

## SCIENCE NEWS

*Science Service, Washington, D. C.*

## THE ABSORPTION OF SCIENTIFIC DEVELOPMENTS BY SOCIETY

DISSATISFACTION with the manner with which society has met and absorbed scientific changes was expressed in a series of four lectures at Princeton by Dr. Frank Baldwin Jewett, president of the Bell Telephone Laboratories. Speaking on "An Engineer Looks at the Social Implications of Science," he said of the government, "the political government, since it must of necessity be organized to do a vast number of things, is less likely to be competent in a highly technical matter such as the development and application than is a private organization designed and operated solely for that scientific purpose."

Although the government can not directly use the services of engineers and scientists because their field is one in which they can operate with entire absence of certain factors normally present and controlling in other human affairs, still the government should make more use of the knowledge of these men.

Speaking from an international view-point, Dr. Jewett asked, "how will the world of those who wish to retain what they have protect themselves against the degrading effects of those who, equipped with the same tools, are struggling to elevate their standards?" "One has only to visit the more recent of the vast technical establishments of the Orient, particularly those of Japan, to be acutely conscious of how far the migration of applied science has carried the world since the days of its beginning, and how pregnant with social and political problems the future is."

To meet these problems, he recommended the inclusion of science training in the education of every student, "with the thought that thereby they and the society they are to form will be better equipped to handle the problems of science and particularly the problems created by science."

He made "a complete refutation of any claim that applied science has reduced gainful employment," and citing the automobile industry, which threw out of work many drivers, hostlers, wagonbuilders and farm laborers, he pointed to the mushroom growth of allied industries of the automobile that have in the end increased the total of employed labor. One evil of science Dr. Jewett showed to be that "frequently the appeal of some new thing is such as to offer a lush field for the get-rich-quick artists or those who pander to the baser sides of human nature." He added that such exploiters must be safeguarded against, for "we no longer have opportunity to become fully acquainted with a new thing before its mass impact has confronted us with a major problem of social control and legal regulation for which we have no established guides."

## INTERNATIONAL SYMPOSIUM ON EARLY MAN

IN a Hall of Man with walls and ceiling gaily modern in red, blue and white design, valuable drab relics of bone

and stone representing man's start on earth are being studied in Philadelphia at an International Symposium on Early Man. The symposium, which is drawing famous scholars of prehistory from far corners of the world, is being held in celebration of the 125th anniversary of one of America's oldest scientific institutions—the Academy of Natural Sciences of Philadelphia.

A skull of Minnesota Man, which Professor A. E. Jenks, of the University of Minnesota, pronounces 20,000 years old, was one exhibit arousing keen interest. If fellow scientists agree with Professor Jenks on the antiquity of this skeleton from a lake bed, then Minnesota Man may become accepted as America's oldest inhabitant—unless some new discovery turns up to carry our prehistory farther back.

A long, slender dart point of bone found resting on the ankle of a prehistoric elephant in New Mexico, is another important clue to America's first people. This hunting exhibit, unearthed by Edgar B. Howard, secretary of the symposium, is considered good evidence that human beings had already arrived in the New World before the last mammoth and other Ice Age animals had all perished. The date of the elephant hunt is set by Mr. Howard at no later than 10,000 years ago.

Ten or twenty thousand years ago is only yesterday in human history. But America has no relics to compete in age with the Old World's revelations on man's beginnings. The struggle of man to establish himself there is told in parts of skeletons—showing brutish jaws or chinless ones, heads ape-like in their flatness or thrust forward at awkward angles, and many another trait that has fortunately, as we think, become obsolete. So valuable and irreplaceable are the scraps of those vanished human types, that many of the foreign members of the conference are bringing with them plaster casts of famous specimens. Latest discoveries in the caves where Peking Man had his home, over half a million years ago, are among those duplicated by casts. They have been brought from China by Père Teilhard de Chardin, Jesuit priest and anthropologist.

At the opening session, Theodore McCown, in presenting a paper by Sir Arthur Keith and himself, introduced Palestine Man, who must have lived at least 60,000 years ago.

For the first time—*Homo sapiens*—the species to which all modern men belong—is discovered existing as far back as the middle of the Old Stone Age. Two types of man lived in the Palestine caves, and both lived about the same time. The caves which have yielded their skeletons are at Mount Carmel. British and American archeologists have been working jointly to salvage the important chapter of prehistory buried there. Of the two types of Palestine Man extracted from their hardened earth beds, one type was small and had many traits like the clumsy, chinless, low-browed Neanderthal men of western Europe. The other type was tall, even approaching six feet, and these men had faces much nearer our own modern type.

The fact about these latter people that is surprising is that they varied widely among themselves in type, in what was described as "their evolutionary plasticity." They are a variety of man who may be considered as the prototype of the earliest modern Europeans.

Carrying the history of mankind back into a much earlier chapter, long before *Homo sapiens*, W. C. Pei, of the Institute of Human Paleontology in Paris, reported the discovery in China of extremely ancient stone tools. One piece of worked stone and some worked bones are believed to be the oldest indications of human handwork in China. These tools seem to be even older than Peking Man, who is credited with beginning the true Stone Age industry in China. Peking Man, China's oldest known inhabitant, has been given an estimated age of half a million years. The new discovery of stone tools goes back to the Pliocene period of geologic time, when man and his work are still almost completely mysterious.—EMILY C. DAVIS.

### THE DISAPPEARANCE OF GOITER IN THE MIDDLE WEST

Nobody disputed Dr. David Marine when he said twenty years ago that a normal thyroid gland could be found only along the seacoast. Michigan and Ohio can successfully refute any one who makes that statement to-day.

There is Midland County, Michigan, where, in 1924, one third of all the school children showed a well-developed goiter and where a questionable enlargement of the thyroid was seen in almost every child. Now in Midland County anatomically normal thyroids are found in 90 per cent. of the children. They have been taking iodized salt to make up for the deficiency in food iodine in that locality. In this same county live five families whose doctor warned them against iodized salt, saying the children would develop acne. These families followed their doctor's advice for from three to six years. When the goiter committee from the state health department made a state-wide survey recently, it was especially interested in these families. The children did not have acne—it is true—but eight of them had moderately enlarged, soft, spongy hyperplastic goiters. Recently the committee examined 3,000 children who had been using iodized salt regularly for years. Less than 2 per cent. of them had goiter. Nor did the committee find more cases of acne than would be expected.

Dr. O. P. Kimball, of Cleveland, who describes in the forthcoming issue of the *Journal* of the American Medical Association the program of goiter prevention in Michigan and Ohio, tells of an interesting contrast in two Michigan cities. In Houghton County are Houghton and Calumet, towns thirty miles apart. Calumet is a mining town and during 1932 the copper mines closed. Many families were on relief and only bag salt (not iodized) was given to relief families. While in Houghton the percentage of goiter cases remained low, in Calumet without the iodized salt, which was the only source of food iodine in half the homes for three years, endemic goiter became proportionately as prevalent as it was before prevention was initiated.

In Detroit the incidence of goiter dropped from 35 per cent. in 1924, when the goiter prevention program was begun, to 5 per cent. in 1936. However, in Cleveland the drop was from 31 per cent. to only 18.5 per cent. The city health department investigated and found that two local salt manufacturers were labeling their various brands of salt "iodized" when containing only one third of the amount of iodine stated on the label and one brand sold by a large chain store contained no iodine at all. In each study made in various other cities, the iodine content of nationally advertised brands and the trade brands prepared by these manufacturers for other companies was found to approach closely the amount advertised.

### ECONOMIC VALUE OF HIGHER OCTANE AVIATION FUELS

How the commercial airlines potentially could save over \$1,000 per trans-continental trip from New York to Los Angeles was described at the National Aeronautic Meeting sponsored by the Society of Automotive Engineers in Washington. This is equivalent to carrying about seven extra passengers per trip at present one-way fare rates.

D. P. Barnard, of the Standard Oil Company of Indiana, suggested the use of super 100 octane anti-knock gasolines to achieve the theoretical economy. He showed in a study of the values of octane number improvements in aviation gasolines in terms of increased earning power of the current type transport planes, that each increase of one single unit in the octane rating of aviation fuels is worth up to five cents a gallon of gasoline, when proper provisions have been made in the original designs.

On a trans-continental flight from Newark to Los Angeles, with an airline distance of 2,524 miles, the benefit would be about \$68 for the increase of a single number in the octane rating. Theoretically, at least, a jump from the present 87 octane fuels to the 100 octane gasolines would thus yield a potential saving of \$1,064 for each trans-continental flight. With a fare of approximately \$140, one way, this is essentially the equivalent of carrying over seven extra passengers per flight. The economic value of using improved gasolines of higher octane rating (higher anti-knock value) lies in the increased payloads that can be obtained for the same horsepower of engine. Increased speed is a secondary consideration.

The advantage of using high octane fuel for military craft was not computed by Mr. Barnard but he rated its value as even higher because small pursuit planes show improved performance in climb and speed, while big bombers have increased range and greater load-carrying capacity.

Modern design of airplanes shows that with present engines and present gasolines a plane can lift about 13 pounds for each horsepower developed by its motor. The increased saving due to better fuels can only be achieved by the proper design of the motors. Some aviation gasolines now available are "too good" for some of the present airplane motors just as some of the automobile gasolines to-day are too good for a 1927 motor car. Such fuels operate all right but do not bring the benefits, which

potentially they possess, because the motors are not designed for them.

Mr. Barnard's cost studies of high octane gasoline for transport planes indicate that "the earning power of octane number improvements is so great that within practical limits cost can not influence the trend toward higher octane number to any appreciable extent."

### AIRPLANE LANDING FLAPS

How unobtrusive and little-noticed landing flaps on the trailing edge of airplane wings can provide a "spare wing" in times of emergency was described by H. D. Fowler, aeronautical engineer of the Glenn L. Martin Company, at the Washington meeting of the National Aeronautic Meeting sponsored by the Society of Automotive Engineers.

Mr. Fowler is the designer of one type of landing flap which, when moved out from its concealed position in the wings, allows the pilot essentially to shift gears and gain from 10 to 15 per cent. greater climbing rate. With one engine out of commission, at a crucial time such as take-off, it is estimated that the flaps increase the climbing rate by 30 per cent. Similarly, the use of flaps in descent permits the airplane to have a lower landing speed and to come down more steeply into a smaller landing field.

Mr. Fowler described his type of landing flap as superior to the so-called split flaps now in general use and explained that the latter had been responsible for some of the recent crashes. Within a year's time three instances where split flaps were indirectly connected with air crashes have been recorded. In two additional instances ice formation on the wings caused crashes. Aptly it has been stated that it is a great safety feature to have two engines—one for spare; several airports—one for spare; several means of radio communication—one for spare, etc.; but apparently one very important factor was not indicated and that is we should have a spare wing ready at all times while in flight to provide just the extra margin of safety.

A major field of usefulness for properly designed flaps is in the long-distance oceanic flying boats and the so-called air-freighters which need superior climbing ability at take-off to get into the air with their large loads. The Diesel-powered German flying boats, which last year accomplished trans-Atlantic trips from the Azores to Long Island, solved this launching problem by the use of catapults from their "mother" ship, but wing flaps can achieve the same objective without this costly and elaborate mechanism.

### ITEMS

A NEW island suddenly popped up in the Black Sea recently, off the southwest coast of the Crimea. It is about 800 feet long and 35 feet wide, and its crest stands about 20 feet above sea-level. According to Tass, the official Soviet news agency, a commission of the Academy of Sciences of the USSR investigated the curious phenomenon. It was found that a huge mass of rock from an undercut cliff had suddenly dropped to the sea floor, throwing the bottom into wave-like folds. The new island is the emerged part of one of these folds.

A MOTION picture of the life history of a rabbit egg, from the moment it bursts from the follicle of the ovary, has recently been released by the U. S. Department of Agriculture. This process was never filmed before. A special technique originated by the film's scientific director, Dr. E. I. Evans, made it possible for the photographer, Carl Turvey, to include this early act in life. A uterus containing five unborn rabbits, each in its placental sac is shown, and Dr. Evans opens one of these sacs by Caesarean section. It took two years to make this scientific film, which will be used in the educational work of the department.

THE work of Dr. Earl S. Johnston, of the Smithsonian Institution, and Dr. Paul R. Burkholder, of Connecticut College, indicates that nightly sleep, or something very like it, is as necessary to plants as it is to men and animals. It has to do with the physiological reaction to light on the part of auxins, the substances within plants that cause growth. Strong sunlight was found to be destructive to the auxins, while "controls" containing like amounts of the substances were left with much greater growth-promoting power after being "exposed" to darkness for equal periods. The destruction or inactivation of the growth substances varied with the length and intensity of the illumination. It also varied, as might have been expected, with the species of plant. Some plants, such as the sunflower, are much more sensitive than others—so sensitive, in fact, that its movements seem superficially to be controlled by an animal-like intention. Offhand it might appear somewhat paradoxical that growth should be most rapid in darkness, yet the phenomenon has often been observed. From these experiments it appears that light and darkness play complementary rôles in growth. Light is required for the synthesis of the auxins in the growing tip of the plant, but, once formed, they are most effective as growth's activator in darkness.

A SCIENTIFIC expert at the National Bureau of Standards has approved installations of cameras at race tracks as being accurate and reliable. At the request of the New York State Racing Commission, Dr. Irvine C. Gardner made a study of the optics of the instruments and checked through the fairly simple requirements of installation which would provide true findings. Need for the study arose because in newspapers some sports writers and others had been questioning the method. Dr. Gardner found that with simple precautions the camera would be satisfactory and in all installations he examined there precautions had been considered adequately.

THE biggest oyster-shell in the world is the distinction claimed for an enormous fossil, four feet long and three feet wide, dug up by geologists of the National Park Service in the proposed Big Bend National Park area, in western Texas. Dr. Charles N. Gould, who has been working in the rich fossil deposits of the region, thinks there may even be bigger shells waiting to be excavated. Another fossil discovered in the Big Bend country is a ten-foot petrified tree. No other tree of that size, living or fossil, has ever been found in Texas. The region is also rich in fossils of dinosaurs and extinct elephants.