# SCIENCE NEWS

*Science Service, Washington, D. C.*

## THE TEMPERATURE OF THE PLANETS

If, by means of a rocket or one of the various methods proposed by Jules Verne and other writers of scientific romances, men are able to travel to the moon, asbestos underwear will probably be a necessary part of the equipment, for when it is noon on our satellite, and the sun is directly overhead, the temperature is about 120 degrees Centigrade or 250 degrees Fahrenheit.

This is the conclusion of Dr. Donald H. Menzel, of the University of Iowa, who has made calculations of the temperatures of the moon and the planets based on observations of Dr. W. W. Coblentz and Dr. C. O. Lampland, at the Lowell Observatory. These results are described in an article to appear in the forthcoming issue of the *Astrophysical Journal.*

Martians, if there are any, do not freeze all the time, for according to Dr. Menzel's computations, the temperature of the equatorial regions of Mars rises as high as 75 degrees Fahrenheit when the planet is nearest the sun. Light areas on its surface are cooler than dark areas, even though on the earth the deserts, which would probably appear brightest to an astronomer on another planet, are the hottest parts of the terrestrial surface. However, the dark areas of Mars absorb more heat and light than the light areas, which reflect it away.

But, though any form of life that might exist on Mars would be comfortable when the thermometer is at its highest, it would have to withstand tremendous variations between day and night, for the temperature of part of the planet in the shade of night was found to be about 120 degrees below zero Fahrenheit. Like the earth, the poles of the planet are cold, for on August 14, 1924, the temperature of the south polar cap was about 150 degrees below zero, though it gradually increased until it was only about 5 degrees below on October 22. This indicates, it is stated, that the polar cap is probably composed of ice and snow.

Measurements have also been made of the temperature of the more distant planets, Jupiter, Saturn and Uranus, and their temperatures are found to be about 200 degrees below zero Fahrenheit, 240 below and 275 below, respectively. It is stated that there is little evidence of internal heat, although many astronomers have supposed that these planets, once presumably part of the sun, are still very hot.

The method by which the observations were made consists in the use of a thermocouple of two different metals which give rise to a small electric current when heat or some other form of radiant energy falls on it. This current is measured by a delicate galvanometer. The apparatus was attached to the 40-inch reflecting telescope of the Lowell Observatory, and by putting screens of quartz, glass, water and fluorite in front of the thermocouple, energy of various wave lengths was filtered out, and the amount of each of these components in the planetary radiation was measured.

## THE LEAD TREATMENT OF CANCER

With thirty almost hopeless cancer cases apparently cured Professor Blair Bell's lead treatment comes well to the front, if not to the center, of the crowded arena of cancer research.

Of the 227 practically hopeless cases treated since November, 1920, 30 have been pronounced cured, in ten the cancerous growth has been arrested and nine are considered greatly improved. Dr. J. G. Adami, vice-chancellor of the University of Liverpool, in a comment in the English medical journal *Lancet,* in which Professor Bell's papers on the lead process of treating cancer have appeared, says that the thirty patients show no sign of lead poisoning or recurrent cancer, are in good bodily condition and are following their usual occupations.

The funds to carry on this line of cancer research have been furnished by private endowment and are administered by the Liverpool Cancer Research Committee of which Professor Bell is now director. In his efforts to find a preparation of lead that would react against the cancerous cells and not harm the surrounding tissue he has been assisted by the department of physical chemistry of the University of Liverpool.

This has proved to be one of the most serious problems of the whole method of treatment. Lead salts injected directly into the circulatory system are poisonous. Colloidal lead, with which the best results are obtained, consists of small particles of lead suspended in a state of more or less unstable equilibrium. The problem of the chemistry department of Liverpool has been to devise a method by which a lead colloid could be made more stable and effective. A group of scientists working under Professor W. C. McC. Lewis have been conducting a series of investigations which, while they have produced a considerable improvement, have not yet been able to make a preparation that will stay suitable for use for more than a few days.

As yet, according to the account in *Lancet,* the product is still so unstable and difficult to prepare as not to warrant the publication of the procedure necessary to make it. It is hoped that ultimately a permanent colloid will be perfected which will be then made available for use in the hands of clinicians carefully trained to administer it.

In his most recently published analysis of his results Professor Bell stresses the point that much work must still be done to make a more active preparation of lead that will be less poisonous to the system generally. All types of malignant growths, he declares, are probably amenable to the influence of lead if only enough of the metal can reach them.

He does not hesitate to employ auxiliary measures of surgery, X-rays or radium when circumstances seem to warrant but recommends that when the growth has been partly or apparently entirely removed, "intravenous injections of lead should be employed within a few days of the operation when possible."

In conclusion he states that "the method of treatment is difficult, and to some extent dangerous and can only be safely employed by those who are thoroughly experienced in the work, and have laboratory facilities at their disposal."

## TEACHING THE DEAF BY TOUCH

A WAY to show totally deaf persons that spoken language has rhythm is being tested by Dr. Robert H. Gault, professor of psychology in Northwestern University, who, under the auspices of the National Research Council, is conducting experiments upon students of Gallaudet College for the Deaf. The method has grown out of Dr. Gault's experiments in relation to sensation of touch. If it is put into use in schools for the deaf, it will help the child who has never heard the sound of spoken words to talk much more normally.

"The deaf person has great difficulty in grasping the idea of the swing of human speech," says Dr. Gault. "That is why his sentences often sound stiff-jointed and queerly accented. By means of apparatus which conveys the vibrations of a speaker's voice to the finger tip of the deaf person, he is able to catch the swing of the sentences and the grouping of words and phrases, and fine distinctions among words."

The apparatus used for these experiments is the same that Dr. Gault has used for some time in testing the practicability of enabling the deaf to understand speech by the way it feels upon their finger tips. The speaker talks into a transmitter, and the vibrations of his voice are amplified 175 times. The deaf listener, who may be in a different part of the building, holds in his hand a receiving device that looks like a radio earphone, and presses one finger against the disc to catch the vibrations. Different vowels and consonants have different vibrations, and one by one the student learns to identify the sounds that make up the language.

Some of the deaf subjects who have spent no more than 120 hours in the laboratory have learned to recognize several hundred words with their fingers. One succeeded in identifying 120 sentences without error, after having been over them but eight times, and others have done almost as well.

These subjects, Dr. Gault says, have now acquired a familiarity with the swing or movement of speech which they never had before. This is giving them a thrill of speech that they never experienced. They enjoy the movement of verse, some verses more than others. They can take a list of unfamiliar sentences and mark them to indicate how a good reader might read them. Subjects of corresponding age and school experience who have not taken part in any of Dr. Gault's experiments are approximately 28 per cent. inferior in this respect to the practiced subjects.

Dr. Gault also has his method in connection with lip reading, and he has demonstrated that the feel of speech is of practical use here.

"There are many different groups of words, each member of which looks like every other word in the group to the individual who is reading the lips of a speaker," he explains. "For instance, the words 'aim' and 'ape' look exactly alike as the lips form them. These syllables, however, are very different when they are felt by aid of the instrument in the laboratory."

The psychologist has selected 103 such groups at random for experimental purposes to discover how far the sense of touch can go in making distinctions among them. In only seven groups out of the 103 did he fail to find definite differences in feel—different enough to enable the subjects to make identification.

Because of the large number of words that are difficult to distinguish in unaided lip reading, he believes that learning would be easier for the deaf child if he could watch the teacher's lips and at the same time feel the words in his fingers.

"When the deaf in school can both see a speaker's face and feel his words and the movement of his speech, instruction can be very greatly speeded up without separating the pupil from the language of normally hearing people," says Dr. Gault.

## RACIAL TYPES

MAN started his evolution with a stocky, solid body of medium height and moderately brunette complexion, and worked both ways from that beginning, according to Professor R. Bennett Bean, of the University of Virginia, who proposes a new system of classification of racial types in forthcoming issues of the quarterly *Review of Biology* and of *The American Journal of Anatomy.*

Professor Bean regards the primitive Neanderthal man of central Europe as the ancestor of the human race, and his physique is taken as the type of a medium-built body, or "Mesomorph." From this central type development took place in two directions, toward a long-legged, long-headed figure and toward a short-limbed, round-headed one. The former Professor Bean calls "Hypermorph," or "high-form," and the latter "Hypomorph," or "low-form."

According to the theory, changes in the body conformation took place when the descendants of the original "mesomorphic" men began their migration. Those who remained inland, under conditions more or less similar to those of their first home, retained their medium structure. Those who migrated to the coastlands developed the longer and rangier "hypermorphic" characteristics under their new environment. Those who wandered southward and southeastward toward the tropics, or northward into the Arctic zone, got into regions more or less unfavorable for the best human development, and, in Professor Bean's words, "were reduced to a more or less infantile form, with short arms and legs and round heads and faces. This finds its extreme manifestation among the Negrillos of Africa, the Negritos of the Pacific, and the Malays, and in a more or less modified form among the peoples of the sub-Arctic regions, as the Siberians and the Lapps."

Professor Bean's new system of classification does not run parallel with the older arrangements of the divisions of the human race, but cuts right across them. In the white race there are both mesomorphs and hypermorphs,

but none of the low-type hypomorphs. In the two other great color-groups, the blacks and the yellow-browns, all three of the new form-types are found.

## THE RESTORATION OF THE SPHINX

VISITORS to Egypt now have the opportunity to obtain an unobstructed view of the front of the Sphinx, including its feet which are on exhibition for the first time in forty years. The Egyptian Government, according to advices reaching Paris, has undertaken not only to clear away the ever-mounting desert sand but also to make much-needed repairs on the venerable genius of the Nile.

The clearing away of the tons of sand and gravel necessary to uncover the Sphinx completely involves so much labor that it was undertaken but three times during the nineteenth century, the last excavation occurring in 1886. A veritable army of fellaheen is required to remove sand by the basketful to a point far enough away so that it will not immediately blow back and render their labor useless. It is recorded by medieval travelers that sometimes only the head of the image has been visible over the shifting sands of the desert.

Between the feet there is now on view the stele, or sculptured tablet of Tahutmes IV, on which is recorded a dream that came to that monarch while taking a noonday nap in the Sphinx's shadow.

Archeologists are somewhat disturbed by several cracks that have previously escaped notice in the rock from which the image is carved. These are being filled under governmental direction with a specially prepared cement. The explanation has been offered that they have been caused by seepage from water that has collected in a hole about three feet deep at the top of the head.

There are various legends about this hole. Some say it is merely a tomb shaft, while others have fruitlessly investigated it with the idea of finding entrance to subterranean treasure chambers.

The French Egyptologist, Hippolyte Boussac, has suggested that the hole was designed to hold the base of a gigantic headdress, such as the Egyptian god Osiris is usually depicted as wearing. It may either have been lost, he says, or never finished like some of the European cathedrals which are lacking a tower or two of the original design, several of them, to this day.

## ITEMS

THE Prussian Lower House has passed a credit of $120,000 for the purpose of having a scientific investigation into a mysterious disease which is affecting fishermen in that part of the Baltic known as "The Häff." The seizure comes suddenly, without warning, when at sea. It consists in severe pains in the muscles of arms and legs, culminating in temporary paralysis of these limbs. The attack ceases within a few hours after the patient is once more on land, but is apt to break out afresh as soon as he goes out to sea again. The theory has been put forward by a British specialist that the disease is a result of chemical deposits proceeding from the outflow of waste from the Stinnes chemical works along that part of the coast, but a very thorough chemical investigation will have to be made before the truth of this can be ascertained.

THE importance of cutting out a definite course for a vocational career and then steering by it is shown by a survey of office workers who applied for jobs at a typical employment bureau. The results, as recently reported by Dr. Harry D. Kitson, of Columbia University, show the educational and job histories of 684 applicants for work. The most striking fact discovered was that 40 per cent. of the men and 12 per cent. of the women were dissatisfied with their choice of occupation and wanted to change to other fields of work. Dr. Kitson states that the histories of such workers as these, none of whom he had guidance in selecting or planning their careers, constitute a plea for educational and vocational guidance.

THE losses of the wheat crop due to the Hessian fly will probably be much smaller than usual this year. According to the report issued by the U. S. Bureau of Entomology of a survey of the wheat-growing states, this insect is at a very low period of its abundance throughout the country. Illinois and Kansas alone show serious infestation, which is attributed to too early sowing and auspicious weather conditions at the time of the insects' emergence in the fall. Dissemination of information about the life-history of the Hessian fly by state and county authorities and cooperation of the farmers in deferring planting until the fly-free date in late September, as well as unfavorable weather conditions, are cited as causes for its decreasing prevalence.

CONTINUED freezing apparently can not kill bacteria that cause typhoid. Professor M. J. Prucha and J. M. Brannon, of the department of bacteriology of the University of Illinois, kept a colony of typhoid germs in a sample of ice cream at a temperature averaging four degrees below zero for two years. From time to time samples were taken out, for all of which positive cultures were obtained. The number of bacteria decreased gradually, it is true, but as many as 11,000 living typhoid bacteria survived in the final sample at the end of two years. In their paper in the *Journal of Bacteriology* the authors conclude from these results that low temperatures can not be relied upon to destroy typhoid germs in ice cream. They do not attempt to explain the resistance of the organisms to low temperature but there is indication, they say, that the kind of medium in which they are grown is an influential factor.

RE-GROWTH of the severed spinal cord in the higher vertebrate animals, a paralyzing injury from which recovery has hitherto been considered impossible, has been accomplished in the physiological laboratories of the University of Chicago. Dr. R. W. Gerard and Dr. Theodore Koppanyi cut the spinal cords of the unborn young of rats, which were later brought into the world not only alive but apparently none the worse for their operation. Commenting on the experiments, Professor A. J. Carlson, head of the department of physiology, said: "Regeneration of the injured or severed spinal cord is known to take place in the lower vertebrates—fishes and frogs—but regeneration in the central nervous system of mammals is unknown or uncertain. These experiments may thus form the starting point for a reinvestigation of this important problem in the higher animals."