

the whole together for an hour. Boiling water ought to be added occasionally, but sufficient only to replace that lost by evaporation. The epidermis and parenchyma of some leaves will more readily separate than others. A good test is to try the leaves after they have been gently boiling for about an hour, and if the cellular matter does not easily rub off betwixt the finger and thumb beneath cold water, boil them again for a short time. When the fleshy matter is found to be sufficiently softened, rub them separately but very gently beneath cold water until the perfect skeleton is exposed. The skeletons at first are of a dirty white colour; to make them of a pure white, and, therefore, more beautiful, all that is necessary is to bleach them in a weak solution of chloride of lime. I have found the best solution is a large teaspoonful of chloride of lime to a quart of water; if a few drops of vinegar are added to the bleaching solution, it is all the better, for then the free chlorine is liberated. Do not allow them to remain too long in the bleaching liquor, or they will become too brittle, and cannot afterwards be handled without injury. About fifteen minutes is sufficient to make them white and clean-looking. Dry the specimens in white blotting-paper, beneath a gentle pressure, after they are bleached.

“Simple leaves are the best for young beginners to experiment upon; the vine, poplar, beech, and ivy leaves make excellent skeletons. Care must be exercised in the selection of leaves, as well as the period of the year and the state of the atmosphere when the specimens are collected, otherwise failure will be the result. The best months to gather the specimens are July and August. Never collect specimens in damp weather; and none but perfectly matured leaves ought to be selected.”

19. THE LEAVES OF AUTUMN.

AUTUMNAL tints of leaves are attributed to various causes. Some chemists determine that it is due to certain acids which are developed. Others aver that a diminished vitality in the plant causes the change of colour; if this be true then we must assume that there is such a thing as a “vital power” in plants which presides over their cyclical changes, and this cannot but be accepted as true as far as our present knowledge goes. One phenomenon, however, must not be lost sight of, in seeking the cause of tinted leaves. Wherever one leaf overlaps another in the forest the under leaf will longest resist discolouration. The very form of the upper leaf may thus be stamped on the one beneath when the covering is only partial. This indicates that frost is a very important agency in the problem.

20. DISCOVERY OF COFFEE.

Toward the middle of the fifteenth century, a poor Arab was travelling through Abyssinia, and finding himself weak and weary, from fatigue, he stopped near a grove. Being in want of fuel to cook his rice, he cut down a tree which happened to be covered with dried berries. His meal being cooked and eaten, the traveller discovered that the half-burned berries were fragrant. He collected a number of these, and, on crushing them with a stone, he found that their aroma increased to a great extent. While wondering at this, he accidentally let fall the substance into a can which contained his scanty supply of water. Lo, what a miracle! the almost putrid liquid was instantly purified. He brought it to his lips: it was fresh, agreeable, and, in a moment after, the traveller had so far recovered his strength and energy as to be able to resume his journey. The lucky Arab gathered as many berries as he could, and having arrived at Aden, in Arabia, he informed the mufti of his discovery. That worthy divine was an inveterate opium smoker, who had been suffering for years from the influence of the poisonous drug. He tried an infusion of the roasted berries, and was so delighted at the recovery of his former vigour, that he called it *cahuah*, which in Arabic signifies force. Thus coffee was discovered.

VI. Educational Intelligence.

—In Japan there are 826 schools, attended by 68,000 pupils.

—Corporeal punishment is not allowed in the schools of Chili.

—The total number of children in California is stated to be 130,116, of whom 99,152 attend school.

—There recently graduated at Howard University, in Washington, thirteen negro law students, one of whom was a woman.

—The phonetic system of reading has been introduced into one of the schools of Burlington, Iowa, and received with marked approval.

—There are eight thousand female teachers in Massachusetts. The whole number of teachers employed in the State is ten thousand.

—Indiana, according to the United States School Commissioner's Report, has 127,015 persons over ten years of age who cannot write their own names.

—During 1869 there were in operation in Portugal, and on the adjacent islands, 1997 schools for boys, and 362 for girls, attended by about 135,000 pupils.

—In Connecticut, according to the report of the Board of Education for 1871, there are fewer adult persons unable to read and write than in any other State in the Union.

—An empty treasury has necessitated the closing of all the schools in South Carolina under the patronage of this State, except in counties having on hand local school funds. The select schools of the State are in quite a flourishing condition.

—The Germans have established no university for the last half-century. Their plan is to strengthen those they have, rather than to found new ones.

—The President of Columbia College receives \$8,000 a year, the professors \$6,000 each. These salaries are the largest paid by any college in the country. The property owned by this institution amounts to \$3,500,000, and yields an income of nearly \$200,000.

—As a proof that education is, even in Russia, on the way to progress, statistics have been forwarded us showing that in the Province of Moscow at least one child in ten now enjoys the benefits of an elementary education. It should be remembered that the proportion in highly educated countries is one in six.

—Mr. Mori, the Japanese minister at Washington, has decided to have the five Japanese girls, placed under his charge, educated by the Kindergarten system, and will place them under the supervision of Miss Loring, of Boston. Already there are four Japanese cadets at the Annapolis Naval Academy.

—Father Secchi communicates to *Les Mondes* the particulars of a violent solar explosion on the evening of the 7th of July. The internal movements of the incandescent vapours were so intense that the luminous clouds were seen to change form rapidly, their height being six times greater than the earth's diameter. The eruption continued about two hours. On the same date an aurora borealis was seen at Madrid and many other parts of Europe, and the magnetic perturbations were very violent at all the observatories.

—Brain-work costs more food than hand-work. According to careful estimates and analyses of the excretions, three hours of hard study wear out the body more than a whole day of severe physical labour. Another evidence of the cost of brain-work is obtained from the fact that, though the brain is only one-fortieth the weight of the body, it receives about one-fifth of all the blood sent by the heart into the system. Brain-workers therefore require a more liberal supply of food, and richer food, than manual labourers.

—A Vienna contemporary speaks of an encouraging phenomenon in the promotion of practical education. The Society of Stenography in Austria has opened a competition in shorthand-writing to the pupils of the middle-class schools in Vienna. It appears from this and many other matters that in Austria as well as in the German empire time is looked upon as money. In Belgium also the practice of short-hand writing has of late been strongly recommended as a useful branch to be added to the curriculum of scholastic instruction.

—According to the census of 1870, the total number of schools in the United States was 141,629; the number of teachers, 221,402, of whom 93,329 were males, and 127,713 females. The total number of pupils was 7,209,938, 3,621,996 being male, and 3,587,942 female. The total income of all the schools was \$95,404,726, of which \$3,663,785 came from endowments, \$61,746,039 from taxation, and \$29,992,902 from all other sources, including tuition. The total income reported is nearly three times that for 1860, and nearly six times that for 1850. It is considered quite impossible that there should have been any such increase; and the apparent augmentation is, without doubt, referable to