SCIENCE NEWS

Science Service, Washington, D. C.

SOME PAPERS PRESENTED AT THE BOSTON MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

By WATSON DAVIS, *director, Science Service*

A DEVICE that automatically takes the talk, including advertising, out of radio programs has been developed by Professor Gleason W. Kenrick, of Tufts College, Massachusetts, who demonstrated this radio talk eliminator. Seemingly endowed with intelligence and discrimination, this robot radio censor looks like a supplementary radio set that is hooked up with a conventional radio broadcast receiver. Actually, the talk eliminator works automatically and utilizes a combination of electrical devices which result in the impartial suppression of all talk and announcements, along with advertising "plugging," that some radio listeners find objectionable. The radio talk eliminator hook-up is such that whenever there is a quarter of a second silence in the program, the radio set is silent for ten seconds. When a speaker stops for breath, his momentary silence, detected by the talk eliminator, in turn silences the radio to his message for ten seconds. The detecting "brain" in the talk eliminator is a detector amplifier similar to the automatic volume control devices now commercially incorporated in radio sets. Whenever the current in the "brain" tube drops to zero for the predetermined fraction of a second, a selective relay comes into action that silences the radio for a predetermined length of time. Professor Kenrick has found that setting the talk-hating robot for ten seconds of silence is an effective antidote for most radio chatter. A very fast talker, like Floyd Gibbons, can beat the eliminator which can not silence him until he stops for breath. Music, which is usually continuous, passes inspection by the censor robot except in the rare instances when there are dramatic pauses as there often are in symphonic compositions. Radio broadcasting stations will be able to counteract the use of the talk eliminator, if many listeners equip their sets with them, by supplying a musical background to all announcements and advertising speeches. But if the talk eliminator is thus thwarted, Professor Kenrick promises to improve it by adding some sound filters which will have the ability to differentiate between musical sounds and the sound of the human voice.

THE idea that fever speeds up our time, recognized popularly in the phrase "feverish activity," has been proved sound by Professor Hudson Hoagland, physiologist of Clark University, Worcester, Massachusetts, who presented evidence of a chemical time clock. He found that patients with a fever, or well persons heated up internally with high frequency electricity, think times passes faster than it really does. Delving into laws of chemistry, Professor Hoagland discovered that the speed of counting seconds appears to obey the well-known relation described by Arrhenius between chemical reaction and temperature. In addition to this evidence that the body and the brain obey chemical laws, he also found evidence for a definite irreversible chemical reaction within human beings that serves as a sort of master clock for our judgment of short intervals of time.

THE longer you listen, the keener your hearing becomes, provided the noise is not too loud, Dr. E. M. Josephson, of New York, told the scientists in putting forth a new hearing theory, in which it is assumed that the mechanical energy of the sound is converted by the cochlea into electrical energy which affects the auditory nerve. Normal ears do not become fatigued, and fatigue is the earliest sigh of progressive deafness, Dr. Josephson contended.

PHYSICIANS in private practise should not fear competition from organized medical work in preventive and routine care of working classes, as Henry H. Denison, the manufacturer, by analogy, with business experience predicted that organized medical service is not likely to exceed more than fifteen per cent. of the whole field of medical practise. Mr. Denison described expanded medical service as a vast useful field that will take care of any technological unemployment that might result from more efficient organized medical services.

FISHES thrive best in water that is not too clean, Professor W. C. Allee, of the University of Chicago, told the scientists. They like to swim in water that has been inhabited for some time by their own kind.

"A ROSE by any other name would smell 6523." This revised version of a famous saying occurred to many scientists at the meeting when they viewed a flavor and odor chart devised and exhibited by Ernest C. Cricker and Lloyd F. Henderson, associated with Arthur D. Little, the Cambridge, Massachusetts, industrial chemist; for 6523 is the odor formula for the rose. Other smells can be given numerical labels of this sort and these can be used to designate them just as numbers are convenient in tagging convicts and motor cars. Each digit expresses one of four components in odor sensations, which in order of writing are fragrant, acid, burnt and caprylic. The numbers indicate intensity on a scale of eight. The meaning of caprylic may be understood if it is known that the word is derived from "goat." Mothballs, or naphthalene, in this code rate 4564, while the familiar gas of rotten eggs, hydrogen sulfide, is 5346. The sweetest smell reduced to this odor code so far is that of vanillin, 6021, and that may explain why so many of us like vanilla flavoring. A rather terrible smell, strangely used as a basis for some of the most expensive perfumes, is skunk-like civet, 5777. But the scale failed when the chemists attempted to express a still more disagreeable smell, that of butyl mercaptan. The odor scale is finding practical use in the perfume and essential oil industry.

OTHER scientists reported: There was probably only one race of human beings in that portion of pre-history known as the upper old stone age, not three as usually believed, according to Professor Gerhardt von Bonin, of the Field Museum, Chicago. Phonograph records are being used to record dialects, linguistic usage and folk tales of New England, according to Professor Miles L. Hanley, of Harvard. Oleic acid on surfaces will cause water vapor to condense in drops and hasten this process fundamental to steam power product, it was demonstrated in an exhibit by T. B. Drew and W. M. Nagle, of Massachusetts Institute of Technology.

A NEW idea of how the human body fights its defensive battles against disease invasions was presented by Professor Reuben L. Kahn, of the University of Michigan, who reported evidence that skin, muscles and other fixed tissues, and not the blood, are the "shock troops" in our continual struggle to keep healthy. Usual medical thought considers the protective forces against germ invasion centered largely in the blood and other body fluids in which are found phagocytes, or bacteria-eating cells. Skin and muscle are usually considered hypersensitive to the same germ that, because of protective immunization, is subdued by the blood. Experimenting with rabbits treated with much the same sort of serum that is so successfully protecting thousands of children against diphtheria, Professor Kahn finds that skin and muscle as well as blood receive immunity when the living body is given protective treatment. In fact the skin, probably because it has been the armor of the body throughout the ages against attack by germs and other harmful agents, is ten times as effective as muscle, brain or blood in combining with and subduing the invading material. Immunity is an ability to detect and then anchor, or combine with, an invading substance; and the great service rendered by a tissue is this combining with the dangerous substance in order that it may not spread throughout the body with disastrous results. Professor Kahn explained that in a germ disease this combining capacity of the tissue may determine whether the trouble is localized or whether the organisms run riot throughout the body. Sometimes the ability to protect is not evident from the blood, yet the skin is on its protective job. This is the case sometimes in Malta fever and in boils caused by staphylococci. The inflammation of infection, as in a boil, is really something to warrant rejoicing because it means that the invading organisms are being destroyed and eliminated. Further studies by Professor Kahn promise to explain some puzzles about infection and give information that physicians may be able to use in the actual treatment of disease.

SIGNIFICANT differences between the germs that cause tuberculosis in humans and those responsible for the disease in other animals have been discovered, and a corps of research workers are hard at work upon the difficult task of attempting to translate these research findings into methods of preventions and cure of tuberculosis that doctors can use, according to Dr. William Charles White, chairman of the National Tuberculosis Association's Committee on Research. The human tubercle bacillus has within itself one substance, a fatty acid, that occurs in none of the other tubercle germs, Dr. R. J. Anderson, of Yale, has discovered. The chemical substance is able to produce the tubercle growths characteristic of the disease without the presence of the bacilli themselves. So far, Dr. Anderson's studies have been confined to only one strain of the kind of bacilli occurring in human beings, but the research is being rushed to include all the human strains. Another promising lead to the possible conquest of the white plague is the fact that the germs that cause the disease have much greater difficulty getting along without oxygen than the germ strains that are relatively harmless. Again this peculiarity has not been practically applied. Preparations are being made to study the life, loves and experiences of a single individual tubercle bacillus, Dr. White explained. Heretofore only large colonies or "herds" of the germs have been observed because of the difficulty of singling out individuals. It is hoped that helpful details of germ life will be found in this way, just as observations of individual men, women and other animals reveal facts that are not discovered by watching crowds.

PHYSICISTS must continue their search for a clean-cut case of the conversion of radiant energy into matter, Dr. Carl D. Anderson, of the California Institute of Technology, declared in describing his discovery and investigations of the positron, the positive running-mate of the familiar electron or unit of electricity. When lead, or aluminum, or other material is bombarded naturally or artificially with cosmic rays or powerful gamma rays, positrons and electrons are often seen to emerge. The theory of Dr. P. A. M. Dirac, British physicist, is that these, which are like visible light, only shorter, are actually transmuted into these particles of matter under the influence of coming close to the kernels of atoms. But Dr. Anderson, from his experiments in Dr. R. A. Millikan's Pasadena laboratory, concludes that what happens is that the rays merely knock out electrons and positrons already existing in the atomic kernels.

DETECTION of murder by poison will be made more sure by a new and accurate method of analyzing human blood to detect and estimate extremely small quantities of alkaloid drugs such as cocain, strychnine and morphine. The new technique, devised by Dr. Burnham S. Walker and Elizabeth W. Walker, of Evans Memorial and Boston University School of Medicine, will detect six parts of drugs in one hundred thousand parts of blood. It will also be used in gaging the proper dose of these powerful drugs in legitimate medicine.

INDUSTRIAL laboratories are now contributing almost as much to the fundamental progress of science as universities and other wholly academic institutions, Dr. Paul D. Foote, Pittsburgh industrial physicist, said. In the last eight years, for instance, fifty million dollars has been spent by petroleum companies in improving the technique of applied geophysics useful in locating oil underground.

COAL is king, and this source of power and new chemical products is more firmly seated on its throne than ever before, according to Professor George B. Roorbach, of the Harvard School of Business Administration. New synthetic chemical products depend largely upon coal, including synthetic nitrogen, synthetic phosphoric acid, acetic acid and the vast army of dyes, drugs, perfumes, photographic materials, synthetic resins and tanning materials. Regions of the earth that have abundant, readily available coal supplies are in an even more preferred position for industrial dominance than heretofore.

GREAT winds blow in the atmospheres of the distant stars compared with which the hurricanes of the earth's atmosphere are mere zephyrs. Dr. Otto Struve and Dr. C. T. Elvey, of Yerkes Observatory of the University of Chicago, announced that while the outer gaseous atmospheres which surround the luminous lower strata of the stars have heretofore been assumed to be relatively quiescent, they have discovered in the rainbow spectra of stars evidence that powerful turbulent currents exist in the atmospheres of many stars. Spectroscopic phenomena that have puzzled astronomers for years are now explained, and Drs. Struve and Elvey even measure the most frequent wind velocity of individual stars. The faint star known as 17 Leporis has an atmospheric velocity of about forty miles per second. In Epsilon Aurigae it is twelve miles per second and in the first magnitude bright star Alpha Persei it is about four miles per second. In the sun, which is a star, there is practically zero wind velocity, however. The winds in the stars may be likened to the winds on earth although the densities of stellar atmospheres are much lower than the density of earthly air.

ASTRONOMY seems to be on the verge of being able to "see" the invisible star light, both longer and shorter in wave-length than visible light from the stars, that can not now be satisfactorily studied by conventional telescopes and mirrors, Dr. Paul W. Merrill, of the Carnegie Institution's Mount Wilson Observatory, told the astronomers. Photoelectric cells, new photographic emulsions and thermocouples, bolometers and radiometers, devices for measuring feeble temperature differences, are being improved to such an extent that astronomers should in the near future be able to extend their present fragmentary knowledge of the distribution of energy in the stellar spectra.

TWO familiar green aniline dyes, made from coal tar, are effective in combating and subduing some of the common skin infections that are due to fungi, Dr. A. McCrea, of Parke, Davis and Company, Detroit, reported. These dyes, known as malachite green and brilliant green, were found to be outstanding in killing action, far surpassing all others tested, including aniline violet, fuchsin basic and gentian violet.

X-RAYS of the bones in children's wrists give a good index of the rate at which they are growing, and how near they are to maturity, Dr. Psyche Cattell, of Harvard University, reported. The shadow pictures showed a correlation between the solidifying of the bones and the physiological age of the children. Among other things, Dr. Cattell discovered that girls who are "big for their age" slow up in their rate of growth from one to two years earlier than do girls who are smaller.

A MEANS of quickly reversing the deep unconsciousness caused by ether and other anesthetics and, in some cases, of bringing back from the brink of death overanesthetized patients, was announced by Dr. Walter V. MacGilvra, a dental surgeon of the Harvard dental school, after experiments in which the Harvard medical and dental faculties have cooperated. A shot of weak hydrochloric acid injected directly into the blood is the agent that has been found effective in recalling and restoring to sensibility patients who would otherwise sleep for hours, and in some cases would never awake. While Harvard scientists have demonstrated the effectiveness of this new medical method, it was a young woman technician in a medical laboratory in Joplin, Missouri, who, by following what is now believed to be a wrong theory, actually discovered the method. Miss Pearl L. Moorman, in an effort to save an animal with which she was working, introduced a minute dose of acid into its blood and found that it awoke from anesthesia. She wrote Dr. MacGilvra an account of her discovery, and both he and a Kansas City medical laboratory verified her results, although her theory that anesthesia makes the blood more alkaline and that therefore acid would reverse the process has not been substantiated. This acid method of terminating anesthesia has been christened "Palinaesthesia," the name having been selected with the blessings of the Eliot professor of Greek at Harvard, Professor Charles B. Gulick. Because extreme alcoholic intoxication, asphyxiation, near drowning, severe electric and other shocks are very similar to the purposely induced anesthetic states caused by ether and other drugs, Dr. MacGilvra believes that injections of weak hydrochloric acid will prove effective in rescuing and bringing back to full use of the faculties, those who suffer from such difficulties. Palinaesthesia has not yet been tried on an extremely intoxicated person simply because Dr. MacGilvra has not yet had such a case made available to him. The first use of palinaesthesia on a human being was made by Dr. MacGilvra and Dr. Alfred Ellison, then resident surgeon at the Worcester Memorial Hospital, last July. It was a real emergency. A patient had had an unusual reaction to avertin and following an operation he was plainly in a dying condition. As a heroic measure, Dr. MacGilvra, using the experience of successful experiments on rabbits, injected a weak solution of hydrochloric acid in the patient's veins. There was an immediate improvement with the first few drops that entered the blood, and 40 minutes after the first injection, the patient, who had been so near death, was actually awake and answering questions. That night the patient complained of annoying wakefulness. Seven more times palinaesthesia has been used on human patients, each time with striking results. Now the doctors are ready to suggest its use not only in emergencies to save life that might be taken by unusual effects of anesthetics, but as a routine method of awakening patients early after operations.