

same time a corresponding number of horse-men issued from apertures placed all round the case. All of which may be said to be open to doubt, but it is certain that this clock was the first which indicated the hours by striking. In some water-clocks a perforated pearl was used for the water to trickle through, it being considered that from its hardness, the water could not enlarge the hole by constant running. It will be seen, of course, that, as with the sun-dial, there was a fatal objection to the clepsydra—the waste of the water by evaporation—and many devices were employed to supply the defect.

Alfred the Great employed very successfully candles to mark the time in his palace. These were made of a uniform size, with the hours marked in circles, and a servant was employed whose sole duty it was to announce the flight of time by sounding a gong. When Alfred found that oftentimes the excessive draughts in his exceedingly well-ventilated palace caused the candles to burn somewhat irregularly, he surrounded them with thin slabs of horn set in frames of wood.

The word clock at first signified only a bell for giving forth sound, and in France to-day *cloche* means a church-bell. The term was first applied to instruments that indicated the hours by striking about the thirteenth century. But striking clocks, moved by weights and toothed wheels, were apparently known in the monasteries of Europe as early as the eleventh century.

Richard Wallingford, the son of a blacksmith, was taken under the protection of the Abbot of St. Albans, and became abbot in his turn. At the commencement of the fourteenth century he invented a clock, the first of which we have any authentic record, which "showed the hours, the apparent motion of the sun, the changes of the moon, the ebb and flow of the tides, etc." It continued to go until the reign of Henry VIII., and in the Bodleian Library at Oxford is preserved the description which Abbot Wallingford wrote of his wonderful invention.

At the Reformation there was removed from Wells cathedral a clock which was made in 1326 by one of the monks. The "dial showed the motions of the sun, moon, and on the top of the clock eight armed knights pursued each other with a rotary motion." This must have been constructed in a very substantial manner, for it was going up to 1834, when a new set of works was supplied by a firm of London clock-makers. In Dover castle there is a clock which bears the date of 1348, and it is still going.

As may be imagined, clocks were not very plentiful in the private households about this time, and use was still made of the sun-dial and the hour-glass. The alarm, supposed by many to be a modern innovation, is in reality of great antiquity, it having been invented to call the monks to their early matins. In the possession of Queen Victoria, at Windsor Castle, is a small clock which was presented to Anne Boleyn by Henry VIII. at their marriage in 1532. This clock, beyond an occasional cleaning, has never been repaired, and is now in actual going order.

From the beginning of the fifteenth century

to the end of the sixteenth the sole aim seems to have been not so much the invention of mechanism which should keep accurate time as for introducing startling effects. One of this sort was on the exterior of the old church of St. Dunstan, in Fleet Street, London, and consisted of two colossal figures who, with clubs in their hands, struck the quarters upon the suspended bells, moving their heads at the same time. Another, only equaled by the famous Strasburg clock (a model of which last was shown at the Centennial), is that in the church at Lubeck. It is thus described: "It represents the changes of the heavenly bodies until 1875; and when it strikes twelve, a number of automatic figures are set in motion; the electors of Germany enter from a side door and inaugurate the emperor, who is seated upon a throne in front. Another door is then opened, and Christ appears, when, after receiving his benediction, the whole cavalcade retire amidst a flourish of trumpets by a choir of angels."

At Versailles, in a court of the palace, is, or was, the "clock of the king's death;" it has no works but a dial and one hand, which was set at the minute of the death of the last monarch of France, and which remained so all through the reign of his successor. This custom was instituted by Louis XIII.

One of the largest clocks in the world is that of St. Paul's Cathedral in London. The dials are nearly twenty feet in diameter, the numerals are two feet in height, the minute-hands nine feet long, and weigh seventy-five pounds each; the hands have a minute stroke of eight inches, and though placed 180 feet from the ground, the minute stroke can be seen by the unassisted eye; the hour hands are six feet long, and weigh 44 pounds each; the pendulum is sixteen feet long; and the note of the bell on which the hours are struck can be heard for fifteen miles in clear, quiet weather.

The largest clock in the world is that of Westminster Palace. The dials are twenty-two feet in diameter, and it has four faces; it goes for a week, and takes two hours to wind up. This clock is connected with Greenwich Observatory by electricity, and is regulated by the true time from that place whenever it varies sufficiently to make it necessary, which is seldom more than once a month.

American clocks have a world-wide celebrity. "One firm in Connecticut produces 600 a day; and in New Haven 50,000 eight-day clocks are made in a year in one factory."

Of late years it has become the custom to regulate the clocks of all important business centers by some one standard. In England this standard is Greenwich time; in this country Washington time is sent at noon every day to all of the Government observing stations and many private establishments. This is done by electricity, and all that is necessary is the giving of a previously agreed upon signal at the appointed time. It may be seen every day at the Western Union building on Broadway, where a time-ball falls at noon; and so accurate is the system that it may be corrected to the hundredth part of a second.

A future article will take up the subject of watches and other pocket time-pieces.

## Talks with Girls.

BY JENNIE JUNE.

### OPPORTUNITIES.



O we make our opportunities, or are they made for us?

This is rather an interesting question, and one considered especially so by a vast number of young women who tremble upon the brink of many possibilities, and constantly let "I dare not!" wait upon "I would!" It is an illustration, also, of the fact that very few questions in this world can be answered by a "Yes" or "No."

Opportunities are of many kinds, and even the recognition of them—the knowledge that they are opportunities, and that we would do well to make use of them—implies a degree of mental perception and moral and intellectual advancement which only a certain proportion of men and women have attained. To some people opportunities are troubles, to some they are difficulties, to others they are annoyances, and it is to be feared that it is not to the majority that they are accepted as means of growth.

Opportunities are big and little. Many people—the young especially—miss the small ones while waiting and hungering for the larger, never dreaming, when these do not come to them, that they missed the stepping-stones in overlooking the little chances which they despise.

The world may really be divided into two classes of persons—those who see and make use of their opportunities, and those who do not. The first are usually called the lucky people. Everything gravitates toward them, because they gravitate toward everything. They are helpful, sympathetic, and assimilative. They seize their opportunities by instinct, before they know what opportunity means. Wherever they go they learn something; wherever they are they do something. When they reach manhood and womanhood they naturally represent the fullness of these things which they have gathered together.

It is a misfortune of prejudice that it narrows our opportunities, and only permits us to see them in given directions. We may do one thing, if the chance presents itself, but we must not do another. We may be helpful to others, but we must not be helpful to ourselves. Women especially have been hemmed in and about with manifold restrictions, whose origin was simply the conventional law of a small proportion—called "society"—of the community in which they lived, and which had no foundation in morals or the ethical life of the great body of humanity. The necessities of men have relieved them largely from this bondage, and thus another code has grown up, the laws of which, as relating to all the minor acts, differ totally for men and for women, and when the latter, from the compelling force of circumstance or natural inclination, go contrary to the traditions and

enactments as accepted by the few who compose their world, they are apt to find the martyr's scourge rather than the victor's crown.

This consideration stands in the way of many women who would gladly seize the opportunity which comes, or endeavor to make one for themselves. But these cases are, after all, few and far between. Life is not made up of great opportunities, but of small ones, and it is out of these that the great ones grow. Moreover, as before remarked, the first rarely come to us as opportunities. They come as duties, and are more frequently considered troubles and obstacles and interruptions to enjoyment than as helps to future advancement.

It seems a great pity that we cannot know all that depends on our doing the wisest thing when we are young; but it is not certain that we should do much better if we did know. Knowledge that simply comes by telling is only valuable to us when we can take it and make it a part of ourselves. If the words are only sounds to us, repeated parrot-like, and forgotten as soon as the memory is charged with something else of more interest to us, the acquirement was worse than useless, for it occupies the time which might have been put to better advantage. This is why the experience of others is of so little value to us. We do not appropriate it or apply it to our own lives; we have to live it all out for ourselves before we feel its force or can employ its lessons.

The great advantage of using one's opportunities is in the unconscious education received from them, which begins with the first and only ends with the termination of existence. Opportunities are the unconscious links of a sort of Jacob's ladder, by which we may climb to heaven, or rather a ladder suspended between earth and heaven, which unites us with and gives us glimpses of one, while we are compelled to live and work upon the other.

Opportunities are doses which are sometimes not at all pleasant to take, and of which we cannot always see the good to be derived from them. In fact, as blessings they are very often disguised, and their real ministry is least of all recognized by its unconscious subject.

Opportunities are like the good fairies of the old story-books. They do their best when they are taken on trust, accepted, and ministered unto for what they seem to be, rather than the providences they are. The best opportunities which come to us, and those which we should most gladly accept and persistently hold to, are the ones, firstly, which assist our growth and development, and ultimately aid us in benefiting others. It is a sin for a girl to be made weak and puny and helpless, or to permit herself to become so, because she can only be a burden and a drone in the universe, instead of an active, useful part of it. If she should be weak and puny, however, from circumstances beyond her control—if air, and sun, and light, and cheerfulness, and work can do nothing to help her—even then she will find her opportunities, and making use of them

will be cherished as a sacred trust rather than felt as a weight and an encumbrance.

Some persons embrace one set of opportunities but neglect others. They are fond of outdoors and activity. They seize every chance of fresh air and participation in sports, but they neglect their indoor life, their home duties, their opportunities for intellectual cultivation and mental improvement.

There are others who narrow existence down to a little treadmill, upon which they keep incessant step, and beyond which they cannot or will not look. Nor is it themselves alone that they sacrifice. The fact that their own lives are one continued plaint and melancholy dirge does not prevent them from endeavoring to set all others to this one minor key, and crush, as far as possible, the instinctive desire toward broader, freer, and more healthful habits and methods. This is all infinitely to be regretted. It is so sad and pitiful to see the sweetness and soundness, the best possibilities, taken out of human existence by ignorance, by neglect of the means—the often very simple means—which lie close to your hand.

Have you ever been in a confined room where perhaps some one lay sick? The air was stifling, the patient oppressed and gasping, the nurse worn and irritable. Ignorance presided there; fresh air would give the sick one "cold," forgetting that sick and well must breathe *some* air, and if the pure is not introduced it must be the impure. But knowledge arrives, and proceeds at once to open the window. The sweet reviving air is waiting outside, and comes in gladly, so happy to have its opportunity. The foul malarious atmosphere is expelled, the invalid revives, ill temper disappears, recovery is made possible, and all this good is accomplished by a breath of fresh air. Thus opportunities become our teachers, and pave the way for other opportunities and still greater achievements.

It is safe to distrust any one who is not thankful for an opportunity, or who stops to measure it by what it may be calculated to return in the way of reward or compensation. To the young especially opportunities seized become the foundations of future power, happiness, and prosperity. Neglected, there is nothing upon which they can raise the structure of future greatness, and it depends upon the kind of opportunities they have encouraged, and the kind they have failed to appreciate, as to what the building is which their daily life will rear, consciously or unconsciously, with or without a purpose.

Naturally the best and most rounded life grows out of an appreciation, and employment of the best opportunities which have come to us, and which multiply each other so marvelously.

This is particularly the case as regards women, because their more sympathetic nature places them in *rappor*t with the universe and its forces, and they have no idea to what an extent they are in harmony with apparent opposites, until some timidly accepted opportunity, taken fearfully as a not-to-be-set-aside duty, puts a key into their hands which unlocks the door of a new and most welcome world.

Oh! blessed possibilities for those who in-

stead of sitting down and selfishly repining, pick up cheerfully the first opportunity that presents itself, if it is only to make clean what was dirty, to plant a tree where was a waste, to study and acquire knowledge instead of remaining in ignorance, to get rid of a bad habit, to strengthen one's self or another in a good one, to lessen confusion by keeping order, and finally to be the unconscious embodiment of a perpetual opportunity by which others may see the result of a true and faithful life.

## Laurel Blossoms.

BY ESTELLE.



THE July sun was just setting behind Norton Crest; and the old pine tree, that for generations past had stood upon its summit, a solitary sentinel, was transfigured in a flood of golden light.

Fred Harrington sat upon one corner of the piazza, his feet perched comfortably upon the railing, and his hands clasped behind his head, locking dreamily at the glory-covered pine, when down the hard gravel road clattered the old stage-coach that made tri-weekly visits to this usually quiet region. Fred had heard nothing of expected company, and the old coach had become so familiar an object that he heard without hearing, and saw without consciousness its approach, so dreamily were his thoughts engaged with the suggestions of the sunset fires and clear outlines before him.

"Aunt Jane, the shawls please; so, let me help you with that."

The clear, ringing voice brought Fred's thoughts back to time and sense; and the vision that met his eyes brought his feet to the floor and a half-smothered exclamation to his lips.

The coach had stopped at the gate, and a young lady in a gray traveling suit, a saucy straw hat perched upon her head, with a floating scarf of shining gray stuff, that looked to Fred's dazed eyes like a bit of moonlight, but which really was a very serviceable veil of gray grenadine, stood, with hands extended, to aid another figure in brown that was just emerging from the depths of the time-honored vehicle.

"Aunt Jane" having been dutifully helped to the ground, and the numerous salutations of the inmates of the house (who had ere this discovered the new arrival and rushed from all quarters), shawl-straps and satchels were appropriated by Thee and Bess and Tom, even little Dick protesting that he wanted "to carry sumfin' of Cousin Minnie's," whereupon the young lady with the "moonshine" on her head gave him her parasol and a kiss—gave them with such a grace as put baby Dick in the seventh heaven, and made Fred wish that he might "carry sumfin'" too.