cilors were appointed, including Dr. T. Kitajima, head of the Japan Medical Association. The society will begin work this autumn; its selection is said to be the result of careful deliberation by 110 councilors.

DISCUSSION

OBSERVATION OF A NEW MEXICO METEOR FROM THE AIR

A METEOR of unusual size and brilliancy passed over a portion of the Texas Panhandle and eastern New Mexico on the morning of March 24, 1933. This meteor was described in *Science News Letter* for April 8, by Dr. John Strong, of the California Institute of Technology, who observed it from a train between Springer and Wagon Mound, New Mexico.

A rare opportunity for observing this meteor was had by C. W. Coyle, a T. and W. A. air pilot flying from Albuquerque, New Mexico, to Amarillo, Texas. Mr. Coyle was in the neighborhood of Adrian, Texas. When first seen by him the meteor was very low; it seemed to be rising in the east and appeared like a floodlight gradually being turned on. Then it seemed to be coming directly toward him, rapidly increasing in brilliancy and leaving a long trail behind.

The meteor passed to the north of his line of flight, and as it passed him, fragments were discharged from the meteor. It seemed to disappear in the longitude of Tucumcari, New Mexico, perhaps in the vicinity of Mosquero. In passing, the meteor seemed to be lower than the airplane, which was flying at an elevation of about 7,000 feet. The direction of the trajectory was judged to be about 70 degrees west of south.

The time of the meteor's flight was about 5:07 A. M. (M. S. T.), and its duration was about 5 seconds. The illumination caused by the meteor is described as "three times as light as day." (The hour was a little before sunrise.) The front of the meteor was a reddish color and behind it was a cone of blue. The "tail" was a bluish, incandescent cloud, which continued visible, through several changes of color and form, until dawn, or till 5: 35 A. M. This cloud of meteoric dust was visible at Amarillo through a low fog or haze, and was at an elevation of about 50 degrees with the horizon.

The passing of the meteor created an electrical effect, which appeared in the radio set of the pilot, resembling frictional static sometimes caused by dust in the air. This effect lasted for a little while after the meteor had passed.

Sounds were reported, as coming from the meteor, at Clayton and Estancia, New Mexico, and Texline, Texas.

The meteor was noticed by an air pilot, Mr. Frank Williams, who was flying west near the Zuni Mountains, about 300 miles west of the other air pilot. He saw the light of the meteor and the cloud which hung in the sky, but the meteor did not pass him. He noticed that the bright light ended suddenly.

An observer at Amarillo, Texas, saw the meteor first at an elevation of about 50 degrees and almost directly northeast of him. He observed it for some seconds, as it seemed to come directly toward him, growing brighter rather than seeming to move. He noticed that the light was bluish at first, but in passing was like the sun. He saw the cloud for 30 minutes, but there was no cloud caused by the explosion. He saw the meteor "explode," he thought near Clayton, New Mexico. He noticed that most of the fragments seemed to "shoot up" and then disappear; only a few, and larger, pieces fell down and backwards.

An Associated Press notice of May 8 stated that a man living near Vanadium, New Mexico, exhibited at Silver City a 400-pound meteor which he had dug up on his ranch at a depth of 18 feet. He reported having been awakened on the morning of March 24 by a loud explosion and quaking of the earth. If this was a piece of the same meteor that was seen in the northeastern part of the state, its position would indidicate that it had been shot out at the time of the explosion of the meteor, following a somewhat different direction from that of the original meteor.

One of the most remarkable records of the meteor is a photograph of the cloud of meteoric dust, that was taken by an Albuquerque photographer about 20 minutes after the passage of the meteor. This shows a very luminous area beyond dark clouds overhanging the Sandia Mountains 15 miles to the northeast. The sky shows just a little illumination at the right of the picture, due to the approaching dawn.

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AN EXPLANATION OF THE CAUSE OF SPIRAL GRAIN IN TREES

SPIRAL grain in so-called twisted trees has engaged the attention of several observers from widely separated parts of the country. Seifriz[1] has reviewed the literature relative to spiral grain and presents an interpretation of the cause.

Eames and McDaniels[2] state (p. 145) that "spiral grain also is related to the structure of the cambium." Division of the cambium by a peculiar kind of cellplate formation has been decsribed by Bailey.[3] Spiral

[1] William Seifriz, SCIENCE (n.s.), 77: 50–51, 1933.

[2] A. J. Eames, L. J. McDaniels, "Introduction to Plant Anatomy," McGraw-Hill. 1925.

[3] I. W. Bailey, *Amer. Jour. Bot.*, 7: 417–434, 1920.

grain depends for the most part upon division of the cambium and the events that follow. When the cambium divides tangentially, xylem or phloem will be formed from the resulting daughter cells. Circumferential increase of the cambium is accomplished by radial (anticlinal) division; by oblique radial division; or, by oblique transverse division followed by increase in size and accompanied by gliding growth; and, by division of cambium initials to form new ray initials (Bailey).[4] It is in the non-stratified type of cambium, as reported by Bailey, that the oblique transverse wall is more commonly formed. Practically all trees reported to have spiral grain possess this type of cambium. The vertical growth of a tree comes about from activity of apical meristems, while very little or no vertical increase occurs at the base of the tree. Radial increase of the tree follows upon cambial activity, with yearly increments of xylem and phloem. Radial division of the cambium is found less frequently in tangential sections than tangential division, as well as oblique transverse division, which may immediately follow radial division. Fig. 1, accompanying this article, was made from a photomicrograph of a tangential section of cambium cut in celloidin, in which division occurred (1) by a radial cell plate; and (2) transversely by an oblique cell plate. The cell plates which subdivide the mother cell into four daughter cells show no pits. What is the future of these daughter cells? We are faced with the fact that the daughter cells in their vertical increase must be given some space in some way, whether or not we accept it as a manifestation of gliding growth. The oblique transverse wall seems to determine the pitch of the path they take in elongation, since they are held in a sort of straight jacket, which prevents true perpendicular elongation. This path of elongation is diagonally around the tree, or spiral, since it is a path of least resistance. After maturation of the daughter cells has occurred, further divisions are tangential, which causes radial increase. The resulting xylem mother cells and their daughter cells, as well as phloem mother cells and their daughter cells, upon maturation follow in the path of the spirally directed cambium initials. As this process continues from year to year with a further radial enlargement of the stem, the spiral path deviates more from the perpendicular and approaches a closer spiral. However, if the oblique transverse wall changes about and starts a path in the opposite direction, the tier of xylem and phloem which follows upon it balances the spiral in the opposite direction, and no spiral grain is apparent. The present writer appreciates an element of uncertainty in this apparently plausible explanation of the cause of spiral grain in trees.

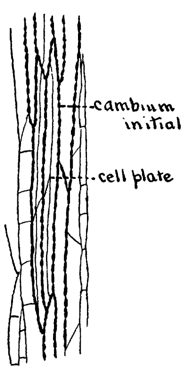

Fig. 1

Knorr[5] suspected that "intensity of the twist" was more pronounced in the later wood of branches, while Herrick[6] observed that pitch of the spiral grain increased with age of the tree, and figures to demonstrate this are recorded. These observations would seem to substantiate somewhat the above explanation. Seifriz[7] interprets spiral grain as a phenomenon based partly on heritable protoplasmic qualities and in part on physiological factors. It is a matter of great uncertainty, whether the cause of the formation of an oblique transverse wall could be attributed to the Liesegang phenomenon. Moreover, the seemingly wide-spread spiral tendency among many plants and animals, which Seifriz believes to be of protoplasmic origin, seems rather remote in its relation to the causal factors of spiral grain. The spiral tendency in trees is fortuitous, but it would seem a natural assumption that parent spiral-grain trees and their progeny should show variations such as occur in all offspring. Consequently, clockwise, counter clockwise and straight grain trees should be expected in any stand of timber trees.

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THE POISONING OF FISH

In the construction of an artificial lake in Davis County, Iowa, for the Fish and Game Commission, it seemed advisable to destroy the detrimental and infected fish which occupied the creek running through it. The fish deemed undesirable were the black bullhead (*Ameiurus melas*), a runt, the black-striped shiner (*Notropis dorsalis*), and the green sunfish (*Apomotis cyanellus*), the two latter heavily infested with trematode larvae. Carp and gar may also have been present.

On account of the character of the creek bed, sein-

[4] I. W. Bailey, *Amer. Jour. Bot.*, 10: 499–509, 1923.

[5] F. Knorr, *Jour. Heredity*, 23: 49–52, 1932.

[6] E. H. Herrick, Science (n.s.), 76: 406–407, 1932.

[7] William Seifriz, *loc. cit.*