

Science News-Letter

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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ASTRONOMY

Naked Eye Sunspots

An unusual number of sun spot groups, four of which can be seen by the naked eye when properly protected, have just been observed by Dr. Frederick Slocum, director of the Van Vleck Observatory of Wesleyan University, and other observatories. In fact, Prof. Slocum said that it was the finest display in many months.

"Early in October a period of marked activity began on the sun," said Prof. Slocum in a statement to Science Service. "By October 13 there were eight distinct groups of sun spots, the finest display since last December. Four of the spots could be seen with the unaided eye, with the aid of a piece of smoked glass or a piece of exposed photographic film.

"The largest single spot was forty-five thousand miles in diameter, and the largest group of spots one hundred and fifty thousand miles long. Five of the groups were in the northern hemisphere of the sun, forming a chain which extended completely across the solar disc. Three of these groups were nearly the same distance from the sun's equator, or from sixteen to seventeen degrees north in solar latitude.

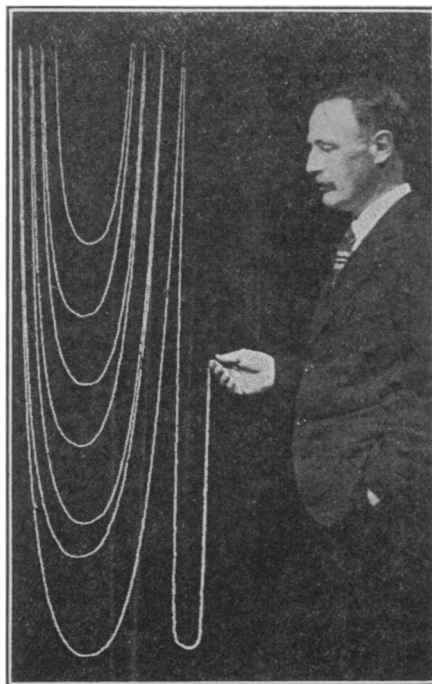
"Two other groups swung into view around the eastern edge of the sun, in latitude twenty-four and twenty-five degrees north. There were also two groups of spots in the sun's southern hemisphere, at latitude eight and nine degrees, but they were small and inconspicuous.

"A very marked feature of the sun was the contrast in number of spots between the northern and southern hemispheres, but this is not uncommon. According to early records, not a single spot was observed on the sun's northern hemisphere from the year 1672 until 1704.

"Since the sun rotates on its axis once in about twenty-seven days, most of the spots have now disap-

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ARCHAEOLOGY



DR. A. V. KIDDER WITH HIS 1000-YEAR-OLD BEADS

Bead Treasure

The rare find of a chain of hand-drilled beads 48 feet long, once the treasure of a prehistoric Indian medicine man, is reported by Dr. A. V. Kidder, anthropologist, who has just returned from a scientific expedition to New Mexico and has joined the staff of the National Research Council. The expedition, which was conducted by Philipps Academy, of Andover, has been exploring the ruins of Pecos Pueblo for several years, but this year the accidental discovery of an older pueblo settlement was made. It was in this ruin, which dates back to about 1000 A. D., that the remarkable bead find was unearthed.

"The beads were discovered in the grave with the medicine man's skeleton," said Dr. Kidder. "The Indian's hair had been gathered into a mat at the back of his head, and the

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CHEMISTRY

The Catalysis of Coal

By EDWIN E. SLOSSON

In the old days before the war men did not know anything better to do with coal than to burn it. Now they are beginning to find out that it may be put to better purposes as raw material for making more valuable commodities.

In those days too when men wanted to get more gasoline than petroleum contained they knew no other way to get it than to smash up the big molecules into little ones, to break down the heavy oils to make light oils. This "cracking" process was regarded as a great achievement in its day and brought fame and fortune to its inventor; quite rightly since we could be running few automobiles without it. But the world is passing into another era now, the age of synthesis, when the chemist will build up instead of breaking down. Starting with the commonest and cheapest materials, air, water and coal, the chemist can construct at will all sorts of valuable compounds for which we formerly had to rely upon nature.

The veteran French chemist, Prof. Paul Sabatier of Toulouse, recently on a visit to America, opened the door to this new era with the key called "catalysis." Shortly before the century closed he found that hydrogen gas could be made to unite with carbon monoxide gas in the presence of finely divided nickel and produce methane, well known as natural gas. Now these two constituents, hydrogen and carbon monoxide, are easily made by passing steam over redhot coal, the "water-gas" process. Many other metals and compounds have since been found to act like nickel as a catalyst, that is, they speed up a process by their presence without being used up or appearing among the products.

This principle has of late been applied with remarkable results by a countryman of Sabatier, General

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Bead Treasure

(Continued)

endless chain of beads was twined about this pigtail as an ornament.

"The beads represent a stupendous amount of labor on the part of patient craftsmen. The shells were brought to New Mexico by traders from the California coast. Each bead was then drilled by hand with a hard wooden drill, and each one was polished.

"The grave of the medicine man also yielded an assortment of his possessions, including a beautiful stone ax, a pouch containing medicine stones, flutes, raw turquoises, a stone pipe, and the paints which he used in making up for ceremonials."

Archæologists working in the region have hitherto concentrated on the Pecos Pueblo ruins, which lie on a high mesa and which were occupied until comparatively recent times. The existence of an older settlement was unsuspected until this summer. The camp of the expedition was set in the nearby lowland, and a member of the party was digging a hole here, in which to bury tin cans, when he came upon a skeleton. Immediate investigation revealed that this was the edge of a much older pueblo, deserted in pre-Columbian times.

"All of the rooms in this ancient pueblo have not been excavated," Dr. Kidder said, "but there is evidence that the place was hastily abandoned. In addition to the finding of fifty buried skeletons, scattered in various places, we have found several skeletons which were left unburied in rooms. One of these has a badly battered skull, indicating an attack or massacre. There is also evidence that the pueblo was set afire."

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An Ohio nutrition specialist says that each day's food should include milk, vegetables, potatoes, fruit, cereals, and eggs, meat, poultry, or fish.

Among Indian tribes north of Mexico there were about 50 languages and groups of languages so distinct that no relationship between them has been traced.

It is never possible to be sure that a volcano is extinct; before the eruption of Vesuvius in 79 A. D. the volcano had been quiet long enough for a forest to grow up inside its crater.

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Naked Eye Sunspots

(Continued)

peared, while all the spots will have passed out of sight around the western edge of the sun by October 26, perhaps to reappear again at the eastern edge in November."

These spots were responsible for brilliant displays of the aurora borealis, or northern lights on the nights of October 14 and 15, in the opinion of Dr. Edwin B. Frost, director of the Yerkes Observatory of the University of Chicago. On the 14th, he says, there was a display of great variety, which reached its height between 1 and 2 a. m.

The northern lights occurred just after the spots had been directly in the center of the sun's disc as seen from the earth.

According to experiments conducted by Norwegian scientists, the aurora is caused by rapidly moving particles of electricity, or electrons, which are shot out from sun spots at speed almost as fast as light itself. As these come out straight from the spots, it is only when the spot is pointed towards the earth, or in the center of the solar disc as we see it, that the electrons come close enough to the earth to cause such phenomena.

These rays are attracted by a magnet, and the fact that the earth is a great magnet draws them when they get near the earth. In support of these ideas, experiments have been made by which the same sort of rapidly moving electrons have been obtained by high voltage electric currents and aimed at a small magnetized steel sphere, producing artificial auroras. The shapes of these man-made "northern lights" agree closely not only with the shapes computed mathematically in advance, but they are also very similar to the actual aurora borealis as revealed by photographs.

Though brilliant displays of the aurora are infrequent except in northern countries, the electrons are being given off from the sun to at least moderate extent continually. By analyzing the faint light from the northern night sky even on a dark night with a spectroscope, a green line is revealed due to the aurora. This can be observed when there is no trace to the eye of the northern lights. Though the origin of this green line has been a mystery, it has been shown recently that it can be duplicated by an electrical discharge through oxygen at the low temperatures that must prevail at the altitudes where the aurora occurs.

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