

SCIENCE NEWS

THE JULIAN CALENDAR

Science Service

MILLIONS of people who go peacefully to bed the night of September 30, according to their calendar, will "lose" 13 days before daylight comes next morning. The next day for them will be October 14, the beginning of the shortest month of their lives. Such is a result of the decrees of the "Pan-Orthodox Congress" of the various branches of the Eastern Orthodox Church at a meeting last spring, fixing a time for the final abandonment of the Julian Calendar which was for 1,600 years that of the Roman empire and of the entire Christian world and which in parts of the world has endured to this day. The change will occur at midnight, October 13, on our common or Gregorian calendar.

Julius Caesar was not a man with a great reverence for ancient customs just because they were old-fashioned. In his day the old Roman calendar had become so inaccurate that it was three months ahead of the sun; when the calendar said it was summer, the sun said it was spring, and festivals fixed by the calendar came at inappropriate times. Julius proceeded to do something about it. He called in Greek and Egyptian astronomers, and established the calendar that bears his name.

The old year had been just 365 days, but the astronomers found that the error in the calendar was due to the fact that the year as measured by the time between two successive nerval equinoxes, or the moment when the sun crosses the celestial equator on its way north, was something longer than this, or about 365 days and six hours. So Caesar invented the Leap Year, adding an extra day every four years and thought the problem solved.

But astronomical science progressed, even during the so-called Dark Ages after the fall of Rome, and by the latter part of the sixteenth century when it was recognized there was a difference of some 10 days between the sun and the calendar, the remedy was also recognized. Pope Gregory XIII called a council of astronomers who, knowing the amount of the error in the method of the Julian Calendar, proceeded to correct it by eliminating one leap year at the end of every century except those for the years evenly divisible by 400. According to this rule 1900 was not a leap year, but 2000 will be.

The Gregorian Calendar was immediately adopted by the Roman Catholic world, but since the adoption of the Julian Calendar the Eastern churches had split away from Rome and acknowledged no allegiance to the Pope, while at the same time the Protestant Reformation was in progress in western Europe and for a long time the Protestant nations stuck to the old reckoning.

England, however, finally adopted the Gregorian calendar in 1752 and it became effective in the American colonies about the same time. The error in the Julian calendar was then 11 days and the day following, September 2, 1752, was called September 14. But the several branches of the Eastern Church and the nations where

it was the dominant religion kept to the old calendar. Russia was the first to break away, the Soviet government adopting the western calendar in 1918; Roumania and Serbia followed in 1919. Among the nations outside of Christendom, Japan, China and Turkey had already followed the lead of the western world, leaving Bulgaria and Greece and the Greek Orthodox Church as the only adherents to the older system.

But where that church is strong, as in Russia and Roumania, there have been two calendars in operation, the religious and the civil, resulting in much confusion. It even affected vitally American industries which employed Eastern Europeans, since pious Orthodox workmen insisted on observing holidays for a second time, when the belated Julian calendar caught up with our own. This will end next month, and for the first time since 1582 the entire civilized world will be keeping the same time with one notable exception. The Ruthenian Catholics, or Uniates, as they are known in Europe, a body of Christians numbering some 8,000,000, of whom half a million are in this country, will still adhere to the astronomy of Julius Caesar. They dwell chiefly in the Russians Ukraine and in neighboring regions, and although they acknowledge the spiritual supremacy of the Roman church they dislike their Greek and Roman Catholic neighbors so heartily that they will not even have the same calendar and the same festival days as they do.

How long they will hold out is a problem; but as things are it seems that the Julian Calendar is doomed to ultimate extinction after having lasted some 1,962 years.

THE EINSTEIN THEORY

Science Service

CONFIRMATION of the third prediction of Einstein resulting from the application of his general theory of relativity was announced to the American Association for the Advancement of Science at its recent fall meeting at Los Angeles by Professor Charles E. St. John, of the astronomical staff of Mt. Wilson Observatory. The lines of the solar spectrum are not identical in position with those due to incandescent samples of the same elements when observed on the earth, and the displacement is toward the red end of the spectrum. This indicates a slowing up of the rate of atomic vibration, as predicted by Einstein, as a result of the difference of the position of the two samples of incandescent elements with reference to the gravitational field of the sun.

Einstein has stated that his theory of relativity stands or falls according to whether or not this effect is observed. Professor St. John has calculated that the displacements of the lines in the solar spectrum predicted by Einstein amount to 86 per cent. of the total observed effect, the remainder being due to other well-known effects resulting from conditions in the solar and terrestrial atmospheres and to the sun's rotation on its axis.

Dr. St. John considers as proved the main prediction of Einstein, that in the vicinity of the center of the gravitational field of the sun the rate of vibration of atoms is slowed up as compared with their rate of vibration when as far away from the sun as is the earth.

The other two Einstein predictions which have already been verified are the distortion of the orbits of the planets around the sun which was soon confirmed in the case of Mercury; and the more famous one of the deviation of light rays by the action of the gravitational field of the sun when passing close to that orb. This last has been confirmed by several observations taken at the last two solar eclipses of the sun. Dr. St. John's announcement completes the list of Einstein's predictions, all of which have been verified.

CEREAL DIET

Science Service

"THE most important dietary problem confronting civilized man to-day is that of restoring the balance of essential nutrients which has been disturbed by the prevailing use of cereal products," the subcommittee on animal nutrition of the National Research Council declares in a report published here in which they outline leading research problems awaiting solution.

Pointing out that human beings will always consume large amounts of cereal foods, they urge investigation to determine the proper place of animal foods in human diet in infancy, childhood, maturity, reproduction, senescence, sickness, labor, war and sedentary life.

"This group of problems in practical human dietetics has always been and always will be," they say. "We have reached an age, however, in which progress in their solution is possible at rates vastly greater than in any earlier era; and these great problems must be kept constantly before research men in order that no opportunity may be overlooked for contributing to their solution through the undertaking of definite projects of properly limited scope."

The necessary laboratories, groups of competent investigators and institutions of various sorts providing satisfactory groups of experimental subjects, are not uncommon but men who are able and interested to organize and to conduct such investigations and who can command the necessary human cooperation are rare.

Among the other general problems outlined in the report are the establishment of a scientific basis for judging farm animals, estimation of the metabolic nitrogen as a contribution to the perfection of feeding standards, mineral and vitamin requirements of farm animals, and the effect of diet on reproduction.

The sub-committee offers its cooperation to any who may desire it in the making of detailed plans for investigations in any of the fields suggested. The statement is signed by E. B. Forbes, State College, Pennsylvania; H. S. Gridley, Urbana, Illinois; F. B. Morrison, Madison, Wisconsin; C. H. Eckles, University Farm, St. Paul, Minnesota, and C. R. Moulton, 509 South Wabash Ave., Chicago, Illinois.

CANCER RESEARCH

Science Service

AN experiment that may explain the essential nature of cancer has been announced by the Imperial Cancer Research Fund in London, according to information reaching the American Medical Association at Chicago. It was found that cells from cancerous growths will grow outside the body if they are planted in a suitable medium, but that ordinary body cells such as those in the kidney will grow only after they have been removed from the body for several weeks. But the ordinary cells were found to grow immediately if some of the extract in which a tumor is growing is added to the ordinary well cells. The British scientists argued from this that cancer cells automatically and continuously produce substances which activate growth and that normal cells produce these substances only when injured.

Long continued irritation of tissues may produce cancer, past experience has shown, and the findings of the British scientists explain and is in accord with this fact. Vitamin deficiency has nothing to do with the growth of cancer the announcement also stated on the strength of extensive researches.

THE SENSE OF COLOR OF BEES

Science Service

BEES are color blind as people sometimes are, and they learn their way about by experience rather than by instinct. These are some of the conclusions reached by Professors F. Frisch and Lothar Tiralá, German biologists, who have made a careful study of the insects. They have shown that to the bee, red and black look alike, orange and yellow look the same as green, and there is no difference in the appearance of blue, violet and purple. But they have one advantage over man; they can see the rays of ultraviolet light, which are invisible to our eyes.

It was also discovered that the mysterious guiding influence by which the bee is brought back to its hive is nothing more than experience. It has long been known that bees find their way home sooner the longer they have lived in their hive. So some bees were put to sleep by ether, taken from a new hive and moved some twelve yards away. None of them could find their way back to the hive until the third day afterward, when 30 per cent. got home. By the eighth day, 90 per cent. of them had learned.

FOOTPRINTS IN THE SANDS OF TIME

Science Service

STRANGE three-toed tracks found in blocks of sandstone quarried to make a walk in front of the former home of President James Monroe at "Oak Hill" near Aldie, Loudoun County, Va., have been declared by scientists to be the footprints made in the sand by a gigantic reptilian dinosaur fifteen million years ago.

While dinosaurs are chiefly known from reconstruction of fossil bones found in the western states where these prehistoric creatures were apparently most abundant,

many tracks of these creatures have been found in eastern states before, although few remains of the fossil reptiles themselves have yet come to light in the East.

The first evidence of dinosaurs was turned up by a farmer's plow in Connecticut in 1802, and was in the form of impressions similar to the footprints in the sands of geologic time just unearthed near Leesburg. At that time these mysterious tracks were thought to belong to some unknown bird and became known as the tracks of Noah's raven. Later investigation and the finding of skeletal remains of the dinosaurs in the West in 1870 showed that extinct reptiles of gigantic size had made them.

The findings of these fossils where President Monroe once lived, has recalled to historians there that Thomas Jefferson, another president from Virginia and a close personal and political friend of Monroe's, was one of this country's earliest fossil hunters and himself discovered what he termed *Megalonyx*, or "The Great Claw," a prehistoric Giant Sloth which lived hundreds of thousands of years ago but several million years later than the dinosaurs.

ENGLISH SPARROWS IN DEATH VALLEY

Science Service

ENGLISH sparrows have made their home in Death Valley, ornithologists of the American Association for the Advancement of Science were told in an address at Los Angeles by Dr. Joseph Grinnell, professor of zoology of the University of California, in which he gave the results of the bird census taken by him in the below-sea-level portions of that desert. This sparrow colony, established in the 60-acre oasis at Furnace Creek Ranch surrounded by a vast desert of extreme type, furnishes an extremely interesting "experiment in nature," he declared, and explained that if it persists it will show how soon, if at all, the color and markings of the birds will be affected by the extreme climatic conditions of their environment.

In accounting for the surprising presence of these nonmigratory birds in the desert, Dr. Grinnell suggested that they probably came in about 1914 when the Tonopah and Tidewater Railroad was constructed to Ryan, which is only 17 miles from the ranch by a road over which more or less teaming is done.

Sparrows are one of the few species of birds which Dr. Grinnell found breeding in the desert. His evidence indicates that sparrows nest late in this hot climate. This is contrary to the theory that it is a certain amount of heat that starts breeding; as it is hotter at Furnace Creek Ranch in April than it is in July in west-central California where sparrows nest generally by April 1.

Most of the 124 species of birds which have been found in Death Valley are migratory.

"As is well known," said Dr. Grinnell, "migration comes to human attention chiefly through notice of the birds which stop over on the way. We do not ordinarily see the birds in actual passage. Death Valley is a north-and-south trough between high mountain ranges, the Amargosa Range on the east, 4,000 to 7,000 feet high,

and the Panamint Range to the west, 5,000 to 11,000 feet high. The valley forms a natural channel for through migration. Thus Furnace Creek Ranch is a natural lodestone, pulling to itself now and then from the migrant stream, individuals or flocks, day or night, and these may loiter a few minutes or a few hours, or even a few days, before resuming their journey. Again and again I had the experience of seeing bands of swallows, which migrate by day not far from ground, arrive from the south, wheel a few times over the alfalfa and then make off northwards."

If Furnace Creek Ranch could be made the base for continuous observations of birds throughout the entire year for a series of years, quite as startling and significant findings would result as have resulted from the migration studies on the island of Heligoland of the North Sea.

ITEMS

Science Service

DEFINITE information as to changes in Yokohama harbor due to the earthquake has been received by the U. S. Hydrographic Office from the master of the American steamer President Jefferson which recently arrived at that port. The inner harbor is now impracticable for deep draught vessels as the bottom has changed and there is less depth. The breakwater is broken and sunk, and cargo can be discharged only into lighters from anchorage outside. Out of 11 lighthouses in and around the harbor only three were reported in order; three had completely collapsed; the others were standing but not in operation.

THE U. S. Navy has developed four planes for entry in the Pulitzer Race at St. Louis on October 3 that have shown unprecedented high speeds in preliminary flights. Two navy Wright fighters, powered with Wright T-2 engines that have developed 700 horsepower in flight tests, and two Navy Curtiss racers, powered with Curtiss D-12 engines, that have shown 500 horsepower, comprise the team. These planes have been driven at speeds over four miles a minute.

A SERIES of exhaustive tests on the wearing quality of automobile tires made of reclaimed rubber is about to be begun by the Bureau of Standards for the purpose of discovering what proportion, if any, of reclaimed rubber may be used without reducing the wearing quality of the tire. Fifty motor truck tires made to order by manufacturers have been received at the bureau and will be used in these tests. The tires are made in four equal sectors, each of which will have equal wear. The proportion of reclaimed rubber to the total amount of rubber used is respectively zero, 10, 18 and 25 per cent. Forty of these tires are to be fitted to Post Office trucks and their wearing quality observed in road service. The other ten will be tested on the apparatus now in use at the bureau for that purpose and on new apparatus designed to approximate road conditions even more closely.

SUBTERRANEAN disturbances in Hawaii have caused the surface of the Lake of Living Fire of the Kilauea volcano to drop 600 feet below the rim, radio reports state.