SCIENCE NEWS

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SCIENCE IN 1942

PSYCHOLOGY AND PSYCHIATRY

(Continued from p. 10, January 1)

Rats so sensitive to noise that they would be thrown into fits by a shrill sound were made immune for days to such sounds by a two-week treatment in which the fit-producing noises were preceded by harmless sounds.

A muscle of the ear, the stapedius muscle, was found to serve as an automatic damping agent to protect the inner ear against excessive noise—perhaps partly explaining why loud noise temporarily deafens.

Airsickness and other types of motion sickness, although originally due to action of the balancing mechanism in the inner ear, is often the result of conditioning to other sights, smells and motions, and if so can often be prevented and cured by psychological means.

Some cases of weakness in distinguishing colors can be relieved by doses of vitamin A.

Individuals who have recently received doses of the sulfa drugs may make wrong decisions because of mental confusion that sometimes persists after this treatment.

The bizarre craving to eat dirt may be caused by diet deficiency rather than mental illness is shown in a survey of the diet of school children.

Radio in the farm districts increases the contentment of those who are well-adjusted to farm life, and increases discontent among the ill-adjusted.

Hallucinations can be produced in normal individuals by the simple form of learning known as conditioning.

The traumatic neurosis of this war, seemingly more severe than the "shell shock" of last time, is expected to take more physical forms such as peptic ulcers and heart complaints, with less functional paralysis; effective treatment combines hypnosis or hypnotic drugs with psychoanalytic methods.

Evidence that the way insulin shock treatment aids the metally ill is by making them forget recently acquired abnormal ideas and behavior was furnished by experiments in which newly acquired learning was forgotten after insulin treatment while older, more thoroughly drilled habits were retained. Similar results were obtained in human schizophrenic patients treated with metrazol shocks.

Sub-shock doses of electric current through the brain were found to shorten the duration of delirium tremens following prolonged alcoholism.

Pneumoencephalography, invaluable in the location of intracranial tumors, was proved to be prognostically misleading in cases of so-called cerebral atrophy; in spite of x-ray evidence of atrophy, behavior development was found to proceed normally.

ENGINEERING AND TECHNOLOGY

Puffed up sand, known as silica aerogel, was introduced as a heat insulator twice as effective as any other substance.

Glass that floats in water and replaces cork, balsa, cellular rubber or kapok in life preservers and life rafts, was made by foaming glass with carbon additions during manufacture.

A continuous fermentation process was developed to convert molasses into alcohol in three to five hours.

A method of heat treating iron or steel in inert atmosphere or vacuum furnace was demonstrated to remove or prevent scale formation.

Plastic coatings were used to replace tin upon cans for many uses, including food packing.

Non-metallic containers of various sorts were introduced to replace tin cans in many industrial uses.

A new electroplating process saved half the tin that goes into a tin can and saved electric power and half the time of plating.

Steam acidified with gluconic acid was used to clean milk cans more quickly.

Induction heating furnaces, operated by electron tubes, were used to coat and flow tin on iron sheet in tin plating process.

A new plastic that can be kneaded and thrust into leaks in life boats was put into use.

Foods, such as lard, were made to refrigerate perishable goods on overseas journeys by being chilled to sub-zero temperatures and placed about the foodstuffs to be kept chilled.

Soldier's V-mail was transported overseas as microfilm and photographically enlarged for delivery.

Heavily coking bituminous coals were successfully burned in household furnaces by use of improved underfed stokers.

Synthetic glass jewels were made in America for pivot bearings of small instruments.

Iron was substituted for printing plates of nickel and copper in experiments.

Chemically toughened wool, resistant to moths and soap, was developed.

A new inflatable rubber pontoon was substituted for the standard aluminum boat for temporary bridges formerly used by the Army, saving rubber by reducing the truck transport needed.

A "pancake" Diesel engine for Navy subchasers was announced as in production.

A wire "umbrella" was developed to protect explosives plants and oil storage from lightning.

Cellulose acetate now completely replaces silk as an insulation for telephone wires with considerable improvement.

Transoceanic telephone cables now seem to be practicable due to the invention of a telephone repeater which can be built into the cable structure itself.

Method of wiping lead joints on telephone cables was brought into use, which saves about 60 per cent. of the usual requirements of tin.

A method of producing x-ray photographs that show three dimensions on a single film was demonstrated.

Merchant shipbuilding facilities were expanded to the point where there are more than 60 yards, with 300 ways and nearly 2,000,000 workers, producing 8,000,000 tons of shipping in 1942.

Cargo ships of 10,500 tons were completed from keel laying to launching in 4⅔ days and from launching to delivery in eight days.

Side-launching of ships was used extensively in war shipbuilding program.

AERONAUTICS

Solution of certain research problems—development of new low-drag wing sections, improvement of flaps, improvement of cooling systems, improved engines and new propeller designs—made it possible for America to build planes to fly faster than 400 miles per hour.

Cylinder heads made by forging in a die, with fins cut on the exterior by a high-speed milling machine, made possible reduction in weight of airplane engines to less than one pound per horsepower.

A portable catapult was developed for land launching of airplanes.

Modification of battle-tested airplanes made possible the development of a new technique of air warfare—low flight at high speed for horizontal bombing, and use of the plane as a fighter when bombs have been dropped.

Inboard bomb racks for wide-hulled flying boats, with guides to "steer" bombs over the side and start them accurately downward, were invented.

Auxiliary turbo-driven propellers for getting rocket planes up through the denser lower atmosphere were invented; they are powered by the rocket blast, and are to be jettisoned once the plant has reached the stratosphere.

New multi-engined transition training planes for instruction of flight crews were developed and put in use.

Pre-flight aviation training was introduced as a regular part of the curriculum in elementary and secondary schools.

A new telescopic sight for rear gunners made possible wider arc of fire and better streamlining of the fuselage.

Apparatus for automatic control of the pressure within a sealed airplane cabin by blowing off to outside air when pressure is high and turning on a supercharger when it falls, was invented.

A cooling meter for aircraft engine cooling, and meters for measuring the visibility of exhaust gases from airplane engines were developed.

A de-icer for airplane propellers that provides for the forcing of anti-freeze chemical through a series of holes when the propeller is rotated, was patented.

A device was developed that warns the pilot of approaching stall conditions by means of a tube which transmits pressure changes from the trailing edge of the wing to a diaphragm within the wing connected with an electric instrument.

Caterpillar-type treads for airplane landing gear were invented.

A new ordnance mount for machine guns, combined with gunner's seat mounted on a circular track, was developed for enabling the gunner to swing himself and his weapon around to fire at any angle and if necessary to pilot the plane.

MEDICAL SCIENCES

Lowest death rate in the history of the United States death registration area and an all-time record low in smallpox cases, recorded in 1941, were reported, after an interval for collection of figures, in 1942.

For the first time in medical history, disease-fighting substances in the blood known as antibodies were formed artificially in laboratory flasks, confirming the theory of molecular changes in immunization.

First direct evidence of human need for certain amino acids in protein foods was discovered in diet studies with human volunteers which showed that arginine is required for spermatogenesis, lysine plays a role in the female reproductive cycle, and tryptophane is also essential, lack of it leading in rats and possibly also in humans to baldness and sex gland atrophy in males and to teeth defects and cataracts in young, growing animals.

First, and strikingly successful, use of the Moorhead Foreign-Body Finder, which uses a radio frequency circuit with movable coil and steel finger to detect shell fragments and the like in war wounds within a few minutes instead of hours as by X-ray and probe, was reported from Pearl Harbor.

Efficient U. S. Army system of evacuating the wounded under fire, sulfanilamide and blood plasma banks scored a notable triumph in saving lives at the Pearl Harbor raid, where almost 100 per cent. of abdominal wounds healed without infection, less than 4 per cent. of compound fractures and flesh injuries became infected.

Propylene glycol vapor was found to be a safe, effective substance for destroying influenza virus and other germs in the air in laboratory experiments and was credited with reducing significantly respiratory infections among 16 children in the ward of an institution where it was tried.

Experimental use of a 10-hour combined chemical and fever treatment of syphilis and, on a wider scale, of six to ten-week intensive chemical treatments were announced.

Discovery that ants are capable of spreading dysentery was announced.

Discovery of chemicals, probably enzymes, in the bodies of young mice which destroy the drug-resistant waxy parts of the tuberculosis germ were announced with some hope of development of an enzyme preparation that might be used in the treatment of tuberculosis.

Hope for a chemical conquest of tuberculosis was encouraged by announcement of successful results in treatment of patients with a relatively new drug, Promin, and by announcement of even greater success in treatment of tuberculous animals with a related chemical, di-amino-diphenyl sulfone.

Reduction of venereal disease in the Army to a rate of 38.2 per 1,000 for the first six months of 1942, with a syphilis rate the lowest in Army history, was accomplished following establishment in the Surgeon General's office of a division of venereal disease control with officers assigned to each large Army camp and each of the larger tactical units.

(To be concluded)