per cent. silicon commonly used in transformers. By suitable heat treatment Mr. Ruder, of the Research Laboratory of the General Electric Company, had brought these specimens into a monocrystalline condition, the orientation of the cubic lattice being different in the different samples. The Hall effect, measured up to field intensities of 25,000 gauss, was about fifteen times as large as for pure iron and appeared to be independent of the direction of orientation of the crystal.

In his work on a single bismuth crystal, Van Everdingen found that the Hall effect in any direction was given by the relation $E = a \cos^2 \theta + b \sin^2 \theta$, where a and b are the Hall effects, parallel to and at right angles to the principal axes of the crystal. In the case of a cubic crystal one would expect that a and b would be equal; in which event, according to Van Everdingen, the Hall effect should be the same in any direction. Our measurements on copper and on silicon steel confirm this and it would appear, therefore, that further investigation of the effect of crystal structure should be on metals with other than the cubic lattice structure.

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A NOTE ON REPUTED ANCIENT ARTIFACTS FROM FREDERICK, OKLAHOMA

IN SCIENCE for February 10, 1928 (p. 160), I voiced several objections to the view that certain artifacts found at Frederick, Oklahoma, were of early Pleistocene age. I suggested that the objects called metates by Figgins and Cook might not be artifacts. This is an error. Having since examined them at the Colorado Museum of Natural History I am certain that two or more are unequivocably metates. This does not militate against my other objections.

During a recent visit to the site Dr. Frank Melton and I found chips, the refuse of blade flaking, on the surface of the gravel deposit, but none occurring in the bed itself. This is conformable with my suggestion that the artifacts taken from the bed are surface material recently included. Dr. Hay will recognize that if the surface chips are of Aftonian age, a possibility he suggests,[1] they should occur in the gravel bed.

This gravel deposit caps a narrow ridge. It is markedly gullied by erosion along its margins, especially in the vicinity of the finds. My suggestion was that the artifacts may have lain in such a gully. Dr. Hay misunderstands that I envisage a deep hollow on top of the ridge, which, as he observes, is incredible, and to which I add, unnecessary.

The replies of Dr. Hay and Mr. Cook[2] do not impel me to revise my opinion that the case for antiquity is unproven.

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AN EXPLANATION

IT has been brought to my attention that in the paper entitled "The Common Ground of the Chemist and Biologist" in the issue of SCIENCE for July 13 there is a statement referring to tuberculin that has been given a significance which was not intended. This sentence at the bottom of the first column on page 23 reads as follows:

> It is a dirty compound of many substances concentrated from a boiled beef broth medium and bacilli and yet it is used as the basis for destroying millions of dollars worth of cattle annually and for the diagnosis of human tuberculosis.

This was an unfortunate use of the word "dirty" and has resulted in a wholly erroneous impression. The word "complex" would have been more accurate and better from every point of view.

The tuberculin long employed has unquestionably proven of great value and while we hope that a product of more definite composition will prove of even greater utility, this awaits further investigation.

WILLIAM CHARLES WHITE

U. S. PUBLIC HEALTH SERVICE

A MAGNETIC STORM

A SEVERE magnetic storm was recorded at the magnetic observatory of the U. S. Coast and Geodetic Survey at Cheltenham, Maryland, on July 7–8, 1928. It was characterized by its sudden onset, great intensity and comparatively short duration. It began at about 6:30 P. M. eastern standard time, July 7, and continued until about six o'clock the next morning. The period of greatest intensity occurred in the early morning hours. About half an hour after midnight the magnets of the horizontal intensity and vertical intensity variometers went beyond the limits of the record and the motion of the declination magnet was frequently too rapid to make a record on the photographic paper. The extreme range of the fluctuations, as nearly as could be determined, amounted to 4° in declination, more than 1,270 gammas in horizontal intensity and more than 640 gammas in vertical intensity. During this storm there was a wonderful display of aurora borealis and telegraph and telephone lines were seriously disturbed.

GEORGE HARTNELL

U. S. COAST AND GEODETIC SURVEY

[1] SCIENCE, April 27, 442.

[2] SCIENCE, April 6, 371.