SCIENCE NEWS

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THE SEMI-CENTENNIAL OF THE TELEPHONE

"MR. WATSON, please come here, I want you." Fifty years ago, on March 10, this sentence was uttered in an attic room in Boston, and the voice of the speaker was heard in a telephone in an adjoining room. To people living in 1926, this would be a trivial incident, but then it was one of the most epoch-making sentences ever spoken. For the speaker was Alexander Graham Bell, and these were the first spoken words in the world's history to be transmitted over a wire.

This result was not due to any accident, however, for it was nearly a year before this that Bell and his assistant, Thomas A. Watson, had succeeded in transmitting the first musical sound—the simple twang of a clock spring—over a wire. With this achievement, the fundamental principles of the telephone had been mastered, but many weeks of work were necessary before the instrument would talk.

Even with the perfection of the telephone as an instrument actually capable of transmitting speech, commercial success did not immediately follow. At first, the telephone was regarded as a scientific toy, incapable of any practical use, but the Centennial Exposition held in Philadelphia in 1876 was the means of bringing it before the public. But even here, where Bell first exhibited it, it attracted only casual attention until Dom Pedro, then Emperor of Brazil, whom Bell had met many years before, had it demonstrated to him. "My God, it talks!" the emperor is said to have exclaimed. This attracted the judges' attention, and Bell's exhibit was soon one of the features of the exposition.

Even then, it was a long pull to put the telephone to commercial use, and it was not until May of the following year that the first commercial line was established. By August, 778 crude instruments were in use—a striking contrast to the 16,000,000 in use to-day.

When the success of the invention was finally assured, development became rapid, and spread over the country and the world. In 1892, Dr. Bell spoke from New York to Chicago. In 1915, into a replica of his original instrument, he again spoke the words which summoned Mr. Watson in 1876, but he replied: "It would take me a week now," for he was in San Francisco, and Dr. Bell in New York.

ARCTIC EXPLORATIONS AND THE ORIGIN OF STORMS

AT least thirteen Arctic explorations are planned for the coming summer, and some of them may locate the cradle of the storms that sweep the north Atlantic Ocean, Dr. William Herbert Hobbs, professor of geology and director of the geological laboratory at the University of Michigan, said in a radio talk from station WCAP.

"If certain studies in Greenland, for instance, are successfully carried through," said Professor Hobbs, "they will be of great practical as well as scientific importance, for what I have in mind is nothing less than the careful observation of the origin of the storms of the North Atlantic and Europe in the cradle where they begin their existence, and in the same early stage of their career the icebergs which are such a peril to the navigation of Atlantic waters.

"Northern storms and northern icebergs, the great perils in the navigation of the north Atlantic, alike have their breeding ground in the great flattened dome of ice which like a gigantic white cap covers almost the entire continent of Greenland—an area 1,200 miles in length with an average breadth nearly one half as great.

"The coldest place on the globe is not, as popularly supposed, the North Pole. The winter temperature at the North Pole is certainly quite warm if compared to parts of Siberia. In fact, throughout the long winter season at points along the coasts of these barren land areas the winds which blow from the direction of the North Pole are the warm ones, while those from the south are correspondingly cold.

"The coldest place where temperatures have been measured throughout the year is located in Siberia, but it is certain that in the heart of Greenland and of the Antarctic the winter cold is much more intense, for even in the midst of summer the mid-Greenland air temperatures have been found to be more than 30 degrees below zero. It is, therefore, of prime importance to find out more about the air conditions over Greenland. One of the several polar expeditions which are being organized this year, that of the University of Michigan, has been planned to study carefully the meteorological conditions of this very critical and significant area by establishing and maintaining for a year a number of weather observing points to be served by aeroplane transportation."

Professor Hobbs maintains that it is this intense cold of the interior area of Greenland which is responsible for the havoc-making storms that issue from its margin.

"The intensely cold ice-caps of Greenland and the Antarctic," he continued, "are the refrigerators of the earth above which the high currents of air which have traveled from the equator are sucked down and drained off as though through a gigantic shaft, and from the bottom of this shaft they are poured out in all directions toward the margins of the ice-cap to make their return to the furnace on the equator, thus making of our air circulation a complete circuit."

THE MINERAL RESOURCES OF THE WORLD

THAT a commercial League of Nations may possibly be established to help settle the world's problems with regard to mineral resources is foreseen by Dr. Charles K. Leith, of the University of Wisconsin, who has reached London on his way to attend an international meeting of geologists in Madrid.

Dr. Leith points out that a mighty conflict is going on between two powerful forces: world demand for the needed supply of minerals, and, on the other hand, nationalistic forces which are working to use the mineral resources of a political state for national gain or protection.

Mineral resources are very unequally distributed among the countries of the world, Dr. Leith states, and in many cases the great centers of supply constitute essentially national monopolies. The dependence of modern civilization upon these unequally divided minerals is growing and the problem of mineral resources figures largely in the consciousness of nations.

"The satisfaction of world demand for minerals must, therefore, over-ride political boundaries," said Dr. Leith. "There seems to be no way to eliminate either set of forces. The problem is to effect a balance or adjustment between them.

"Internationalization of resources, in the sense of turning them over to some super-national control, is probably a political impossibility, even if it were desirable, which is doubtful. But there is an opportunity to standardize by international agreement the many international commercial arrangements which are now effecting a fair and workable compromise between world demand, on the one hand, and nationalistic policies, on the other."

Dr. Leith advocates an international economic conference, with fact-finding committees, and "ultimately, perhaps, what will amount to a commercial League of Nations." This, he said, would not put an end to national mineral monopolies, nor would it cause a nation rich in minerals to lose advantages of these possessions.

THE PRIMATE LABORATORY OF YALE UNIVERSITY

Of all the man-like apes, which have been studied by psychologists, the gorilla probably is the leader intellectually. This is indicated by a series of tests recently completed on a young female gorilla by Dr. Robert M. Yerkes, professor of psychology at Yale University.

Dr. Yerkes has returned from Jacksonville, Fla., where he spent six weeks testing the animal, which belongs to Benjamin Burbridge. Mr. Burbridge, an experienced hunter, captured the gorilla single-handed in the forests of the Belgian Congo. On his last trip to Africa he caught four, but two died in Africa; one, which was taken to Belgium, has since died, and the other is Congo, the one that was studied by Dr. Yerkes. Probably it is the only example of its species, the mountain gorilla, that has ever been brought to the United States.

The chimpanzee, the most familiar anthropoid ape, has been the subject of many psychological inquiries. The Yale Institute of Psychology has several chimpanzees in its "Primate Laboratory," on which tests are being conducted, but on account of the scarcity of specimens, the gorilla has never before been studied experimentally.

"One's first impression is that the chimpanzee is the more intelligent," said Dr. Yerkes, "but that is probably due to the temperamental differences of the two animals. The chimpanzee is the more emotional and impulsive; the gorilla is the more deliberate, and works calmly and with better judgment, and I should expect that the gorilla would go farther in the long run. I was able to work with Congo for hours at a time, and she stuck to her tasks. A chimpanzee by comparison tires quickly."

The animal weighs about 65 pounds, Dr. Yerkes stated, and is perhaps five years old. Although their average span of life is not certainly known, they probably attain the age of 30 or 40 years. Congo displays great strength, for "when she tugged at me, I felt as if something would break," he said. When tested with a spring balance, she pulled 160 pounds, which, considering relative weight, would be equivalent to a pull of 400 pounds by a man. Despite this, however, the animal is quite gentle, in Dr. Yerkes's opinion, for, he said, "she doesn't realize her strength."

The methods used with the gorilla were similar to those employed on the other anthropoids. One consisted in arranging the animal's food so that it was necessary to pull on a rope to obtain it, and then, after this had been learned without aid, the rope was hooked at one end, and it was necessary for the monkey to unhook it before it could retrieve the reward.

Several hundred feet of motion pictures were made of the ape while she was solving problems, and these, in conjunction with many thousand feet which Mr. Burbridge made of the gorillas in their native haunts in Africa, will throw considerable light on gorilla psychology. "You may know much about the psychology of the chimpanzee, but it doesn't help you more than does human psychology to understand the gorilla," said Dr. Yerkes. "What impressed me most is the great array of mental differences between the gorilla and the other great apes."

PSYCHOLOGICAL TESTS FOR TAXICAB DRIVERS

A new and promising set of drivers' tests, which reproduce traffic conditions of city streets by means of apparatus in a laboratory, has been devised, and is being used by taxicab companies in seven cities as a means of selecting drivers.

The tests, which are the work of Dr. A. J. Snow, of Northwestern University, are not finally perfected, but a preliminary report of them appears in a forthcoming issue of *The Journal of Applied Psychology*, because, the author says, "of the popular and misleading publicity that has appeared in newspapers and magazines" and because of the insistent demand of the automobile industry to know the facts about them.

The tests are said to be equally suited to selection of pilots for any transportation vehicle—street car, electric elevated line, steam or electric railway, and passenger or freight motor car. They are being used by different taxicab companies in Chicago, Cleveland, Pittsburgh, South Bend, Toledo, Omaha and Louisville.

The method of picking drivers is illustrated by Dr. Snow's test of "perception of space and motion." Two toy automobiles, whose motion is controlled by a system

of pulleys and weights, are mounted on a board 20 feet long. A fixed scale of numbers is marked three inches apart along tracks on the board. The prospective taxi pilot stands facing the apparatus, 15 feet away. The vehicles are moved at different speeds in various directions, according to eight different prearranged combinations. The driver is asked at a given signal to indicate at what point the two cars will pass or overtake one another. The experimenter records the error between the driver's estimate and the actual point of passing, and also the rapidity of his responses, his speed of learning and constancy of attention.

"The theory underlying this test," Dr. Snow explains, "is that the subject who is unable, with any degree of accuracy or promptness, to make the necessary judgment suffers from a visual defect, which makes him an undesirable candidate for a pilot of any transportation vehicle. It should be understood, of course, that for each test a learning period has been established. In this period the instructions are explained until the applicant can demonstrate to us an understanding of them."

Another test measures the emotional stability of a driver during an emergency by requiring him to throw certain switches at certain signals, at the same time that he receives a slight electric shock.

Recklessness is tested by having him guide a small metal pencil through miniature traffic lanes on a board. The lanes vary in width and length and have sharp turns and curves. Electrical apparatus attached to the board shows the driver's steadiness and judgment at difficult points and also registers the time in fractions of a second that it takes him to move the stylus through the points of difficulty.

An individual's intelligence is no gauge of his success as a driver, Dr. Snow finds, except that very low intelligence is a sure indication of unfitness. Consequently, drivers are given only a simple intelligence test, to test such powers as memory, attention during distractions and common sense reason. The taxicab applicants are also put through a rigorous physical examination.

A Chicago taxi company which employs 6,000 drivers has rejected 15 per cent. of its applicants since January first, using the new tests as a standard of fitness. The company reports that the reduction of accidents has been substantial.

ITEMS

A SUCCESSFUL operation of transplanting a portion of the pancreas into the mammary gland of a dog has recently been performed by Drs. A. C. Ivy and J. I. Ferrell, of the Northwestern University School of Medicine. The pancreatic gland produces potent fluids necessary to the body, including insulin, which prevents diabetes. The scientists do not believe, however, that this method of transplanting a portion of the pancreas can be used practically for the surgical cure of diabetes in man. It is merely another step, they say, to a better understanding of the physiology of the pancreas. The investigators discovered that when the animal was fed, the transplant secreted normal pancreatic juice, which is the most important of the digestive juices. This observation proves that when one eats a meal a substance passes into the blood stream and stimulates the pancreas to secrete. This agent is called "secretin," and is a hormone that is formed by a glandular layer in the intestinal wall when food and gastric juice come in contact with it. The substances that excite the formation of this hormone are, in order of their effectiveness: gastric juice and digestive products of fat. It was also found that the transplanted piece of pancreas functioned to such an extent in producing a sufficient amount of insulin that diabetes would not occur when the remainder of the pancreas was removed.

MEASLES are wide-spread and on the increase throughout the temperate zone, according to information collected by the health section of the League of Nations. From the same source it is learned that England had more smallpox cases the first week of 1926 than for any other week in the last twenty years. There were 255 as against 203 and 178 of the preceding week. All the cases are of a mild form, however, and are confined entirely to the north, mostly in Northumberland and Durham. General reports on influenza and incident respiratory infections in European countries indicate that a maximum was reached around the middle of December and that there has been a slow but steady decline ever since.

SLEEPING sickness is prevalent in the Camaroon district of West Africa. Reports received by the Society of Tropical and Medical Hygiene state that it is particularly bad in the region of the Nyong River. Over a third of the population, as nearly as can be estimated, have been afflicted, with an ensuing mortality of over ten per cent. The country has been divided into districts, the better to combat the disease. In the past, say the medical workers in this area, it has been possible to save only those suffering from the first stages when the parasites are only in the blood and lymph, but it is now hoped that those whose brain tissue has been affected can be cured. The society believes that if proper means are employed to give treatment to the natives and to insure hygienic preventive measures it will be possible to eliminate sleeping sickness from this locality. Accordingly it has recommended to the Ministry of Colonies that arrangements be undertaken whereby such measures can be got under way.

Two Chicago doctors, Dr. E. R. Le Conte, of the Rush Medical College, and Dr. H. A. Singer, of Cook County Hospital, in the forthcoming issue of *Archives of Pathology* give an account of several cases of unexpected death in alcoholics that from their symptoms were not attributable to delirium tremens or alcoholic poisoning. Postmortem investigation of such cases always shows a huge fatty enlargement of the liver. The connection of alcohol with fat changes in the liver has long been recognized and in these aggravated cases it would seem as if the accumulation of fat were so great as to destroy completely the normal functions of the liver that have to do with supplying the body with sugar. Chemical examination of the blood of such patients has showed consistently a significantly low sugar content. This extensive replacement and enlargement of the liver by fat in heavy drinkers may bring about an entirely unexpected death.