

ACOUSTICS

Machine to Carry Out Spoken Orders Predicted

► A MACHINE which can carry out spoken orders was predicted at the meeting of the Acoustical Society of America.

Dr. Homer Dudley of the Bell Telephone Laboratories, presenting a paper by a Hungarian scientist, explained that experimenters have been working for 200 years on making a machine which will speak.

"It may be that the future will see devices developed along this line so that the human voice can give commands which will be interpreted by a machine and the order carried out automatically without the intervention of a single human hand," the paper by Dr. T. H. Tarnoczy, Budapest, Hungary, suggested.

Credit for the first important device which could speak goes to an eighteenth century experimenter, Dr. Tarnoczy's paper explained. Wolfgang von Kempelen, a royal counselor of the Holy Roman Empire, simply tried to copy the human voice mechanism.

"He used a bellows for the lungs, a leather-covered ivory reed from a bag pipe for the vocal cords, a wooden box for the mouth cavity, an India rubber funnel for the mouth opening and a number of keys to displace moving parts for various consonant positions."

Modern speaking devices, developed by the Bell Telephone Laboratories more than a decade ago, are the Vocoder and Voder, which produce a variety of speech sounds with electrical instruments.

Today, the paper said, we are learning more about the simple meaning of information "hidden like skeletal patterns" in confusing and complex speech waves. Future machines may be able to obey vocal commands, as well as reproduce human speech sounds, the Hungarian scientist proposed.

Science News Letter, May 21, 1949

ENGINEERING

Better to Average Three Than Two Best of Three

► BEST two out of three isn't best.

This scientific finding was announced by Dr. W. J. Youden of the statistical engineering laboratory at the National Bureau of Standards.

Better than best two of three in many cases is the average of the three, Dr. Youden has discovered.

This finding has important applications for scientists and engineers. They make many measurements where the results vary. Three measurements are the smallest number which can reveal one of the answers to be wrong.

Given three different figures for the same measurement, many scientists now take the two which are closest and aver-

age them to get the "best two of three."

This "very often" leads to less precise results than an average of all three measurements, Dr. Youden declares.

A Bureau of Standards announcement explains that he made "an empirical study of triads drawn at random from a large group of measurements constructed to conform to the characteristics of a normally distributed set entirely free from gross errors."

What Dr. Youden did was to go over hundreds of sets of three measurements, charting the ratios of large to small differences in the figures. He concluded that the two-of-three system dropped third measurements which should be used.

Unsettled thus far is an old mathematical problem: A rule or standard for rejecting some observations. Statisticians, aided by new gains in theory, are again working on this, the Bureau reported.

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ENGINEERING

Contour Mapping Is Streamlined

► A CAR and a trailer with electronic equipment are used by scientists of the Sun Oil Company to replace the old-type land surveyor and his transit. The combination makes the job of determining elevations needed for contour mapping of large tracts of land both speedy and easy.

The heart of the new surveying equipment is an elevation meter, described by its inventor, Ford L. Johnson and Fred M. Mayes of Sun Company, as a complex electronic integrating mechanism. It is an automatic measuring instrument, mounted in the trailer, that keeps a running record of dips and rises in the land surface over which the trailer runs.

The trailer transporting the instruments which comprise the elevation meter is a three-wheeled affair. Two wheels on its left side follow exactly in the track of the towing car or truck. The third wheel, on the right side merely serves to balance the trailer.

Measuring instruments are attached to the left-hand wheels. An odometer measures the distance travelled. A pendulum records the inclination of the trailer. As the car and the trailer proceed along a route, both the distance-measuring counter and the angle-measuring unit send electrical signals from the trailer to an electronic calculator in the automobile.

In the search for new oil deposits, the elevation meter is used in conjunction with a gravity meter, an instrument long used in oil prospecting to obtain information relative to probable underground geological formations. In this application, the elevation meter provides correction for differences in elevation at which gravity meter readings were taken. Another use of the meter is in the production of topographic maps.

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ACOUSTICS

Suggest Kind of Noise, Not Amount, Annoys You

► IT MAY BE the kind of noise, not the amount, that annoys you. This was suggested to the Acoustical Society of America meeting in New York by Dr. G. L. Bonvallet of the Armour Research Foundation, Chicago.

He explained that studies show a loud, steady hum is less likely to bother you than quieter but abrupt noises.

Industrial sounds, it has been found, are more likely to be blamed than even louder traffic noises. Dr. Bonvallet said this is probably because the public feels that something can be done about the industrial noise. But auto horns and clanging street cars are rated major annoyances.

Can noise cause you serious physical or mental disturbance? That one needs more study, Dr. Ralph M. McGrath of the Western Electric Company told the sound scientists.

"Proof", explained Dr. McGrath, has been offered that noise can hurt you—and that it can't. Scientists will have to do more work before they can decide, he concluded.

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ACOUSTICS

Our "World of Noise" Can Be Hushed Some

► OUR "world of noise" can be made quieter by a few relatively simple changes, the Acoustical Society of America was told in New York.

Dr. Leo L. Beranek of the Massachusetts Institute of Technology charged that "buildings have become more and more flimsy."

Not only are our homes invaded by the sound of traffic and planes, but "what is worse, the noise of one's neighbors at play or in battle," he complained.

Here are some suggestions Dr. Beranek made for promoting peace and quiet:

Architects should plan homes so that noisy functions are separated from quieter ones.

Plumbing fixtures can be selected for quietness, as well as other virtues.

Rubber-tired buses can be substituted for street cars, subways for elevated trains.

Strictly enforced ordinances can reduce excessive horn-tooting by motorists.

Noisy commercial activities can be kept away from residential areas by zoning laws.

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CE FIELDS

ACOUSTICS

Humidity Plays Upon Your Piano, Observations Show

► HOW your piano stays in tune depends upon the relative humidity in your living room, Dr. Robert W. Young, physicist of San Diego, Calif., told the Acoustical Society of America, meeting in New York.

Dr. Young described observations on a six-foot grand piano which he studied for a year in his own San Diego living room. The relative humidity there varied between 20% and 70%.

Within the three central octaves the tuning rose on the average 0.3% in frequency for each increase of 10% in relative humidity.

The effect of humidity is most noticeable when the piano is played with other instruments that are not similarly affected by moisture in the air.

Dr. Young's observations confirm the recommendation that pianos should be tuned with each change of season. Not only that, but the tuner should take into account the humidity at the time that he is doing the tuning. If the weather is dry, the tuning should be lower than usual.

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MEDICINE

TB Cases Are Increasing While Deaths Are Dropping

► TUBERCULOSIS is on the increase although deaths from the disease have been cut by 20% since 1940, according to Dr. Herbert R. Edwards, executive director of the New York Tuberculosis and Health Association and Godias J. Drolet, statistician and assistant director of the New York Association.

In the eight-year period, 1940 to 1947, TB deaths decreased by 12,364, from 60,428 to 48,064, they told the National Tuberculosis Association meeting in Detroit. During the same period new cases of the disease increased by 33,065, from 100,772 to 133,837.

"Who is it that needs our attention now—the dead or the living?" they queried.

Recognizing the role of mass X-ray surveys in the discovery of many new cases, Dr. Edwards nevertheless does not believe that they explain the increase. He points to New York City as an example. There new cases do not show much difference in the stage of the disease at the time of discovery and patients entering TB hospitals are still mostly advanced cases.

Dr. Edwards suggests that modern treat-

ment may be responsible for the widening gap between new cases and fewer deaths.

"Onto the invaluable bed rest regime there have now been added the benefits of collapse therapy and daring surgical procedures, further assisted by the newer antibiotics," he declared.

"Just as chemotherapy has played a vital part in the treatment of pneumonia, lowering its mortality without necessarily the incidence or outbreak of the disease, so modern treatment of tuberculosis may be similarly affecting the mortality from the disease and yet not necessarily reducing the attack rate."

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ANTHROPOLOGY

Guatemalan Indian Tribe Shows Loss in Height

► MYSTERIOUS loss of height—nearly two inches in the course of some two centuries—by a group of Indians in Central America was reported by a Smithsonian Institution scientist.

The Indians are the descendants of the Maya, who were the most advanced New World tribe before Columbus. Dr. T. Dale Stewart, curator of physical anthropology at the Smithsonian, has measured some 200 Indians of Mayan stock in western Guatemala.

Comparing the modern Indians with skeletal remains of their ancestors, Dr. Stewart found that the modern Maya-speaking peoples are about five centimeters (nearly two inches) shorter.

This strange loss of height cannot be explained on economic factors, the scientist explained, because the modern Maya live as well as their ancestors. Some unfavorable factor, perhaps a loss in the soil of some element needed in traces in the human diet, has become pronounced during the past two centuries and caused the loss in stature, Dr. Stewart suspects.

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PHYSICS

Young Physicist Wins "Nature of Light" Award

► DR. JULIAN S. SCHWINGER, 31, professor of physics at Harvard University, was awarded the \$2,000 Charles L. Mayer "Nature of Light" prize.

The award to Dr. Schwinger was announced by Dr. Harlow Shapley, director of the Harvard College Observatory and chairman of the National Science Fund of the National Academy of Sciences.

A special advisory committee of physicists cited three papers by the Harvard scientist as "the best contribution to a logical consistent theory of the interaction of charged particles with an electromagnetic field."

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GENERAL SCIENCE

Two Scientists Elected Science Service Trustees

► DR. L. A. MAYNARD, professor of nutrition and biochemistry at Cornell University, and Dr. Rene J. Dubos, bacteriologist and member of the Rockefeller Institute for Medical Research, have been elected new trustees of Science Service, the institution for the popularization of science.

Dr. Maynard was nominated by the National Academy of Sciences and Dr. Dubos was nominated by the National Research Council.

The following officers were renamed in annual meetings just concluded:

President: Dr. Harlow Shapley, director of Harvard College Observatory; vice-president and chairman of the executive committee: Dr. Alexander Wetmore, Secretary of Smithsonian Institution; treasurer: O. W. Riegel, director of Lee School of Journalism, Washington and Lee University; secretary: Watson Davis, director of Science Service.

Additional members elected to the executive committee were: Frank R. Ford, editor, Evansville (Ind.) Press, and Dr. Karl Lark-Horovitz, Purdue University.

The Board of Trustees of Science Service passed resolutions of appreciation of the long service of Dr. E. G. Conklin of Princeton University, Princeton, N. J., as a member of the executive committee, a responsibility that he insisted upon relinquishing. Dr. Conklin, who continues as a trustee, also served as president of Science Service from 1937 to 1945.

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WILDLIFE

"Friendly" Wild Animals May Have Rabies

► IF A SKUNK offers to get chummy, don't let it. But then, probably you don't need to be warned on that point.

Start over: If a little fox acts friendly and fearless, look out! That fox may be mad. Not mad at you, but just mad. Afflicted with rabies, hence very dangerous to play with.

The American Veterinary Medical Association warns that one possible symptom of rabies, in normally shy and elusive wild animals, is a boldness and easy approachability. Anyone taking advantage of this seeming friendliness runs a chance of being bitten, with exceedingly serious consequences.

An even greater danger from rabid wild animals is indirect: they may bite dogs, which then come home and develop the disease, right where they are likeliest to have chances to bite members of the family or domestic animals.

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