

see them. His reply was very emphatic: "Das ist ja ganz unmöglich!" I gathered from his further conversation that he belonged to the Intelligence Bureau of the Austrian Foreign Office, and that his work consisted in reading such journals. I envied him, but could not suppress my feelings of astonishment at his reading such "ganz geheimen Dokumente" in a public restaurant.

It may be mentioned in conclusion that Germany was much more liberal than Austria about the circulation of Entente publications. At least until the later months of the war, it was possible to go into any of the larger *cafés* of the German cities and enjoy a cup of coffee-substitute over a copy of the *Times*, *Le Temps*, *Secolo*, and various other newspapers of the Allied countries.

ROBERT W. LAWSON.

The University, Sheffield, December 17.

Royal Meteorological Society's Phenological Returns.

WITH 1920 the phenological returns complete the thirty years, which period is a recognised critical epoch in meteorological records.

In consequence of the war, our observing stations fell to 110 in 1918, against the high-water mark of 132 in 1914. We are most anxious now to recover lost ground, and would in this respect like to make 1920 preparatory to the years to follow.

A reasonable total would include at least 220 stations, an average of twenty only for the eleven Meteorological Office districts. At present we are short of this in all but South-east England and the Midlands. The six districts forming Scotland, Ireland, and North-east England average only $3\frac{1}{2}$ each. Wales has two stations only, both in the south-west.

The observations asked for refer to the blooming of thirteen common flowers and the appearances of six birds and six insects. Other migrant records and notes are also invited, but these are of secondary importance.

A copy of the observing form and of a recent report will be sent with pleasure (the reports so far as they are available) to any readers of NATURE who would be interested to help.

We especially suggest the value for all interested in Nature-study and regional survey classes.

Inquiries should be addressed to one of us, or to the Assistant Secretary, Royal Meteorological Society, 70 Victoria Street, S.W.1.

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Einstein's Theory and a Map Analogue.

I AM grateful to the Director-General of the Ordnance Survey for directing my attention to an inaccuracy in my article in NATURE of December 11, p. 375. It was there stated that it is not possible to strain a map of the earth's surface so that all great circles become straight lines.

This is clearly contrary to the known fact of the central projection. As a matter of fact, the sphere is one of the limited class of surfaces for which it is possible to strain all geodesics into straight lines. For an arbitrary surface this is not true. The difference between the properties of the sphere and of the general surface gives a fair indication of the geometrical notions at the back of Einstein's theory.

E. CUNNINGHAM.

THE SUN DANCE OF THE TETON SIOUX.

AS man advances in the scale of culture he loses his dependence on Nature. The dweller in a modern city relies chiefly on artificial means for his pleasure and comfort, but the American Indian realised that his whole success depended on his co-operation with natural forces. He studied his surroundings and evolved a system of reasoning by which he attempted to explain them. A thoughtful Sioux Indian said to the writer: "When we see the changes of day and night, the sun, moon, and stars in the sky, and the changing seasons upon the earth, with their ripening fruits, anyone must realise that it is the work of someone more powerful than man. Greatest of all is the sun, without which we could not live. The birds and the beasts, the trees and the rocks, are the work of some great power."¹ Having recognised a creative power with the sun as its most important manifestation, it was a natural step in native logic to regard the sun with a reverence that is best expressed by the word "worship."

While the worship of the sun, in various forms, was widespread among the Indians of North America, the sun dance was a ceremony the observance of which was limited to certain plains tribes. The sun dance among the Santee Sioux differed in some respects from that of the Teton Sioux, which is herewith presented, but the underlying idea is the same. The sun dance was "the first and only religion of the Sioux," and even at the present time it is considered too sacred a subject for ordinary conversation. At the opening of the writer's study a member of the tribe said: "If we were to talk of the sun dance there should be at least twelve persons present, so that no disrespect would be shown, and no young people should be allowed to come from curiosity."

The purpose of the sun dance was the public offering to *Wakan'tanka* (Great Mystery) of what was strongest in the nature and training of the Indian—namely, his ability to endure physical pain. He did this in fulfilment of a vow made in time of great anxiety or danger, usually when on the warpath. The time of the sun dance was the full moon of midsummer, "when all Nature and even man is rejoicing." Into this joy and beauty, as though to give a greater contrast, the Indian projected his personal suffering. For a month before the sun dance it was customary for the medicine men to "pray for fair weather," singing their songs of magic power, burning sweet grass, and offering their pipes to the sky, the earth, and the cardinal points as they made their petitions. It is said that the oldest men cannot remember the falling of rain during a sun dance.

From long distances the people came and made their camp in a great circle. The dance enclosure was in the centre of this circle, and was about 50 ft. in diameter. Around it was erected a shelter

¹ "Teton Sioux Music." By Frances Densmore. Bulletin 61, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C., p. 96. Other direct quotations, as well as the facts herein presented, are from the same work. The Bureau of American Ethnology has kindly given permission to reproduce the illustrations used in this article.