field on the trajectories of high speed cosmic ray particles can easily be demonstrated in the physical laboratory. The pictures on the preceding page and on the cover show a device which was designed by Dr. W. F. G. Swann of the Bartol Research Foundation of the Franklin Institute.

A three-inch glass sphere containing an electromagnet represents the earth. Through the evacuated space around it is shot a beam of electrons. Unlike billion volt cosmic rays, however, these electrons are of only 100-volt speed and can readily be deflected by the small magnet.

Imagining, in the pictures, that the luminous beam represents positively charged cosmic ray particles, we are looking straight down upon the north pole of the earth. The cosmic ray path, in this case, lies in the plane of the equator.

In the picture on the cover, a ray of only moderately high energy is bent by the magnet. The view on the preceding page, taken with the magnet turned off, shows how an extremely energetic particle could pass undeviated through the earth's field.

This magnetic bending has provided physicists with information as to the energies of the rays, and has told them that the majority carry positive electrical charge. To this end, measurements in various parts of the earth—on mountain peaks and in stratosphere balloons—are interpreted with the aid of highly complicated mathematics.

Science News Letter, July 18, 1936

ENTOMOLOGY

Shocks Drive Out Borers From Infested Elm Trees

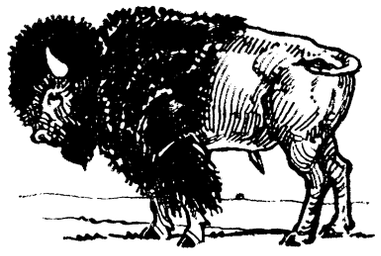
ELM BORERS infesting the trees of Victor H. Schmidt, of Kansas City, Mo., were dislodged in a manner literally quite shocking. Mr. Schmidt, weary of digging them out one by one with a pocket-knife, drove in a couple of nails a few inches apart, attached wires, and "turned on the juice" from a small magneto he had rigged up for his children to play with, and which they had previously been using to get angleworms out of the ground. Out came the borers in a very few seconds. Subsequent digging with the knife showed that the electric method had forced a hundred-per-cent evacuation of their dugouts.

In his report (*Science,* July 10), Mr. Schmidt suggests that perhaps a more powerful current might be used to advantage by nurserymen and orchardists.

Science News Letter, July 18, 1936

ECOLOGY

NATURE RAMBLINGS by Frank Thone



Assisted Competition

BUFFALO grass, the short, crisp, curly growth that characterized the western prairies and plains when the white settlers first came, had no magical connection with the huge, shaggy beasts from which it derived its name. If anything, it was distinguished by being able to resist the trampling hoofs and devouring mouths of the buffalo more successfully than the bluestem and other tall grasses, and so came to dominate buffalo areas where it might otherwise have been crowded out.

This curious biological "triangle of forces," in which an animal harmed one group of plants and indirectly aided another, is discussed in a report by Dr. Frederic E. Clements of the Carnegie Institution of Washington.

The key to its discovery was a surviving area of buffalo grass, growing within sight of the tower of the Nebraska state capitol. Heavily grazed by cattle after the disappearance of the bison, it still preserved something of its old-time appearance. The thick short sod of the buffalo grass held almost all of the territory, with sparse scatterings of the tall prairie grass species here and there in it. The buffalo grass was decidedly "boss" of the situation.

Then a fence was thrown around part of the area, and all grazing stopped for a time. As if by magic, the tall grass species, now free to bear crops of seed, began to reassert themselves. They crowded out existing weed growths in a single season, and after a few years were dominating a great deal of the terrain previously almost monopolized by the buffalo grass.

This helps to explain a phenomenon noticed during the period of settlement, Dr. Clements said. The pioneers years ago noticed that wherever they went the buffalo grass vanished and the taller prairie grasses tended to take its place on the rangeland. They got the notion that buffalo grass and buffalo were somehow linked together, and that the tall grasses, traveling with the settlers, choked it out. What actually happened was that the settlers drove out or killed the bison herds, and the tall grasses, always present but kept down by bison grazing, were released from this repression to get the better of their shorter grass-competitor.

Science News Letter, July 18, 1936

METEOROLOGY

New Methods of Observing Allow Better Forecasting

MORE accurate and more continuous day-to-day observations of solar radiation will allow forecasting of some features of the weather two weeks in advance, Dr. C. G. Abbot, Secretary of the Smithsonian Institution, Washington, known for his studies on solar variations, told scientists at the A.A.A.S. meeting.

For the new method of weather forecasting an extension of the present solar radiation observations of the Smithsonian Institution will be needed. At present, there are three observatories on high mountain peaks in desert regions. Financial support has been provided for adding seven observatories to those now operating, so that the necessary weather forecasting information can now be obtained.

Another way of obtaining the information would be to use balloons that sail above 100,000 feet (about 20 miles) carrying with them extremely lightweight instruments that record the sun's radiation and flash their findings via short wave radio to scientists below on the earth.

Dr. Abbot's studies show that variations of solar radiation ranging from one-half to one and one-half per cent produce well-marked temperature changes of about 5 to 15 degrees Fahrenheit at various cities. And he finds that these changes occur in all months of the year, lasting at least two weeks after the solar causes die away. Dr. Abbot and other experts see in this a method of weather prediction which will look further into the future than the procedures now in daily use.

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Trees planted on the outside of highway curves are useful in warning motorists of a change in the direction of the road.

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