

weapons, have been unearthed. Opposite the Romans lay one Sassanian with his hand still raised and his sword near him.

"European scholars call Dura the Pompeii of the Euphrates," said Dr. Rostovtzeff, "and it deserves this name."

*Science News Letter, December 8, 1934*

## METEOROLOGY

## May Base Long-Range Weather Forecasting on Sea Warmth

**P**ossible use of ocean temperatures, in conjunction with other factors, in forecasting air temperatures and precipitation along the middle and northern Atlantic seaboard has been suggested by Dr. Charles F. Brooks, director of the Blue Hill Meteorological Observatory of Harvard University, and Ernest M. Harwood of the Blue Hill research staff.

"It seems possible," says Dr. Brooks, "that the coastal waters may give indications of the air-temperatures of the following month along the Middle and North Atlantic seaboard, low sea-temperatures being followed by high air-temperatures, and vice versa. Furthermore it seems likely that the precipitation stands in inverse relationship to the general sea-temperature of the preceding month."

The data studied covered a five-year period during which sea temperatures were recorded on sea-water thermographs installed on commercial steamships in the western Atlantic, chiefly those sailing between New York and Bermuda. The land temperature and precipitation recordings were made at Boston and Baltimore, Md.

"The sea should have both a direct and an indirect influence on the coastal weather. The direct one should simply make the coast warmer and moister, when winds blow onshore off a sea warmer than usual, and vice versa," Dr. Brooks says.

The indirect effect works through the changes in general atmospheric pressure-distribution favored by departures of sea-temperature. When the sea is above normal in temperature it will not only heat the air but will also give it more vapor than usual. Such heated and humidified air is lighter than the average, and so the atmospheric pressure is lower. The lower pressure over the sea favors northerly land-winds, both cool and dry, on the coasts to the northwest. So a warm sea should favor subnormal

temperature and precipitation, Dr. Brooks believes.

Conversely, with sea-temperature below normal the air would be denser, the pressure higher, and the wind consequently onshore from the south, bringing warmer and moister weather to the coasts. On the Atlantic seaboard, where the winds are prevailing offshore, the direct influence must obviously be minor, therefore, the indirect should dominate.

"The sequences of departures of weather and sea-temperature do not show any striking opposition, so we cannot say that the problem of seasonal weather-forecasting from ocean-temperatures is solved," Dr. Brooks warns. "On closer examination, however, the expected inverse relationship is found to predominate rather consistently."

*Science News Letter, December 8, 1934*

## PHYSICS

## Two Automatic Instruments Facilitate Light Analysis

**E**xpected to be of tremendous assistance in the analysis of light, two new instruments are being developed at the Massachusetts Institute of Technology by Prof. George R. Harrison, director of the spectroscopy laboratory. Light analysis, or spectral analysis, is one of the most powerful of modern scientific weapons.

One of Prof. Harrison's instruments automatically measures and computes the wavelengths of spectrum lines, which are the separate bands that appear when a beam of white light is spread out by a prism or grating into an artificial rainbow. The other instrument, called an interval sorter, determines the energy of atoms and molecules from the spacing of these spectrum lines.

In measuring a spectrum by previous

methods, the scientist observed by eye the distances of the spectrum lines from some standard line, using a delicate machine known as a comparator. For a spectrum photograph containing many of these lines the task might easily require days or even weeks. To avoid errors caused by temperature changes in the mechanism, each plate had to be measured several times and the results reduced by complex calculations.

Although the new machine for measuring wavelengths is still in the process of development, it makes measurements twenty times faster than by the conventional methods, and the results are twice as accurate. Further development is expected to make it 200 times faster than the old method. A beam of light supplants the human eye in recording the measurements by means of a photoelectric hookup. (Turn Page)

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The interval sorter speeds up the process of determining energy levels of spectra several hundred times, eliminating computations which in some instances total 100,000 in a single analysis. Prof. Harrison's machine makes automatic computations at the rate of 50,000 a minute, sorting out the wavelength intervals and recording them photographically at the same time.

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ARCHAEOLOGY

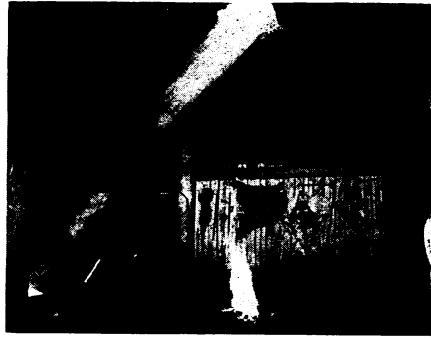
## Tragedy Tale 150 Years Old Verified by CCC Digging

A TALE of Indian tragedy has been checked and found apparently true by excavations of CCC workers, under direction of the North Dakota State Historical Society.

A village of Mandan Indians, so the old story goes, stood on ground where Fort Abraham Lincoln later was built. But 150 years ago, the Mandans went down under a double-barreled dose of trouble. First smallpox swept the village. Then, the weakened community was visited by the thing it feared most, a raid of wild Sioux Indians. Relentless, the Sioux burned the village, and the few surviving Mandans fled to take refuge with another tribe.

Excavation seems to bear out this story, says George F. Will, an authority on Mandan Indians, who has taken an active part in the investigation.

"Very obviously the topmost layer of the houses was destroyed by fire, as there is a great deal of evidence to that effect. There are a quantity of human bones, showing that as many as four or five children and some grown women were thrown into storage pits, presumably then empty. Since the Mandans always buried the dead outside the village on scaffolds, this is very good evidence either of widespread epidemic or of



MANDAN FIREPLACE FOR BOY SCOUT COUNCILS

*This earth lodge, exactly like those Mandan Indians used to build, has been constructed on Indian foundations at Fort Lincoln State Park under supervision of North Dakota archaeologists. Scout meetings, picnics and other gatherings may be held round the Indian-style fireplace.*

enemy attack. As none of these skeletons show marks of injury, it is probable these were victims of smallpox."

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PSYCHOLOGY-ECONOMICS

## President Called Better Psychologist Than Economist

PRESIDENT Roosevelt is considered "a better practical psychologist" but "a more amateur economist" by Dr. J. McKeen Cattell, who describes himself as "a professional psychologist, who is an amateur economist."

Dr. Cattell writes under the title "A Scientific Approach to Emotional Problem." (*Scientific Monthly, December*). He is former professor of psychology in the University of Pennsylvania and Columbia University and is editor of *Science* and other journals. He says:

"It is alleged that one of those dubbed 'brain trusters' has asked what part of the body can be trusted better than the brain. The difficulty is that some of those in the saddles at Washington tend to trust the heart rather than the brain. A scientific approach to the emotional side of economic problems is not easy."

Discussing one phase of the economic situation and the new deal, Dr. Cattell says:

"It may be that in a period of depression work should be shared with the unemployed by prescribing a short day's

This village was inhabited when the Mandan culture was at its highest, the excavations reveal. Tremendous quantities of pottery of very high type are among the objects unearthed. Two fragments of pots are decorated with conventionalized turtles, which Mr. Will pronounces the first naturalistic designs ever discovered on Mandan pottery.

Nearly a bushel of good quality corn, well preserved by having been burnt over, was found in a village storage pit that was not cleaned out when the inhabitants were driven from home. This corn shows the braided husks and the ears, just as Indian women used to braid them to hang up for a reserve of seed corn.

A number of earth lodges such as the Mandans built are being erected in state park areas, for their historical interest, and these will be put to practical use for scout meetings, picnics and other gatherings. (*See SNL, Feb. 14, 1931, p. 109*).

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work, though this is doubtful. As a permanent policy it would be disastrous. Before the industrial revolution most men, women and children worked twelve or more hours a day and got black bread, hovels and lice; people died at the average age of thirty years or earlier. Now, thanks to the applications of science and the better organization of society, child labor has become intolerable; eight hours of work for six days a week will provide the necessities and many of the comforts of life. The average length of life has been more than doubled.

"Thirty hours of work a week will today supply the necessities of life, but not the comforts. The hours should not be longer than is compatible with the health, happiness and efficiency of the worker, but it seems that he should be permitted to work thirty hours a week and live meagerly, or forty-five hours and have 50 per cent. more money, which could be used for bathtubs, telephones, radios, cars and children."

*Science News Letter, December 8, 1934*

## VITALISM and MECHANISM A DISCUSSION

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