

eral varieties were described; also the minerals formed in the rocks associated with the tourmalines. Two kinds of gem tourmaline were recognized and their occurrence in cavities or pockets noted. Professor Wolff showed a series of tourmaline crystals, including two of the largest yet discovered; also a number of the original plates illustrating Mr. Hamlin's 'History.'

Dr. Charles B. Davenport discussed the rôle of water in growth. Organic growth was defined as an increase in volume. The definitions given by others were reviewed and analyzed. The processes of growth were analyzed and the factors involved in growth noted. The experiments and observations of plant physiologists assign the principal rôle to water in the growth of plants. Experiments made to determine the percentage of water in the body of developing tadpoles at different stages show that growth is due chiefly to imbibed water. The rôle of water in the development of organisms and its bearing on the meaning of curves of growth were discussed in detail.

SAMUEL HENSHAW,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy of Science of St. Louis on the evening of May 17, 1897, twenty-six persons present, a committee appointed at an earlier meeting presented a short biographic sketch of the late Dr. James N. Leete, for many years an active and influential member of the Academy.

Mr. J. B. S. Norton read a paper embodying the results of an examination into the effects of the tornado of May, 1896, on trees about St. Louis, in which it was shown that, while ordinary winds have some influence on the form and strength of trees, in strong winds uprooting is caused by wet soil, weak spreading roots and a large surface exposed to the wind. If the roots hold, breaks may occur in the trunk or branches, depending on the strength of the wood, the form of the tree, the mode of branching and the weight and resistance of foliage. While the edge of dry leaves presented to the wind offers little resistance, when foliage is wet and massed this may be very different. Local

variations in these several factors make a comparison of different species difficult. It was shown that *Acer dasycarpum* was badly broken on account of its brittle wood and heavy foliage, while the weak-wooded *Tilias* and *Liriodendrons* were also broken. Spreading-topped trees, like *Ulmus Americana*, as a rule, were broken and uprooted, though the branches were only bent in the tougher-wooded individuals. As a general thing, conical trees, like *Ulmus campestris*, *Liquidambar* and most conifers and the strong-wooded oaks, were little injured. *Taxodium distichum*, from its slender form, strength and elasticity, was injured least of all. It was shown that after the tornado, which occurred early in the vegetative period, most of the trees continued the summer's growth by producing new foliage shoots. While a few died from the inability to secure food, others indicate injury by flowering and fruiting more profusely than usual. It was shown that some of the trees which were broken have already begun to show serious decay where the branches were removed, so that the final injury can hardly yet be measured.

The results observed here were compared by the speaker with those which have been reported from time to time in connection with severe storms elsewhere.

The paper was discussed by Mr. H. von Schrenk, who submitted some interesting specimens, slides and drawings illustrating the formation of a double ring in 1896, resulting from the refoliation of the branches denuded shortly after the season's growth had begun.

WILLIAM TRELEASE,
Secretary.

NEW BOOKS.

L'évolution régressive en biologie et en Sociologie.

JEAN DEMOOR, LEAN MESSURT, ÉMILE VANDERVELDE. Paris, Alcan. 1897. Pp. 324.

Guide to the Genera and Classification of the North American Orthoptera found North of Mexico. SAMUEL HUBBARD SCUDDER. Cambridge, Edward W. Wheeler. 1897. Pp. 87.

The Entropy Temperature Analysis of Steam Engine Efficiencies. SIDNEY A. REEVE. New York, Progressive Age Publishing Co. 1897. Pp. 250.