

Twisting was not observed on the western slopes mainly because we were not stationed near these regions. It is likely that the same conditions would prevail there since the storms retained their same relative positions as on the eastern slopes.

Twisting of trees other than those at timberline has been observed and noted but not studied to any great extent. Apple trees are usually twisted in the prairie regions, but no definite set to the twist was noticed. It often occurred that both left and right twisting could be found in the same tree. In cutting up an old orchard that had died we found many trees of this type.

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THE GROWTH OF STALACTITES

AN occurrence, similar to that discussed by Professor Ellis in *SCIENCE* for January 16, 1931, "Concerning the Rate of Formation of Stalactites," came to my notice during an inspection of Fort Delaware in the summer of 1929.

Fort Delaware is situated on Pea Patch Island, in the middle of the Delaware River, 12 miles below Wilmington and is of the pre-Civil War type with walls of gray granite and interior finish of high grade brickwork. Though started in 1848, it was not completed until after the Civil War.¹ Thus the setting is similar to that at Fort Pickens.

Abundant growths of stalactites were found in process of development from the brick arches on many of the lower casements, the material for their growth being supplied mainly from the lime-natural cement-sand mortar but perhaps to a slight extent from the bricks, which showed some spalling due to water action. These stalactites varied as to type, many being of the slender, fragile variety described by Professor Ellis, with the larger ones reaching over a foot in length, while others were much stouter, with a length of four to five inches and a diameter of over one half inch, and were therefore strong enough to be readily collected. They consisted of a pure white carbonate of lime. Lime deposits also covered the floors of these casements to a considerable extent and in a few cases the development of stalagmites was beginning to be noticeable. Deposition was still in active progress.

As Fort Delaware had already become practically obsolete by the time it was completed, deposition may have been going on undisturbed for as long a period as 60 years. On the other hand, as there was some activity at the fort during the Spanish-American

War, 30 years may be set as the lower limit available for the growth of the longer stalactites.

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A CASE OF A BOY POSSESSING AN AUTOMATIC DIRECTIONAL ORIENTATION

IN a note in the *Psychological Bulletin*¹ twenty-two years ago H. C. Warren described the case of a boy who had an extraordinarily good sense of direction. A few months ago I wrote to this individual and asked him several questions about his sense of orientation. The answers received were all in the negative—that is, the individual disclaimed that he possessed any different sense of orientation than the ordinary person has who uses familiar objects or the sun as a guide. Whatever ability at orientation this individual had as a boy he has obviously lost as a man.

Recently a married couple who attended one of my classes reported that their son possessed an unusual sense of orientation to the points of the compass. He never seemed to get lost, they said, and when in a strange city could be relied upon to tell them in which direction they were going. While driving in an automobile through unfamiliar country he was able to tell the direction at any time.

With the cooperation of the parents I tested the boy in our psychological laboratory. I took him into a dark room, blindfolded him and confused him by revolving him (without, however, making him dizzy) in a noiseless rotating chair. After a few correct judgments he began to make large errors, and soon lost all absolute orientation. He oriented himself immediately as soon as he was permitted to see.

I convinced myself that he possessed no genuine "magnetic" sense of direction. This finding was corroborated by a story of his parents to the effect that if he went to sleep while riding in an automobile at night he was temporarily lost as to directions when he awoke. Regardless, however, of his lack of a sense of absolute orientation, it is exceedingly interesting that once he gains a true orientation during his waking hours he seems to remain oriented at all times. I might add that he is twelve years of age, above the average in intelligence and curious about everything that goes on around him.

His mother furnished an interesting bit of information on the origin of the development of this sense of orientation. As she is left-handed and frequently confuses "to the right" with "to the left," she used to give orders of the following sort to the youngster:

¹ H. C. Warren, "Magnetic Sense of Direction," *Psychol. Bull.*, 5: 376-377, 1908.

¹ Charles H. Roe, "The Building of Fort Delaware," *The Military Engineer*, Vol. 21, pp. 350-354, July-August, 1929.