THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

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SECRETION CAUSING FEMALE SEX URGE DISCOVERED

The internal secretion that causes the sexual impulse in the female animals and human beings has been discovered and extracted by Dr. Edgar Allen of the University of Missouri and Dr. Edward A.Doisy of the Washington University Medical School, St. Louis, in collaboration with B.F. Francis, H.V. Gibson, L.L. Robertson, C.E. Colgate, W.B. Kountz, and C.G. Johnston.

This hormone which is obtained from the ovaries resembles the long desired "love potion" of romance and literature. Female animals treated with it take the initiative in courtship, even at an early age. Drs. Allen and Doisy believe that this extract of the contents of the ovarian follicles is the ultimate cause of sex instincts.

Young animals into which the magic liquid is injected become mature before they normally would. For this reason the discoverers of the ovarian hormone think that it may be responsible also for the development of the feminine characteristics which physiologists call secondary sex characters.

Evidence has been obtained that all female animals have the same sort of ovarian hormone, just as the internal secretions from the thyroid, pancreas, adrenal and other glands are effective regardless of the animal from which they are obtained or the animal in which they are used.

Extracts of the new hormone obtained from swine stimulated the sexual impulses in mice and rats. Similarly, animal extracts are being used in experiments on human beings with favorable results.

"We have high hopes for the therapeutic value of this product to medicine in the treatment of hypo-ovarian disorders", Dr. Allen declares.

Subcutaneous injection of small quantities of the ovarian hormone at intervals of four to eight hours bring about reactions in rats and mice similar in all respects to the natural effects. The results of the treatment are apparent 48 hours after the first injection.

Tests made on commercial ovarian extracts now in the market show that these preparations fail to act like the new hormone, Dr. Allen emphasized. The investigators have also found that the hormone when administered by mouth does not produce the desired effects, and that it has no effect on the sexual functions of the male animal.

WARM OCEAN WATER MAY CHANGE CLIMATE

The ocean is warming up. The International Ice Patrol, operating from Halifax, Nova Scotia, reports that the temperature of the sea covering the 35,000 square miles of the Grand Banks of Newfoundland is 7 degrees higher than normal for the time of year. Similar conditions are found in neighboring waters, icebergs and ice-floes are almost non-existent south of Newfoundland, and widespread though temporary changes in the climate of eastern America and western Europe are thought likely to occur in the near future by Lieut. Edward H. Smith of the U.S. Coast Guard Service who reports these phenomenal conditions.

His report is based upon the reports of the Coast Guard cutters maintaining the ice patrol. In it he says:

"The early reports from the patrol this spring are of more than passing interest due to the relatively high temperatures which are being encountered over practically the entire continental shelf south of Newfoundland. The Grand Bank, a submerged promontory of 35,000 square miles, is normally covered by a reservoir of water that is free from outside intrusions, such as ocean currents, from September to March every year. This reservoir has a mean depth of 35 fathoms, or 210 feet. It is cooled by the end of winter to a uniform temperature from surface to bottom. This water mass in March constitutes one of Nature's largest and most accurate thermometers, which registers the severity or mildness of the preceding winter season. Normally this thermometer is chilled by the cold blasts from Canada to a temperature of 30-32 degrees Fahrenheit, but this year the spring temperatures are 37-38 degrees; 7 degrees above normal. When we stop to consider that it takes approximately 3300 times as much heat to raise a given volume of water one degrees as it does a similar quantity of air, we can realize the tremendous amount of heat reserve the Grand Banks possesses this year. This also records the passage of oneof the warmest winters this region has experienced in the past ten years.

"The patrol vessel has visited several fishing hamlets along the south coast of Newfoundland and all these places state that the winter of 1923-24 was one of the mildest within the record of their oldest inhabitants. There has been very little Arctic field ice drifting south of Newfoundland this spring. The Grand Banks and off-lying banks to the westward are normally covered by fields during March and April, while this year there were no fields south of Newfoundland during this period. Furthermore, during the months of April, May, and June, there is an average of 350 bergs totalled south of Newfoundland. This spring there have been only seven bergs and at the present writing, May 4, there is not one. We have no year like it on record."

Commenting on these observations, Lieut. Smith says that such vast bodies of relatively warm water may be traced across the Atlantic for months and have been known to have immense effect upon the general distribution of atmospheric pressure and so upon weather conditions on both sides of the Atlantic.

"That great heat regulator, the North Atlantic", he concludes, "is passing this spring through an unusual thermal process, undoubtedly of a temporary nature. Its direct effect will most certainly be reflected in multitudinous ways and in far distant lands."

BLOOD FROM CONVALESCENTS PREVENTS CHICKEN-POX

Experiments made at Johns Hopkins University by A.A. Weech indicate that chicken-pox may be prevented by inoculating persons known to have been exposed with a serum obtained from convalescent patients. He gave this treatment to nine infants who had been exposed. Only one of them contracted the disease in a mild form after a long incubation period. The work is a continuation of similar experiments of a year ago, and is similar to the method used in preventing measles.

Chicken-pox, while not a serious disease, is very contagious and spreads rapidly, especially among children in schools. Attempts have been made previously to prevent the disease by vaccinating the children with the material obtained from the little blisters which occur on the skin. The results have been of interest, and the method appears to have had considerable value in checking the disease.

Experiments made on the prevention of measles by injecting the children exposed to the disease with serum taken from the blood of those who had recently recovered gave promising results, and last year workers at the Johns Hopkins University tried the same method in chicken pox. Out of 42 children inoculated within five days of exposure to the disease, 7 contracted a mild form, and 30 escaped without symptoms.

A LACTIC ACID THEORY OF THE UNIVERSE

By Dr. E.E.Slosson.

We know that chemistry plays an important part in modern industry. We know that certain chemical substances in minute amount, such as the hormones that naturally exist in our bodies and the drugs that we unnaturally put into our bodies, have an effect upon our health and temperament. I wonder if we cannot go farther and inquire if our metaphysical notions may not also be traced back to chemical causes. How, for instance, do we get our abstract ideas of space and time which form the framework of the external world?

Our concept of space seems to be founded primarily upon the movement of our muscles. It requires more of an effort to reach a yard than to reach a foot. We get more tired in walking two miles than in walking one. Of course it does not always require the same effort to cover a given distance with the arm or by the legs, but the relation is much more constant than the data given by the sense of sight, where objects change their shape and size quickly, as we or they move about, in a way that must be most perplexing to a baby. Even yet we may be deceived by our eyes and mistake a bush on the next hill for a tree on the horizon. Our sense for sound is still more unreliable. So we fall back for substantiation and verification of extent and distance on some sort of muscular exertion. We measure space by our feeling of fatigue. It is much the same with our sense of the lapse of time. Two hours' work seems longer than one. Though time seems to go faster or slower, depending on whether our employment is enjoyable or distasteful, yet we average it up in the long run as we do our spatial estimates, and consider space and time objectively as constant.

Now what is the cause of the feeling of fatigue on which we base our ideas of extension and duration? It is evidently dependent in some way upon the accumulation of the waste products of muscular exertion, such as lactic acid. Whenever we exercise a muscle lactic acid is produced in proportion to the exertion and when the lactic acid is made more rapidly than it can be carried off by the blood and consumed we get the sensation of fatigue. So our measure of space is somewhat dependent upon the amount of lactic acid in the body.

If this argument does not convince the reader, I may approach it in another way. Our only knowledge of space comes from our exploration of it by movements of limbs or body. A spherical and stationary amoeba, a mere drop of jelly, cannot be considered as having any conception of spatial extent. When a little lactic acid accumulates on the surface of the amoeba the protoplasmic granules at that point absorb water from other parts of the organism by imbibition. This produces a pseudopodium, or extempore limb, with which the amoeba may reach out or propel itself along. When the lactic acid vanishes surface tension overcomes the imbibition and the organism resumes its resting spherical form. According to this theory the origin of limbs and of movements comes from an accumulation of lactic acid.

It seems to me then that there is a chain of casual connection between lactic acid formation and our conceptions of space and time. If so, it means that our metaphysics has a chemical foundation; that geometry is essentially a branch of chemistry; that astronomy likewise depends on chemistry; that Einstein's theory of a four-dimensional time-space continuum has its origin in deficient oxygen to keep down the lactic acid. In short, we have a lactic acid theory of the universe, Q.E.D.

NEW PROCESS MAKES PAPER FROM WOOD SHAVINGS

Dr. Alfred Tingle, former research chemist for one of the leading pulp and paper mills of Canada, has brought to perfection in University of Oregon laboratories a new process for producing paper pulp from wood in which shavings and similar "cull" material of the ordinary paper pulp mill may be included to give a satisfactory pulp for making a heavy grade of dark paper. All danger of overcooking smaller pieces of wood waste while larger pieces remain uncooked is avoided in Dr. Tingle's method.

Another important feature of the new process, according to Dr. Tingle, is that it can be carried on with a much simpler and less expensive plant than is needed for any other form of pulp.

The application of Dr. Tingle's digestion method, which he believes may prove cheap enough in operation to use in connection with waste products, is expected to be of great importance to the lumber industry. When the new process is applied to high grade spruce chips the product may be considered, for many purposes, a competitor with draft pulp.

Dr. Tingle's process involves a double treatment of the wood. The chips or shavings are first digested under pressure with a solution made from lime and sulphur. The product is then crushed to a fine, soft pulp in a suitable acid liquor. The "spent acid" from the manufacture of ordinary sulphite pulp may be used for this purpose. The washed pulp can then be made into a very good grade of paper which, research chemists believe, will compare well with that made from kraft.

YOUNG WOMEN DYING AT STARTLING RATE

Startlingly heavy mortality among young women from 20 to 30 years old has been found by Rollo H. Britten, statistician of the U.S. Public Health Service in an analysis of recently issued Census Bureau figures. The reason for this peculiar rise in death rates is obscure, Mr. Britten states, and cannot be explained as due to violent causes.

There has been an increase, he points out, in deaths from causes connected with child-birth. Tuberculosis, influenza, and pneumonia are also evidently involved in the excess rate among the young women.

Other facts brought out in the analysis are that cities show a more rapid decline in mortality than do the rural districts; that persons of mature age show an increase in length of life; and that there has been a continuation of the general improvement in the expectation of life at birth, with colored persons showing greater improvement than the whites.

NEED OF MILK FOODS IN T.B. DEMONSTRATED

The importance of milk, cream, and butter in the diet of sufferers from tuberculosis was indicated in a paper read by Dr. M.I. Smith of the U.S. Public Health Service before the annual meeting of the National Tuberculosis Association. Dr. Smith experimented with white rats and found that those infected with tuberculosis needed five times as much vitamin A to keep from losing weight and strength as did normal healthy rats. Vitamin A is found abundantly in butter fat.

Dr. Smith also reported on experiments with cells found in tuberculous growths. Indications are that these endothelial cells have a dual nature, aiding the tubercle bacillus in its harmful effects on the animal body as well as protecting against the infection. Dr. Smith declared that if the nature of the endothelial cell could be changed so that it would no longer carry on warfare against bacilli, two beneficial results might be achieved: The tubercle bacillus might succumb to the action of some of the body fluids and tuberculous growths might not form, thus effectively checking the disease. Dr. Smith and Dr. William Charles White are continuing experiments at the Hygienic Laboratory in Washington.

READING REFERENCE - McCollum, E.V. The Newer Knowledge of Nutrition. New York, Macmillan Company, 1922.

FLAPPERS

The bobbed haired Miss with henna hued curls is not an exclusively modern product. On the Samoan islands, native men wear their hair long. The women, however, cut theirs short and bleach it to an auburn tint with a wash made from the leaves of a wild plant. Beauty spots made from Alafa, a thin leaf-like fungus, are often stuck on their foreheads and cheeks. These patches give the belles a striking appearance at night. They are phosphorescent.

SIMPLE SCIENCE

BY WOW

FIRE

Scientists tell us that matter is something that takes up room. If it takes up too much room it matters a great deal, especially in street cars. When such matter takes up more than one room it's usually a family, except in cities where several families live in one room.

When matter combines with oxygen we call it oxidation, and we always get heat produced. If the process happens to be very rapid we get enough heat to cause some light. When both heat and light occur we call it a fire.

The nicest kind of fire is a wood fire in the fire-place, only you need four of them to keep you warm all round. The Old Country people have only one in each room. That's why their houses are always cold.

Fire was known in very early times but it was very hard to make then, so the ancients used to keep it going for fear they might have to start another one. It was prized very much, hence the "hallowed hearth" idea.

When a thing burns it gets heavier because it takes on oxygen. This is easily understood because when one burns his finger it's no light matter.

Insurance agents are like wolves, they don't like fire. Likewise they charge high rates because they claim that people are careless about fire, but I guess they know we're pretty sure to be careful.

Fire is very useful, especially in cold countries, although Eskimos don't use it much because they wear so many furs. Most people prefer to keep warm with fires and wear fewer clothes, particularly women.

It's a grand sight to see a big fire - if it's not near home. There are many kindsof fire. Acetylene gives a nice bright flame. We use it a lot in the country, but coal-oil's our mainstay, although we swear a lot at it when the burners get dirty.

Some flames give lots of light; others don't. The more carbon there is in a flame the brighter it is. That's why acetylene is so bright because it's rich in carbon.

Most everything burns if it get hot enough, even iron. We should be very careful to keep valuable things cool, especially our tempers.

YOUNG GIRLS NEED GOOD SKELETONS

Height rather than weight determines the food requirements of little girls, while after the age of 12 years the girl's weight is the principal factor in dertermining how much food she requires. So said Dr. Francis G. Benedict of the Nutrition Laboratory of the Carnegie Institution of Washington at Boston at the recent meeting of the American Philosophical Society at Philadelphia.

"The food of children should, first of all, produce a good growth of the skeleton," said Dr. Benedict, "for a well-developed skeleton, upon which muscles and fat can be adjusted in the normal process of growth, is the determining factor in the growth of young girls.

"The remarkable fact is that girls from 12 years to 20 years of age all have the same fuel needs, when at rest in bed. A 12 year old girl, weighing 85 pounds, produces as much heat when asleep in bed as a 20-year old girl, weighing 125 pounds. Thus each unit of weight in the younger girls has a higher heat production and for the age range between 12 and 20 years the best method of estimating the fuel needs is on the basis of the calories per pound of body weight for each age."

Dr. Benedict said young girls were, so to speak, geared on high, and their organisms needed proportionately more food than did those of older people. It had been found, he said, that between the ages of 12 and 20 years girls needed equal amounts of food irrespective of their weights. That is, the younger and lighter ones use up the most energy for every pound of body weight.

LATE SPRING WILL INJURE TRUCK CROP PRICES

The growers of early fruits and vegetables will probably lose money this spring in the opinion of experts of the U.S. Department of Agriculture. In ordinary years the wave of maturity sweeps steadily from south to north, keeping step with the advancing season. The long cool spring of the present year, however, has delayed the development of the southern crops, and they are two or three weeks behind where they usually are at this time of the year. It is reasonable to expect that this cool weather will be followed by a sudden rise of temperature, and all the crops, both north and south, will come into marketable condition at about the same time, instead of following each other as they usually do.

This does not mean that the price will be reduced to the consumer, it is explained. It means only that the producers who are farthest from the markets will allow their crops to go ungathered, preferring to stand the loss of the season's work rather than incur the additional expense of shipping to an overstocked market where they will be compelled to sell for less than the cost of production.

Consumers with automobiles can probably practice the cash and carry system with considerable advantage to themselves and to the farmers by combining a pleasure jaunt with a foraging expedition, and bringing home supplies of fruit and vegetables that otherwise would be left to rot in the fields.

TUBE TRANSMITTER USED FOR FOG SIGNAL

The first tube transmitter to be used in this country for fog-signal purposes has been put in service on the Ambrose Channel Light Vessel at the entrance of New York harbor. This transmitter was installed after a series of satisfactory tests, indicating freedom from directional distortion, lessened interference, and increased efficiency. Tests for night effect showed practically no distortion due to this cause affecting the use of the signals for navigational purposes.

Radio fog beacons transmit a signal which when received by a radio compass receiving set allows the operator aboard ship to locate the direction of the transmitting station. The radio compass consists essentially of a loop antenna which receives signals more effectively than in another.

SUMMER LAID EGGS RICH IN VITAMIN

Fresh eggs are extolled as probably second only to codliver oil as a source of one of the indispensable vitamins by Dr. D. Breese Jones, chemist in charge of the protein investigation laboratory of the U. S. Department of Agriculture. They are rich in Vitamin A which promotes growth and prevents a serious affection of the eyes.

It was found that a luckless sore-eyed, stunted rat, afflicted because of the lack of Vitamin A in his diet could be completely cured in a short time by the administration of from half to three-quarters of a gram of whole fresh egg daily. An average sized egg weighs about 50 grams. Dr. Jones emphasizes the fact that the eggs used were strictly fresh and were laid in summer when the hens had access to fresh, green feed, itself rich in vitamins.

HERE ARE WILD FLOWERS YOU MAY GATHER FREELY

Daisies and buttercups are still fair game for the automobile wild flower hunter. No closed season has been declared on them by the Wild Flower Preservation Society which has determined what wild flowers may or may not be freely picked without danger of extermination. The list of flowers which may be picked at any time is large.

The common field daisy is on the list, together with such other farm weeds as the wild carrot and the wild mustard. No amount of picking can destroy them apparently. Buttercups are included, as is another old favorite, "butter and eggs". Black-eyed Susans or "Ox-eye daisies" are also non-exempt, as are clover and dandelions. The dandelion home-brew crop is apparently for ever assured in spite of the increased demand resulting from prohibition.

Wild asters of all sorts, evening primroses and everlastings may be gathered at will, and so may the stiffer and more formal boneset, wild sunflower and joe-pye weed. Goldenrod is fair game at all times. The list may be extended to include arrow head, bindwee, California poppy, chicory, cinquefoil, dogbane, ground ivy, Japanese honeysuckle, the lupine of the western plains, milkweek, wild morning glory, poke weed, St. John's wort, touch-me-not, trumpet creeper, wild lilac, yarrow, and a number of lesser known wild flowers.

All of these are allowed for free picking by lovers of wild flowers, and their variety assures the possibility of an artistic bouquet at all seasons. So the picknickers are counseled by the Wild Flower Preservation Society to leave the dogwood and arbutus alone with many other delicate flowers of the woods and fields, to be chary of picking blue flag and galax and hepatica. If they must pick flowers, they should stick to the tough and enduring ones first mentioned. There will always be enough daisies, buttercups, and goldenrod to go around.

BONES OF DANTE SHOW HE WAS NOT A "NORDIC"

Dante was not a Nordic, as some anthropoligists have asserted, but a member of the Mediterranean race. So declares Prof. Fabio Fassetto of the University of Bologna in a paper presented to the American Association of Anatomists at their meeting in Buffalo. The evidence is from a recent examination of the bones of the great poet.

The most important feature of the skeleton is the large capacity of the cranium or brain case. This is 1,700 cubic centimeters, or much more than the average even among men of high intellect. Dante's height was about 5 feet, 5 inches. The shape of the bones of the head definitely identifies Dante, according to Professor Frassetto, with the Mediterranean race, contrary to the opinions of those who believed the poet's name and family to have been of German origin.

Compared with the size of his head, Dante had a small face, the bones show; and his features were not symmetrical, there being a marked deviation of the nose toward the right. Spinal bones showed evidences of arthritis, or an inflammation of the joints.

SANITATION, NOT SERUMS, CONQUERING TUBERCULOSIS

Hygienic measures alone, without use of any serums or vaccines, have been responsible for the great decrease in mortality from tuberculosis during the last 35 years, said Dr. Hans Zinsser of the Harvard Medical School in a public lecture in Boston on the tuberculosis problem. The death rate from the desease per 100,000 of population had been reduced from 326 in 1888 to 114 in 1920, he said.

There was no specific nor serum that was a valid protection from or cure of the disease, the lecturer stated. Many had been tried but none had proved reliable. Yet the situation was decidely hopeful, he declared, basing his optimism on the rapid reduction of mortality rates by purely hygienic and sanitary measures.

OIL BURNING ELECTRIC ENGINE TO BE USED BY RAILROAD

A contract for the construction of a new type of electric locomotive, using oil for fuel for an internal combustion engine of the Diesel type which in turn will drive the generators furnishing power to the drivers, has been signed by a large railway system with the General Electric Company and the Ingersoll-Rand Company. The new locomotive is designed for switching purposes.

The power equipment of the locomotive consists of a 300 horsepower oil engine manufactured by the Ingersoll-Rand Company, directly connected to a 200 kilowatt General Electric generator. The motive power consists of four HM-840 motors, one of which is geared to each of the four axles. The unit has a total weight of 60 tons all on the drivers.

The Ingersoll-Rand unit is a six cylinder engine designed to burn fuel oil

and having the features of the well known Price system of direct fuel injection. This system avoids the use of high pressure injection and also effects a reduction in weight, an improvement in mechanical efficiency and an increased simplicity and reliability. The fuel is injected into the various cylinders through a distributor by means of a single acting plunger type pump. The lubricating system is of the continous filtration type by means of which the oil is returned from a crank case through an oil filter before being returned to the system again.

All parts of the cylinders, cylinder heads and combustion chambers are water cooled by means of a thermostatically controlled water supply. The water from these water jackets passes to a radiator located on the roof and a thermostat maintains an even temperature regardless of weather conditions. Sufficient fuel can be carried for 48 hours continuous switching service. The muffler for reducing the noise of the exhaust is also mounted on the roof.

As ordinarily used in switching service, this 60-ton locomotive consumes between 20 and 26 cents worth of fuel oil per hour. The engine is free from smoke and therefore especially suitable for service in cities or other places where smoke is objectionable.

THE SUN MUST BE UNCOMFORTABLY HOT

The atmosphere of the sun, upon the heat of which all life upon the earth depends, can only be explored by wireless messages, Dr. Charles E St. John of the Mount Wilson Observatory, Pasadena, California, told members of the American Philosophical Society in Philadelphia recently. The interpretation of these messages received as light is the task of the astronomer, he said.

Dr. St. John took his audience on an imaginary journey to as far toward the real surface of the sun as the astronomers have been able to penetrate. Warning them to expect a warm climate, he said that after passing through the silvery white corona which may extend from the sun for several hundred thousand miles, they would find themselves in an unthinkably rare atmosphere of ionized calcium, the metal which is the basis of limestone, and then s through layers of the gases of other elements, hydrogen, helium, magnesium, titanium, sodium, calcium, and iron in succession like the layers of an onion.

Finally, he said, they would reach the lowest circle so far explored where they would find the atmosphere containing all the elements known to exist in th the sun, the pressure that of a partial vacuum, and the temperature about 10,000 degrees Fahrenheit. The wind velocities would average about 1,000 miles an hour, Professor St. John said.

Birds censuses are to be taken this summer by the U.S. Department of Agriculture and most of the work will be done by unpaid, volunteer observers.

Blackwater fever, a dangerous tropical disease, and the severer forms of malignant malaria, are now believed to be identical.
