

knowledge of the dryness or wetness of the summers.

When salmon are scarce along the Atlantic coast all sorts of theories are advanced to explain it, such as poaching, drift-netting, general over-fishing, failure to breed from the right fish, winds from the wrong quarter, some cataclysm in the ocean.

The scarcity is a matter of deep concern to many fishermen who depend to a greater or less extent upon catching and selling salmon as a source of livelihood, to many guides and hotels catering to the salmon anglers, and to the anglers themselves, who in New Brunswick alone pay the Provincial Government more than \$80,000 a year merely for the angling rights on certain rivers.

The Hudson's Bay Company has kept records of the furs it has taken from the Northwest for more than a hundred years and these show that such animals as the rabbit, the lynx, the marten, the fox and others, have been scarce on the average every 9.6 years. So is it with the partridge or ruffed grouse, in Ontario. Statistics of Canada's fisheries, which have been collected since Confederation, show that also the salmon of the Maritime provinces have been more or less scarce on the average every 9.6 years.

Twin Fingerprints

So alike are the finger and palm prints of so-called "identical" twins that Dr. John W. MacArthur, University of Toronto geneticist, told the Royal Society of Canada that this type of twinning can be correctly diagnosed 4 times out of 5 from finger and palm prints alone without comparing faces. Left and right hands of the same person average about 27 per cent. unlike in twins as well as single born, using a new method devised by Prof. MacArthur. Matching left hand with left and right with right, pairs of identical twins differ by only 19 per cent. in their patterns, lines and ridges. Ordinary brothers and sisters and fraternal twins differ by 38 per cent.

Only Thunderheads Electrified

Only thunderheads, technically known as clouds of the cumulonimbus type, contain localized electric charges, Dr. D. C. Rose of the Canadian National Research Council told the meeting. Airplane flights among the clouds, during which delicate potential gradient and conductivity measurements were made, furnished this proof of the non-electrical character of ordinary clouds.

Living Fossil Hates Heat

A "living fossil" insect that thrives at a temperature a few degrees above freezing and is overcome with the heat in the palm of a human hand was described by Dr. E. M. Walker, professor of biology of the University of Toronto, in his presidential address to the biological section. This primitive creature, which evolution has passed by, is found at heights of over a mile in Canadian Rocky Mountains among moss, decaying logs and rocks near glacial bogs.

A slender, light amber-colored, wingless insect, $\frac{3}{4}$ inch when full grown, its name is *Grylloblatta*, after *Gryllus*, the cricket, and *Blatta*, the cockroach. It is a link between these two common groups of insects.

So slow are its life processes in its cold surroundings that instead of taking a few weeks to develop and a year to pass through a life cycle, as do most insects, its growth from egg to adult requires about five years and the period from one generation to another is no less than seven years.

To carry some of these insects to Toronto it was necessary to pack them in ice-cooled containers.

Poison Weeds

There is a chance that practical weed control under field conditions may be achieved by use of relatively small doses of plant poison, it was reported to the Royal Society of Canada by Dr. W. H. Cook of the Canadian National Research Council. Unwanted plants are often reduced to half their usual size by a chemical dose only one-tenth that required to kill them.

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POPULATION

Japan Will Double Numbers While Europeans Decrease

PRESENT-DAY struggles of single European nations to stamp their own culture on the world seem peculiarly futile and pathetic when viewed in the light of certain figures now published for the first time in an American publication by Princeton University and the Population Association of America.

Will the world of future years be one peopled by the nations of the East?

This is the question that can be read between the lines of those marshalled rows of figures in the Population Index. Japan, although losing a grievous number of infants in extremely high infant mortality, is growing at a rate so

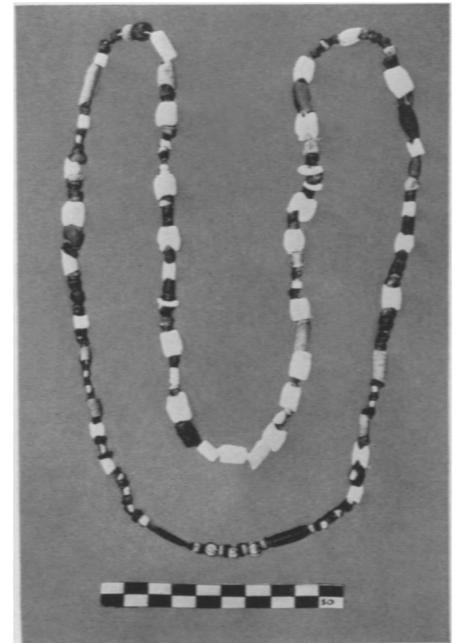
high that it is not comparable with that of either the Northern European nations or North America.

Although the girl child is not so important as her brother in some civilizations, she is the one who counts most in the calculations of the vital statistician. It is the number of daughters born to the women of proper age for motherhood that eventually determines (along with death rates) how many of their kind shall walk the earth. So figures of total population increase or decrease do not interest statisticians so much as those more significant ones showing how many daughters may be expected to be born and grow to child-bearing age for each woman now living and at a reproductive age.

In the United States, births of daughters are not numerous enough to insure replacement of one generation by the next. In Japan, the reproduction rate is high enough to double the population in each succeeding generation. France, in the depression year 1933, lacked 18 per cent. of enough births to insure replacement. England lacked 27 per cent., Germany 30 per cent. and Austria 33 per cent.

The hand that rocks the cradle appears to be working out a new destiny for the future of the world.

Science News Letter, June 5, 1937



WEALTH OF THE ANCIENTS

This necklace on which are strung beads some of which are of gold was an adornment worn in the Stone Age.



AT OLDEST CITY

In new low depths at Tepe Gawra has been found the oldest known closed pottery kiln with which the mysterious glaze of the Tepe Gawrian pottery is believed to have been achieved.

ARCHAEOLOGY

Strike 'Gold,' Music, Art In the World's Oldest City

Primitive Stone Age People Wore Golden Necklaces, Built Architectural Gems, Fired Painted Pottery

TEPE GAWRA, the world's oldest city, is proving one of the most fascinating places on earth.

From its depths this season, archaeologists have extracted news about civilization that amazes and thrills them. Discoveries reveal that earlier than anybody supposed, between 4500 and 4000 B. C., men and women were enjoying art and music, decking themselves out in gold jewelry, building temples worthy of being called architectural gems. They had what you might call culture, back in that mysterious time, even though they didn't know how to read and write and hadn't discovered how to melt up copper for good metal tools. They were Stone Age folk and illiterate, if you like, but they lived in a great age.

Americans may well take special interest in revelations from this city of the Tigris River Valley in old Mesopotamia, for it is being excavated down through its 22 layers of ruins by a joint expedition of the University Museum, University of Pennsylvania, and the American Schools of Oriental Research. Dr. E. A. Speiser, professor of Semitics of the University of Pennsylvania, is directing the expedition.

Digging into the twelfth to sixteenth levels of the city this season, Dr. Speiser expected to find himself among ruins of more and more primitive people, in the heart of the fifth millennium B. C. He was amazed to find what they knew.

Discoveries include:

1. Thousands of beads, including lapis

lazuli, and the oldest gold beads of known age. No worked gold of such known antiquity has been found before.

2. The earliest example of landscape painting ever found. This is on a large vase, shattered, but reconstructed by the archaeologists. Two panels on the vase show the great Tigris and Euphrates Rivers with hunters stalking wild beasts along the streams.

3. The oldest temples in group form known. These are architectural gems, and would be remarkable if built thousands of years later, Dr. Speiser declares. They include such architectural devices as piers and pilasters, typical of the Middle Ages.

4. The secret of how Tepe Gawra's interesting painted pottery was fired. This is revealed by a building with round shafts seven feet deep leading to a series of underground chambers. These chambers were closed kilns, and the shaft permitted indirect firing with perfectly controlled temperature. This is the oldest known example of a closed pottery kiln.

5. A figurine of a mother goddess, from the sixteenth level. This shows the sort of deity worshipped when man was emerging into civilization.

Science News Letter, June 5, 1937

ENGINEERING

Hints for Hot Weather Comfort in the Home

WITH summer less than a month away and hot weather imminent throughout a great part of the nation perspiring people are already thinking of ways to keep cool. In restaurants, motion picture theaters and a few office buildings you can get touches of air conditioning. But the great mass of the people who have not yet reached the higher salary brackets have little hope, just yet, of cooling their hot homes in summer in this fashion.

Yet in the great bulk of the country, and except for short, especially hot periods of the summer, a few sensible hints from the research laboratories of the University of Illinois can stay much discomfort.

The University has a special heating and cooling research home which is disclosing much knowledge of value in human comfort. Its construction is merely that of a well-built house such as many people can afford.

Here are the Illinois hints that you might try this summer.

Keep open as many windows as possible from 6 p. m. to 6 a. m. and keep



STONE AGE DEITY

A figurine of the "mother goddess" worshipped when man was only just emerging into civilization.

as many windows closed, as possible, during the other hours of the day.

In other words, let the cooler night air work for you during the hot daytime. Moreover, keep the attic door open during the night and the windows in the attic open so that the natural chimney thus created will help suck up the hot air in the lower levels of the house.

Have awnings on the windows on the three sunny sides of your house for extra comfort. If you actually had an air conditioning system in your home you would find that awnings so used would reduce the cooling load on the equipment by 20 or 30 percent.

Science News Letter, June 5, 1937

NUTRITION

Vitamin B Prevents Hair From Graying—In Rats

ONE more compelling, if unimportant, reason for eating plenty of vitamin B is that it may keep your hair from turning gray. This appears to be one implication of research reported by Drs. Agnes Fay Morgan, Bessie B. Cook and Helen G. Davison, of the University of California, at the meeting of the American Institute of Nutrition. The implication is not made by the scientists, who content themselves with reporting

observations of graying hair in rats deprived of one part of vitamin B.

Vitamin B is extremely complex. It has been split up into six or more vitamins, each with slightly different effects on the body. One of these protects against the severe nervous disease, beriberi. Another protects against the hard-times disease, pellagra. This part of the vitamin B complex, as it is now known, has been split again, one part of it protecting against the skin inflammation of pellagra.

A vitamin B preparation made from rice bran filtrate is concerned with graying of hair, at least for rats. Rats which did not get this "filtrate factor", as it is called, turned gray. Adequate doses of the filtrate factor prevented or cured the condition.

This filtrate factor is found in cornstarch, which is surprising because corn is supposed to be one of the causes of pellagra, Dr. Morgan points out, since it is found in the diets of most pellagra patients. The filtrate factor, however, is

not only found in cornstarch but has been thought to be the pellagra-preventing part of the vitamin and the same preparation has actually cured pellagra.

This filtrate factor, whatever its function will prove to be, cannot apparently be formed in the body but must be supplied in the diet. Two closely related vitamin B factors, however, can be formed in the rat's body when lactose or milk sugar forms a considerable part of the animal's diet.

Females Use Iron

Female rats make better use of iron in the diet than males, it appears from research reported at the same meeting by Dr. Mary S. Rose and Helen J. Hubbel of Teachers College, Columbia University. Rats made anemic by milk feeding were fed milk plus iron and copper until the hemoglobin content of their blood reached a certain level. Analysis at this point showed that the females had larger amounts of iron in their bodies than the males.

Science News Letter, June 5, 1937

PHYSICS

Transmutation of Elements Changes Chlorine Into Argon

A NEW transmutation of the elements in which the chlorine atoms in common table salt are changed first to potassium and then into the inert gas argon is reported by Princeton University scientists. The transmutation is one of the first achieved with the new cyclotron apparatus now in operation after a year's construction period. Ionized helium atoms are the bombarding source of energy which brings about the elemental change.

Prof. Henry D. Smyth, chairman of the physics department at Princeton, made announcement of the work by the four-man research team of Dr. Milton G. White, Drs. Malcolm C. and William J. Henderson and Dr. Louis N. Rideour.

The form of potassium created, indicated Prof. Smyth, lacks one neutron and exists for a brief interval. Its average life is 10.8 minutes.

A feature of the Princeton cyclotron is that it employs the heavy, electrically-charged helium atoms as bullets to bombard the element chosen as target.

Helium gas of the same kind which is used in inflating airships in the United

States is passed into a special vacuum chamber where it collides with a strong electron beam. In the collision the helium atoms lose their outer electrons and become helium ions.

These helium ions, known as alpha particles, are inserted into the intense magnetic field of the cyclotron at its center and go round and round in ever-widening circles for 100 revolutions. At each trip they are accelerated faster and faster by an electric field until they attain velocities of about 15,000 miles a second (about 1/10 the speed of light) just before they are shot at a target.

Bombarding atoms involves considerable chance for about 1,000,000 helium bullets must be driven at a chlorine atom before one hit is made.

The new form of potassium, created as an intermediate step in the chlorine-argon transmutation, is an isotope of natural potassium. In passing over by spontaneous disintegration into argon it liberates energy equivalent to 3,000,000 electron volts in the form of fast-moving positrons.

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