

were marked to show what was the consensus of opinion of 900 persons. For the third group of 300, the questions were marked to show the opinion of experts or authorities.

The opinion of experts was not nearly so influential as that of the group of 900. The changes of opinion among those who saw the expert opinions amounted to 51 per cent. for the high school students, 45 per cent. for the college students, and 34 per cent. for the adults. The shifting under the influence of group opinion was 64 per cent. for the high school students, 55 per cent. for the college people and 40 per cent. for adults. The shifting when the papers were not marked was very small in comparison, ranging from less than 14 per cent. for adults to about 17 per cent. for the high school seniors.

Science News Letter, June 13, 1931

ARCHAEOLOGY

Prehistoric Iroquois Camp Explored by Scientists

A SITE near Syracuse, N. Y., where prehistoric Iroquois Indians once held camp has been explored by Prof. Thorne Deuel, of Syracuse University, it has just been announced.

In the camp refuse, the expedition found decorated sherds of Iroquois pottery, including some which human portraits on them. The excavators also unearthed heavy polished celts or tomahawk heads, and a fragment of a square-rimmed stone pipe which may have figured in council meetings of the tribe. Some of the small, finely chipped flint points which were used on the ends of projectiles were other discoveries, as well as hammerstones, bone awls and a considerable quantity of charred corn.

The line where the palisade of the camp stood can be traced by the charred points of the stakes, still in place, Prof. Deuel found. The interior of the wood is rotted. The charred exterior indicates that the Indians may have used this method of preserving the wood.

The site appears to have been inhabited by Iroquois of a late period, but still uninfluenced by European contacts, the expedition reported.

Science News Letter, June 13, 1931

While ordinarily regarded as a childhood disease, diphtheria sometimes attacks middle-aged and old persons with fatal results.

CHEMISTRY

Delicate Cellulose Destroyed By Wood Pulping Methods

THERE ARE many losses of fiber in the processes of pulping and paper-making that are hard to locate and control. By chemical test it is known that 60 per cent. of the weight of wood is potential pulp fiber; yet the actual paper as it is reeled off the machine often weighs 40 per cent. or less of the original wood weight.

This means that at all American mills in a year the cellulose equivalent of some 1,000,000 cords of wood goes floating into the sewers as fibrous waste. Where and how the losses occur has been broadly indicated by chemical studies supplemented recently by microscopical investigations at the U. S. Forest Products Laboratory, Madison, Wis.

Among the paper-making parts of wood are some very stable and chemically resistant cellulose and some other cellulose-like substances that are easily hydrolyzed or broken down into sugar during the cooking process through which all the material must pass. This is the greatest single cause of loss, averaging about 50 per cent. of the weight of the wood. The remainder of the loss is due in large part to the waste of cellulose from the medullary rays of the tree, according to a report of microscopical studies made by G. J. Ritter, F. A. Simmonds, and P. R. Eastwood, of the Forest Products Laboratory.

The medullary ray is that part of the wood which, in oak particularly, shows up as smooth, light-colored flakes on quarter-sawed surfaces. Though not conspicuous in most woods, the medullary structure makes up from 7 to 11 per cent. of the volume of the trunk in softwoods and from 15 to 22 per cent. of the volume of the trunk in hardwoods.

It is this large bulk of medullary ray cellulose which the microscope has shown to be particularly susceptible to disintegration in pulping and paper-making. By examining samples before and after each step it was found that losses of the material occur at virtually every stage of the chemical and mechanical processes the fiber must go through.

In the opinion of Dr. Ritter, there are also losses of longitudinal fiber, but it is of minor importance compared to the



USUALLY A TOTAL LOSS

A microscopic photograph of the ray cells of spruce magnified 100 diameters. The rays, which make up from seven to eleven per cent. of the volume of wood, are usually a total loss in chemical pulping processes.

ray-cell loss. In general, he believes, our present-day methods of wood pulping are too severe for the more delicate wood components, and that great potentialities of saving await the development of a milder chemistry and processing.

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ENGINEERING

Moving Trains Weighed By New Giant Scales

SCALES weighing up to 400 tons, strong enough to withstand the passage of a locomotive over them, are now being used on railroads, according to a report submitted to the National Conference on Weights and Measures by A. Bousfield, chief engineer of E. and T. Fairbanks and Company.

The Pennsylvania and New York Central railroads each own scales with 75-foot sections suitable for weighing, while in motion, the longest and heaviest cars now used by the railroads.

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