

FUNCTION OF LEAVES.

Are Constructed on Principles Similar to Those of Lungs. In the body of an animal there is always going on a process of slow combustion. Oxygen taken in by the lungs enters into a union with carbon derived from the food, carbonic acid is formed, and heat evolved. Every atom of carbon disengaged from oxygen by the plant represents an expenditure of heat upon the leaves equal to that developed during its combustion with oxygen in the animal system. In the leaves this heat disappears; it becomes latent, and is stored up as potential energy. When we burn a piece of wood, not only is the carbon which the tree originally extracted from the air restored to the atmosphere in the form of carbonic acid, but the heat given out by the burning wood corresponds exactly to the amount by which the sunbeams were chilled through the activity of the leaves while the wood was growing. Robbing the sunshine of its heat in this way, leaves must act as refrigerators; leaves exert a further cooling influence on account of the watery vapor they are constantly giving off, for whenever water evaporates much heat is rendered latent and ceases to be discerned by the senses. A man is said to exhale about 100 gallons of carbonic acid a day. Bousingault estimated that a square yard of leaf surface, reckoning both the upper and lower sides of the leaves, can under favorable circumstances decompose rather more than a gallon of carbonic acid in a day. At this rate, 100 square yards of leaf surface should keep a man going with oxygen. A single leaf would suffice for quite a number of people, for, according to the late Prof. Ass Gray's computation, even a moderately sized elm possesses five acres of leaf surface. Widely as they differ in appearance, a lung and a leaf are constructed on very similar principles. In the lungs the air tubes are subdivided into an infinite number of small ramifications, around which the blood vessels are distributed in an extremely fine network. By this arrangement an immense surface is exposed to the air, with a comparatively small expenditure of space. Through the delicate membranous walls of these fine tubes the air penetrates into the blood vessels beneath, and from the blood carbonic acid diffuses into the air tubes and is exhaled. The typical leaf, again, is a thin, expanded plate, offering a large surface to the air relative to its mass; its lower stratum is honeycombed with innumerable air spaces and intercellular passages, which communicate with the external air through thousands of pores or stomata. Oxygen and carbonic acid are exchanged through the walls of the leaf cells very much as in the lungs, but in the reverse order. The flattened form of the leaf secures illumination and promotes evaporation; lungs, having no need of light, are shaped to suit the space available. The resemblance between the submerged leaves of aquatic plants, such as the water buttercup, and the external gills, or branches of the young tadpole and other amphibians, is particularly striking. Both organs are cut up into fine, thread-like segments, giving them a fringed or feather-like appearance; the large absorbing area thus presented to the water facilitates the absorption of the dissolved gases. Leaves are, however, organs of nutrition. This resemblance to respiratory organs arises entirely from the fact that by far the largest proportion of a plant's food is absorbed in the gaseous condition. Referring to this adaptation of the leaf, Johnstone, in his "Agricultural Chemistry," says: "How beautiful is the contrivance of the expanded leaf! The air contains only one gallon of carbonic acid in 2,500, and this proportion has been adjusted to the health and comfort of animals, to whom this gas is hurtful. But to catch this minute quantity the tree hangs out thousands of square feet of leaf in perpetual motion, through an ever-moving air; and thus, by the conjoined labors of millions of pores, the substance of whole forests of solid wood is slowly extracted from the fleeting winds." Chlorophyll itself owes its formation to light; but to conceive how the ethereal undulations, acting on the living substance of a leaf cell, can elaborate a structure so complex baffles imagination. How marvelous are the properties of light and how manifold its adjustment to differently constituted materials! Light is at once the most useful of natural agencies, and the most beautiful of physical phenomena. And yet it must be tempered to our vision. Painful and blinding the glare from rock or desert, but what more grateful than the sight of fresh green meadows! In contact with the grass light is purified from rays which fatigue and injure our eyes. This tempering of the sunshine is another of the many benefactions we owe to the ministry of leaves. —London Knowledge.

RULES FOR A WIFE.

There Are Only Seventeen of Them—Happiness in the Home. Many persons unable to read that most interesting book, "The Romance of Isabel, Lady Burton," may like to see the rules she writes, upon her marriage, in her diary, for her own guidance in the new relation—rules to whose observance she believed much of her subsequent happiness was due: First. Let your husband find in you a companion, friend and adviser and confidante, that he may miss nothing at home. Second. Be a careful nurse when he is ailing, that he may never be in low spirits about his health without a serious cause. Third. Make his home snug. If it be ever so small and poor there can always be a certain chic about it. Men are always ashamed of a poverty-stricken home, and therefore prefer the club. Attend much to his creature comforts; allow smoking or anything else; for if you do not somebody else will. Make yourself cheerful and attractive, and draw relations and intimates about him, and the style of society (literati) that suits him. Fourth. Improve and educate yourself in every way, that you may enter into his pursuits and keep pace with the times. Fifth. Be prepared at any moment to follow him at an hour's notice and rough it like a man. Sixth. Do not try to hide your affection for him, but let him see and feel it in every action. Never refuse him anything he asks. Observe a certain amount of reserve and delicacy before him. Keep up the honeymoon romance, whether at home or in the desert. At the same time do not make prudish bothers, which only disgust, and are not true modesty. Do not make the mistake of neglecting your personal appearance, but try to look and dress well to please his eye. Seventh. Perpetually work up his interest with the world whether for publishing or for appointments. Let him feel when he has to go away that he leaves a second self in charge of his affairs at home, so that if sometimes he is obliged to leave you behind he may have nothing of anxiety on his mind. Take an interest in everything that interests him. To be companionable a woman must learn what interests her husband, and if it is only planting turnips, she must try to understand turnips. Eighth. Never confide your domestic affairs to your female friends. Ninth. Hide his faults from everyone and back him up through every difficulty and trouble. Tenth. Never permit anyone to speak disrespectfully of him before you, and if anyone does, no matter how difficult, leave the room. Never permit anyone to tell you anything about him, especially of his conduct with regard to other women. Never hurt his feelings by a rude remark or jest. Never answer when he finds fault, and never reproach him when he is in the wrong, especially when he tells you of it, nor take advantage of it when you are angry, and always keep his heart up when he has made a failure. Eleventh. Keep all disagreements for your own room, and never let others find them out. Twelfth. Never ask him to do anything—for instance, with regard to visiting other women, or anyone you particularly dislike; trust him and tell him everything, except another person's secret. Thirteenth. Do not bother him with religious talk; be religious yourself and give good example; take life seriously and earnestly; pray for and procure prayers for him and do all you can for him without his knowing it, and let all your life be something that will win mercy from God for him. You might try to say a little prayer with him every night before lying (sic) down to sleep, and gently draw him to be good to the poor and more gentle and forbearing to others. Fourteenth. Cultivate your own good health, spirits and nerves, to enable you to carry out your mission. Fifteenth. Never open his letters, nor appear inquisitive about anything he does not volunteer to tell you. Sixteenth. Never interfere between him and his family; encourage their being with him, and forward everything he wishes to do for them, and treat them in every respect (so far as they will let you) as if they were your own. Seventeenth. Keep everything going, and let nothing ever be at a standstill. Kites for Meteorology. A series of seven kites of the Harvard type, sent up from the Blue Hill observatory on September 19, reached a height of 9,386 feet above the summit of the hill, this being the highest ascension thus far made. The kites carried an aluminum box with instruments for recording temperature, pressure, and humidity, and the records are a further demonstration that kites may become a valuable addition to the methods of meteorology.

CHARITABLE CONSTRUCTION.

This Much Used Phrase Is Harshly Criticized. The above phrase is used in many instances because people want to avoid the trouble of a just construction. We give an accused person the benefit of a doubt, as we say, and pride ourselves on so doing; but the truth is there should be no doubt about the matter. A man or woman conscious of innocence courts full and free investigation of suspicious circumstances. We are not speaking now of cases coming within the pale of legal proceedings, but of society stabs and thrusts. One of the bulwarks of our modern law is the principle of thinking every man innocent until he is proved guilty. Let society go on the same broad principle, and it would be revolutionized. After guilt has been proved—if it should be proved—then the charitable construction may come in—the spirit that interprets follies, excesses or crimes in the light of heredity, acquired weakness, strong temptation, etc. Even in this, there is an element of justice, as may be plainly seen. Do not forget that there is a hospitality of the soul as well as that of the material hearthstone. Open wide the doors of your faith and intelligence—better still, go halfway to meet your spirit's guest, and taking him by the hand, literally if you choose, but figuratively, at least, say to the world: "This man shall have the benefit, not of my doubt, but of my belief in him, until I know beyond question that I must abandon that belief." But society's thrusts are oftenest at girls and women—they are the worst sufferers from compromising appearances. Say, then, of the victim of the slur and innuendo: "I shall investigate these charges without delay. My sister shall not be subjected to damaging imputations one unnecessary moment. Meanwhile she is innocent in my eyes." A few such rare and noble souls have lived in the world. A blessed old Quaker lady, when pined with dark hints and insinuations, would take the insinuator's hand and say: "Come, my dear, there and I will go and find out if that is true." But, alas! how seldom is such investigation made! Under the pretext of charitable construction, the suspicious circumstances gather blackness and volume, the web is woven tighter and closer, the serpent's hiss grows louder and more sibilant, and the innocent, light-hearted victim wakes some fine morning to learn how bitter-ly true are Tennyson's lines about the cloud of poisonous flies encircling each man's head as he walks! Then there are the innumerable cases where there is not even an attempt at charitable construction. Newspaper sensationalism demands local color, and the yellow the better. The thicker the padding which the industrious reporter can put into his article, the more paternal patting of the head will he get from his chief when he brings in his delectable scoop. And the public, the dear, hungry, but easily-pleased, public—how it spreads the choice morsel on its muffins or toast, stirs it, smilingly into its morning coffee, ruminates over it on ferryboats and trains, through business hours or at social functions! The jackal instincts dies hard in some hearts. One almost despairs at times of the power of evolution. In conclusion: if the phrase in question were used in the sense of that charity which thinketh no evil, there would be no logical grounds for this article. Instead, it is used by those who persist in thinking evil, yet plume themselves on making charitable excuses. And how subtly this may be done! By the mock pity of the crocodile tear, the doleful drooping of the false mouth, the slow, solemn shake of the hypocritical head. By the artful breaking off of the half-uttered sentence, the sly interpolation of ahs and ifs and buts. By every device of a scandal-loving mind, anxious only for the truth when it does not tend towards vindication. If ever a man or a woman is justified in crying: "Save me from my friends!" surely the victim of such charitable construction is so justified.—Leslie Dane, in Housewife.

Bulletin Financier.

Mardi, 9 novembre 1897. COMPTOIR D'ÉCHANGES (CÉLÉBRÉ) (BOURSE) DE LA NOUVELLE-ORLEANS. Table of financial data including exchange rates, gold and silver prices, and various market indicators.

Bulletin Commercial.

Mardi, 9 novembre 1897. Table of commercial data including market prices for various goods, currencies, and commodities.

Table of market prices for various goods, currencies, and commodities, including items like flour, oil, and other market goods.