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.

The announcement of the discovery or invention often is limited to a plain statement of claims without any explanation of how the new development has been obtained.

Notable examples in recent months include:

(1) The announcement of durium, the synthetic plastic of which the fifteen-cent "Hit of the Week" phonograph records are manufactured. The publicity on this development simply stated that a new and suitable plastic had been developed, and the materials used and the composition of the plastic were not revealed.

(2) The carbon monoxide removing attachment for automobiles developed by Dr. J. W. C. Frazer, of the Johns Hopkins University. What this device does was told in the announcement, but how it operates and the composition of the materials contained in the cannister were not made public.

(3) The development of a super-speed motion picture film by the Eastman Kodak Company. The benefits to be derived from the use of this film, soon to be placed on the market, were elaborated, but no technical information about the emulsion or the research that led to the development of this speedy emulsion could be obtained from the company even after it was pointed out that this information would be desirable.

Such instances will undoubtedly multiply in the coming months and years.

It is recognized that for the commercial protection of some of the companies supporting research there must be some instances in which it is impossible to reveal the technical details and steps of the scientific procedure that led to the discoveries and inventions being exploited commercially.

In many cases, however, lack of scientific detail is not due primarily to the fear of revelation of any material which would interfere with commercial exploitation or the obtaining of a patent. It seems to arise from the fact that many of the announcements are prepared and visaed by the sales, advertising and other purely commercial departments of the company supporting the research.

It is not proposed that the commercial side of an industry be relegated to a position of absolute subordination to the research laboratories and the scientists employed. But it is suggested that the progress of science and the understanding of science on the part of the general public will be accelerated if scientists in industrial work will insist, so far as possible, that publicity reports of their work be as carefully prepared and as revealing as reports intended for publication in scientific and engineering journals.

WATSON DAVIS

SCIENCE SERVICE

THE LIFE OF BOOKS

[Apropos of the reference to "Life of Books" in SCIENCE, Feb. 27.]

THIS has long been a subject of great concern to librarians, under our present system of heating, the most of which is unhygienic, as practicing physicians and others will confirm, from the time of Franklin.

The disintegration of bindings I find largely confined to leather, particularly the Russian leather type. There is, however, in my library a wonderfully preserved volume, bound in human skin, in 1861—the skin from a soldier who died in the Civil War. This has completely resisted the effect of both the steam and hot water system of heating, and is in as perfect condition to-day as when bound in '61.

In a voluminous scientific correspondence which covers the period 1838–1891, the only writing paper which shows disintegration in the whole series of letters is the blue paper used by the Smithsonian Institution, principally letters of Joseph Henry and Spencer F. Baird during the 50's and 60's of the last century.

JOSEPH LEIDY II

REPORTS

THE MILTON AND CLARK AWARDS AT HARVARD UNIVERSITY

AWARDS amounting to more than $60,000 have been made from the Milton and Clark Funds to members of the teaching staff of Harvard University to enable them to carry on research during the academic year 1931–32. The following list contains the names of those to whom the awards in the physical and biological sciences have been made and a statement of the purposes for which the grants will be used.

Henry E. Bent, instructor in chemistry, for study of the electron affinity of a number of organic free radicals in order to obtain quantitative data relative to the valence of carbon.

Raoul Blanchard, professor of geography, for continued geographical exploration field-work along the north shore of the St. Lawrence estuary from Quebec to the Strait of Belleisle.

Nicholai A. Borodin, curator of fishes, for study of the "Anabiosis" or the phenomenon of resuscitation of fishes after being frozen.

Paul E. Boyle, instructor in operative dentistry, for study of the circulation of the dental pulp.

William J. Clench, lecturer on zoology, to collect