initiated for the design and construction of a field kitchen and bakery units.

Test drug transfer

The U.S. Army Medical R&D Laboratory designed and fabricated an accessory kit for the standard hypodermic jet injection devices to permit a quantitative transfer of test drug into the skin intradermally for such tests as T.B., histoplasmin, etc.

Electro-mechanical hand models

The U.S. Army Medical Biomechanical Laboratory designed and fabricated six electro-mechanical models of the hand with automatic proportional control of grasp. One hand has been fitted to an amputee. The other five hands have been submitted to New York University and the Veterans Administration. All are now undergoing clinical testing.

Ozone concentration

The U.S. Army Atmospheric Sciences Laboratory, in 1966, provided to the scientific community the first *in situ* measurements of the change in ozone concentration in the atmosphere during a total solar eclipse. The increase in ozone by 100% during total eclipse was abrupt; a sudden decrease in concentration was noted as the sonde emerged from the shadow; and in less than 20 seconds, the ozone had reached its equilibrium value.

NAVY EXAMPLES

New high-temperature explosives

Navy chemists at Naval Ordnance Laboratory (White Oak) have synthesized more than a dozen new and potentially useful explosives that are heat resistant. Several of these have already seen use in military weapons and space vehicles, and several others are being considered for similar applications. Success in this area is due primarily to extensive fundamental studies of the relationship of