SCIENCE NEWS

Science Service, Washington, D. C.

TELEPHONE'S DEVELOPMENT AS THE RESULT OF ORGANIZED RESEARCH

DR. FRANK B. JEWETT, president of the Bell Telephone Laboratories, speaking before the Franklin Institute, Philadelphia, pointed out that without highly organized industrial research the modern telephone would never have come to its present stage of perfection.

Dr. Jewett traced the research development of the telephone and its associated arts of the radio and sound motion pictures in an address following the presentation to him of the 1936 Franklin Institute Gold Medal. From 1880 to 1900 the telephone grew in industrial stature because its problems were of such a nature—looking back they seem extremely elementary—that they could be solved by uncoordinated individuals working, each for himself, in separate laboratories and by borrowing proved knowledge from the older telegraphic field. Coordinated, organized research came into being when the increased demands for inter-community phone service occurred. Problems of distance transmission arose, unsolved difficulties with interlocking switching facilities sprang up and the central offices had to be redesigned to meet increased volumes of traffic. Ingenuity for a short while helped, but it soon became apparent that the solutions obtained were becoming increasingly costly. The final solution came by a mass attack on the problems from widely different fronts, utilizing knowledge in widely scattered fields. At one stage it was even necessary to go over into physiology and anatomy to learn more about the process of hearing itself.

In accepting the medal, Dr. Jewett indicated that it should be regarded less as a personal honor to him than as a trust for his younger colleagues and associates who have made telephone advances possible by their research. His own job had been to direct these men so that they could develop the maximum of their creative scientific ability. He said: "It is easy for a superior to take or appear to take credit for accomplishments of his younger associates. What is hard is regularly to appear in the rôle of a critic—an apparent reactionary in the ranks of ardent enthusiasts. As I look back over my thirty years of work in this field of applied science, I have a feeling that I may have contributed as much toward advancing the art of electrical communication by what I have prevented being done as in what I have encouraged."

NEW COMET TO BECOME VISIBLE IN JULY

THE new Peltier comet, discovered recently by an amateur astronomer, will in all probability be the brightest since the last appearance of Halley's famous comet in 1910. It will be easily visible to the naked eye during the latter part of July when it will flash into sight just before dawn each morning. It will be the first comet visible without telescopes since 1927. The new comet was found recently near the North Star by Leslie C. Peltier, garage employee of Delphos, Ohio, who has become one of the world's outstanding amateur astronomers.

According to calculations made at the Harvard College Observatory, the comet is now approximately 120,000,000 miles from the earth, but since its discovery its brightness has increased from the ninth to the eighth magnitude. When first sighted it was visible only through telescopes, although low-powered ones picked it up easily, but by the end of July the comet is expected to be brighter than the sixth magnitude and within 20,000,000 miles of the earth. At that time, the Harvard computations indicate, it will begin to recede, slowly fading from sight.

Drs. Fred L. Whipple and Leland E. Cunningham, of the Harvard Observatory staff, who made the calculations from photographs taken with the observatory's cameras, state than any one wishing to see the unusual astronomical display had better do so this year, for the comet is not expected to return to the vicinity of the earth for several centuries. It is now located in the northern constellation Cepheus.

Although the comet is moving in a south and east direction, it is moving so slowly that it is expected to be in substantially the same position two months from now when it becomes visible to the naked eye. Its course has been tentatively determined as in the shape of an open parabola about the sun. Apparently it never approaches that body any closer than the earth does, that is, about 93,000,000 miles.

FORCES ACTING ON AN AIRSHIP DURING LANDING AND TAKE-OFF

NEWS pictures of the second landing of the *Hindenburg* at Lakehurst, N. J., show straining ground crews tugging frantically at the throw lines of the giant airship. Three times the aircraft missed the mooring mast. Water ballast showered soldiers, reporters and photographers below to prevent a ground bump and hydrogen had to be valved to lower the craft again to the mooring mast level. "Docking" the airship was real work in both the technical and labor sense.

On the same day the *Hindenburg* landed, more than 300 aeronautical scientific men and engineers were gathered at the laboratories of the National Advisory Committee for Aeronautics at Langley Field, Virginia, to inspect the latest developments in research which is keeping the United States in the forefront of military and civil aviation. Strikingly illustrative of the importance of the research of the committee was the report on the very same problem which confronted the *Hindenburg* in its difficult Lakehurst landing.

During last year, the great wind tunnel where the Army and Navy's combat planes are tested, have been turned, for a time, to the study of problems in landing giant airships. A large platform, big as many a ballroom floor, was built in the experimental chamber of the giant tunnel to simulate the ground. An airstream flowed across the floor as would the wind on a landing or take-off. And a twenty-foot long model of the ill-fated *S.S. Macon* went through experimental take-offs and land-

ings for the members of the committee. Only in the enormous wind tunnel at Langley Field could such a large model be used for experiment.

Through concealed and delicate instruments the forces acting on the *Macon* model were discovered as the airship replica was turned—or yawed as the aviation scientists call it—at varying degrees with the airstream. The results were astounding. For an airship the size of the *Macon* (and by inference the *Hindenburg* also) the forces in a mere twenty-mile-an-hour wind were 25,000 pounds in vertical lift and the lateral forces on the craft could amount to 65,000 pounds! Thus on landing it is not inconceivable that a ten-ton truck could be lifted off the ground by the effects of the airship's yaw and the wind. No wonder then that the ground crews strain frantically on their lines in efforts to ground the craft.

The new studies will be highly desirable because they bring a new conception of the magnitude of the forces acting. Ground crews can be better trained for their difficult and all important task. In many cases their number will be augmented to meet emergency conditions.

THE COAST LINE OF LONG ISLAND

THE entire ocean front of Long Island—120 miles long—has become an out-of-door laboratory for the study of beach erosion.

The U. S. Beach Erosion Board, a division of the Corps of Engineering of the U. S. Army, and the Long Island State Park Commission are making the cooperative survey which will study, on the broadest possible scale, the nature and cause of beach erosion. Previously erosion and sand movement studies have been designed to aid or solve some specific situation.

Four times each year, and as soon as possible after severe storms, underwater profiles are made by the field staff. These profiles are graphs made from depth data along lines that run from the beach out to sea for distances 4,000 to 5,000 miles off-shore. Taking successive studies it is possible to see how the ocean bottom is changing with time and is altered by known storm conditions. Water samples and sand samples form another part of the project. The former are samples from which quantity of sand in suspension can be determined and the latter consists of sand composing the ocean bed.

An auxiliary study consists of current readings showing the speed and direction of currents along shore which can pile up sand in one place and remove it from another. Subsurface floats are used where the water is over two feet deep. For depths shallower than two feet surface floats and colored liquids are dropped into the water and their movement watched and measured.

Aerial photographs and borings of the bottom to determine its basic nature are also part of the program, according to *Shore and Beach,* the quarterly journal of the American Shore and Beach Preservation Association.

TEST FOR BLOOD PRESSURE OPERATION

A TEST which enables the surgeon to predict the outcome of operations for relief of high blood pressure before he starts the operation was reported by Dr. Edgar V. Allen, of the Mayo Clinic, Rochester, Minn., at the meeting of the American Heart Association. Dr. Allen developed the test in collaboration with Drs. J. S. Lundy and A. W. Adson.

The test is used to determine which patients will be helped by this modern method of relieving very high blood pressure. Patients who will not be helped as shown by the test are thus spared what would be, in their cases, a useless operation.

The test consists in injecting into a vein an anesthetic, sodium pentothal, which puts the patient to sleep. This anesthetic, which is related to amytal, causes the patient's blood vessels to dilate temporarily, thus lowering the blood pressure. The operation produces the same effect but it is a permanent one. If the anesthetic does not cause the drop in blood pressure, the surgeon knows the operation would not be successful either.

The patient is under the anesthetic for about 15 minutes in the simple test and is able to be up and around within an hour. The operation itself consists in cutting a set of involuntary nerves which control dilation and contraction of blood vessels within the abdomen. A similar operation has been devised for Raynaud's disease, the condition in which impaired circulation in the extremities causes the fingers and toes to turn white, blue, or red on exposure to cold or when the patient gets excited. An improved technique for performing this operation was reported by Dr. James C. White, of Boston, and consists of cutting those involuntary nerves which control the size of the blood vessels of the extremities. As first devised, the operation cured the condition as far as the toes were concerned, but Dr. White noticed that a few months after operation the hands continued to turn color when the patient became excited. In his opinion, this is because the nerves were not cut in the right place, so he devised a new operation for relieving the condition in the hands which apparently gives the same results as the original operation does for the feet.

PREVENTION OF A MEASLES EPIDEMIC

A WHOLE county in rural Michigan has escaped a severe epidemic of measles by a united campaign of measles prevention and modification undertaken by the county medical society. The campaign was begun early this year in the face of a predicted epidemic of unusual proportions, not only lowered the county death-rate from the disease, but showed how effectively a concerted attack against disease can be carried out in a country community.

Dr. E. G. McGavran, secretary of the county medical society, Hillsdale, Mich., describes the county-wide use of a recent weapon in fighting measles, immune globulin, in the forthcoming issue of the *Journal* of the American Medical Association.

This practical agent of preventing or lessening the severity of measles, successfully used by Dr. Charles McKhann, of Harvard, in the Children's Hospital, Boston, was imported from the Massachusetts State Biological Laboratories by the county medical society. Individual physicians, conservative and critical of results, were given

the "serum" free of charge. In return they promised to keep a careful record of their cases and turn these back to the county society for analysis and conclusions.

To get the public behind the measles prevention program, the medical society sought newspaper publicity, made speeches before associations of parents and teachers and talked to the children about measles and its dangers.

Only four instances of the failure of the immune globulin when administered intramuscularly were reported. Dr. McGavran states that in these cases the "serum" was given nine days or more after exposure to the disease. If these four cases were thrown out because of incorrect time of administration and incorrect amount of immune globulin used, 100 per cent. success could be reported in the seventy-three cases remaining. When the new treatment was given by mouth rather than intramuscularly, the percentage of success was only slightly lower.

ITEMS

AN earthquake officially described as a "very strong shock," occurred at the Solomon Islands in the South Pacific Ocean on May 19 at 10:05 P. M. Eastern Standard Time. From earthquake data assembled by Science Service, seismologists of the U. S. Coast and Geodetic Survey located the quake's epicenter at about 8.5 degrees south latitude, 160 degrees east longitude.

THE great research laboratories of the National Advisory Committee for Aeronautics were thrown open to visitors as the two-day session on aircraft engineering research began on May 20. The giant wind tunnel, which will hold a full-sized combat pursuit plane of the nation's air forces, was again the center of interest as government officials and the executives and engineers of the aircraft industries arrived by boat from Washington. A similar conference was also held on May 22 for the personnel of the government agencies using aircraft, representatives of engineering societies and the faculties of professional schools.

THE world's largest high-speed wind tunnel, which can create an air flow at a top speed of 700 miles an hour, was the key demonstration of the "open house" staged at the research laboratories of the National Advisory Committee for Aeronautics. The super-high air speeds in the eight-foot diameter tunnel permit the testing of large-scale airplane models at speeds greater than either the world's speed record or the maximum speed attained when the most modern airplanes are driven nose first toward the earth in a power drive. The staggering air speeds are obtained by a sixteen-foot propeller powered by an 8,000 horsepower motor housed in a separate building. The powerful twist imparted to the air by the propeller is removed by a series of vanes.

A TWENTY-FOOT diameter robot balloon made of cellophane has been launched on the riding field of Swarthmore College. The balloon, inflated with hydrogen, was sent into the stratosphere by Dr. Thomas Johnson, assistant director of the Bartol Research Foundation of the Franklin Institute. Its ultimate function will be to study the nature of cosmic rays without the necessity of sending up giant balloons carrying scientific men. Automatic radio transmitters send back to earth the information obtained by scientific instruments. In this initial flight Dr. Johnson did not send up cosmic ray measuring equipment, but merely recorded temperature and pressure in the upper air. After a study of the flight, plans will be made for further research and refinements of the apparatus.

DENMARK is building a new *Dana*, to replace the old oceanographic research ship of the same name, sunk about a year ago in a collision with a German trawler. Oceanographic research is so important for the fishing industry that funds were immediately granted by the Ministry of Finance for a new research ship to an amount of about 900,000 crowns, or about $200,000. The new *Dana* will have a length of 147 feet, a beam of 26 feet, and a depth of 13 feet. A 700-horsepower Diesel engine will give the vessel an average speed of from 11 to 12 knots. Thanks to generous offers from Scotland, Holland and England, putting their expedition ships at the disposition of the Danish research authorities until the completion of the new *Dana*, there will be no break in the continuity of the fishery research, as a single year's break in this work might have disastrous results for the fishing industry.

A HUNT for the most ancient human beings in America will be conducted this summer, by an expedition to the northwestern doorstep of the continent, where the first immigrants presumably entered. Led by Henry B. Collins, Jr., of the Smithsonian Institution, the expedition sponsored jointly by the National Geographic Society and the Smithsonian Institution, is *en route* to the westernmost point of North America, Cape Prince of Wales, Alaska. This is the most likely place where ancient men would have crossed from Asia, only 55 miles away *via* Bering Strait. Previous Alaskan expeditions by Mr. Collins and other archeologists have pushed Eskimo prehistory back to about 1000 B. C. The expedition has hope of finding skeletal remains or discarded weapons of still earlier people who must have passed this "port of entry" region at the dawn of American habitation.

A MOTION picture camera so small and compact that it can be pushed into the larynx, to take films of the vocal cords in action, has been invented by two Viennese investigators, Dr. Kamillo Wiethe, a physician, and Dr. Franz Gerhard Back, an engineer. It is expected to be useful in at least three ways: to study the mechanics of the voice, particularly in famous singers; to investigate the physiology of the production of the various vowel sounds, and as an aid in the diagnosis of throat diseases, particularly those with a nervous involvement. The new camera is an addition to an already existing series of miniature photographic apparatus designed for obtaining pictures of various internal cavities. One camera, for taking pictures of the inside of the stomach in the diagnosis of gastric ulcer, cancer and other ailments, is swallowed by the patient. It carries its own tiny light bulb with it. Once the exposure is made, the surgeon pulls the camera up again and develops his film.