

# Science News-Letter

A Weekly Summary of Current Science

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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.

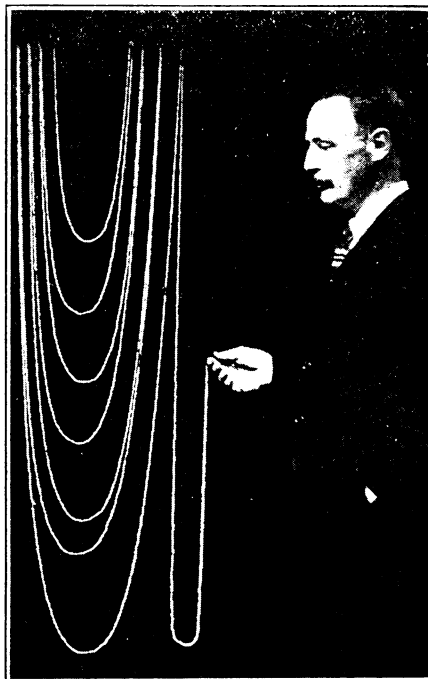
"Two other groups swung into view around the eastern edge of the sun, in latitude twenty-four and twenty-five degrees north. There were also two groups of spots in the sun's southern hemisphere, at latitude eight and nine degrees, but they were small and inconspicuous.

"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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## The Catalysis of Coal

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Georges Patart, and still more extensively in Germany by Prof. Franz Fischer, director of the Institute of Coal Research at Muelheim-Ruhr, and Dr. Friedrich Bergius of Heidelberg. All these three European leaders in catalytic research are coming to Pittsburgh to attend the International Conference on Coal held at the Carnegie Institute of Technology, November 15-19, and what they will have to tell of the application of catalysis to industry will surprise many of our people, for in this field America is far behind Germany and France.

For instance, we have been making methanol by the old fashioned method of distilling wood, but now the Badische Chemical Company makes ten to twenty tons of it a day from water gas at a cost of only 20 cents a gallon. Methanol, formerly known as "wood alcohol," has long been employed in all countries as a denaturant for industrial alcohol, and has caused many cases of blindness in Germany and America by being used for whisky by those who were already so blind as not to tell one alcohol from another. Various other alcohols, such as butyl alcohol, made in America by fermenting corn and used for automobile lacquers, are made in Germany from water gas. The waste gases that in some sections of the United States are still allowed to escape from coke ovens unused are, at the mines of Bethune, France, cooled and condensed and utilized for making methane, benzene, ethyl alcohol and ammonia.

Owing to the catalytic process for synthetic ammonia invented by Fritz Haber, Germany is now exporting fertilizer instead of importing it as before the war. About 425,000 tons of free nitrogen from the air is now fixed for fertilizers by catalysis every year, and this takes the place of 2,700,000 tons of Chilean nitrate. But Muscle Shoals still stands idle.

Benzene, which can be made from coal in various ways, is the mother substance of the aromatic family of chemical compounds, a family of over a hundred thousand and rapidly growing. Among these are the aniline dyes and drugs that have made the world brighter and safer in our generation. One of these synthetic products, carbolic acid, is familiarly used as an antiseptic and is nearly as useful but much less familiar as one of the two components of bakelite. The other component, formaldehyde, is also an antiseptic and also made artificially.

The chief stimulus to such investigations in Europe is the search for home-made motor fuel. We Americans are not interested in this question now but some day we shall be, and meantime it is interesting to watch the chemists over the water trying to see how many different things they can make out of common coal, like children playing with the Chinese tangram.

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## MEDICINE

### Animal Experiments Open

Experiments on animals necessary for the progress of medical knowledge do not take place behind barred doors, despite the claims of the antivivisectionists.

The animal rooms of medical laboratories are always open to responsible visitors according to a survey of the medical colleges and research institutes of the country, recently conducted by the American Association for Medical Progress.

Several directors extend special invitations to officers of humane societies so that they can see for themselves the exact conditions under which animals are kept for experimental purposes. Some laboratories will only receive visitors who have seen operations performed on human beings because it is argued that only in this way can a lay person appreciate the similarity between the two and the care taken against inflicting pain and avoiding infection.

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## MEDICINE

### Dishes and Germs

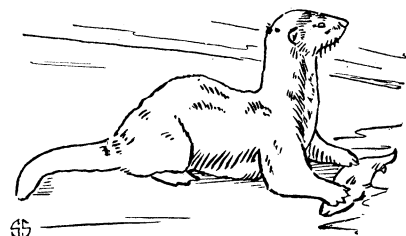
Germ-carrying dishes in public restaurants provide another menace to which the public is exposed. W. A. Hadfield and J. W. Yates, chemist and sanitation expert of Madison, Wis., have found how dishes can be made bacteriologically clean as well as clean in appearance. Chlorine is now widely used in treating and purifying drinking water in many communities. The experts recommend a similar treatment of dish rinsing water to kill the germs of the wash water that otherwise becomes heavily contaminated in even the cleanest establishments. They found the most satisfactory method of hand washing dishes was to use two compartments, one for washing and one for final rinse. Twenty-five to a hundred parts of sodium hypochlorite, a chemical that liberates chlorine, should be added to the rinse water in which the dishes should be immersed for at least a minute.

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## BIOLOGY

### NATURE RAMBLINGS

By FRANK THONE



### Survivors of Civilization

This has been a great year for the ancient art of swimming, as practised by the human race, a species rather ill-adapted for swimming, all things considered, but making up in determination what it lacks in fins or gills. But it is autumn now, and the hardest of the channel-swimming nereids and tritons have come ashore until the word shall go forth, next summer, that "the water's fine."

But the water is fine all year round for that most skilled swimmer among all terrestrial mammals, the otter. Without the special adaptations of such more strictly water-dwelling animals as the seal and the walrus, the otter is almost as much at home in their element as they are, and he has the advantage over them that he is still perfectly competent for a land life with all four feet. The otter is a member of that group of slim-bodied, short-legged carnivores that includes weasels, skunks, martens and minks, but though these are all good swimmers none of them has become primarily aquatic and fish-hunting in habit, as he has.

The otter does show some adaptations to his water-loving life, especially in his somewhat thickened tail, which serves as a powerful rudder, enabling him to twist and turn and follow the swiftest trout. His ears are reduced in size, and his fur is very smooth and sleek, looking almost like a naked skin when it is wet. It is this close, thick, lustrous fur that has made the otter the victim of unremitting persecution by hunters and trappers, and that the genus has been able to survive centuries of this is a real tribute to the otter's intelligent care of its young and its sturdy ability to look out for itself in a rough world.

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When our eyes are in motion we are stone blind.

Elk once roamed this country from coast to coast.

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