

THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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EDWIN E. SLOSSON, Director
WATSON DAVIS, Managing Editor



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DISTEMPER IN DOGS TRACED TO NEW GERM

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Distemper, a disease that causes much death and suffering among dogs, has been traced to its cause, a newly discovered bacillus similar to the organism responsible for typhoid fever. Prof. Robert C. Green of the department of bacteriology of the University of Minnesota is the discoverer of the new germ.

The disease known as distemper has recently become serious and costly to silver fox fur farmers in this country.

"I am investigating distemper in dogs and in domesticated silver black foxes at the request of the American National Fox Breeders' Association," Prof. Green stated in an exclusive interview with Science Service. "The present epidemic in foxes extends to all parts of the United States, entailing heavy losses.

"I have isolated from diseased dogs a new species of bacillus belonging to the genus *Salmonella*, which upon injection will reproduce distemper in both the dog and in the fox. A similar new germ which I have isolated from diseased foxes will upon injection reproduce the typical disease in both dog and fox.

"The disease in both fox and dog is comparable to typhoid fever in man. It can be considered primarily a gastro-intestinal disease. The disease is usually complicated by a secondary infection in the throat, mouth and nose, and often with a fatal pneumonia at the end.

"The bacillus which I have isolated is closely related to the germ causing typhoid fever. In these investigations it has been artificially cultivated in the laboratory in glass, and the disease has been produced by the injection of pure cultures. The disease is usually spread by direct contact and through body excretions.

"Because the natural disease is followed by an immunity it is hoped that an artificial immunity can be obtained by vaccination."

NO MALARIA IN SWEDEN

Malaria, which has caused so much trouble in other parts of the world, is now practically unknown in Sweden, but the Royal Bacteriological Institute of Stockholm is engaged in making a study of the Anopheles mosquito, which carries its germ. This mosquito is harmless unless it has sucked the blood of a person with the disease, and has had time to develop the parasites in its own system. Not being located in a malaria zone Sweden is in slight danger of infection, but if an epidemic should break out abroad, travelers might bring the disease. In such a case, the Institute is prepared to take immediate measures to check it.

TABLET BOOK REVIEW

DICTIONARY OF BOTANICAL EQUIVALENTS, SECOND EDITION. By Ernst Artschwager and Edwina M. Smiley. Baltimore: Williams and Wilkins. 124 pages. \$3.25. 1925

Most of us American followers of science are frankly rather shaky on our foreign language. We contrive to get a fair reading knowledge of one language and perhaps a fair bluffing knowledge of a second, somehow, during our graduate year; but we are always glad enough of a little help when it comes to digging out something interesting or important in the literature. Botanists have reason to be very grateful to Dr. Artschwager and Miss Smiley. They give us not only the necessary words in German and French but also the out-of-the-way ones, with lists in Dutch and Italian as well. If you cannot give an accurate translation, off-hand of "hockerig aufgeblasen", "ruban", "kweekerij", and "zigosi", it is a sign that this book will be useful to you.

HOW TO TEACH GENERAL SCIENCE, By J. O. Frank. Oshkosh: Castle-Pierce Press. 134 pages. \$2.00 1925.

This is a mighty useful book for that numerous, much harassed, frequently bewildered person, the teacher of general science to high school freshmen. Besides highly pertinent chapters on the aim of the work and the content of the courses, it gets down to such practical details as how to get a job, what books to spend your limited library funds for, how to hold your class to their work, what commercial firms will supply you, for little or nothing, with materials for display or demonstration use. A most consoling little book.

ROOT BEHAVIOR AND CROP YIELD UNDER IRRIGATION. By Frank C. Jean and John E. Weaver. Carnegie Institution of Washington, 1924. 65 pages, 6 plates.

As an application of the methods of root study developed by Weaver, Cannon and others to crops on unirrigated, lightly irrigated and fully irrigated experimental plots at Greeley, Colorado.

Chain stores, operated by Chinese, now dominate certain lines of retail trade in the Philippines.

ARMAGEDDON EXPEDITION BACKED BY ROCKEFELLER

Armageddon, the famous place of history, mystery, and prophecy, is to yield its buried secrets to an American expedition backed by John D. Rockefeller, Jr. Plans are being made at the Oriental Museum of the University of Chicago by Prof. James H. Breasted for excavations on a large scale, to begin in the near future. Over four hundred workmen will be employed, in addition to the regular staff of scientific experts. Professors D. F. Higgins of the University of Chicago, and C. S. Fisher, formerly of the University of Pennsylvania, expect to leave for Palestine about September 1 to make preliminary surveys of the ground and select suitable camp sites.

Armageddon, where according to scripture the last of the world's great wars will be decided, is a mountain district, a continuation to the southeastward of the Carmel highland, lying in central Palestine, just across the great plain of Esdraelon from the holy city of Nazareth. The town of Megiddo, from which the region takes its name, commands a pass that leads to the plain of Sharon on the seacoast and has therefore been the scene of much fighting in ancient times between the kingdoms of the Euphrates valley to the north and Egypt to the south, as well as tribal battles of the Israelites with their neighbors. The part that Israel took in this fighting is recorded in two places in the Old Testament.

The first of these is in the song of Deborah and Barak, after the discomfiture of their enemies: "The kings came and fought, then fought the kings of Canaan in Taanach by the waters of Megiddo." (Judges 5:19). This triumph of the Israelitish champions (one of them a woman) over Sisera, leader of the army of their oppressors, is the record of a small and local war. In the second conflict recorded, Israel was an ally of Assyria against Egypt, and its king, Josiah, sacrificed his life at Armageddon in the effort to turn back the Egyptian invader: "In his days Pharaoh Nechoh, king of Egypt, went up against the king of Assyria to the river Euphrates; and king Josiah went against him; and he slew him at Megiddo, when he had seen him. And his servants carried him in a chariot dead from Megiddo, and brought him to Jerusalem, and buried him in his own sepulcher. And the people of the land took Jehoahaz, the son of Josiah, and anointed him and made him king in his father's stead." (II Kings, 23: 29,30).

With this long tradition of bloody fighting, it is not to be wondered at that the terrible apocalyptic visions of final battle, slaughter and dissolution at the end of the world should have been localized by the seer of Revelation at Armageddon.

How old the town of Megiddo is, no one knows, but archaeologists agree that it is older than history; or rather that the series of cities on the same site, or built above the ruins of the other, present such a long succession. It will be the purpose of the present expedition to gather data to illuminate this point, and will do it to gain much new light on the ancient civilizations that met and battled there.

The expedition has selected, as the site of its ^{first} excavations, the scene of the most recent of the many battles of Armageddon: a ridge which lies about ten miles from the city of Nazareth, where the British, under General Allenby, met and defeated the Turks during the Great War.

PHOTOGRAPHS ANALYZE BEAUTY OF MUSIC

In the study of what is beautiful in singing and what makes it beautiful, investigators in the Iowa laboratory under the direction of Dr. Carl E. Seashore of the State University of Iowa are basing their scientific studies on the photographing of the sound waves by moving pictures. The movement of the sound waves is converted into movements of a light beam which are photographed in fine detail. The expression of emotion or art in music can be analyzed and measured in terms of these waves.

The center of interest has been the "vibrato", which is an expression of the tender emotion. Dr. Milton Metfessel is responsible for the latest feature in these investigations. He adds to the photograph of the singing a parallel series of photographs of bodily movements and changes, such as heart beat, breathing, and movement of muscles in the throat. He believes that by this method he can identify the bodily features which determine the emotional and artistic quality of the singing.

"We want to know, for example, how a vibrato is produced," Dr. Seashore explained. "We know that it is involuntary action of certain muscles, and we should be able to tell which muscular actions are primary and which are secondary and by what parts of the nervous system this unconscious action is controlled."

YALE TO STUDY MECHANICS OF WALKING

Facts and figures about leverage, stresses, and distribution of weight in the human foot are to be sought by means of specially designed instruments at Yale University.

For several hundred thousand years men have been operating that remarkable mechanical device - the human foot - without knowing exactly how the thing worked or what to do when the mechanism failed. X-rays and studies of anatomy have helped to reveal the complex structure of the walking apparatus, but experts still differ in their interpretation of how the bones and muscles and tendons are coordinated.

Dr. Dudley J. Morton, instructor in surgery at Yale, who is in charge of the foot investigation, says that results of the army examinations during the recent war clearly show the practical value of the proposed research. The usual standard for determining the foot efficiency of the soldiers was the condition of the longitudinal arch.

"This method," he says, "led to the rejection of many applicants and drafted men whose feet presented low arches but who had never experienced discomfort even under strenuous activity, because their body weight was properly distributed through their low arched feet. On the other hand, many thousands of accepted recruits who possessed well developed arches were soon assigned to 'development camps' because of foot trouble.

These facts testify to the unreliability of the height of the arch as a standard for determining the potential strength and integrity of the feet. The proficiency of the foot depends essentially upon the ratio of weight distribution to the chief bearing points of the feet."

Dr. Morton aims to estimate by mechanical means what the normal ratio of weight distribution is, that is, how the weight is distributed over the different sections of the foot, and how the ratio varies as the foot and other parts of the body change their position.

He points out that he hopes "to devise, if possible, a practical method of foot examination which will eliminate the personal element on the part of the examiner and establish a uniform and accurate standard for foot examination both within the profession and for industrial and other purposes".

The investigation is expected to provide a working ground for later study and progress in the treatment of foot disorders.

POISONOUS PRINCIPLE FOUND IN CANCER EXTRACT

A definite poisonous principle in cancers and tumors, long suspected but until now undemonstrated, has been shown to exist, according to the claims of three German researchers, Drs. R. Syderhelm and W. Lampe, who worked together, and Dr. V.E. Merteus, who conducted his investigations independently.

Drs. Syderhelm and Lampe made alcoholic extracts of cancerous tissue, dissolved the precipitate they obtained in salt solution, and injected mice with it. The extract proved to be very poisonous to the mice, but only when the operation of extraction was carried on at a comparatively low temperature. At ordinary room temperatures no result was obtained. They conclude that the poisonous principle is destroyed at ordinary temperatures by an autolytic enzyme or self-digestive ferment that comes out in the extract along with the toxin.

Dr. Merteus made an extract from tumorous tissue with weak alcoholic solution, and found that the white powder left behind upon evaporation was poisonous to mice and guinea pigs.

Another German scientist, Dr. A. Werechinski, has obtained results that seem to confirm the view that cancerous and tumorous growths are similar to embryonic tissue, in that they are simply masses of rapidly growing cells; but that they have "run wild" and escaped from the controls of normal growth. Dr. Werechinski injects finely minced embryonic kidney and adrenal tissue under the skin of a guinea pig, which subsequently developed characteristic tumorous growths in two different parts of its body.

YOUNG COCKLEBUR PLANTS POISONOUS TO PIGS

The cocklebur, long known as a bothersome weed but not regarded as poisonous, has been convicted of causing the death of numerous hogs as well as other farm animals, by experiments conducted in the experimental pens of Purdue University. It is poisonous, however, only in its youngest stage, when the two thick, fleshy seed leaves are all the foliage it has. Later, when the true leaves make their appearance, its poisonous qualities diminish.

DIABETES AND CANCER FIGHT EACH OTHER

On the heels of the discovery of the antagonism between malaria and paresis which has made it possible to treat the latter disease by inoculating the patient with the former, comes a claim by a Russo-German physician, Dr. A. Braunstein, that he has discovered a similar antagonism between two other diseases, cancer and diabetes.

Recent researches in Germany have shown that cancer cells possess an abnormal appetite for sugar. One worker has shown that in thirteen hours a certain type of cancerous tissue can consume its own dry weight in sugar. Dr. Braunstein, who has been working on the problem for a dozen years, states that in his clinical experience he has noticed three outstanding facts regarding the mutual influence of diabetes and cancer. First, when a diabetic patient becomes afflicted with cancer the dangerous concentration of sugar in his blood and other body fluids falls off notably. Second, the patient becomes much more tolerant toward sugar and starch-containing foods. Finally, if the cancer is removed by surgical operation, the sugar content rises again.

BRITISH SCIENTISTS TO HEAR CANCER GERM DISCOVERER

One of the discoverers of the cancer germ, J. E. Barnard, F.R.S., will talk before the meetings of the British Association for the Advancement of Science to be held at Southampton, England from August 25 to Sept. 2.

Mr. Barnard's title is announced as "The Observation of the Infinitesimally Small" and he will tell of his perfection of the ultra-violet microscope with which he assisted Dr. William E. Gye in seeing for the first time the minute organism or virus that is credited with causing cancer in chickens.

Practically every branch of science from astronomy to zoology will be covered by the program since the results of the past year's researches will be reported.

Science is now entering the field of athletics as is indicated by the title of a paper by the famous physiologist, Prof. A. V. Hill, "The Physiological Basis of Athletic Records" and the discussion that is to be held on "The Acquisition of Muscular Skill".

Engineering in ancient Rome, evolution in fact and theory, new ideas in meteorology, aeronautics of the future, gravitation, and many other subjects are to be discussed in individual papers or symposia.

This year's sessions are to be held under the presidency of Prof. Horace Lamb, F.R.S.

The Navy Department is cooperating with the Weather Bureau in the use of airplanes for obtaining weather data.

It is expected that the value of foodstuffs exported from the United States this year will exceed \$1,000,000,000.

ANTIEVOLUTION INITIATIVE PETITION, CIRCULATED IN CALIFORNIA

Fundamentalists in California will shortly begin the circulation of a petition that will allow a proposed anievolution law to be voted upon directly by the people of the state at the next state election. Plans are being made by those opposed to the teaching of evolution in the schools to carry on their campaign throughout the state with the hope of effectively duplicating in result the famous Tennessee law under which Scopes was recently convicted at Dayton.

Unlike the Tennessee law which specifically mentions the Bible, the California measure which the fundamentalists desire to place on the ballot by petition will not mention the Bible or Genesis, but will attack evolution as unscientifically founded.

The Science League of America, whose offices are in San Francisco, has announced that it will shortly hold protest meetings.

HONEY BEES "LET GEORGE DO IT"

That honey bees, proverbial models of industry, are also shrewd enough to take advantage of the greater strength of larger insects when confronted with a task greater than their own powers, is indicated by observations made by Prof. A. C. Burrill and E. A. Schwarz of the Missouri state museum, writing in "Science"

The bees were trying to get honey out of the long, narrow, deep flowers of the bush honeysuckle.

"They tried continually to go down the tube, only to stick long before reaching the nectar," says Prof. Burrill. "then they would buzz around big wood bees who did not seek to enter corolla, but crawled down outside near the tip of the sepals and punctured the corolla tube with their strong black mouth parts. Honey bees frequently followed these bees and stuck their probosces through the large slit made by wood bees. This is another instance of the honey bee adaptability to secure nectar from flowers with tubes longer than the tongue. A war of words has raged in bee journals for some years as to how honey bees could get nectar from red clover with florets longer than bee tongues. Is it possible that they follow some other insect to punctures in floret tubes there?"

LYING NOT DETECTED BY APPARATUS

In order to test the claim of former experimenters that lying might be detected by observation of the blood pressure and the ratio of breathing in to breathing out, Carney Landis and L. E. Wiley of the University of Minnesota conducted a series of experiments upon students in the University.

Suitable apparatus for recording blood pressure and the ratio of inhalation to exhalation were attached to the subject. He was then given six cards upon which were various geometrical figures and numbers. He was told to lie in regard to three of the cards and to tell the truth in regard to the other three when questioned by the operator concerning the cards. Next an imaginary crime was detailed to the subject and the evidence connecting him with the crime was outlined.

He ~~was~~ ~~able~~ ~~to~~ ~~lie~~ ~~concerning~~ ~~certain~~ ~~of~~ ~~the~~ ~~evidence~~ ~~and~~ ~~to~~ ~~tell~~ ~~the~~ ~~truth~~ ~~about~~ ~~the~~ ~~rest~~ ~~upon~~ ~~questioning~~ ~~by~~ ~~the~~ ~~operator~~.

Very careful readings of the apparatus were kept during the trials and curves were drawn up to give a graphical picture of the changes in blood pressure and inspiration-expiration ratio. Out of a total of 30 curves in the first test only 40 per cent. were judged correctly by a jury of 12 persons. Fifty per cent. of the blood pressure records for the second series, using the imaginary crime as a stimulus were judged correctly. The inspiration-expiration ratio gave correct diagnostic values in 63 per cent. of the cases in one series and in 50 per cent. in the other series. From the inconsistent results the authors conclude that the method is unreliable.

SCIENTISTS TELL WHY SHOES PINCH

Scientists have at last blasted the prognosticating reputations of old ladies who can tell when it is going to rain by their corns, for John Arthur Wilson and George O. Lines, Milwaukee chemists, have shown that there is a direct relation between foot comfort and chemical composition of shoe leather.

The investigators found that the changing amount of moisture in the atmosphere causes expansion and shrinking of the leather and that shoes made of chrome leather shrink three times as much as ones vegetable-tanned and are therefore three times as uncomfortable. The porosity of permeability of leather to water vapor also affects foot comfort directly because feet cannot breathe in an atmosphere where the humidity is one hundred per cent. The most impermeable and most uncomfortable leathers were those containing the largest amounts of finishing materials or oils and waxes. This was strikingly illustrated in the case of patent leather where the permeability to water vapor was 6 per cent. compared to 82 per cent. for vegetable-tanned calf and 67 per cent. for chrome-tanned calf. But if patent leather shoes could be worn with the shiny side in they would be three times as comfortable as with the shiny side out because with the water vapor next to the grain of the hide the permeability factor is 20 instead of 6.

STREET CAR MOTORMEN PUT TO TEST

Special laboratory tests by which it may be possible to pick out the man who has the makings of a safe and efficient street car pilot are being devised by Dr. Morris S. Viteles, of the University of Pennsylvania.

A man's rating on an intelligence test does not always indicate whether he is likely to lose his head in emergencies, or to run his car badly, Dr. Viteles finds. This was shown by giving such tests to motormen in regular employment and comparing the results with the men's records in service and with the opinions of their supervisors.

Dr. Viteles then worked out a motorman selection test by which signals are given on a piece of mechanical apparatus and the prospective motorman responds with the same muscles that would be used in operating a trolley car. This apparatus measures the safety factors, such as a man's capacity to learn, his ability to keep his attention steadily on his job, and to act quickly in emergencies so as

avoid accidents. To test an applicant's general ability and courtesy, the psychologist devised a set of questions such as: "If an intoxicated man was annoying the passengers in your car would you: 1. Put him off the car? 2. Pay no attention to him? 3. Turn him over to the nearest officer? or 4. Report to the train dispatcher?"

The problem of the alert and capable motorman is also being studied by use of elaborate testing machines in a new laboratory in Paris. A feature of the French laboratory is a realistic reproduction of a street car, in which the motorman's reaction speed and control are put to the test.

NEW CHEMICAL SPRAY ERADICATES WEEDS

Selenium compounds were found more useful in destroying weeds than as insecticides for trees and plants by Miss F. Marion Lougee and B. S. Hopkins of the University of Illinois in testing the possibility of substituting selenium for sulphur compounds in plant sprays. Selenium, a chemical substance of the sulphur family, is more poisonous than the latter, but was found to be injurious to foliage. But the properties which make selenium compounds undesirable for spraying trees in leaf may make them useful for combatting pear blight, oystershell scale, blister canker and other plant diseases, in the opinion of the experimenters. Compounds of this substance are very deleterious to such plants as dandelions, burdock, and plantain but hardly affect grass and clover, which may make it a valuable new weed eradicator.

STRAW MULCHING SLOWS NITRATE FORMATION IN SOILS

The practice of mulching soils with straw slows up the process of nitrate formation, according to experimental results reported by W. A. Albrecht and R. E. Umland of the University of Missouri.

The soil used in the experimental work consisted of a layer of top soil of brown silt loam about eight inches thick and a subsoil of rather compact clay loam. Three experimental plots of the same dimensions were laid off. One plot was given a heavy mulch in the proportion of six tons of straw to the acre; one plot was given a mulch in the proportion of two tons per acre; the third plot was not mulched. Analysis revealed the nitrogen content of each of the three plots to be practically the same at the start of the experiment.

The plots remained for one year during which time samples were taken at intervals of two weeks to determine the progress of nitrate formation. It was found that nitrates were formed very much more slowly in the mulched plot than in the unmulched, in spite of the fact that nitrogen in the form of ammonia was present in larger quantities under the straw mulch.

The conclusion was drawn that straw mulch in applications as heavy as six tons per acre cuts down evaporation of the moisture from the soil, thereby lowering the temperature. Mulch also prevents normal exchange of air. All of these factors tend to produce a poor physical condition in the soil and unfavorable conditions for the proper formation of nitrates from the nitrogen available.

It was also found that the lighter mulch gave similar results as the heavier mulch except in a lesser degree.

CENTRAL POWERS STILL EXCLUDED FROM INTERNATIONAL SCIENCE BODY

Germany, Austria and the enemy countries of the world war are still excluded from the councils of international science. The International Research Council at its third meeting held at Brussels last month failed in an effort to admit to this international organization the countries not included in the ranks of the Allies and neutrals of the war period.

Although there is a minority, represented chiefly by France, Belgium, Czechoslovakia and Poland, that favors the continued exclusion of their former enemies, it was the method of voting rather than this faction that prevents the opening of the council's doors to a truly international membership. The rules of the union, composed of thirty-one members since the recent admission of Latvia and Tunis, require a two-thirds vote of all member countries for a modification of the rules of the council. A two-thirds majority means 53 votes and there were only 52 votes represented at the Brussels meeting. Thus even if the delegates had been unanimous in their desire to admit the Central Powers, which was 16 votes from the truth, no changes could have been made.

Dr. Vernon Kellogg, permanent secretary of the National Research Council, who headed the United States delegation, voiced his disappointment and made clear his apprehension at the state of affairs. Delegates from Sweden, Denmark, England, Norway and Holland joined him in intimating that danger faces the present international organizations if the situation is not relieved in the near future.

The problem may be solved through a mail ballot polled by the executive committee this fall, since the statutes of the council allow voting by mail. If this fails a special assembly may be called for the near future. Dr. Vernon Kellogg of the American delegation was elected a member of the executive committee vice Dr. George E. Hale who resigned on account of health.

The delegates from the United States in addition to Dr. Kellogg were: Dr. W. W. Campbell, president of the University of California, and Dr. Charles E. St. John of Mount Wilson Observatory.

A committee to consider the relationships between solar and terrestrial phenomena was appointed by the council and its membership included Dr. St. John and Dr. C. G. Abbot, assistant secretary of the Smithsonian Institution.

EIGHT MONTHS CHOPPED FROM AVERAGE LIFE BY STATISTICS

In spite of the fact that the continued betterment of health and living conditions in this century has given Americans the expectancy of longer and longer lives, the average American had his "expectancy of life" reduced from 56.01 years in 1921 to 57.32 years in 1923, or a loss of about eight months. According to statisticians of the Metropolitan Life Insurance Company, who compiled the figures, greater prevalence of influenza and pneumonia in 1923 caused the reduction but from advance indications for 1924 and 1925 the expected span from birth to death will be a larger number of years than it was in 1921, a banner year.
