

SCIENCE NEWS - LETTER

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No. 72

CLAIMS NATURE FASHIONS
ONLY STREAMLINE MODELS

Cleveland. That fish, birds, moths, snowdrifts, and boulders are all forced to take similar shapes by Wind & Water, nature's firm of magic tailors, who have decreed the streamline model for all bodies moving or immersed in a moving fluid, is claimed by Dr. Enoch Karrer of the Nela Research Laboratories here.

Seeking from a new point of view to answer the question of the relation between shape of a body and the natural forces acting upon it, Dr. Karrer has reached the conclusion that any deformable body moving in a fluid or immersed in a moving fluid will assume a shape that is as nearly as possible "streamline" -- which is a shape familiar to all persons who have seen illustrations of the Zeppelin airships. Finding his illustrations of the principle of streamline in geology, meteorology, physics and biology, he determined that the adjustment of the shape of a body was very similar to adjustments directed by light and by Gravity.

Two granite boulders lying 4,000 feet above sea level, atop a rather bare mountain in Australia, show by their long axis the shaping influence of prevailing winds, much as the shape of snowdrifts is influenced by the wind. The peculiar mushrooming of snow about tree trunks, it is declared, is due to the pressure over the surface of the round tree trunk of moving air. Snowdrifts on

the surface of the earth, it is shown, generally are streamline, and where obstructed by a fence or a house, such obstacles are moulded into the streamline contour.

According to Dr. Karrer's view any moving body of any shape immersed in a fluid is subjected to forces of restraint that diminish as the body has a shape approaching streamline. Familiar examples are found in birds, where not only the shape of the body, but the thickening of the front portion of the wing and the lay of the feathers are conspicuous examples of this influence. A striking verification is found in the hawkmoth which has elongated wings with thickened front edges, and the contour of the body is a true streamline. Though its wing surface is small in comparison with its body, this moth is one of the most powerful on the wing.

Dr. Karrer is inclined to believe that in the case of birds and fishes there is an adjustment for different conditions of living, and also that streamline contour will vary according to the different speeds of flight and of different relative speeds of current. In continuing the pursuit of facts from his new point of view, it is likely that Dr. Karrer will develop further interesting observations of the phenomenon which he has termed "stream adjustment".

WORD IN TIME MAY SAVE MENTAL GROWTH OF CHILD

Ithaca, N. Y. Stammering should be corrected in the school both for the good of the child afflicted and for the normal pupils who may through mimicry acquire this habit which impairs mental growth, according to Dr. Frederick Martin, of the Conservatory of Music here.

"By calmly waiting for a child to out-grow speech defects," he said, "these false habits of speech may be driven in deeper and spasmodic twitching of muscles may be brought about. When first noticing any stumbling, stuttering or hesitancy in recitations the teacher should gently check the child without attracting attention of other members of the class and lead him to a more confident, deliberate, and better articulated mode of expression, before fear and inhibition produce secondary disturbances of the entire mental mechanism."

CANADA HAS A
HELL ON EARTH

By Kirby Thomas, Mining Engineer

New York. There's a hell on earth up in the Canadian wilds reports a Canadian Government agent who has returned from Fort Norman on the Mackenzie River in far northern Canada.

He went there to investigate the new oil discoveries reported in the past few months, and found in many places enormous quantities of burning coal and shale. The air is full of the smell of sulphur and burning coal. At night along the river great cliffs of sizzling molten clay may be seen.

This sounds very Dantesque but its probability cannot be denied. It is well known that the fantastic and highly colored "bad lands" formations of South Dakota owe their origin and conditions to just such a happening. In fact some of the beds of coal in that region are still burning. Similar phenomena are known in other parts of the world.

Some may marvel that coal and oil are found so far north, even within the Arctic Circle, since coal, especially, is known to be derived from plant life which flourished in a tropical or mild climate. The coal beds of the Mackenzie River region, however, are several million years old although comparatively recent as the geological age of the earth is now generally accepted. At the time they were formed, and also much more recently, the climatic conditions of the earth were very different from now. It is not only conceivable, but certain, that tropical conditions, in the relatively recent geologic past, have existed at both the North and South polar regions.

As to how the fire started one can only surmise. It may have been from lightning, or most likely from spontaneous combustion such as takes place in the coal storage bins quite frequently. This little local "hell on earth" probably has been burning for countless thousands of years and it will continue until burned out or until the air can no longer reach the burning material to supply the necessary oxygen for combustion.

SCIENCE IGNORANT OF
BIGGEST LIVING THINGS

San Francisco.

Since Jonah obtained his alleged inside information or since the whale rejected that disagreeable prophet, there has been little study made of the feeding and other habits of the mammoth mammals of the sea. This is the plain inference from statements made in regard to these denizens of the deep by Dr. Barton W. Evermann, Director of the Museum of the California Academy of Sciences, in a recent statement prepared for the coming Commercial Congress of the Pan-Pacific Union.

According to Dr. Evermann, the reported recent finding of a 10-foot shark and 3000 pounds of sardines in the stomach of a sperm whale emphasizes the fact of how little is known of the preferred menu of these ocean-going animals, and their relation to the fisheries.

Sardine fishermen of Monterey Bay, as well as those of Norway, he says, claim that whales herd the sardines inshore and are therefore beneficial to the sardine fishery. They object to the killing of these pelagic voyagers, for that reason.

Not only that, but naturalists do not even know what species occur on the Pacific Coast of North America. The Sei or Japanese sardine whale, unknown to the scientific world until found in Japanese waters, in 1912, was taken off our coast in great numbers in 1918, the first year ever identified here.

The whales and other mammals of the sea should be investigated by the Committee on Conservation of Marine Life of the Committee on Pacific Investigations of the Division of Foreign Relations of the National Research Council, Dr. Evermann believes. Following these investigations, treaties should be entered into between this and other countries for the protection of the largest creatures of the largest sea.

(A Chat on Science)

EVOLUTION WORKING BACKWARD

By Dr. Edwin E. Slosson

Once farmers planted the nubbins of their corn and the potatoes that were too small to sell. Now they know better. They cut up their finest potatoes to plant, and every grain of their seed corn is pedigreed as carefully as a Colonial Dame. The result is seen in the doubled yield in potatoes richer in starch and corn richer in protein. Modern agriculture is fertilized by science.

The most backward branch of biology is the infant science of sociology. It is only just beginning to get its eyes open, to see things; in time, perhaps it will be able to do things, like the older sciences. But there is need of haste. The age of instinct is passing, the reign of reason has not come. Man has been pushed up to his present position. He has succeeded in slackening the pressure. Will he go forward rationally, of his own free will, or sink back until again he falls under the sway of the blind and merciless forces of the struggle for existence?

A decrease in the birthrate is not necessarily a misfortune to a country. Very likely, for instance, the British Isles have now all the population they can support in comfort under present economic conditions. The alarming thing about it is that the breeding is from the poorest stock instead of the best. Whatever objective standard one may take this is true. A statistical study of the population of Great Britain showed that in the districts where there was the most overcrowding, the cheapest type of labor, the lowest degree of culture and education, the highest percentage of pauperism and lunacy, the greatest criminality and the highest death rate from tuberculosis and infantile diseases, there the number of children were greatest in proportion to the possibly productive

wives. It is a clear case of the survival of the unfittest, the reversal of evolution. No race can maintain its efficiency and virility against such reactive forces.

The future of a country depends ultimately upon the character and ability of its people. Increase of wealth, advance of science, improvement in education, discoveries in sanitation, juster social conditions, all the achievements and hopes of the present age will be of little benefit to posterity if there is a decline in the native quality of the race. It would be disastrous to hand over a more perfect and complicated governmental machine to inferior engineers. One-seventh of the present generation will be the parents of one-half of the next. Therefore, two generations of selection, natural or designed, would completely transform the character of a nation. Is this seventh composed of the best men and women that we have?

This is what is going to determine whether civilization shall advance or retrograde. Galton's ideal of eugenics may be too much in advance of the age to be practical, but at least something could be done to awaken the people to the imminent dangers of dysgenics.

LIGHT WILL CONTROL CHEMICAL PROCESSES

Pittsburgh. Light will automatically control many intricate chemical processes in the future, says Lloyd Logan of Mellon Institute.

Through the use of light-sensitive cells, deviations from the desired constitution of a product will be shown in the color, reflective power, intensity, or other properties of its light emitted at a given temperature. The changes in the optical character of the substance undergoing treatment can be determined and by suitable relays and valves the character of the product can be corrected when deviations occur.

DEPORT FOREIGN DEFECTIVES URGES EUGENICS OFFICIAL

Cold Springs Harbor, N. Y.- Eugenically undesirable immigrants should be deported before damage is done to our own human stock, says Dr. Harry H. Laughlin, assistant director, Department of Genetics, of the Carnegie Institution of Washington, in urging improvement in the United States deportation service, and more extensive repatriation of alien defectives.

"A survey of 460 State institutions with a total of 210,835 inmates, completed recently by the Committee on Immigration and Naturalization of the House of Representatives," he points out, "found 21.14 percent of this fifth of a million inmates to be of foreign birth, and 44.09 percent either of foreign birth or having at least one parent of foreign birth. Thus, in our institutional management, we can ascribe at least one third of the total expenditures to the foreign stock which has arrived in the United States within this generation. If the states on the average spend 21 per cent of their total revenues for maintaining inadequates, about 7 per cent of the total revenue is spent in caring for degenerate and dependent foreign human stock."

BIBLE TEACHES EVOLUTION WHICH OUTDOES DARWINISM

Washington. "Bryan ought to attack Darwin as a hidebound reactionary whose notions regarding the slow rate of modification of species seriously challenges the truth of evolution as taught by the Bible," says Charles V. Piper, agrostologist of the U. S. Department of Agriculture.

No serious scientific man will admit that human evolution has proceeded as

rapidly as the story of Genesis necessarily supports, he declares. Chronologists figure that according to this story the creation of man took place about 4004 B.C. Acceptance of such a date carries the implication that all existing types of man, - white, red, yellow, ^{brown and} black, - Japanese, Malay and Negrito have all descended from Adam and Eve, in that time. It matters not what anthropological characters may be assumed for Adam and Eve, the diversity of their supposed progeny illustrates what the biologist means by evolution.

NEWS OF THE STARS

New Nebulae and Nova Discovered

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

Approximately 2,000 new nebulae have recently been discovered by Donald H. Menzel on ninety photographs taken with the 24-inch Bruce telescope at the southern station of the Harvard College Observatory at Arequipa, Peru, according to a statement from the Harvard College Observatory.

Of the eight hundred brightest of these nebulae it is believed that about thirty-five per cent. are spirals which are by far the most numerous of all the varied types of nebulae. Some years ago Prof. Keeler working with Crossley reflector of the Lick Observatory estimated that there were about 120,000 spirals within the reach of this instrument and it is believed that fully five times this number are within reach of the great reflectors of the Mt. Wilson Observatory. The total number of nebulae now recorded and catalogued is about 20,000 and one-fourth of this number have been found at the Harvard Observatory on photographs taken with the Bruce telescope with exposures of from one to five hours. The station of the Harvard College Observatory at Arequipa was established for the

purpose of obtaining photographic surveys of the southern heavens and classifying objects that cannot be observed from northern observatories. Most of the newly discovered spirals lie within 45 degrees of the south pole of the heavens, and so are below the horizon in our latitudes.

The distribution of spiral nebulae in the heavens is most remarkable for they apparently avoid the plane of the Milky Way toward which the majority of all other celestial objects tend to crowd and are receding at high velocities in the directions of its poles. The distances of the spirals are unknown but they are the most rapidly moving of all celestial objects and it is generally believed that they are at distances of hundreds of thousands if not millions of light years from the earth. Their velocities through space average about 480 miles per second. Their origin and nature is still one of the mysteries of modern astronomy. An analysis of their light shows it to be such as would be emitted by a cloud of stars with intermingled nebulosity and spirals viewed edgewise are almost invariably surrounded by a band of dark absorbing matter cutting off the light from the enclosed nebula. There are some excellent reasons for believing that the spirals are systems of stars or "island universes", as the term is, that are at enormous distances from the earth.

In addition to the recent discovery of new nebulae at Arequipa another nova has just been discovered at the same station by Miss Annie J. Cannon in the constellation of Scorpio. Many novae have been discovered by Miss Cannon and Miss Woods on Harvard plates in recent years. Miss Cannon sailed for the Arequipa station this spring to take up the study of photographic plates of the southern heavens that have been taken at this branch of the Harvard College Observatory in Peru.

AGRICULTURAL NEWS OF THE WEEKPREDICT FUTURE EFFECT
OF FARM FERTILIZERS

Kingston, R. I.

By carefully studying records of experiments which have been carried on for the past twenty-five years, Dr. Paul S. Burgess of the Agricultural Experiment Station of the Rhode Island State College has been able to foretell the difficulties which may arise from the use of fertilizers and to advise how such troubles can be avoided.

According to this authority, there is no foundation for the statement that soils will become more acid from the continuous use of acid phosphate. Of the nitrate bearing mixtures, ground starfish and nitrate of soda reduce soil acidity while other carriers of nitrogen, such as sulphate of ammonia, increase acidity.

All the mixtures supplying potash tend to reduce soil acidity. The non-leguminous green manure crops, such as rye, decrease it, while leguminous green manure crops, such as clover, increase it.

Knowing these tendencies the farmer can mix his fertilizers so as to maintain the soil in the desired condition of acidity or alkalinity while furnishing just the amounts of the various plant food elements needed.

CERAMIC MEN INVADE CANADA
ON EXCURSION MEETING

Rochester, N. Y.

- Engineers and managers of ceramic plants in America, with their families, are taking a week's excursion through Canada and visiting many of the pottery, glass and brick manufactories near Montreal, Ottawa, and Toronto. This combined meeting and trip is being engineered by the American Ceramic Society.

GREAT STORM DISASTER
NOT PROBABLE HERE

Washington. Existence of the typhoon which snuffed out the lives of tens of thousands of Chinese in and around the port of Swatow, 250 miles from Hongkong, was known in this country long before it struck that unfortunate city. Officials of the U. S. Weather Bureau claim that a similar disaster from some of our equally severe Gulf and Caribbean Sea hurricanes is unthinkable because people here are better prepared to meet such an emergency.

Superior forecasting facilities and more intelligent warning cooperation, it is claimed, would enable those living in the low lands to gain higher ground before the great wall of water could engulf them. Many of the hurricanes which strike our southern coast are predicted several days in advance.

Warnings of the recent Chinese storm were probably forwarded by the Philippine Weather Service to Hongkong fully a day before the typhoon reached Swatow, it is believed.

NEW TYPE OF AIRCRAFT
BREAKS INTO MUSEUM

Washington. While inventors in Washington, Chicago, and Dayton, are working in secrecy to construct a practical helicopter, D. E. Garber, airplane expert of the division of mechanical technology of the Smithsonian Institution, is making a model of the first promising design of this type of vertically rising aircraft.

This model, soon to be added to the National Museum, is being built after the design of Sir John Cayley, the Englishman who is regarded as the father of modern aeronautical science. Mr. Garber says that this design made in 1843 was astonish-

ingly sound in principle, although the body of the Cayley machine was fancifully fashioned after that of a bird with a birdhead carved on the prow. Vertical lift was to be obtained by two wind-mill like propellers which were to act as a sustaining plane when the machine was driven horizontally by another propeller situated at the rear. Equilibrium was obtained in much the same way as the most successful of the recent European helicopters.

Sir John Cayley showed in his writings, however, that he realized that aerial navigation depended upon new material and power such as has been found in aluminum and gasoline

EDITORIAL

A WEATHER VICTORY

The dead number 50,000 and the homeless 100,000 in China's latest war with nature. This decisive victory of the elements is recorded but briefly in the daily press. In spite of the few seconds necessary for a wirelessly bulletin to travel here, the disaster is so far away geographically and racially that strike-ridden America has little time to think about it.

In a more advanced country, where internal strife has not upset the normal protective forces of applied science, a typhoon would be predicted and avoided with little loss of life. The floods and storms along our Gulf Coast are no less severe than the storm that has reduced China's population slightly. Though Galveston suffered from its flood, the life loss was comparatively low. The approach of dangerous weather would be predicted at least a day in advance by meteorological scouts of the Weather Bureau. Radio, newspaper, flag warnings, and couriers via auto, bicycle, horse and foot, would spread the warning. The people would have sufficient perception to realize the danger and guard themselves against it. If an exodus from the city were necessary, railroads, trolleys, automobiles, horse and wagon would provide the necessary transportation.

Little is known about the recent Chinese storm. Weather Bureau officials believe that the Swatow typhoon was predicted by the Philippine meteorological service and perhaps a warning was sent to China. But even in the intensely practical applications of science that are accepted with hardly a "thank you" here in America, China lags behind.

DO YOU KNOW THAT -

U. S. airplanes equipped with radio are making photo reconnaissances of sections of the Philippines where head hunting was formerly practiced by the natives.

The common house centipede destroys house flies in considerable numbers.

Galalith, a product resembling celluloid but made from sour milk, can be moulded, carved, and polished and made into innumerable small articles like buttons, buckles and ornaments of all kinds.

The obnoxious weed, the prickly pear, already covers 5,000,000 acres of land in New South Wales and is spreading at the rate of 20,000 acres a month.

DO YOU KNOW THAT -

The ruddy kingfisher, a bird native of Borneo, makes its nest in the hive of a peculiarly vicious kind of bee.

Enough dairy butter is consumed in the United States to provide each person each year with 18 pounds.

If all the ductless glands which control the growth and working of the human body were rolled together they would form a parcel small enough to fit in the vest pocket.

Aerial time tables giving prices and time of all European^{air} lines have been published in Germany.

DO YOU KNOW THAT -

The cuckoo lays its own eggs in other bird's nests and has its young reared without trouble to itself.

Brazil's jungles are being combed by British, Italian, Swedish, and Norwegian interests in search of the babassu and other oil bearing nuts which have lately been recognized as important sources of edible oils.

Chaotic conditions in western Ireland have increased the difficulty of forecasting the weather for the British Isles as important observatories for detecting the cyclonic disturbances from the Atlantic are located in that disturbed area.

Biologists believe that the ancestors of modern whales had hair like other mammals.

DO YOU KNOW THAT -

A barrel of pitch can be emptied by allowing it to flow very slowly from a small hole. At any time during the flow a sharp hammer blow will shatter into fragments the stream of flowing pitch.

Evaporated milk will whip, but it is not useful for whipping purposes because the whip will not stand up.

The Japanese government plans to link up the various islands of the Empire by wireless telephone and telegraph.

A postal engineer to improve the mail service in New York City is provided by a bill introduced into Congress.

DO YOU KNOW THAT -

A lake where one may get a bath at any temperature desired by simply swimming a few strokes is located in the Valley of Ten Thousand Smokes in Alaska.

The latest compound microscope contains all the main features of the microscope constructed by Robert Hook in 1665.

Chief causes of ill-health in northern South America are not tropical diseases, but respiratory and rheumatic affections.

The Missouri Botanical Garden contains a rare white variety of red bud.

DO YOU KNOW THAT -

The shark-sucker, a defenceless and retiring fish, takes shelter in the mouth of the savage and voracious shark -- but it is not harmed by the shark.

Moist soap rubbed on the puncture from a mosquito bite will cause the irritation to pass away.

The League of Nations conducts an international epidemiologic information service which has been keeping the different governments informed as to the status of typhus, intermittent fever, and cholera epidemics which have been sweeping westward out of the famine regions of Russia.

Frost and heavy rains have cut in half the normal crop of boarding house prunes of Agen district in France.

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FRAGMENTS OF SCIENCE

It is found that the period during which tree growth takes place even in equable climates with indeterminate seasons does not extend over more than two or three months, and that growth is not rythmical in any sense, but depends upon food-supply, temperature, moisture and other environmental conditions. Awakening of buds, formation of leaves and flowers, and elongation of branches may occur many days or even weeks before trunks begin to enlarge. The leaves of a beech tree in Baltimore began to unfold April 10, 1919, and enlargement of the trunk began about May 18. Daily equalizing variations by which a tree may be actually smaller in mid-afternoon than at sunrise are greatest in the ash, pine, spruce, fir and walnut, and least in poplars, sycamore, beech and oak trees. Accurate measurements of the changes in trunks internal to the growing layer show that these variations are directly connected with the mechanism of the ascent of sap and are explainable upon the assumption of a rigid water column in a trunk composed of wood-cells and vessels capable of some shrinkage and expansion. Crudely expressed, the trunk behaves like a heavy hose feeding from a pressure system to a fire engine. When the engine tends to take water faster than supplied, the hose tends to collapse; when the engine slackens its action, the hose swells. - D. T. MacDougal.