

Rhode Island—had no cases during 1935. In the same year, however, eight Western states—Washington, Idaho, Montana, Wyoming, Colorado, South Dakota, Nebraska and Kansas—had over 5,000 cases.

These states have a combined population of less than 8,000,000. Their combined smallpox rate was 64 cases per 100,000 population.

"If these eight Western states were as thickly populated as are the six New England states with 131.8 persons per

square mile," the life insurance company statisticians point out, "one can readily imagine the havoc that might ensue."

Until the smallpox problem, largely centered in this northwestern area, is adequately met by "systematic vaccination and revaccination, there is no prospect that we shall reduce smallpox in this country to the level already attained by most of the civilized nations of the world."

*Science News Letter, June 20, 1936*

#### CHEMISTRY

## Dyeing Studies Give Size Index of Cotton "Pores"

**S**TUDIES on the size of particles of dye used to color cotton fabrics now give an index of the possible diameter of the "pores" in a single fiber of cotton.

The "pores" are so small that seven million of them would have to be placed side by side to make an inch, it was revealed at the meeting of the Thirteenth Colloid Symposium of the American Chemical Society by research chemists of the du Pont Co., Samuel Lenher and J. Edward Smith.

To allow dye particles to penetrate into the cotton fibers and produce good dyeing characteristics it was found that the particles had to be smaller than one seven-millionth of an inch in diameter.

"This size," said the chemists, "is, we believe, directly related to the size of the submicroscopic pores of the cotton fibers."

### To Aid Fog Study

Also before the Colloid Symposium was presented another du Pont research report which attacks the fundamentals of such problems as the nature of fog and the physical properties of inks and paints.

E. D. Bailey, J. B. Nichols and E. O. Kraemer, research chemists, described how the new Svedberg centrifuge at Wilmington was being used to study the particle size, which is basically tied up with turbid solutions.

Turbidity, they explained, is caused by the different amounts of bending which light encounters as it passes through a solution containing tiny particles in suspension. Even though the solution and particles may each be transparent to the rays, the combined effect is a turbid appearance.

"The problem is by no means academic," said the chemists, "for it is of fundamental importance in combating fog and haze as in the illumination of airports, and in making inks and paints, which are turbid because they contain suspended particles."

*Science News Letter, June 20, 1936*

#### ARCHAEOLOGY

## Stone Age Secrets Wrested From Old Weapon

**S**CIENTISTS poring over weapons in modern "crime laboratories" are able to extract many secrets that the layman would not guess at. And, acting as detectives of science, a group of German museum workers have "mined" a single weapon for information never before obtained about the way of life of people in northwestern Europe ten or fifteen thousand years ago (*Forschungen und Fortschritte, May 10*).

The weapon is a flint dagger about eight inches long, dating from the earlier part of the New Stone Age. It was found during the digging of a ditch through a moor in northern Germany. There is nothing remarkable about the weapon itself; Neolithic flint daggers are rather common throughout Europe.

Exceedingly remarkable, however, is the fact that this dagger was still in its leather sheath, with a long leather carrying strap still wrapped around it, just as the owner left or perhaps lost it, those many centuries ago. Also, part of the wooden handle was still in place, and between the wood and the stone a layer of cloth which had been inserted to improve the grip of the wood on the stone. Leather and cloth are usually

quite absent from finds as old as this, for they do not endure long against the ordinary forces of decay, but in the present case the acids in the soil of the moor had preserved them.

A group of scientists immediately went to work, each identifying some special part of the find. The leather of the sheath was sheepskin: an outer sheath decorated with shallow cuts in a spruce-needle pattern, and an inner lining of softer sheepskin. The carrying strap was of cowhide.

The wood of the handle was very difficult to identify; it seems most probable that alder was used. Confirmation of this opinion is found in millions of alder pollen grains, mixed with the moor soil at the level where the sheathed dagger was uncovered.

The cloth fragment proved to be highly interesting. The warp was almost wholly decayed, through the action of the acid water. A tiny fragment, unidentifiable by ordinary methods, proved to be linen when subjected to a new-type ultra-violet analysis. The wool was a mixture of sheep wool, goat wool, horsehair and cow-hair.

Adding all these fragments together, it was possible to conclude that the people of this region, very early in the New Stone Age, were herdsmen keeping sheep, goats, horses and cattle, that they were farmers who included flax among their crops, and that they were fairly proficient in both the tanning and working of leather and the weaving of cloth.

*Science News Letter, June 20, 1936*

#### SEISMOLOGY

## Coast of Australia Shaken by Earthquake

**A** SHARP earthquake shook the northeast coast of Australia on Wednesday, June 10, at 3:22.4, Eastern Standard Time, scientists of the U. S. Coast and Geodetic Survey have calculated on the basis of data transmitted telegraphically through Science Service. The epicenter was in the general region of 15 degrees north latitude, 145 degrees east longitude.

Stations reporting were those of the Dominion Meteorological Observatory, Victoria, B. C.; the observatories of the Jesuit Seismological Association at St. Louis University, Canisius College and Fordham University; and the observatories of the U. S. Coast and Geodetic Survey at Sitka, Alaska, and Honolulu, T.H.

*Science News Letter, June 20, 1936*