

EDWIN E. SLOSSON, EDITOR HOWARD D. WHEELER, MANAGER

SCIENCE SERVICE 1701 MASSACRUSETTS AVENUS THEOPHONE, MAIN 2615 WASHINGTON, D. C.

SCIENCE NEWS BULLETIN

No. 31

Edited by Watson Davis

October 31, 1921

INBREEDING MAY BRING OUT DESIRABLE TRAITS IN RAT AND MAN

(By Science Service)

Philadelphia, November .- The old question of whether inbreeding is harmful or beneficial has been put to a severe test by Dr. Helen Dean King of the Wistar Institute of Anatomy and Biology of the University of Pennsylvania, who has mated brother and sister albino rats for forty generations, a period that would correspond to 1300 years in the human race. Under such close and continuous inbreeding this race of rats has improved instead of degenerating. Dr. King attributes the success of this experiment to the soundness of the original stock and the careful selection of the best animals of each generation for breeding the next. The same principles would probably apply to the human race and she says:

"History teaches that the prejudice against consanguineous marriages that has persisted from the beginning of the Christian era until the present time did not exist among the early nations and that such marriages were common for many centuries among the early Greeks, Phoenicians, Jews, Peruvians and Egyptians. One of the longest of known human pedigrees, that of the royal Ptolemies of Egypt, was noted for its close inbreeding, brother and sister marriages being very frequent. There is no evidence that the marriage of near kin was injurious to any of these early races. The decline of the Greeks and of the Egyptians came when they ceased to be an exclusive people and the strength and vigor of the race were sapped by vices and luxuries introduced from other countries.

"In the present status of society there is little thought for the well being of the generations yet to come. Marriages are practically unrestricted; known transmittable defects in families are usually ignored; and the unfit are freely allowed to produce their kind and thus add to the increasing number of defective that are a burden and a menace to the race. Laws forbidding consanguineous marriages therefore are not only desirable but necessary, since there are comparatively few families that are known to be free from serious hereditary defects. Sometime in the future an enlightened people will appreciate the value of favorable human mutations and of combinations of genetic factors that produce exceptional ability, and will endeavor to implant them in the race through consanguineous marriages, just as the expert breeder of today takes advantage of the appearance of desirable traits and tries to fix them in his stock through the skilful use of inbreeding and selection. When the time comes that marriage is based not only on the physical fitness of the individuals but also on their recorded pedigree for several generations, and is absolutely forbidden to the unfit, the surest means of improving the race will be through consanguineous mar-Fitges in families in which the members show exceptional mental and physical adowment in ways that are of value to themselves and to the community at large. any of the ills to which man is a present subject, for example epilepsy, will then vanish. Superior and desirable traits will appear in an ever increasing number of individuals and in time become the heritage of the race."

"Mendelism has thrown a flood of light on many obscure problems in heredity and it has enabled us to interpret the varying results obtained in different series of inbreeding experiments. Investigations in this field have shown that,

under normal conditions of outbreeding, characters which are favorable for the species dominate in heredity those which are harmful. The genetic factors for the injurious characters persist in the germplasm from generation to generation, however, and bring out the latent, undesirable traits whenever conditions permit. Outbreeding, therefore, tends to hide defects but it does not eliminate them. Inbreeding invariably brings to light the latent characters existing in the species that were hidden by outcrossing; it can not, from its very nature, introduce any that are new. The constitution of individuals produced by inbreeding therefore depends upon the chance segregation and recombination of genetic forces already existing in the stock when the inbreeding was begun. Some of these individuals will exhibit characters which are undesirable or positively injurious; others will show a preponderance of favorable qualities. Random matings in such an inbreed stock will not suppress the undesirable traits. If, however, individuals possessing the unfavorable characters are discarded and only those with advantageous qualities allowed to breed, the undesirable traits eliminated through selection can not later reappear in the stock since the germplasm no longer continues the genetic factors on which these traits depend. Inbreeding, with selection, thus becomes a powerful agent to purify a stock - to bring about uniformity and a concentration of desirable qualities, and to eliminate serious defects and undesirable traits. It is through inbreeding, combined with selection, that the most celebrated breeds of cattle, of sheep, of trotting and race horses and of dogs have been evolved."

NEWS OF THE STARS

What is the Matter with the Moon?

By Isabel M. Lewis, of the U. S. Naval Observatory.

As a member of the solar system the moon is a rather insignificant body. It is surpassed in size by all of the planets and a number of the satellites of the outer planets. Yet like the small boy of the family it causes a lot of mischief. Ask the astronomer what member of the sun's family causes him the most trouble and he will reply undoubtedly "the moon". The greatest mathematical geniuses of the past and present, have wrestled with the problem of the moon's motion and have acknowledged defeat. The moon simply will not travel according to schedule. Tables have been constructed from time to time according to the Newtonian theory and predicted positions of the moon given to the highest degree of refinement. The latest and most valuable of these tables new in use by all the leading Almanac offices are the tables so admirably compiled by Prof. E. W. Brown, one of the leading mathematicians of the day. By including terms and corrections, as in the past, whose source is unknown the moon is fairly well harnessed for the time being but Prof. Brown has expressed the opinion that the moon's motion is not in accord with the theory and some unknown cause for its erratic behavior must be found.

An excellent test of the accuracy of the predicted places of the moon is obtained from total solar eclipses. The astronomer predicts from his lunar tables the time for the beginning and ending of the eclipse to tenths of a second of time but the moon delights in being six or eight or eighteen seconds aliead of mtime, - or late possibly, - an unpardonable error in the eyes of the astronomer. An error of several seconds of arc in the moon's position throws the path of totality on the earth several miles from its true position and because the astronomer does not trust the moon he locates his eclipse expeditions as nearly in the center of the predicted path as possible that he may not find himself bathed in sunlight at a time when he was anticipating total eclipse.

Theorists delight in advancing reasons for the erratic behavior of our the tollite. Frankly the cause is unknown. Some unknown law may be involved but the problem still awaits solution.

When two bodies in the solar system are at a considerable distance from one another or when one of the bodies is attended by satellites that are comparatively very small it is a fairly simple matter to predict accurately their relative positions for any time. This is what astronomers call the problem of the motions of two bodies. When a third body is introduced, however, comparatively large and near to one of the bodies as in the case of the earth and moon, the two form with the sun the complicated problem of the motion of three bodies and to follow the motion of three mutually disturbing bodies is a work for mathematical geniuses only. Such a problem is furmished by the moon and after solving this problem in a highly satisfactory manner, as has been done by Prof. Brown, the astronomers find that there is still something about the motion of the moon that does not conform to theory.

We might go through the entire list of speculations, perturbations by an unknown satellite, action of electromagnetic forces, resisting mediums, variable gravitational attraction etc. None has solved the problem and we are faced with the simple fact that the erratic behavior of fair Luna has not been accounted for up to the present time.

OLD FARMING THEORIES UPSET

(By Science Service)

Pullman, Washington, November .- Many of the old theories and actual practices in other sections are absolutely worthless in the "desert farming" areas of Washington, according to M. A. McCall and Henry F. Holtz in a recent Experiment Station bulletin. Even fall plowing, the best in "old Iowa", does not equal early spring plowing, nor does the much-talked of "dust blanket" of the Middle West find a place in this dry land agriculture. The problems are getting moisture and holding it; and under the climatic conditions in this section, the loose soil mulch which is desirable for holding moisture, is a poorer "sponge" than a comparatively firm soil.

The "dry belt" of the Pacific Northwest has been a stumbling block for many prospective farmers, so that those who are successful must produce their crops at a minimum cost. Usually the best results are secured with the least cultivation, so that the average hired man's method of plowing, that is as shallow as the plow will stay in the ground, is the popular and productive method for this type of agriculture because the most moisture is lost from a deep layer of loose soil. Experiments have proven the farm practice of disking instead of plowing to give equally as good yields in some sections.

Successful farming in such a climate requires a knowledge of local conditions and the proper application of economy and "dry farming" principles.

MAKE RUSTLESS AUTO BODIES OF NEW BRITISH STAINLESS IRON

(By Science Service)

A stainless iron, which is more expensive than brass because it contains carbon free chromium or ferrochromium, has been placed on the market by three British firms in bars and sheets, according to information from London. It is used for automobile wheels, hoods, and bodies, and as it does not corrode or tarnish, painting or varnishing is eliminated. Unlike stainless steel, the new non-corroding product contains less than one tenth of one per cent. carbon and can be forged, pressed or stamped.

DANISH SEND SHIP TO STUDY GEOGRAPHY OF OCEAN

(By Science Service)

Washington, November -- For ten months, the vessel "Dana", a former British mine sweeper purchased by the Danish government, will steam over the Atlantic and the scientists aboard, under the deep-sea explorer, Dr. Johannes Schmidt, will study the geography of the Atlantic, and particularly the natural history of the fresh -water eel.

3

HUMAN VOLUNTEERS PROVE HUMAN TICK TRANSMITS RELAPSING FEVER

(By Science Service)

Washington, November .- By human experimentation, the human tick has been proven to be the transmitting agent of relapsing fever in Panama, according to information received here.

Three human volunteers risked their lives by being infected with the fever after tests on white rats and monkeys had indicated that the ticks carried the relapsing fever spirochaetes from one animal to another.

In the experiments conducted by Lewis B. Bates, Lawrence H. Dunn, and Joe H. St. John of the Board of Health Laboratory and Ancon Hospital, in the Canal Zone, one volunteer had injected beneath his skin some blood from a white rat infected with relapsing fever. Into another of the patients was injected hypodennically a suspension of naturally infected ticks, while the other volunteer submitted to being bitten by naturally infected ticks. All of these men fell ill with the fever and, with the evidence provided by animal experimentation, this is considered conclusive proof that the human tick is the carrier of the germ of relapsing fever.

Relapsing fever has been known also as famine fever in the past as it often accompanies times of privation and famine. It is somewhat like typhoid, but it recurs and is intermittent, and this derives its name.

AMERICA'S INTEREST IN THE TRADE OF THE FAR EAST

(By Science Service)

One of the most serious questions that the coming conference on the Pacific Will have to deal with is the control of the tropical sources of raw materials, according to Dr. Isaiah Bowman, director of the American Geographical Society, and author of "The New World", a volume on the problems of political geography just issued.

"When it is realized how large a part tropical and subtropical products play in modern industrial and commercial life, it seems natural that it should be the policy of Great Britain, the largest trading empire in the world, to get as great a share as possible of the raw materials and trade resources of the Far East, and she has pursued this policy with marked singleness of purpose ever since she acquired the Suez Canal," he says. "To take a single instance, - throughher control of the free ports of Hongkong and Singapore she has made London one of the chief world markets for rubber, tea, spices, jute, guns and hides. With her huge war debt, trade control and development are matters of vital importance. She has the banking facilities and also the commercial experience of the past to increase production in new lands. In recent years the trade motive has also become a more active factor in Japan's foreign policy, especially in relation to eastern Asia. These two powers, as well as France, will seek to improve their financial and ocean transportation facilities in the Far East."

"In the past the United States has bought the products of the Far East chiefly through Great Britain, Japan, and Germany. Her annual purchases of Oriental products just before the World War exceeded \$200,000,000, and her exports were more than \$100,000,000. The largest single source of American trade in the Orient is Japan (total of nearly \$150,000,000 in 1913). The Straits Settlements come next, Singapore being a great port for the raw materials from the East Indian region - tin, hides, spices, rice, fish, tungsten, and rubber. Great Britain and Japan have maintained their trade advantages in the Far East, because they have their own ports there. Americans have been operating chiefly from Manila, which is not a free port. It now has large modern piers and extensive warchouses, and were it to become a free port it would have an enormous influence in developing the wealth of the Far East and the Philippines. In the past twenty years American trade with the Philippines, chiefly in hemp, sugar, vegetable oils, and tobacco, has risen to \$50,000,000 yearly."

-4-

(Editors: You will find these short paragraphs useful as a daily feature or as fillers.)

DO YOU KNOW THAT ---

The sun rises about half an hour earlier and sets about half an hour later on an average for the year at the top of the Woolworth Building in New York than at street level.

Oilfield fires are estimated to cause a loss of 1,500,000 barrels of oil in the United States annually.

Certain species of crane-fly, of the genus Trichocera, are commonly found in mines and sometimes at great depths.

A strong earthquake is sometimes, though not always, preceded by a few slight shocks, and it is invariably followed by numerous shocks of this character. The aftershocks sometimes continue for years. More than 3,000 aftershocks were registered by seismographs during the two years following the greatn Mino-Owari earthquake, in Japan, which occurred Oct. 28, 1891.

DO YOU KNOW THAT --

The highest atmospheric pressure to which divers and workers in caissons are subjected is about $4\frac{1}{2}$ atmospheres.

The ancient Romans practiced the artificial dwarfing of children, who were kept in a casting or frame to stunt their growth.

The wind-built hills of sand known as dunes, which grow to heights of from 5 to 40 feet along our Atlantic coast, attain much larger proportions in other parts of the world. Dunes 100 to 200 feet high are found in Bermuda and the Bahamas.

Fish that prey on mosquito larvae were used on a large scale in freeing the city of Guayaquil from yellow fever. They were placed in the thousands of receptacles in which the inhabitants keep their domestic water supply.

DO YOU KNOW THAT ---

The belief in brownies in England may be a survival from ancient times, when a small, dark race of aborigines inhabited the country.

American asphalt pavements consist chiefly of sand and pulverized limestone. The asphalt itself serves merely as a binder to hold the other materials together. In Europe asphalt pavements are generally made of asphaltic limestone, or "rock asphalt," consisting of limestone naturally mixed with asphalt.

and does not not only one and per and has not only one to app

A string of kites sent up by the Weather Bureau in mortheastern Oklahoma broke loose in a high wind and was subsequently found at a place in Kansas 150 miles away.

The "lime juice" once universally used by mariners to prevent scurvy came chiefly from the Mediterranean and, though partly derived from the sweet lime, was mainly obtained from lemons. When the juice of the sour lime, imported from the West Indies, was substituted by the British Navy it failed to have the desired effect, and thus lime juice fell into disrepute. DO YOU KNOW THAT --

Early in the 16th century wooden rails were laid in certain English collieries, over which a cart loaded with coal could be drawn by a horse. This was the crude beginning of railways. Later a strip of iron was laid on top of the rail, and about 1767 rails made entirely of iron were introduced.

The hottest marine' climate in the world is probably that of the Red Sea, in summer. On this sea the thermometer on board ship has been known to remain at 98 degrees Fahrenheit for three consecutive days and nights, and it occasionally reaches 105 in the shade.

The Belt of Orion is three degrees long. The distance across the top of the bowl of the Dipper is ten degrees. The full moon is half a degree in diameter. These facts will help in estimating angular distances in the heavens.

A list of more than a thousand books and articles on the Einstein theory of relativity has been compiled at the John Crerar Library, in Chicago.

DO YOU KNOW THAT ---

About two hundred different substances are made from petroleum.

Many observers have reported sounds, described as "swishing," "crackling," etc., accompanying displays of the aurora. Whether such sounds are real or imaginary or due to causes other than the aurora is an unsettled question.

Before Stephenson built his first high-speed locomotive, the famous "Rocket," in 1829, horses furnished the motive power on most railways. In some cases horses and locomotives were used on the same road.

An ancient example of "protective mimicry" is seen in the wings of fossil cockroaches of the Coal Age, which are strikingly like the leaflets of certain ferns that flourished at the same period. This resemblance undoubtedly aided the insects to conceal themselves among the fallen leaflets.

DO YOU KNOW THAT --

The average height of a full-grown human being, segardless of race, is 65 inches. The term "giant" is sometimes technically limited to individuals above 79 inches (200 centimetors).

Telephonic announcers are loud-speaking telephone receivers used for announcing trains in a railway station, paging people in a hotel, calling employees in a factory or store, advertising goods displayed in a store window, etc. As many as 100 of these instruments are sometimes operated from one transmitter, so that simultaneous announcements can be made in all parts of a big establishment.

A well in Wisconsin studied some years ago by Prof. F. H. King showed an abrupt rise of the water level whenever a train passed over a railway track 140 feet from the well. Slow and heavily loaded freight trains produced the most marked effect. Similar fluctuations of the water in wells commonly accompany earthquakes.

In the blue Gulf Stream water between the Azores and the Newfoundland Banks green layers have been observed to be due to the presence of a minute phosphorescent medusa.