SCIENCE NEWS

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THE CENTENNIAL CELEBRATION OF THE AMERICAN PATENT SYSTEM

DR. HARRISON E. HOWE, editor of *Industrial and Engineering Chemistry,* opened the centennial celebration of the American patent system. In his address he brought out that the ancient Romans had one of the world's most noted discoveries within their grasp, printing with lead type, yet they never foresaw its usefulness. When visiting the ruins of a palace of a Roman emperor in Rome, one may see a lead pipe, fashioned to convey water to his bath, with letters raised in the lead. But one is unable to explain why, having taken that step, it occurred to no one to smear upon the raised letters a little pigment in some vehicle and press it upon papyrus, metal, wood or textile. Printing from type seemed at the time of such small importance to those engaged in the development that even secrecy was unemployed. Nor did the inventor ever lay claim to his invention, leaving some doubt as to who he actually was. "Gutenberg is ordinarily given the credit, but it is by no means certain that he fully deserves it. But if he did, his reward was only a few lawsuits and a life of debt—far too little incentive to encourage many others to invent."

The 1,000-year depression in inventiveness which marked the Middle Ages might still exist if men had not accidentally stumbled on a way to incite the art of inventing. The need of monarchs for some means of rewarding either deserving or favored henchmen became serious. Destitute rulers were hard pressed to devise suitable rewards for "services rendered" out of their meager purses. They needed all the taxes they could collect and had no more baronies or duchies to give away. The result was that they devised monopolies which were secured to the recipient by proclamation. This proclamation was named a patent.

The abuses under such a system whereby all persons had to pay a sixteenth century "John Doe," a tax on a common material for every food, can be imagined. In the historic "Statute of Monopolies" in 1623, the British Parliament declares all such monopolies illegal except those applied to new manufactures or inventions. Thus on a single exception to a lengthy piece of legislation in antique British law is based the patent systems of the world and there lies the reason why the 1,000 years inventive depression has not extended into the present era.

Thomas Ewing, of New York City, formerly commissioner of patents, spoke on the same program on the American patent system. In its stimulating effects on the mentality of the laboring classes of the nation the American patent system can be compared with the public-school system, which is the most democratic element in America's social structure. While the Constitution was being framed there was, at one time, a provision for the establishment of a national university. This was later dropped and the provision respecting copyrights and patents was inserted. The two operate in much the same way, but the patent system is more democratic because it reaches the artisan class, whereas the class reached by copyright, broadly speaking, is much more limited and is higher in the social scale. The system benefits individuals by making it possible to create property without the employment of capital. Another aspect of the democratic force of the patent system is that it enables the individual or small business man to compete with the great, large industrial companies. The "armor" of big business can be pierced by the "spear-head" of invention.

THE EXACT SHAPE OF THE EARTH

SEEKING more information about the exact shape of the earth, an expedition of the Hydrographic Office of the United States Navy will leave Panama on November 30, on a 6,500-mile cruise in the U. S. submarine *Barracuda.* The expedition, under the auspices of the American Geophysical Union and sponsored by the American Philosophical Society, will explore the waters of the Caribbean Sea for six weeks, investigating the unique geological area off the lower Antilles.

Its scientific personnel includes Dr. Maurice Ewing, geophysicist, Lehigh University; Lieutenant Albert J. Hoskinson, gravity expert, the U. S. Coast and Geodetic Survey, and Dr. Harry H. Hess, of the department of geology of Princeton University. The trip has been planned by Captain Lamar R. Leahy, U. S. N., Navy Department hydrographer, and by a committee of the union on ocean basins and their margins, of which Professor Richard M. Field, of the department of geology of Princeton University, is chairman.

The main objective of the expedition will be a program for measuring the force of gravity in the region where the great West Indian archipelago bends toward South America. This is suspected to be one of the greatest deformations of the earth's crust. Volcanic eruptions and earthquakes are frequent there. Since the variations in the force of gravity are greater in the region of island archipelagoes than anywhere else in the world, it is expected that the data obtained on this expedition will throw important light on many fundamental geological problems.

Among the instruments which will be used in making the investigation is a crystal clock, placed at the disposal of the expedition by the Bell Telephone Laboratories of New York, which is expected to increase the accuracy of the gravity observations beyond that which could be obtained with the chronometer methods formerly employed. A multiple pendulum apparatus, invented and constructed by F. A. Vening Meinesz, of the Netherlands Geodetic Survey, a pioneer in under-water gravity measurements, will also be used.

With the exception of the Netherlands, the United States Navy has led all other nations in this type of scientific investigation, this being the third expedition in which its submarines have been employed. In 1929 the *S21* established 49 gravity stations in the Caribbean Sea and

the Gulf of Mexico, and in 1932 the *S48* made more than 50 in the vicinity of the Bahamas and Cuba. Because the disturbances on the surface of the water, even in calm weather, make operation of the delicate instruments impossible, the submarine is essential in establishing gravity stations. In order to reach sufficiently quiet waters the submarine must be submerged to a depth of 75 feet. To make the gravity readings usually takes about three quarters of an hour. Then the submarine is brought to the surface again and proceeds to the site chosen for the next gravity station, probably from 25 to 75 miles away.

The Navy Hydrographic Office expects to obtain several thousand sonic soundings during the course of the expedition. A large number of soundings will be taken in the unexplored area of the sea bottom east and southeast of the Virgin Islands, where a great deep, similar to the Nares Deep north of Puerto Rico, is thought to exist. During the course of its cruise the expedition will visit Trinidad, Barbados, Martinique, Antigua, St. Christopher and St. Thomas.

A NEW VACCINE FOR YELLOW FEVER

DR. WILBUR A. SAWYER, of the International Health Division of the Rockefeller Foundation, reported to members of the American Society of Tropical Medicine meeting in Baltimore, that a new vaccine against the dreaded yellow jack is expected as a result of isolation of a new, safer strain of yellow fever virus. The vaccine which Dr. Sawyer and associates developed some years ago, and which can only be made in limited amounts, had to be used with serum from blood of individuals immune to the disease as a result of recovery from a previous attack. The new virus, it is expected, can be safely used for vaccination without this protective immune serum. However, vaccination is not yet in the stage where it can be used for entire populations. Protection of a whole country or continent from the disease is being sought by other methods. Recent developments in Brazil have shown that new methods for the control of this dangerous disease must be developed.

Following the discovery by Walter Reed and his associates that the disease is spread by a particular kind of mosquito, and the demonstration by Gorgas in the Panama Canal Zone that anti-mosquito measures could check the disease, it was thought that the disease could be completely wiped out from the face of the earth. Campaigns in one country after another were undertaken, with apparent success. The method was to eliminate mosquito breeding in key locations, the cities and towns and other centers of population. Just as scientists thought they were nearing victory, investigators for the Rockefeller Foundation discovered that the goal was nowhere near in sight. The reason is that a form of yellow fever has been discovered in forest regions of South America. Anti-mosquito measures effective in cities will not work in these forest and jungle regions and new methods will have to be found. A further complication is the discovery that yellow fever can be carried by more than one type of mosquito. The newly discovered yellow fever mosquitoes have different breeding habits and will require new and different methods of control.

—JANE STAFFORD

A MORE DANGEROUS FORM OF MALARIA

DISCUSSIONS before the American Society of Tropical Medicine, in Baltimore, brought out evidence that the kind of malaria now most prevalent is more dangerous and virulent. Malaria, transmitted by mosquitoes, is no minor disease. Thousands of lives are taken each year; with increased virulence the death toll may be greater. It is higher now than it has been at any time since 1929, and the disease is spreading into new areas once free from malaria.

Physicians, health officials and laymen were taken to task for their indifference to this situation by Dr. Henry E. Meleney, of Vanderbilt University School of Medicine. When some three hundred cases of encephalitis occurred in one year in Missouri, excitement ran high in lay and medical circles. In the same year, there were the same number of cases of malaria in Tennessee, a non-malarial state, but no attention was paid to this situation. He advocated a curb on the sale of "chill tonics" as part of a seven-point program for checking the ravages of malaria. In his opinion these "tonics" are "pernicious" and actually contribute both to deaths from malaria and to the development of many cases of chronic malaria. Dr. E. L. Bishop, director of health for TVA, reported that guarding against the malaria threat has been an important feature of the TVA construction and development program. Control of malaria depends to a large extent on eliminating stagnant water where the malaria mosquito might breed. The extensive shorelines of the huge lakes behind the Norris and Wilson dams might have provided breeding grounds for myriads of dangerous mosquitoes and made malaria control throughout the area practically impossible. Each dam constructed by the TVA was designed in cooperation with health authorities, so that clean shorelines and other conditions unfavorable to the breeding of mosquitoes were provided. In addition, no reservoirs are filled during the mosquito breeding season.

BALTIMORE MEETING OF THE SOUTHERN MEDICAL ASSOCIATION

NEW, better methods of diagnosing and treating thyroid gland disease, especially toxic goiter of Graves's disease, were described by Dr. David Henry Poer, of Emory University, Atlanta, Ga., at the meeting of the Southern Medical Association. The old method of determining whether a patient suffered from overactivity or underactivity of the thyroid gland was to fit a mask over his face through which a measured amount of oxygen was supplied. From the time needed to use up the oxygen, the physician could determine the patient's oxygen consumption and from that his basal metabolic rate, or the speed at which his thyroid gland was driving his body in its various activities. This test has turned out to be rather unsatisfactory. A new test, pleasanter for the patient, though it takes longer, is now available. This

test is made by taking a sample of the patient's blood and determining the amount of iodine in it. As iodine is part of the chemical which the thyroid gland makes and by which it influences body activity, this test for the amount of iodine in the blood tells the physician whether the gland is making too much or too little of the active chemical.

Dr. Huntington Williams, health commissioner of Baltimore and professor of hygiene and public health at the University of Maryland, spoke on the death rate from measles. Figures covering a ten-year period in Baltimore show that the risk of death from measles for a child under one year of age is forty-seven times greater than for a child between five and fourteen years of age. Deaths from measles are due to ignorance and neglect. Every effort should be made to keep children under three years away from measles. This is only difficult during an epidemic of the disease, and in cities and urban communities, measles epidemics come quite regularly every two or three years.

—JANE STAFFORD

TESTING OF PRISON BARS

THE newest aid of science in combating crime is the magnetic apparatus developed at the National Bureau of Standards to test the properties of tool-resisting prison bars. The device was developed by R. L. Sanford, senior physicist at the bureau, at the request of the Bureau of Prisons and the Department of Justice.

At the meeting of the Philosophical Society of Washington on November 7, Mr. Sanford showed how a non-destructive test on prison bars had been achieved with his alternating current magnetic comparator. Usefulness of the device will be to test new bars purchased by the Federal Government for prisons.

Prison bars are really two bars blended into a solid whole. Outside is softer ordinary steel which can be cut with a hacksaw. But within are inserts of hardened steel that can not be cut by any tool which a prisoner is likely to obtain. This dual type of construction of bars is necessary because the inner, very hard steel is brittle and if used alone might be shattered by a sharp blow in quite the same way that one may break the blade of a knife if it is used as a screwdriver. In the prison bars the outer, softer material absorbs the shock of a blow and protects the inner, hard material from fracture. Moreover, the outer steel is an excellent heat conductor and prevents the prisoner from heating the inner steel if he employs a home-made blowtorch consisting of a candle and a soda straw.

The prison bars are tested in a balanced electrical circuit which can be thought of roughly as an electrical scale in which the magnetic properties of a standard and test sample of steel are compared. The primary premise behind the device is that two steel bars which are alike chemically and structurally will be alike, also, in magnetic properties. And that it is impossible to do anything to a piece of steel which will change its strength without, at the same time, altering its magnetic properties. Thus, if one finds that the magnetic properties of the sample correspond to those of a known, approved standard the two are otherwise alike.

ITEMS

FOUR months of field tests in television broadcasting from the Empire State Building, New York City, at the cost of a million dollars have brought television for the public nearer to reality. The engineers of the Radio Corporation of America and the National Broadcasting Company report that they have not yet finally designed the television sets that will be sold for the general public. Television as demonstrated was seen on a new 12-inch receiving tube. And the images were in black and white, instead of the greenish tone of previous cathode ray tubes. The screen was 7½ by 10 inches and a fairly large group could watch the show at the same time. Image and sound were perfectly synchronized. To do this a system is necessary in which there are 1,400,000 impulses amplified and broadcast in one second.

THE average motor car now in use is nearly five years old (4.71 years) according to an analysis of passenger-car registration presented to members of the American Petroleum Institute meeting in Chicago on November 12. Such cars are well past "middle age" in the survival life on an automobile, which is 8.4 years, according to a report made by Marcus Ainsworth, of Automotive Industries, and A. Ludlow Clayden, of the Sun Oil Company. The automotive engineers were able to arrive at their findings by making a mortality curve for automobiles. The cars in "per cent. living at the end of each year" were plotted vertically and the years from 1935 back to 1922 forming the base line. Sixty per cent. of all the cars in use at the end of 1935 consisted of the three most popular low-priced makes—10,845,295 out of 17,896,616 cars.

OLD age can be held at bay and life itself prolonged some seven years by dietary means according to evidence obtained in nutrition studies with rats made by Dr. Henry C. Sherman, Mitchill professor of chemistry at Columbia University and research professor of the Carnegie Institution of Washington. The diet which extended the prime of life in rats had an increased proportion of milk, making the diet richer in vitamins A and G, calcium and protein, Dr. Sherman reported in a lecture given before the institution. This diet "expedited growth and development, resulted in a higher level of adult vitality as shown by several criteria, and extended the average length of adult life, or improved the life expectation of the adult." Extension of life expectation has heretofore been made for lower age levels by hygienic means which reduced the chances of death by diseases of infancy and childhood. By applying the new knowledge of nutrition, Dr. Sherman believes it is now possible to extend life during "the period of the prime." Because eminent men usually attain their positions of "fullest opportunity" at an age when only the last third of their years remain to render "fullest service to the world," Dr. Sherman believes that the possibility of extending the prime period of life has greater than biological significance.