SCIENCE NEWS

HAWAIIAN EXPLORATIONS

Science Service

THE first scientific expedition ever to attempt a complete survey of the life on Uncle Sam's small isolated and uninhabited oceanic islands which extend west from Hawaii for 2,000 miles, has returned here with large collections of biological specimens, including numerous new species of birds, fish and plants. Dr. Alexander Wetmore, of the Biological Survey of the U. S. Department of Agriculture, who had charge of the explorations, stated to-day that this material may throw much new light upon the distribution of life in the Pacific.

The expedition was undertaken by the Biological Survey in cooperation with the Bishop Museum of Honolulu and the United States Navy. The exploring party was transported to and from the islands by the "U. S. S. Tanager," a one thousand ton ship of the mine-sweeper class, and was out for four and a half months, visiting all the islands and stopping at each long enough to make collections, maps and corrections to existing charts.

From Honolulu to Ocean Island, the westernmost of the group, these islands are either of volcanic origin and rocky and frequently dangerous to approach, or low atolls surrounded by coral reefs.

The mysterious Necker Island, about one mile long, uninhabited and barren, was visited. Here the party saw strange stone platforms, thought to have been built in prehistoric times by Polynesian peoples and used as a religious shrine to which pilgrimages were made from distant islands. The explorers found peculiar idols and implements used by the ancient people on such occasions. Evidently Necker Island was never permanently inhabited, but Nihoa, the nearest island from which the worshipers could have come, is 150 miles away and the main Hawaiian group is about 300 miles distant. No mention of this island has been found in Hawaiian myths or legends.

While practically all the islands visited were uninhabited, they were found to be exceedingly rich in birds. They form what is known as the Hawaiian Bird Reservation. Sandpipers, curlews and golden plover, birds which breed in Alaska and the Arctic regions, were seen in numbers and much knowledge was gained in regard to the habits of these remarkable long-distance migrants.

Donald R. Dickey, motion-picture expert with the expedition, secured many reels which reveal the strange habits of some of the oceanic birds. On Laysan Island he secured pictures of the "dance" of the albatross. These seabirds, as large as geese, engage in this dance in pairs and the dance is continued during the entire eight months the albatrosses are on land. It consists in a regular series of steps and motions in which they advance and retreat, fence with their bills, raise one wing, and similar motions which Dr. Wetmore referred to as the Laysan fox trot.

The birds found on these islands were as tame as domestic chickens. When one of the scientists would sit down to make a few notes, the albatrosses would walk up to him and after apparently satisfying their curiosity, turn and discuss him among themselves.

Johnston Island, the southernmost of the islands of the Territory of Hawaii, and Wake Island, 2,000 miles west, were also visited. Many rare fishes were found and at Johnston Island several unmapped reefs were charted by navy airmen from an airplane carried by the expedition for that purpose. So small and isolated is this last mentioned bit of American territory that Japanese fishermen from Hawaii, who make trips into these waters every year, frequently return to report that they can not find it.

This was the first scientific expedition of the kind in which the navy has taken part since the Wilkes Expedition of 1842.

HORSE CAN EXERT 21 H. P. NEW TEST SHOWS

Science Service

THAT a horse may develop as much as 21 horsepower in an emergency has been demonstrated in a series of experiments conducted by the Horse Association of America with a testing apparatus invented by E. V. Collins, of the engineering department of the Iowa State College of Agriculture and Mechanic Arts, for the purpose of finding out just how much a horse or a mule can pull.

The tests showed a team of good horses can exert a tractive pull of 2,000 pounds, or enough to lift a ton vertically. Such pulls as these are not needed on ordinary roads. It was shown that on a concrete road surface the amount of pull required to start a farm wagon, weighing with its load more than 7,700 pounds, was only 125 pounds.

The influence of the road surface was demonstrated by additional experiments which showed that to start the same load on a good brick road required a pull of 200 pounds, while 300 pounds were required on an asphalt surface and 520 pounds on a good dirt and cinder surface. In other words, the same team can pull four times as much on a concrete road as it can on the best surfaced dirt road.

The new tests emphasized the value of breeding and of training in horses and have opened up new possibilities in the direction of scientific measurement of performance of differing breeds and individuals. While the value of weight in draught animals was again demonstrated, a surprising result of the tests was that gameness counted almost as much. A little broncho team, weighing 455 pounds less than its competitors, pulled larger loads in proportion to weight than any other team entered in the tests in any class. More extended tests will be made next year.

The apparatus consists essentially of suspended

weights attached to a wagon-like vehicle in such a manner that it can not be started until the weights have been lifted. As soon as the horses exert enough power to raise the weights the wheels are unlocked.

DEATHS DUE TO AUTOMOBILES

Science Service

DEATHS from automobile accidents continue to increase while the general death rate among industrial policyholders of the Metropolitan Life Insurance Company declined to nearly the lowest August figure ever recorded, according to the summary for that month just compiled by Dr. Louis I. Dublin, statistician.

Deaths among the insured due to automobiles were at the rate of 18.4 per 100,000 as compared with a figure of 15.4 for the same month last year. Fatal accidents of all classes also showed an increase, the death rate from this general cause amounting to 73.8 per 100,000 as compared with 67.2 in August, 1922.

The death rate as a whole among the insured was the lowest for any month of the year and the lowest August death rate ever recorded among this group of insured, except for the figure for August, 1919. The rate this year was 7.7 per 1,000 as against 7.6 in the former year.

If these figures are representative of the general population a person now is in much more danger of being killed by an accident than of dying from either cerebral hemorrhage or Bright's disease. The mortality rates of these two important causes of death sank last month to 47.5 and 58.3 per 100,000 policyholders, respectively, the lowest figure ever recorded for these diseases in any month among this important group of the population.

LIGHTNING STROKE

Science Service

DEATH from a lightning stroke may not be as painless as has been supposed, if the experience of M. L. McQueen, instructor at the University of Wisconsin, who was struck and recovered, is typical. The incident occurred this summer and has just been reported in detail to the U. S. Weather Bureau by Eric R. Miller, meteorologist in charge of the Madison, Wis., office.

McQueen was walking across an open lot in company with another instructor, W. E. Armentrout, who was killed by the bolt. McQueen remained conscious throughout his experience and fully realized what was happening to him. Relating it some days afterwards he said the pain from the spasmodic contractions of his muscles was terrible, but was nearly equalled by that due to the terrific heat of the flash and the noise. He also suffered from a sensation of intense pressure in the head.

The current entered his body at the left shoulder, which was seared over an area of four square inches. His leg muscles near the ankles were sprained and wrenched by spasmodic contractions. He was paralyzed from the waist down for several hours and was weeks recovering from the burns and the injury to his muscles.

That iron has little directive effect on lightning is indicated by the fact that a railroad rail lay only 10 feet away from the two men, railway construction work within 30 feet, while within less than 50 yards were a tall crane, wire fences and buildings. An iron smokestack was not much further away in the direction from which the cloud had come.

SEED POTATOES

Science Service

How to make two crops of white potatoes grow where only one grew before has been simplified by a discovery of Professor Joseph T. Rosa, of the University of California. The difficulty in sections where two crops are possible has been that the seed potatoes from the first crop must be seasoned three or four months before planting if they are to sprout readily.

Professor Rosa has found that if the new seed potatoes are cut up in the usual way for planting and then dipped into a weak solution of nitrate of soda for from thirty minutes to an hour a short time before they are put into the ground they will sprout as quickly as seasoned seed. The common fertilizer grade of nitrate of soda can be used at the rate of three and a half pounds to ten gallons of water, and as the solution may be used repeatedly the cost is very small. In an experiment started February 23, 1923, seed potatoes treated by this method came up quickly and gave practically a 100 per cent. stand by April 3, while untreated seed came up much more slowly and did not show a full stand until April 21, nearly three weeks later. It was found that the treatment was useless unless the tubers were cut before dipping in the solution. Besides enabling the potato grower to use his early crop potatoes to plant a fall crop and thus get two crops in one year on the same land, Professor Rosa believes that the new treatment will enable growers to mature their early crop still earlier than at present, and thus get the benefit of the higher prices that usually prevail for early potatoes. It may be entirely possible, he says, to make important potato states like New Jersey, Virginia, the Carolinas, Florida and California independent of the more northern states, from which they usually obtain most of their seed potatoes for planting.

EARTHWORMS LEARNING BY EXPERIENCE

Science Service

EARTHWORMS have memory and may be trained in the way they should go, but their brains are not in their heads but in their abdomens. Professor L. Heck, of the University of Prague, has announced this discovery as the result of experiments with a collection of worms some five hundred in number. They were introduced into a passage shaped like a capital T and carved from a block of wood which was covered with a glass plate so that the movements of the little creatures might be observed. When they came to the junction about half of them turned one way and half the other.

Then it was arranged so that those that took the left-hand passage received a mild but presumably disagreeable electric shock. At first the worms did not know just

what to make of all this, but after they had all been through the experience about two hundred times, they nearly all were converted to "safety first" and took the right hand turn. When the electrodes were then moved to the right-hand passage they learned to shift to the other after only 65 passages, evidently showing more aptitude.

In the human sense, earthworms have no brains; their nervous systems consist of a series of little ganglions, or nerve centers, on the under side of the worms and connected with each other by nerve fibers. If the worms were cut in two, the fragments still showed the ability to distinguish between the safe and the unpleasant road to travel, showing that the earthworm remembers in every one of his ganglions, and is able to learn and profit by experience, which in spite of their higher organization many men are unable to do.

INDIAN DOLLS

Science Service

CLAY dolls patted into shape by the baby hands of a four-year-old Navajo papoose may overturn finespun theories of learned ethnological scientists. Dr. J. Walter Fewkes, chief of the Bureau of Ethnology of the Smithsonian Institution, has received a collection of small toy people made by an Indian child in northern Arizona which are remarkably similar to images found in excavations on prehistoric American city sites and thought to be fetishes or magic charms worn by savage warriors as a protection against injury.

Dr. Fewkes laughingly admitted that it is possible that the joke is on the ethnologists. He said that in the course of his numerous excavations on ancient Indian sites he had probably found many such images and interpreted them as fetishes. The images unearthed may have been so used and the childish working of the adult savage mind may be responsible for their similarity with the precocious product of the modern Navajo child.

The figures just received are about two inches long and the majority of them apparently represent women. The little artist failed to furnish them with any eyes, ears or noses.

MIGRATION OF MALLARD DUCKS

Science Service

INTERESTING facts in regard to the migration of mallard ducks were told by Frederick C. Lincoln, of the U. S. Biological Survey, in an address before the American Ornithologists' Union in convention at Cambridge, Mass., on October 10. By means of pictures and maps Mr. Lincoln showed the methods used and the results obtained in banding 4,000 mallard ducks for identification.

The center of the great breeding range of the mallard duck is in lower Saskatchewan, Canada, while the center of its winter range is along the lower Mississippi from the mouth of the Ohio to the Gulf. Among the birds marked by Mr. Lincoln in Illinois were some which later turned up in Texas, a few miles west of Houston. The route apparently taken by these birds converged at that point with the routes taken by ducks formerly banded at Salt Lake City. As the western birds are from flocks which have a different range and breeding ground, it remains to be discovered by later returns whether the Mississippi mallards, whose winter range mingles with that of the western birds, join the western flocks and fly north with them in the spring or whether their homing instinct is unerring and they return to Canada by the Mississippi valley route.

One duck caught at the mouth of the Mississippi some years ago was shipped to New York, banded there and released, and was killed in Saskatchewan, Canada, two years later. Apparently in this case, said Mr. Lincoln, the homing instinct had directed the bird back to his home breeding ground and from there he had twice been back and forth on the old Mississippi route before he was shot.

Some of the ducks banded in Illinois have been found in the South Atlantic states, and whether they flew across the mountains or took a more circuitous route is yet to be determined by additional returns from the banding experiments.

NATIONAL VALUE OF RESEARCH

London Times

COAL-TAR chemistry is only an apposite instance of the value of research and the national danger of neglecting it. It is a dramatic instance, partly because the basal discovery which led to German domination in dyes, drugs and explosives was made in England, and partly because whilst England is trying to provide for her future by big ships, new harbors and air squadrons, Germany is concentrating on chemical industry and chemical research.

But the principle is more important than the instance. By all means let us hope that coal-tar chemistry in all its ramifications of dyes, drugs and munitions will be firmly established in this country, and that we shall no longer run the risk of having our industries arrested and our national will to survive thwarted because another country is suddenly able to cut off our supplies. Science, however, does not stand still, and even the firm establishment (unhappily not yet accomplished) of the dye industry in this country may still leave us in danger.

It is certainly not easy to predict which of the many lines of contemporary discovery in pure science is going to provide the "key" to national security in the next quarter of a century. But two possibilities may be suggested merely as indications of what may happen.

Most of the energy used in human operations comes from fuel stored in past ages, for water-power, tidal-power, wind-power, and other accessory supplies are relatively insignificant and more difficult to harness. Wood, peat and the products of existing vegetation are still also of relatively small significance, although the use of power alcohol may come to have a substantial place. The total world supply of power, in actual fact, is drawn chiefly from coal, oil and shale, substances which are limited in their total amount, irregular in their geograph-

ical distribution, and require labor to win them and transport to carry them where they are required. The rising cost to the consumer of all kinds of fuel shows that the world supply is not expanding to meet the demands on it.

Science may meet the demand for fuel in two ways. It may contrive such economies in utilizing it as to expand its value greatly, a process more likely to be carried out in countries where the local supplies are limited than in a country like Great Britain, which still exports the bulk of its coal raw. The economical utilization of fuel may become one of the conditions of survival. But a new source of energy may be discovered, and physicists are not without hope that the vast reservoir of energy locked up in the constitution of matter—what is known as sub-atomic energy—may yet be released for human purposes. The industrial applications of such a discovery, if possessed by a single nation, would give command of the world.

We spend enormous sums on the defense of the realm and can apparently afford many millions to prepare now for contingencies that may never arise in the remotest parts of the world. We have a committee of imperial defense, whose sole business is to keep constant watch on future dangers and to concert measures for meeting them. A civilian finds difficulty in forming a judgment on the decisions of naval, military and air-force experts, and the country as a whole is ready to provide what money the experts demand to secure the safety of the peoples of the empire. But there is no public department, no committee, no organization charged with the duty of watching the developments of scientific research here and in other countries in the interests of national safety. And yet we may be in greater danger from the strategy of applied science than from all that armies and navies and aeroplanes can accomplish against us. We, like every other nation, are engaged in a constant warfare against the forces of nature, a warfare in which no mistakes are excused and no quarter is given. We, like every other nation, are in constant peaceful struggle with other nations for our industries and our commerce. We, like every other nation, might at any time find our most costly armaments and implements of war out of date in the presence of some new application of scientific discovery.

Fortunately there is an increasing activity in research and a slowly growing feeling in its favor amongst all classes of the population. But the development of science also means the development of its applications, and those who are most zealous about the one may be—usually are—indifferent about the other. The services of scientific men, even of the highest distinction, are cheap, and it would cost little to support a small committee of scientific defense, whose sole duty would be to watch the developments of science throughout the world and to advise government departments as to possible applications of new discoveries.

ITEMS

Science Service

THE wood pulp resources of the world may be greatly increased by the use of a new process of manufacture described by Professor Ralph H. McKee, of Columbia University, before the American Chemical Society. There are several species of coniferous woods which are at present unsuited for manufacture into sulphite pulp because of their high content of resinous matter. The process which he described consists in dissolving out the turpentine and rosin with liquid sulphur dioxide and then converting the residue into the usual sulphite pulp which is stated to be of good quality. It was also stated that turpentine and rosin could be produced commercially by this process cheaper than by present methods. Dr. McKee also described a new process for eliminating the nuisance of waste sulphite liquors from pulp mills. This process, which he said has been successful and profitable on a commercial scale, depends upon the fermentation of the liquor. Commercial alcohol is obtained and the residue evaporated and used as fuel. Dr. McKee stated that the fuel so obtained from the average pulp mill is adequate to give a thousand horsepower day and night, besides sufficient steam to do all the evaporation required.

"SUPERBLY beautiful groves of Japanese bamboo will some day change the landscapes of our Southern States and furnish a unique timber material suited to a host of purposes on the farms where it will be grown," officials of the Bureau of Plant Industry of the U. S. Department of Agriculture predict. At the department's plant introduction garden in Savannah, there is a grove of this timber which now covers over an acre of land, has poles in it over 55 feet high, and is spreading rapidly. This bamboo thicket was developed from a few plants imported early in the eighties.

A METHOD for measuring flowing water in large quantities with speed and precision, which is particularly applicable to the needs of large hydroelectric power plants, has been announced as a success by its inventor, Prof. C. M. Allen, of Worcester Polytechnic Institute. It depends upon the change in the electric conductivity of water when a known amount of salt is added to it. A brine of known concentration is quickly added at a certain point up-stream and the time taken for it to pass electrodes inserted in the pipe line further down is noted, the change in the conductivity of the water marking accurately the time of the passage of the brine. If, then, the volume of the conduit between the two points is known, the volume of flow may be accurately determined. Comparison of this method with slower and more cumbersome methods now in use have demonstrated its accuracy.

SUBMARINES with eyes in the clouds and nerves of radio threaten to make life more dangerous for warships plowing the surface of the sea. Reports of torpedo practice received by the Navy Department from the commander of the Pacific Battle Fleet show that the combined use of submarines, airplanes and wireless has increased the efficiency of submarine attack. In order to aid and expedite the attack of a submarine division on a target ship in operations in progress on the west coast, DH-4B spotting planes transmitted an accurate estimate of the course and speed of the target ship to the submarines by wireless. Considerable improvement in the scores of the under-water craft was reported.