

# THE SCIENCE NEWS-LETTER

*A Weekly Summary of Current Science*

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Dr. Edwin E. Slosson

CHATS ON SCIENCE  
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## THE FIGHT AGAINST THE POTATO

What would we do without the potato? None is so poor that he can not afford to eat it. None is so rich that he afford to disdain it. If all the potato plants of Europe should suddenly perish and prove irreplaceable a large part of the population would have to starve or emigrate.

Yet the people fought the potato as though it were the plague when it was first introduced into Europe. They were used to the plague and regarded it as proper punishment for their sins but the potato, coming from the wild west of America, was new and therefore to be feared.

Sir Francis Drake is supposed to have brought the potato to England in 1586, having perhaps taken the tubers, in the course of one of his privateering cruises, from some Spanish vessel, together with other less valuable booty, such as gold and gems. Anyhow, he is credited with it by the Germans who erected a monument in his honor at Offenburg in 1854 and struck off a medal to the British admiral as the savior of Germany in 1916 when a big potato crop enabled them to hold out another year.

But such honors always come by slow freight. It took people a hundred years or more to learn that potatoes were good for them to eat. They fed them to their pigs and cattle which, not having the prejudices of rational men, took to them readily.

The Germans also fed their prisoners of war on potatoes and it happened that one of them was a French chemist, Parmentier, who, having been captured in 1758, was held a prisoner in Hanover for five years and had to live largely on potatoes. One would have thought he would have acquired a distaste for them but on the contrary when he was released he urged his countrymen to cultivate the potato as a vegetable "that in Times of Necessity can be substituted for Ordinary Food". But the French, even though starving, would not eat potatoes until finally Parmentier persuaded the king and queen to taste some and wear a bouquet of the blossoms. The people, seeing that the king and queen were not poisoned, consented to sample them for themselves.

In 1728 an attempt was made to introduce potatoes into Scotland, but they were denounced from the pulpit on two contradictory counts; that they were not



mentioned in the Bible and so not fit food for Christians, and that they were the forbidden fruit, the cause of Adam's fall. They were accused of causing leprosy and fever.

In England the effort of the Royal Society to promote the cultivation of the potato was suspected to be a conspiracy of capitalists to oppress the poor. The labor leader, William Corbett, said, "It has become of late the fashion to extol the virtues of potatoes as it has been to admire the writings of Milton and Shakespeare", and he declared the workmen ought not to be induced to live on such cattle food.

When the British army was sent to fight in Flanders - not in 1914 but a hundred years before - they acquired two shocking habits. They learned to swear terribly and they learned to eat potatoes. The monks of Bruges had introduced their cultivation by compelling their tenants to pay part of their dues in potatoes. The farmers, seeing that the monks thrived on them, began to save some of the crop for their own use.

In Germany our own Benjamin Thompson, having become Count Rumford in Bavaria, undertook to clean the beggars out of Munich. When he had rounded them up he had to feed them and being a student of dietetics he decided that potato soup was the cheapest and most nutritious food he would find. But he had to smuggle the potatoes into the kitchen secretly, otherwise he would have had a hunger strike in the poorhouse.

And so, thanks to the initiative of scientists, kings and monks, and to the involuntary assistance of pigs, prisoners and paupers, the world got the inestimable benefit of potatoes.

I wonder what we are fighting today as wrong-headedly and vainly as potatoes were fought by our forefathers.

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#### PROPOSE FAR REACHING REFORM TO MAKE " SIZE" MEAN SOMETHING

Everything from needles and frying pans, fountain pens, and desk tops, to fence wire and tent canvas is provided for in a proposed uniform system of indicating sizes by a geometrical series of numbers, being investigated by the American Engineering Standards Committee. F. J. Schlink, assistant secretary of the Committee, declared that this is the most far reaching and fundamental development ever presented to his organization for study.

Sizes of many articles in use today, he said, are based on chance or outworn tradition. Nail sizes, for instance, actually originated in the cost expressed in English pence, of 100 nails back in days when nails were made by hand smithing, at a cost having no relation whatever to prices now current.



According to the proposed plan, the size of the article would be based on some property or dimension bearing definitely on its serviceability. Nails should probably be sized by driving strength, which takes into consideration length and wire diameter together, while the sizes of fountain pen barrels would be based on actual ink capacity.

The chief feature of the system, however, is that each standard size is larger than the preceding size, not by a definite addition, but by a fixed percentage.

For instance, in the case of shoes, a given size instead of being  $\frac{1}{3}$  inch longer than the preceding size would be a certain constant percentage longer. It is not the  $\frac{1}{6}$  inch by which a shoe is too short or too narrow which makes it pinch, but the relation which that deficiency in length or width bears to the actual size of the foot being fitted. In large shoes,  $\frac{1}{6}$  inch may be a satisfactory interval for comfortable fitting; while in a small shoe, say for a child's foot,  $\frac{1}{6}$  inch above or below the proper size might be tolerable. This difference in length between the various sizes should not be constant all the way from the child's 4 inch shoe to the No. 12 adults shoe which is 12 inches long, but should vary with the size; for most commodities a constant percentage increase over the preceding size will best serve the purpose. It is the homely idea of the inch on the end of one's nose, which is universally recognized as a bit awkward, though the same inch would be quite harmless when applied to larger objects.

Whatever the unit of measurement used in the different articles, all sizes of any given commodity would differ in a uniform and fixed proportion which would be represented by a series of numbers, say 10, 16, 25, 40, 64, 100, (each 60% greater than the preceding). By a simple shift of the decimal point a new series, 1.0, 1.6, 2.5, 4.0, 6.4, 10.0, may be obtained, or again 100, 160, 250, 400, 640, 1000, providing for the very smallest or the very largest sizes for which there is any possible use. A freight car of 64,000 pounds capacity, or fence wire 64 thousandths of an inch in diameter would thus alike be preferred number sizes. The series can start with any number and continue to the largest needed stock size, with additional intermediate numbers inserted according to a definite scheme, when needed.

The ease in designating a size, which such a system affords, may favor the general commercial use of uniform sizes for uniform purposes, with the enormous economies in manufacture and distribution which would result.

Preferred numbers is not an entirely new theory, but merely the expression in terms of a general law of the principles that have been worked out in long practice in some of our products that are the most highly developed from a scientific and engineering point of view. The diameters of electric wires, the wattage of electric lamps, the horsepower of certain types of electric motors and steam engines, the sizes of stay wires for airplanes, the sizes of druggists bottles, and even the vibration frequency or "wave lengths" of the tones of the musical scale, already fit the preferred number series quite closely.

The War Department has requested the cooperation of the American Engineering Standards Committee in working out a preferred numbers system on a national basis so as to simplify design and production of war material. In making this request the War Department says: "It is, therefore, of the greatest importance that the design of ordnance, which in time of war must all be manufactured in industrial plants, should be simplified as far as practicable and that it be standardized



with industrial products. It would be a great step in the simplification of design if a system of preferred numbers were used, and it would be highly advantageous to the Department if the different industries interested would combine through your committee in using the same fundamental system."

The principal usefulness of such a system will be for new standardization work, and revision of old standards when they come up for review, said Mr. Schlink. The American Engineering Standards Committee is studying the plan to see how well it fits existing conditions, and whether it should be recommended for use in the work of the numerous technical committees developing standardization projects. It has already found acceptance in Germany and France and is being carefully considered in a number of other European industrial countries.

#### SCIENTISTS HEAD FOR WILDS TO HUNT ANCIENT RELICS

Scientists are scattering to the wild and waste places of this hemisphere in their annual intensive attempts to wrest from Nature additional secrets of the past. Archaeological, ethnological, biological, and geological expeditions are daily leaving here to take the field in lonely canyons and wide places of our own West and unsettled regions of Canada, South and Central America.

Dr. Charles D. Walcott, secretary of the Smithsonian Institution, and Mrs. Walcott are just leaving for British Columbia where they will hit the trail. He will study the rocks of the Rockies and read the stories written in fossils; she will paint the wild flowers and measure the melting of the glaciers.

C. W. Gilmore, Smithsonian paleontologist, has already begun to dig up gigantic fossil reptiles found near Jensen, Utah.

Sylvanus G. Morley, of the Carnegie Institution of Washington, is continuing his reconnaissance of the wilds of Yucatan and Guatemala, in his effort to locate further remains of the Maya, said to have been the most highly developed of America's ancient people.

Dr. J. Walter Fewkes, chief of the U. S. Bureau of American Ethnology, has just gone to the Cumberland Valley, Tenn., to inspect excavations being made in Indian mounds there by W. R. Myer, archaeologist. From there he will go to Colorado, Utah, and New Mexico, for further investigation of the abandoned apartment houses of the cliff-dwellers who once lived there.

Neil M. Judd, archaeologist in charge of the National Geographic Society's explorations in Chaco Canyon, N. M., has already resumed work on Pueblo Bonito, one of the largest of the prehistoric Indian community dwellings.

M. W. Sterling, ethnologist of the U. S. National Museum, is preparing to leave for Mobridge, S. Dak., from which place he will proceed to another ancient Indian village site where skeletons, implements, and other relics of an extinct people have been found.

To get information about the manners, customs, and languages of living, but rapidly disappearing Indian tribes a number of investigators are leaving for sections more or less remote from civilization.



Dr. Truman Michelson, ethnologist, left this week for Labrador to study remnants of the Algonquin Indians on the southeastern portion of that peninsula. J. N. B. Hewitt will visit Wisconsin, New York State and Ottawa, Canada, to conduct studies among the Iriquois and other Indians and Francis LaFlesche will study the material culture of the Osage Indians of Oklahoma.

Animals as well as men of the past and present are also the subject of exploration. C. R. W. Aschemeier, of the U. S. National Museum, has left for the Amazon to collect exhibit specimens, especially of the porpoises living in South American rivers and believed to be closely related to the sea-going species familiar to ocean travelers. While Arthur deC. Sowerby, under the direction of Robert S. Clark, and Charles M. Hoy are now in troubled China hunting big game and other mammals for the government collections.

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#### MUSICAL ABILITY INHERITED ACCORDING TO DEFINITE LAW

Musical talent descends from parents to children in accordance with the known laws of heredity, according to the conclusions of two German scientists just reported to the American Medical Association by its Berlin correspondent. Professors Haecker and Ziehen of the University of Halle made an investigation for musical ability into the family histories of several thousand persons where one parent is musical and the other is not.

Boys are more musical than girls, they found, especially if their mothers had musical talent. The inheritance in that case seemed to go to the opposite sex, the girls of the family having no especial ability in music. Where both parents are musical the trait follows the regular laws of heredity and 40 per cent. of the offspring have talent, 40 per cent. are somewhat musical, and 20 per cent. have little or no musical ability.

Children with marked inherited ability frequently exhibit it before the end of their second year, the report states. As might be expected, musical talent is usually discovered earlier if the parents are musical. Children of such parents can frequently sing correctly before they can talk.

Indicating that musical ability may develop in the absence of musical training in childhood, the cases of 46 composers cited, 13 of whom had no opportunity to hear good music in their younger days.

Studying the relation between musical and other talents the investigators found that a gift for music is likely to mean the absence of a taste for mathematics, but to indicate in many cases a gift for drawing and for poetry.

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READING REFERENCES- Seashore, Carl E. The psychology of musical talent. Boston, New York. Silver, Burdett and Company, 1919. Bateson, William. Heredity. In Smithsonian Institution, Annual Report 1915. Washington, 1916.  
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## CAMELS ONCE ROAMED ARID AMERICA

Camels, the modern symbol of aridity, roamed over the site of our nation's capital hundreds of thousands of years ago, according to Dr. J. W. Gidley, vertebrate paleontologist of the U. S. National Museum. Fossil remains of these animals have been found widely distributed throughout western America and while apparently not so numerous in the East, he said, they seem to have been especially plentiful in what is now Florida and probably ranged all along the Atlantic coastal plain to well above Washington.

The structure of the body shown by the fossil bones of these native American camels indicates that they may have been able to go for a long time without a drink, like the modern ships of the desert. They also had pads on their feet adapted to travel over deserts or beaches, although this continent was probably not as dry then as now, Dr. Gidley said.

Three distinct types of camel have been found in North America, he explained. One appears to have been a relative of the camels living in the Old World today; another species was kin to the llamas now found in South America; while a third extinct kind was much larger than the other two and looked more like, although it was not related to, the modern giraffe than the camel as we know it.

Back three million or so years ago, the camels were small, insignificant animals, with little resemblance to these large camels later developed here.

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## AVIATION ALTITUDE RECORD MAY SOON BE BACK NUMBER

Airplanes may soon be climbing to 10 miles above the surface of the earth, according to Brig. Gen. William Mitchell, assistant chief of the Air Service. The present world's record of 34,000 feet may be beaten any time the Air Service thinks it worth while to try, the general said in a recent interview.

"Fifty-five thousand feet altitude is now quite practicable", he said. "For that work special equipment would have to be provided, but new army planes are being equipped to make 35,000 feet without difficulty. We have calculated that there is air enough to support a plane to the height of 55,000 feet. Oxygen and artificial heat would have to be provided for the aviator. We expect to take photographs from 35,000 feet this summer."

The advantage of the great height was the additional speed which might be obtained, the general said. The winds in the upper atmosphere are known to be very high and mostly from the west so that if a plane were bound east it could take advantage of them to make rapid progress.

Manless planes might be sent to this altitude and flown to Europe in a matter of hours, Gen. Mitchell said. The control would be any airdrome on this side and, by means of radio, the movements of the plane might be directed and also made



known. Direction finders would give the direction from any one station, while bearings from two stations some distance apart would give the distance accurately. The manless plane would report automatically by radio every two minutes.

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#### BLIMP TO ATTACK MOTHS HIGH IN TREE TOPS

Use will be made of a U. S. Army Air Service motorized balloon in a chemical attack on strategic positions of the damaging gipsy moth along a wide front in New Hampshire, it was learned at the U. S. Department of Agriculture in Washington recently. In this way, aeronautical science will help to check the ravages started by the escape from a biological scientist's laboratory in Massachusetts in 1869 of a few of these imported European pests which annually cause millions of dollars worth of damage to fruit, shade, and forest trees in New England.

In close forests and upon hill tops it has been found impossible to use effectively the insecticide sprays which are employed in orchards, along roads, and in comparatively open country. Speedy airplanes have tried unsuccessfully to reach these pests in the more inaccessible tree tops. The slower moving puny blimp, it is hoped, will be able to hover over infested areas long enough to thoroughly spray these trees.

The wind plays an important part in the spread of these pests, as in the caterpillar stage they have long hairs which act as sail-planes. Also when disturbed the larvae spin silken threads by which they lower themselves to the ground. On top of hills and from high trees the winds catch these silken cords and carry them and the insect aeronauts great distances through the air. By using a balloon, the government will be fighting air machines with an air machine.

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#### RACE HORSE ENDURANCE DUE TO RED BLOOD CELLS

The reason that race horses have a greater endurance than the average animal lies in the fact that they have a much larger proportion of red cells in the blood, Dr. Christian P. Neser of the Division of Veterinary Education and Research at Onderstepoort, South Africa, says in a communication to American scientists. Whereas the blood of a permanently stabled horse, which has practically no exercise, contains only about 23 per cent. by volume of red blood cells, some of the race horses when in severe training were found to have as high as 52 per cent. red corpuscles. Over half of the blood in such cases was made up of these microscopic red cells.



Dr. Nesor, when making a comparative study of the blood of different equines, was puzzled over the marked variations in the proportion of erythrocytes - as red blood cells are technically called - in different animals. He could not correlate this condition with differences in food, age, or sex, but did find, however, that all severely worked horses had without exception a much higher content of red blood cells than usual. The race horse, which was the most severely worked animal of any of those studied, had the highest content of red corpuscles in the blood, and, in these particular horses, this proportion was highest when it was in the height of training. Although horses, which had been bred for this type of service, always had a somewhat higher content of erythrocytes, this investigator found that the process of training was accompanied by a rapid increase in the percentage which continued until a maximum blood content was reached; this occurred when the horse was in full training.

This is just another illustration, Dr. Nesor pointed out, of the fact that the animal body when subjected to peculiar conditions, adapts itself in a manner suited to the occasion. In this case the tissues, particularly the muscles, need oxygen faster than the blood normally supplies it to them. The erythrocytes, as is well known, function as carriers of oxygen and any great increase in these cells augments the oxygen carrying power of the blood; if this provision were not made, the muscles would not be able to stand the strain of racing on account of a lack of this essential constituent.

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#### AMERICAN SUGAR SUPPLY CUT BY INSECT DAIRY FARMING

How insect dairy farms run by imported Argentine ants threaten the sugar supply from plantations of the South, was revealed in a bulletin published recently by the Agricultural Experiment Station of the Louisiana State University.

The mealy-bug, a tiny insect pest, feeds upon the tender parts of the sugar cane and kills or weakens the young shoots so that a poor stand of cane is the result. Before the introduction of the Argentine ant this damage was not great, as these insects have parasitic enemies which prey upon them and keep their numbers down.

But the mealy-bug, the bulletin states, secretes a sweet, watery liquid or honey-dew, of which the Argentine ants are very fond. In order to protect the supply of this liquid, these ants build mud barns to protect the mealy-bugs from sunlight, rains, storms, and predaceous enemies. They carry the young mealy-bugs to the most desirable feeding places on the plant and by collecting the "honey dew" keep them clean and so prevent parasitic fungi from doing them serious harm.

Under this protective regime, the mealy-bugs have multiplied, and extended their ravages on the cane crops. To prevent further extension of this damage, the state and federal government are now undertaking a poison campaign to exterminate the Argentine ants which are running the honey-dew dairy farms.

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Inefficient cable service between the various Canary Islands has led to the proposal to establish a series of wireless telephone stations on that Archipelago in the near future.

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### DIAMONDS CHANGE TO GRAPHITE WHEN HIGH HEAT IS APPLIED

How diamonds, queenly jewels of luxury, may be changed into graphite, the prosaic substance which forms the lead of our so-called lead pencil, is the reverse-motion Cinderella story reported to the American Electro-Chemical Society by M. DeKay Thompson and Per K. Frolich of the Massachusetts Institute of Technology. A heat of 1650 degrees Centigrade is the fairy wand used to bring about the beginning of the slow transformation. Investigators have differed, heretofore as to what heat is required to convert diamonds into some other form of carbon and whether or not this form is graphite. The Massachusetts men claim to have settled these questions.

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### SUNLIGHT KILLS BUGS WHICH DAMAGE LUMBER

Nearly everyone has had the experience of turning over a rotting log in the woods and finding the under side alive with insects which prefer to live and to work in the darkness. When the log is lifted over they scurry away to shady places.

Now the U. S. Bureau of Entomology, utilizing this dread of sunlight, has found out that direct sunlight on logs will in many cases kill not only the insects on the outside of the log but those within as well.

Logs act as heat traps. When placed in the sunlight they let in the heat faster than they radiate it and so get hotter and hotter until they are about 20 to 25 degrees above the temperature of the surrounding air. If the temperature of the air is up to 80, the inside of the log so exposed gets hot enough to kill all the bugs, or at least all those which do damage.

The method has been used in the control of the western pine beetle on the Pacific Coast and in the prevention of pin-hole defects in green logs. Damage by other borers to green and seasoned logs can be prevented in a similar manner, and the treatment has proved effective against the borers which injure mesquite fence posts in the southwestern states.

The solar heat method has been practiced on a large scale by several large manufacturing companies under the supervision of the Bureau of Entomology and has prevented insect damage to a large amount of valuable timber.

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### AUSTRALIA TO MEASURE HEAT RECEIVED FROM SUN

Measurements of the heat received from the sun will soon be begun in Australia. The first solar radiation station is about to be installed there by representatives of the Smithsonian Institution which has been carrying on such work in Arizona and Chile for several years. A. F. Moore, director of the Mt. Harqua Hala radiation station, will sail from San Francisco, June 26 to set up the apparatus.

Interest in solar radiation measurements began in Australia about two years ago when a group of scientists set out to find the means of setting up such a station. Means have recently been provided and the instruments will be set up by Mr. Moore at the Riverview College observatory near Sydney.



It is hoped later to establish a similar station in the arid interior region of the continent. Results from the Riverview station are expected to be of great interest and importance in comparison with the Smithsonian solar radiation stations in Arizona and Chile.

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#### ITCH CAUSING INSECT COMES BACK STRONG

Brown tail moths, the hairs from the caterpillars of which cause the extremely irritating human skin eruption known as "brown-tail rash", have suddenly shown an increase in New England after an almost complete disappearance, Dr. A. L. Quaintance, entomologist of the U. S. Department of Agriculture declared recently. Similar measures to those used against the damaging gipsy moth will be used in an attempt to check the spread of this nuisance.

The brown tail pest was brought to this country from Europe and first discovered at Somerville, Mass., in 1897. In a few years it had spread throughout the New England States and become unbearable to the residents of many sections on account of its poisonous wind-borne hairs. Many thousands of acres of forests also were attacked by the insect and the trees defoliated. The prevailing winds have tended to cause the spread in a northeasterly direction into Canada while disease among the insects in recent years apparently almost wiped them out. Now, however, they are again on the increase and causing trouble.

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#### AVIETTE LITTLE USE EXCEPT FOR SPORT

Small airplanes, similar to the one flown by Georges Barbot, French aviator, will be of little practical value in the opinion of Brig. Gen. William Mitchell, assistant chief of the Air Service. Its chief use will be in sport, he believes.

"The little planes of small power are all right in good weather", said Gen. Mitchell, "but they can't stand adverse conditions. They are not as economical as the 'Messenger' planes which we use. Although they burn less gasoline they go much slower so that the consumption of gasoline per mile is higher. The 'Messengers' can fly in any flying weather, and at high speed; the French machines are slow and depend on weather conditions. They will be useful in sport and for knocking around in but I don't think they would be of value for other purposes."

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It is estimated that the annual property damage resulting from inadequate street lighting in the United States amounts to \$54,000,000 or \$4,000,000 more than the entire country's annual street lighting bill.

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If the world's total annual wool production was divided equally among all the inhabitants on earth, each one of us would get one and four-fifths pounds.

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Nearly half of the daily papers of this country are published in six states: Pennsylvania, California, New York, Ohio, Illinois, and Indiana.

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