ENGINEERING

Mapping Machine Charts Invisible Fields of Force

➤ AN AUTOMATIC field mapping machine which has nothing to do with the work of land surveyors may find important laboratory uses, General Electric Company scientists predicted.

The machine maps the invisible field of force surrounding electrically-charged pieces of metal. It was developed by General Electric, but is not yet available commercially.

Solving of problems in such fields as magnetics, fluid streamlining, heat conduction and airplane propeller blade torsion may be speeded by the new device.

Metal specimens are connected to a power supply and placed in water for tests with the mapping machine. Three tiny probes register the voltage, while the motion of the probes is recorded as lines on a drawing board by a four-foot metal arm.

Science News Letter, October 9, 1948

PSYCHOLOGY

Accuracy of Plane Speed Estimates Is Studied

➤ CAN YOU WATCH a B-26 plane fly overhead and estimate how fast it is going?

Even officers in the Army Anti-aircraft have trouble in making accurate estimates, the Army Psychological Association learned from Drs. William C. Biel of the Aero Medical Laboratory, Wright-Patterson Air Force Base, and Guy E. Brown, Jr., of Eastern Washington College of Education.

An officer who must aim a gun at a fast-moving plane will be influenced in guessing its speed both by his knowledge of what the plane can do and also by how fast the plane is flying. Planes flying at speeds lower that their ordinary cruising speeds will be judged to be flying faster than they are, experiments with 20 officers showed the psychologists.

As the plane is flown at higher and higher speeds, there is a consistent tendency to underestimate its speed more and more.

Difference in direction of the courses had no significant effect on the accuracy of the estimates, it was found.

The errors in speed estimation are great enough to introduce large errors in anti-aircraft gunnery when gun sights are used with which speed of target must be estimated.

Science News Letter, October 9, 1948

ARCHAEOLOGY

400-Year "Lost" Period In Indian Prehistory Filled

➤ THE 400-YEAR "Dark Ages" period in European history, stretching from the fall of Rome to the beginning of the Middle Ages, had its counterpart at about the same time in the prehistory of an important Indian culture. This gap between A. D. 500 and 900 in the known story of the long-vanished Mogollon Indians of the Southwest has been filled in by discoveries made in New Mexico during the past summer, stated Paul S. Martin, anthropologist of the Chicago Natural History Museum.

Previous excavations of the archaeological traces of the Mogollones had shown stages in their cultural evolution from a nomadic hunting people to dwellers in snug pit-houses—in effect, roofed-over cellars. This stopped abruptly at A. D. 500 and took up again at A. D. 900.

The diggings described by Mr. Martin turned up new pit-houses in which the Mogollones lived during the hitherto unknown interim. They were deep, rectangular excavations, with long, stepped-up passage-entryways facing east. Cupboards cut into the earthen walls were used for storing supplies, instead of pits in the floor in the earlier houses hitherto known.

Dishes and kitchenware, represented by pottery fragments, also show an advance in culture. The rather unattractive brown ware found in the older pit-dwellings is replaced by more delicately wrought, pleasingly decorated utensils. The Mogollones were beginning to be civilized.

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ANTHROPOLOGY

Columbus Met Indians of Peaceful Disposition

➤ WHEN COLUMBUS first landed in the New World, he met a relatively hospitable, peaceful and nearly civilized group of Indians.

This is the finding of Dr. Irving Rouse of Yale University in a new study of the Arawak Indians who lived in the West Indies at the time of Columbus. The new volume on the Arawaks is one of a series of publications by the Smithsonian Institution which is making an exhaustive study of South American Indians.

The apparently peaceful Arawaks, a tribe of small farmers, were early victims of the invading Spaniards, who took them as slaves and forced them to work in gold mines. They also introduced European diseases which took a high toll. One village of 200 on the British island of Trinidad in the West Indies is the main surviving settlement of Arawaks today.

About the time of Columbus, a group of Arawaks settled in Florida. They appear to have been the original searchers for the "Fountain of Youth," but the fate of these early invaders of Florida is unknown.

In most respects, the Arawaks were like many other American Indian tribes. They wore little clothing and bathed often—more often, in all probability, than the Spaniards. But like many other Indian groups, they were virtually wiped out.

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IN SCIEN

ARCHAEOLOGY

Egyptian Scientists Are Aiding U.S. Expedition

➤ TWO LEADING Egyptian scientists, Prof. Gelal Hafez Awad and Prof. Mohamed Mitwally, both of Farouk I University at Alexandria, have been participating in the work of the University of California African Expedition, with field headquarters at Nairobi, Kenya.

Prof. Awad, a geologist, has made extensive collections of specimens and field studies in Kenya and on the island of Zanzibar, where special facilities were made available by the Sultan. Especially good hunting was found among fossils of ammonites, which were coil-shelled distant cousins of the present-day pearly nautilus that lived some 200,000,000 years ago.

Prof. Mitwally, anthropologist, made physical measurements of more than 1,200 African natives, representing nine different tribes and racial groups, over territory ranging from Zanzibar to Lake Victoria. Among the peoples on whom records were obtained are Jaluo, Bantu, Kavirondo, Kikuyu, Kamba, Nandi, Digo, Giriama and Zanzibarese.

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GENERAL SCIENCE

New Group To Study Conflict and Cooperation

➤ SCIENTISTS interested in the study of conflict and cooperation at all levels of life are now organizing a permanent body to make their own cooperation more effective. Formation of the new society, which as yet has no name, was decided upon at a special symposium held recently in Washington. At this meeting a comparison of views and working methods by botanists, zoologists, anthropologists, sociologists and workers in several other scientific fields convinced the participants that they had so much in common that a grouping for joint action would be justified.

Immediate goal of the new society will be to discover, as objectively as possible, the extent to which conflict among living organisms, whether microbes or men, is inevitable and even useful, and to what extent cooperation exists in the natural world and what its consequences are. Ultimately it is hoped to find possible applications of the facts thus discovered to the problems of conflict among human individuals, groups and nations.

Chairman of the organizing committee is Dr. Edward F. Haskell of the Society for Applied Anthropology, with headquarters in New York.

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CE FIELDS

MEDICINE

Growing Old Has Some Health Advantages

➤ GROWING OLDER has some advantages on the health side, Dr. Wingate M. Johnson, of the Bowman-Gray School of Medicine, Wake Forest College, told members of the Medical Society of the District of Columbia, meeting in Washington.

Older people usually have much better resistance to infectious diseases, he pointed out. Migraine headaches usually disappear soon after middle life. Diabetes is less severe in the old than the young. Cancer progresses much more slowly.

While the muscles become flabbier, the bones more brittle and the joints stiffer, vigorous exercise is seldom required of the older man, Dr. Johnson said. Hence there is less demand on his muscles and he is not so apt to break his bones.

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VETERINARY MEDICINE

Find Metal in Animals With New Apparatus

➤ IF YOUR favorite cow inadvertently swallows a bit of baling-wire, or stops a bullet fired by some trigger-happy deer-hunter, it may soon be possible to locate the offending piece of metal with a device built on the same principle as a wartime land mine locator. The new apparatus, which still awaits clinical tests by veterinarians of the Army's Medical Department, was developed in Fort Monmouth, N. J., by technicians of the Army Signal Corps.

As in the mine locator, a flat "search head" is passed over the area where the presence of offending metal is suspected. Interference with the device's magnetic field by metal causes a change in the sound heard by the user in his ear-phones.

If successful, the apparatus should be a great help to veterinarians generally, since X-rays of animals are difficult to make and frequently not adequate.

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ENGINEERING

Humidity Recording More Accurate with New Device

➤ ". . . NOT THE HEAT but the humidity" may be recorded more accurately in the future, thanks to a new device developed at the National Bureau of Standards.

A humidity test apparatus, designed by Arnold Wexler and developed under the sponsorship of the Department of the Navy's Bureau of Ships, produces air of known humidity. This is used to calibrate the instruments used for making readings of the humidity. The new apparatus was developed primarily to test the humidity-sensing elements in the radiosondes used to collect atmospheric data for weather forecasting. Other applications for the testing equipment may be found in the fields of refrigeration and air-conditioning, it is predicted.

A divided flow of air at velocities of up to 1,500 feet per minute is used in the apparatus to produce air of known relative humidity at temperatures from zero to minus 40 degrees Centigrade.

Dry air entering the apparatus is divided by a proportioning valve so that part of it is kept dry while the rest is saturated by passing over trays of ice. In a mixing chamber, the dry air is combined with the saturated air in predetermined proportions to produce the desired humidity.

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ENGINEERING

Coal-Burning Gas Turbines Are Best for Locomotives

➤ GAS TURBINES, burning coal, may power locomotives on future trains, an engineer declared at the annual Indiana Coal Conference in Terre Haute.

Dr. John T. Rettaliata, dean of engineering at the Illinois Institute of Technology, termed the coal-burning gas turbine "the most serious competitor to the presently popular diesel locomotive." He added that the gas turbine will offer the "ultimate in locomotive design."

A 4,000-horsepower locomotive which will burn coal is now nearing the test stage. It is expected to have lower fuel and maintenance costs than any other locomotive in history, Dr. Rettaliata said.

In the gas turbine, direct current type of electric transmission can be used, as is done in the diesel-electric type. But pulverized coal is burned in the combustion chamber to produce the gas which drives the turbine. The power plant includes a turbine which drives a compressor, and through a reduction gear, the generator.

By using a large amount of excess air, a clear stack free from smoke results, the engineer explained. This is important in meeting the requirements of present city ordinances, he pointed out.

Fuel costs of the coal-burning gas turbine locomotive are estimated at half those of a diesel, while lubrication costs will be as little as one-tenth, Dr. Rettaliata said.

Using coal as the fuel offers other advantages than economy, too, he suggested. Coal reserves are expected to last about 3,000 years, while oil reserves may last only 15 years, Dr. Rettaliata estimated. And the use of coal would help customer relations for railroads which get much of their revenue from hauling coal.

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PLANT PHYSIOLOGY

Radioactive Carbon Shows Cane-Sugar Formation

➤ RADIOACTIVE CARBON from Oak Ridge was used in producing definite proof that green leaves can add together the two simple sugars, glucose and fructose, to form cane sugar or sucrose, by Dr. Constance Hartt, research plant physiologist of the Hawaiian Sugar Planters' Association.

It had long been known that if cut leaves are placed in glucose-fructose solution in the dark, there is an increase in the amount of cane sugar they contain. However, until now it had not been conclusively demonstrated that the simple sugars actually entered the leaves and became changed into cane cugar.

Dr. Hartt first made radioactive glucose and fructose by "feeding" radioactive carbon dioxide to sugarcane leaves in the sunlight, and then chemically converting the sugar thus produced into the form needed for the experiment. Then these radioactive sugars were supplied in solution to other cane leaves in darkness, with all exchanges of material checked by minutely accurate quantitative methods.

The new cane sugar formed in the leaves was radioactive. Since the only possible source of radioactivity under the conditions of the experiment was the glucose-fructose solution, it proved definitely that the new cane sugar came from the two simpler sugars. Moreover, the total radioactivity of the cane sugar was very close to the value calculated on the basis of the twin sugars in the solution.

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ENTOMOLOGY

Spiders Digest Prey Before Eating It

➤ SPIDERS DIGEST much of their prey before eating it, R. E. Snodgrass of the U. S. Department of Agriculture points out in a new Smithsonian Institution publication. They wet their food with a digestive juice from their stomachs. This digests the soft parts to a liquid, which the spiders then swallow. So powerful is the enzyme that small lizards and fish captured by big tropical spiders can be liquefied in as little as two or three hours.

The publication is devoted mainly to a study of the mouthparts of mites and ticks, which are zoological second cousins of the spiders. Like the spiders, these forms have nowhere near as well-developed mouthpart systems as their more progressive distant kinsmen, the insects. They are therefore also dependent on liquid diets. Some of them suck up such nourishment as they can find on decaying plant materials. Others, notably the ticks, have developed an ability to feed on the blood of larger creatures, and have thus become pests and even carriers of dangerous diseases.

Science News Letter, October 9, 1948