the point in question since I can not read the original, but I have confidence, perhaps undue confidence, in the truthfulness of such noted scholars notwithstanding the fact that others in whom I have less confidence have made opposite statements.

Not only does the inability to read the original frequently constitute a serious difficulty in the way of using the sources as regards historical statements in mathematics but in some cases these sources are not known to exist. For instance, the original of Euclid's "Elements" is not known to be extant and yet these "Elements" are commonly regarded as very important in the history of our subject. It seems therefore that some of the most noted mathematical historians have reached conclusions which could not have been based on a study of the original documents. It is, of course, not implied here that it is undesirable to go to the sources with respect to questions relating to the history of mathematics whenever this is possible. On the other hand, it is implied that valuable conclusions have sometimes been drawn by those who have not been in position to do this. At any rate, it is well to bear in mind that a mathematical proof depends upon the knowledge relating to the subject on the part of those for whom it is intended and hence is relative, not absolute.

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MORE ABOUT TWISTED GRAIN IN TREES

SCIENCE for February 13, 1931, contains an article by C. K. Wentworth noting the predominance of right-handed twist in spirally grained trees. Similar observations have been recorded by others. A Forest Service official on the Pike National Forest, Colorado, reports that out of 396 alpine fir trees, 85 per cent. had right-handed twist and 14 per cent. left-handed twist, leaving only 1 per cent. with straight grain. Similarly, 26 pines showed 14 individuals with right-handed twist and 4 with left-handed twist. The author also was struck with the predominance of right-handed twist when trying to find trees with left-handed twist suitable to photograph. On the other hand, in an examination of 463 Douglas fir timbers at a mill in Tacoma, Washington, he was surprised to find 94 with left-handed twist and only 8 with right-handed twist (very slight twists not being considered). The other timbers were straight grained.

No satisfactory explanation of the cause of spiral grain has yet been made. There even remains the question as to whether it is due to heredity or environment. H. G. Champion, of the Forest Service of India, reports that seed from straight-grained trees give fewer spirally grained seedlings than seed from twisted trees. The resulting grain, however, was examined only in the young stems of seedlings, and it is not certain whether the same condition would be maintained as the trees grow older.

On the other hand, Paul van Oye reports from France that trees with tap roots have no torsion, those with lateral roots have slight torsion, and those with running roots have it to a marked degree. This corresponds to the general observation that in the higher altitudes where the soil is scant and tap roots can not develop, spiral grain is much more common than in the deeper soil at lower elevations.

The frequent deduction, as made by Wentworth, that twisted grain may be due to prevailing winds acting on asymmetrical crowns is not tenable since there is no evidence within the tree trunk that actual twisting of the trunk took place after the wood was formed. Such twisting would show distinct mechanical injury to the fibers which is not found to be the case. Furthermore, the twist would be greatest near the center and least at the periphery of the trunk, assuming that it developed gradually over a period of years. Usually the reverse is the case.

Any satisfactory explanation of the cause of spiral grain must also explain why trees should be straight grained, since whatever factors are operative in keeping the fibers of most trees parallel with the axis of the trunk are modified in producing spiral grain. To say straight grain is the normal condition is not adequate, since in some hardwood species, especially in the tropics, the normal condition is for the fibers to be inclined right-handed for a number of years, then left-handed for about the same period, and then back to right-handed, and so on.

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PUBLICATION OF INDUSTRIAL RESEARCH

THE growth of industrial research in America and the intermingling of purely utilitarian scientific work with the so-called "pure" scientific research that may be found in many industrial laboratories raise a question of vital interest in the reporting of science to the public.

Often the achievement of a new industrial process is made known to the public through the medium of a publicity statement issued by an individual or a corporation. Often these publicity statements do not have the wealth of detail that characterizes the publication of a scientific paper. The circumstances surrounding a technical development are often highly complicated. A patent may be pending. Or for other reasons the heads of the organization paying for the research do not wish to reveal the scientific and technical details of the process or the invention.