ASTRONOMY-PHYSICS

Part of Cosmic Rays May Come From Sun

COSMIC rays, the intensely "hard," all-pervading radiation that comes from somewhere in outer space, may come in some small degree from the sun.

This is indicated by recent researches of Prof. Viktor Hess of the University of Graz, Germany, one of the pioneers of cosmic ray research. With instruments set on heights in the Alps, he and other physicists have detected a very slight increase in the intensity of the radiation when the sun is at mid-heaven. This averages only about one-half of one per cent. of the total radiation, but according to Prof. Hess it is a constant, and hence probably a significant, variation.

If the sun really is the source of even a small fraction of the cosmic radiation, it lends support to the view held by a number of European scientists, that these rays come from the stars, for the sun itself is a star, and not a very large one at that. Experiments conducted by two of Prof. Hess' colleagues, Dr. O. Mathias and Dr. Steinmaurer, have indicated that there is about a two per cent. daily variation from average intensity. They are still engaged in checking up on this result.

Prof. Hess adds, however, that even if the stars are definitely shown to be sources of cosmic rays, this does not wholly shut out the possibility of a part of the rays coming also from interstellar space, the source believed in by the American school of investigators.

Science News Letter, April 18, 1931

ENGINEERING

Stabilizer Reduces Rolling On Roughest Seas

See Front Cover

EVEN DURING the stormiest weather there should be no sea-sick passengers on the vessel that will carry in her hold the 120-ton gyro-stabilizer pictured on the front cover of this week's SCIENCE NEWS LETTER. The photograph shows the stabilizer on test in the South Philadelphia Works of the Westinghouse Electric and Manufacturing Co., where it was built to the order of the Sperry Gyroscope Co. for a foreign shipbuilder.

The huge stabalizer is 11 feet in diameter. The rotor alone weighs 55 tons and is spun at 930 revolutions per minute by a built-in 200 horsepower motor.

Engineers say that the apparatus, precessed by an external electric motor of 75 horsepower, would keep a 450-foot ship from rolling more than two degrees. Almost an hour is required to get the 55-ton rotor up to its speed, and when power is shut off the rotor, it will revolve of its own momentum for more than two hours.

The stabilizer is one of the largest ever constructed. A smaller one was ordered recently by the Italian government for use in a ship of 2000 tons.

It is understood that stabilizers will be introduced into trans-Atlantic passenger service when a new 45,000-ton Italian liner begins operation next year. The vessel is expected to carry three huge gyro-stabilizers, and will be the largest ship to be protected against rough seas in this manner. This will be the second important recent change in the design of trans-Atlantic liners, the first being the introduction of the bulbous bow by the German vessels, the Bremen and the Europa.

Science News Letter, April 18, 1931

CONSERVATION

Airplanes Barred as Lion-Hunters' Chariots

HUNTING lions from airplanes is distinctly out, in all parts of Africa where the British writ runneth.

The open veldt of the great African game country offers great possibilities for cross-country coursing in automobiles, and easy landing for airplanes. Hence sportsmen who like to take life easy in more than one sense have been father over-shooting lions.

This is regarded as bad for several reasons. It threatens the sport with extinction, which alone would be serious enough to settle the matter without further discussion, so far as many Englishmen are concerned. Sportsmen are joined in their anxiety, however, by zoologists, who do not wish to see another splendid wild animal added to the list of extinct species. And conservationists and animal ecologists see in the lion a useful regulator for the numbers of antelope and other grazing animals which without some natural check might increase too rapidly and over-graze the range.

Only in thickly populated districts, where lions become troublesome stock-killers and potential menaces to human life, is exterminative hunting tolerated.

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IN SCIENC

BACTERIOLOGY

Test Germs Weakened Before Being Killed

SOME of the remarkable claims for gem-killing power advanced by highly advertised antiseptics may need to be revised as the result of a report by Dr. G. F. Reddish of St. Louis, to the American Chemical Society. He found that some testing laboratories were using kinds of the peptone germ food that weaken the *Staphylococcus* test germs and thus make them easier to kill when a disinfectant or antiseptic is tested.

Science News Letter, April 18, 1931

ECOLOGY

Sunlight Is Measured In Field and Forest

TEN TIMES as much sunlight falls on a given stretch of open meadowland in summer as in winter. In a forest, the quantity of sunlight that filters down through the leafy roof is determined by the kind of trees that make up the stand.

These are among the facts determined by researches of Dr. Orlando Park of the University of Illinois, carried on for three years in four types of Illinois forest and in open country. The results will be presented in detail in a new scientific periodical, *Ecological Monographs.*

Dr. Park used an engineering instrument known as an illuminometer, which expresses illumination in terms of foot-candles. He found that the summer sunlight on an open meadow reached a figure as high as 10,000 foot-candles, while winter sunlight was often no more than 1,000. The sunlight reaching the ground in a forest varied according to the type of leaves overhead. Cottonwoods, evergreens, black oaks and maples each produced a characteristic filtering effect. There was also a seasonal variation in the forest, as the leaves appeared in spring, grew denser in summer, became more opaque in autumn and finally fell from the trees.

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E FIELDS

ARCHAEOLOGY—AVIATION

Air Survey Reveals Camps Along Roman Wall

AN AERIAL survey of the famous Hadrian's Wall, relic of Roman days in Britain, has been made by the Royal Air Force, and four temporary camps, heretofore undetected, have been located. The wall, which extended across Britain from coast to coast, marked the northern frontier of Roman territory and fortified it against invasion.

A revision of the wall's later history has come about through another recent discovery, consisting of two important inscriptions. These were found along the wall at Birdoswald. In an address before the Society for the Promotion of Roman Studies, R. G. Collingwood, British archaeologist, stated that the inscriptions explain that the wall was destroyed twice because the garrison was withdrawn by usurpers. These usurpers were using the army in Britain to aid them in a fight to gain the throne of the Roman Empire. On a third occasion, the wall fell because it was attacked on all sides at once by barbarians.

It had previously been supposed that the great wall succumbed to enemy attack because it was not a very strong and adequate line of defense.

The two new inscriptions are of the time of the Roman Emperors Severus and Diocletian.

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BOTANY

Beautiful Mountain Shrubs Follow Trail of Disaster

FIRE, avalanche, windstorms tearing down great swaths of forest—these are the path-clearers for the great thickets of rhododendron, mountain laurel and other fine shrubs whose beauty arouses the admiration of visitors to the Southern Appalachians. These plants, members of the heath family for the most part, go into such devastated areas and hang on there, in spite of the poverty of the soil and constant winds that try to suck the life-sap out of their leaves.

This in brief summary, is the story of a study of the "heath balds" of the Great Smoky Mountains recently concluded by Dr. Stanley A. Cain of Butler University, Indianapolis. The "balds" and "slicks" of these mountains are composed of thick tangles of shrubs, which in the blossoming season are often very beautiful. Dr. Cain found in many studies of the soil that a little digging would always disclose a layer of charcoal, even if the surrounding forest showed no signs of fire in past years.

Into such "deserts" a host of plants might come. But in this particular region the soil is poor and acid, and the evaporation rates are high. This discourages all but the tough-leaved, hardy heath-shrubs. These, like the people of the southern mountains, can endure much poverty and hardship and still remain alive. Their possession of the denuded areas is an indication of better adaptability to difficult conditions than is possessed by the general run of the vegetation.

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ARCHAEOLOGY

Hunted Diana's Head; Found Broken Bacchus

PROF. Siegfried Loeschke of the Provincial Museum at Trier, Germany, went a-hunting for Diana's head and came back with most of Bacchus. This unusual piece of archaeological hunter's luck has recently happened at the great temple district on Trier, where more than sixty pagan temples and chapels and a theater, all dating back to imperial Roman days, have been dug up within the past few years.

Some time ago a beautiful marble statue of Diana was turned up. The head was lacking, having been broken off when the image fell or was overturned. It must still be buried somewhere near where the statue was found. Professor Loeschke was regretting one day that due to post-war hard times in Germany his museum lacked funds to continue the exploration at this place, when a wealthy foreigner gave him enough money to continue the search for the missing head. The new dig disclosed, not the sought-for head of the goddess, but a broken statue of Bacchus. The head of this statue also is missing. Now Professor Loeschke is hoping for a chance to find both heads.

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PALEONTOLOGY

African Dinosaur Skeleton Set Up in Berlin Museum

BERLIN visitors passing through the Natural History Museum will have an opportunity to see a huge dinosaur skeleton from Africa, which has just been set up. It represents a beast similar to the American dinosaurian genus *Diplodocus,* though it is not quite so large. As the skeleton stands in the museum, it measures about 41 feet in length and just under ten feet to the highest part of its arched back. It is known to science as *Dicraeosaurus.* The skeleton was collected by a recent German expedition to the Tendagugu region in East Africa.

Science News Letter, April 18, 1931

CHEMISTRY

Six In Ten "Tasteblind" To Bitter Chemical

"TASTEBLINDNESS" is the only term that can be found to describe the reaction of a fortunate forty per cent. of folk who cannot taste para-ethoxy-phenyl-thio-urea. For the other sixty per cent. find it intensely bitter—bitter as gall, bitter as quinine, bitter enough to make them go round sticking out their tongues and making wry faces for an hour.

This curious difference in perception has been discovered by Dr. Arthur L. Fox, of the laboratories of E. I. du Pont de Nemours and Company at Wilmington, Del. He has tried this very complex organic compound on everybody who would volunteer to taste it, and has found that approximately three-fifths of his "victims" declare it intensely bitter, while the rest say that it "has no more taste than sand."

Para-ethoxy-phenyl-thio-urea is an innocent-looking white stuff, usually available in coarsely powdered form. It is a close chemical relative to another compound, known to the trade as "dulcin," which is several hundred times as sweet as sugar. To make dulcin, one atom of sulphur is dislodged from the molecule of para-ethoxy-phenyl-thio-urea and an atom of oxygen substituted for it.

Dr. Fox has found that this curious "tasteblindness" is displayed by the same persons to other compounds as well, all of them of the thio-urea group. But so far as known, dulcin tastes exceedingly sweet to everybody.

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