

# THE YOUTH'S INSTRUCTOR

REMEMBER NOW, THY CREATOR IN THE DAYS OF THY YOUTH.

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## THE NEW YEAR.

"Hitherto hath the Lord helped us." 1 Sam. 7: 12.

"HITHERTO" — how bright the pathway!  
"Onward" brighter still shall be;  
What is past is but a foretaste  
Of the joy in store for thee.

"Hitherto" great mercies crowned thee  
Every day and every hour;  
There are greater mercies "onward,"  
Larger measures of God's power.

"Hitherto" sweet mem'ries linger  
Of the "hithertos" gone by,  
But the "onward" we are nearing  
Has much more to satisfy.

Further "onward," more of Jesus,  
More of his unfathomed love,  
More of his all-powerful presence  
With us till we meet above.

Master, be thy constant presence  
With us through the untried year!  
And, in company with Jesus,  
Love shall banish every fear.

## NEW YEAR'S GREETING.

THE practice of wishing one another a happy New Year is certainly a commendable one, and has been observed in the old world for many centuries. With some, alas! it has become a matter of habit more than anything else,—the beautiful principle that might underlie the action, sincerely and prayerfully wishing one another really everything good in the new year, being completely lost sight of. With persons of that class it sometimes occurs that even while they observe the custom from mere habit, they are planning how they can get the advantage of the very ones whom they thus wish well; plotting things which, if carried out, cannot but injure the parties on whom they are practised, in one way or another.

Let our greeting be from the heart to the heart,—the sincere and prayerful wish to come out of the new year better and nobler in soul and character than when we entered it. Surely, when we look back upon the year just finished, we must see where we have come short, many times, of filling out the measure of a perfect life. Let us then consider these experiences in a teachable and earnest spirit, that we may avoid them not only in the year now before us, but may rise so much above the like that we cannot be led astray any more; for that is the only sure way to make genuine advancement.

While we do not wish to waste our precious

moments at the view of the imperfections of the past by moaning over what might have been but cannot be undone now, let us be all the more keenly on the alert as to what may yet be in the year now before us, and strive with all there is of us to do our very best in every direction that tends to ennoble character, and thus fulfil the purposes of our loving and kind heavenly Father with us, who has given us besides all the untold blessings of life the opportunities we enjoy at present. To aid in carrying out such commendable resolve, the INSTRUCTOR will strive to be always a true friend and helper, by its weekly visits bringing timely words of Christian encouragement and

breadth and depth as well as beauty of character, all the more zealous to improve to the utmost the very much greater opportunities and privileges we enjoy in comparison with those of the few scattered readers of the INSTRUCTOR forty-two years ago. And may the fact that with these increased advantages and privileges afforded us, our responsibilities are proportionately larger, serve to keep us from falling into any of the follies which seem to charm so many youth to-day, but which can end only in unhappiness and misery sooner or later.

If we are in doubt about anything, whether to do it or not, let us ask ourselves, Would Jesus do this, if he were in my place? and if we cannot confidently say Yes to that question, let us not allow ourselves to do that thing of doubtful propriety. There is enough to do, all about us, and at all times, that we can do, which will be pleasing to God and for the best good; why then not be truly noble, and do that, leaving all doubtful doings to those who have no respect for themselves nor care to develop a symmetrical character that will bear every reasonable test.

AUGUST KUNZ.

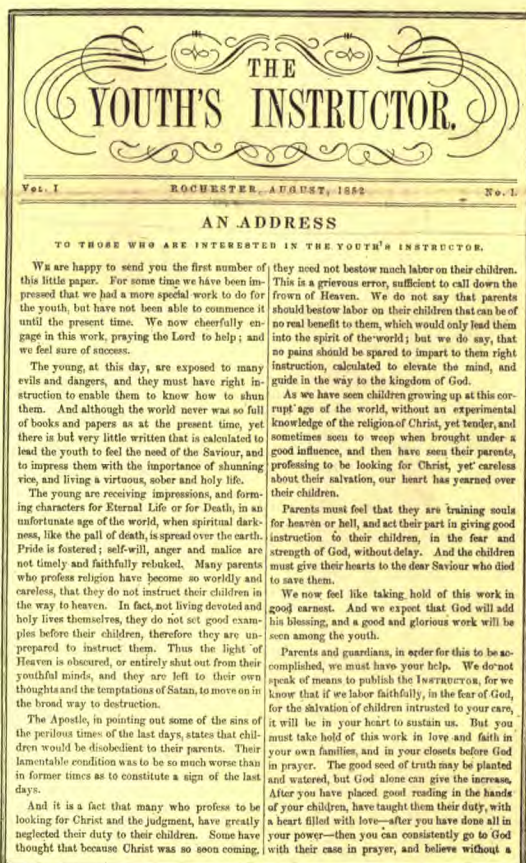
## WHAT IS TIME TO YOU?

AN old adage says, Time is money; but it is much more. To be sure, to some people time is a mere commodity with which to trade and gain wealth. Others let it run to waste on their hands, or spend it in riotous living. But there are persons to whom time seems like a cornucopia with plenty for all, whence they glean many a precious gem of wisdom and truth, although the great masses of mankind pass by without heeding it, and eventually die in ignorance. To some it is like a fertile tree, whence they pluck delicious and nourishing fruit all the year round; while others indolently lie in its shadow, and famish for the want of food.

Again, time is like a ladder, upon which many ascend to usefulness and distinction, but others descend upon the very same ladder into disgrace and ruin. Hence time is just what we make it for ourselves,—a great good or a dire evil, an everlasting blessing or an eternal curse. The Saviour utilized his time so well that during the three years and a half of his ministry he not only healed vast numbers of sick and raised the dead, but he redeemed a world from the curse, and "brought immortality to light through the gospel."

Dionysius, the Sicilian, utilized his time so completely that when asked by some one if he had a few moments to spare for an idle stroll, he replied, "God forbid that I ever should be idle a single minute."

What is time to you and me?



cheer, as well as much useful information in general, to thousands of homes. This has been the constant aim of the paper from its beginning, and is the very purpose of its existence.

We give, in reduced size, the first page of the very first number of the INSTRUCTOR ever published, and those with good eyes may read the identical text of the larger half of the original address by Brother James White, who was under God the founder of the YOUTH'S INSTRUCTOR not only, but of many other enterprises, educational and otherwise.

As the paper has grown from the first irregularly appearing small eight-page monthly to its present handsome proportions, appearing regularly from week to week, so let us grow in

# OTHER LANDS

## NAGOYA AND ITS CASTLE.

IN TWO PARTS.—PART II.

WE observe that most large cities in the world are built either on the banks of rivers,—London on the banks of the Thames, Paris on the Seine, Rome on the Tiber; or by good harbors—Naples on the shore of the Bay of Naples, Boston at the head of Massachusetts Bay. But unlike these cities, Nagoya has neither sea-port nor river to assist the manufactures, to promote the trade, to increase the population; therefore its growth as a city was not so flourishing as the prophet's gourd, but it rose slowly, steadily, gradually, yet progressively, until the whistle of the steam engine aroused the city and its neighbor to a new and more active life, so that now it stands inferior only to Tokio, Kioto, and Osaka.

The province of Owari itself is the widest and most fertile plain in Hondo, the main island; and we see the mountains and hills in the distance from the city; and it is said that in these mountains and hills the "decisive battle of succession" was fought in the seventeenth century,—known to all as the "ancient battlefield of Komaki."

The city has many Buddhist temples and monasteries, as well as shrines of the Shintoists, and is the stronghold of these sects. The Cathedral of Hon-gan-ji is the largest building owned by the "New Sect" of Buddhism, and is situated in the southern part of the city; while the Kenchujii Abbey, where the princes of Owari and other notable men are buried, is standing on a hillside in the eastern part of the city. Both of them are very conspicuous to the eyes of visitors. The "Holy Temple" of Atsu-ta, which belongs to the Shintoists, is about four miles from the city. It is one of the most famous temples in this locality.

There are many public buildings in the city, all of which are built according to European architecture. The mentioning of a few of these buildings will give the reader an idea of the city. They are as follows: The state government buildings, the city hall, the county court, the court of appeal, the military headquarters of the Nagoya district, the third division of the Imperial Constable, the postal telegraph office, railway stations, the spinning factory of Owari, the state museum, the state hospital and the medical college, and the state normal school, high school, the commercial college, etc.

Besides these, there are many schools, both public and private. The Buddhists have a college for training the young preachers. President F. Nanjo, A. M., Ph. D., is well known among the scholars in England as well as in the United States as the translator and compiler of the Sanskrit dictionary in the English language, and the author of the Sanskrit grammar for the English-speaking people. The Christians have Anglo-Japanese schools, where the foreign missionaries teach the English, and the common branches and the sciences are taught by the native teachers. There are two of these schools, one belonging to the Canadian Episcopal Church, the other to the New Methodist. Besides these there are three high schools for women, each belonging to denominations; namely, the Presbyterian, the Methodist Episcopal, and the Congregational. There is one more private

school quite contrary in its nature to those private schools just mentioned; it is the military academy, supported by the military officers, to educate those who wish to enter the military college in Tokio.

Having noticed something about the heathen temples and the educational work in this city, I must now observe the charitable work also. In stating this, I feel a great responsibility that the work should continue. To this branch of work belong two orphans' homes and a home for the old and destitute. One of the orphans' homes is supported at public expense, while the other is maintained by the donations of charitable Christians both at home and abroad. It was started at Nagoya in October, 1891, by Mr. J. Ishii, whom an American journalist, after learning that Mr. J. Ishii had two more orphans' homes besides this branch one, termed "the oriental George Miller." One of the above, which contains eight hundred orphans ranging from infancy to children fourteen years of age, is situated in the Okayama Prefecture.

There was a great earthquake in this city and its neighborhood on Oct. 8, 1891. It began to shake about five o'clock in the morning, and was so violent that "a sound of thunder was heard under ground, and immediately afterward a violent shock threw down the greater part of that city;" and within only six minutes thousands perished. Only a few days afterward we found sixty-eight orphans scattered here and there, their ages being from four to twelve years, wandering in the streets, crying with hunger—poor children who had parents a moment before the earthquake, but by the earthquake their parents perished. These pitiful circumstances led us to open an orphans' home especially for those who lost their parents by the earthquake, calling it "the earthquake orphans' home." And even until now the hand of the Almighty Father of all is upon this institution, and these helpless orphans are learning the love of God and the Bible truth day by day.

This orphans' home is not the only institution for which the great earthquake created a necessity; but it brought also a home for the old and destitute in Nagoya, for those who lost their sons and daughters, by whom they were supported. The home was built by the donations of Christians in Canada as well as in the United States. The aged people here in this institution are above sixty years of age. There are twenty in number at present,—many having died before the writer left the institution.

In Nagoya we can see nearly all of the eight denominations of Buddhism and the three sects of Shintoism. We find also the Roman Catholic Church and the Greek Catholic Church, and eight denominations of Protestants. The city is in verity a small congress of religions.

YOSHIRO SAYEKI.

### SILVER COINAGE IN MEXICO.

A FEW days ago, while at the mint in the City of Mexico, I stopped to look at the final balances in which the Mexican silver dollar is weighed before it is turned loose upon the public. In one side of these balances is placed the weight, the equal of which the silver dollar must contain; in the other, the dollar is placed. If they balance, the dollar is pronounced ready for circulation. If the dollar is lighter than the weight, it is cast aside.

I stopped the weigher for a moment, begging him to test the weight of a United States silver dollar by his balances. The United States dollar went up. It was lighter than the weight

in the other side of the balances. It contained less silver than the Mexican dollar. A few minutes later, I went into a restaurant. The price of my dinner was just a dollar. I handed the cashier the United States silver dollar. He gave me back in change a Mexican silver dollar. Because of the difference, therefore, between the stamp of the United States and that of the republic of Mexico, I received a larger dollar than I gave, and got my dinner besides. This simple illustration is conclusive proof that the United States silver dollar, but for the stamp which gives it a fictitious value, is worth only half a dollar.

The condition of silver in Mexico is rendered worse by the fluctuations in its value. At Laredo, Tex., just across the Rio Grande from Mexico, I went into the "Bank of Laredo" to exchange United States for Mexican money. The cashier gave me eighty-eight cents premium. Another bank near by gave me ninety cents premium. The depot agent gave me ninety-two cents premium. The keeper of a lemonade stand received Mexican money at fifty per cent discount; that is, when I gave him a Mexican dollar for a fifteen-cent glass of lemonade, he gave me back thirty-five cents in change—valuing my Mexican dollar at fifty cents, and pricing his lemonade in United States money. Many stores in Laredo and the eating-houses across the river in Mexico very cheerfully exchanged Mexican money for United States money at the rate of two for one. Mexican money is quoted in the market like wheat or cotton or sugar. It may go up any day, or it may go down—most likely down. It is very noticeable, too, that when the price of money decreases, the price of products increases. The simplest illustration of this is in the eating-houses. In Texas, meals at the dining stations are fifty cents in United States money. Cross the Rio Grande into Mexico, and the price of a dinner becomes a dollar. Cheap money also produces extravagance. When a dollar is worth but half a dollar, one spends it three times as quickly as when it is worth a dollar.

It is perfectly clear that the masses of Mexico—the laboring people—suffer most from their depreciated currency. They are never paid off in anything else. They never buy with anything else. The premium on good money over bad never comes to them. They pay premiums. They never get them. The exporters of Mexico who send abroad coffee, tea, hemp, hides, henequin, and tobacco get paid in foreign money, and make profits accordingly. The laborers who cultivate these products are paid in Mexican silver. And these laborers get a miserable pittance by comparison with the wages paid the laborers of the United States. The general average of all the States, according to Mr. Romero, shows a minimum of twenty-three and a half cents; a maximum of fifty cents; an average of thirty-six cents. These wages, remember, are paid in Mexican money, which is worth only half as much as United States money.—*Claude N. Bennett, in the North American Review.*

ELECTRICITY has been applied to a novel use in the East Indies. A platinum wire, connected with the poles of a battery, is stretched around a tree, and becoming red hot, is gently sawed, until it burns its way through. It is thought that a tree can be cut down without any waste of timber in about fifteen minutes, that would require two hours to fell the ordinary way.

WHATEVER makes us take an unselfish interest in others, makes us better.



### CALLED TO BE BURDEN-BEARERS.

"THE SON of man came not to be ministered unto, but to minister, and to give his life a ransom for many." "If any man will come after me, let him deny himself, and take up his cross, and follow me. For whosoever will save his life shall lose it: but whosoever will lose his life for my sake shall find it."

We have a message to bear to the world, and every one who has a connection with the work of God, is required to be a burden-bearer. Many professed Christians have been self-centered too long. They have been self-sufficient, and without a vital connection with God, and they do not understand their needs. We would urge all now to understand the Gift of God, and ask of him living water, that he may be in you a well of water springing up unto everlasting life. Then you will refresh others; then you will not be anxious to have the highest place. You will not have a carnal ambition to crowd and elbow your way into notice, and to be ambitious for the highest position; but you will realize that your highest place is at the feet of the great Teacher, to learn of him who is meek and lowly in heart. You will realize that your part is to behold Jesus, to contemplate his perfections, to talk of him, and to have your hearts all aglow with the love of God. Then you will possess Christ's meekness and lowliness of heart. Then you will be in a condition to listen to words of truth, and to be benefited by them; for you will then practise the truth, and teach others also the truth as it is in Jesus.

You should seek God with all your heart for yourselves, that the faith which you possess may be a working faith,—a faith that is genuine,—a faith that works by love, and purifies the soul. Through the grace of Christ you will make decided endeavors to overcome all cold, rough, harsh, uncourteous ways and manners. These un-Christlike attributes will be clearly seen as they are, as you behold the Pattern; for it is by beholding Jesus, by talking of Jesus, by contemplating Jesus, that you will see the offensive character of sin, of selfishness, or hardness of heart, and you will do the very thing that God requires you to do, and that you have not yet done. You will put away all self,—self-importance, self-love, self-esteem, envy, evil-surmising, and jealousy, and plead for the Holy Spirit to come into your hearts and abide with you. As you taste and see that the Lord is good, you will hunger and thirst after more of the Holy Spirit, and will make an entire surrender of your will and your way, your plans and ideas, to God, and will keep the way of the Lord. Your words and deportment must be guarded.

The mighty cleaver of truth has taken you out of the quarry of the world. You were rough stones with jagged edges, bruising and marring whoever you came in contact with; there is a work to be done to smooth off the rough edges. If you appreciated the value of the work that is to be done in the workshop of God, you would welcome the blows of the ax and the hammer. Your self-esteem will be hurt, your high opinion of yourself will be cut away by the ax and the hammer, and the roughness of your character will be smoothed off; and when self and carnal propensities are worked away, then the stone will assume

proper proportions for the heavenly building, and then the polishing, refining, subduing, burishing processes will begin, and you will be molded after the model of Christ's character. His own image is to be reflected in the polished character of his human agent, and the stone is to be fitted for the heavenly building. Angels of God look upon the human agent that thus reflects the brightness and glory of the character of Christ, and proclaim in the heavenly courts: "We are laborers together with God: ye are God's husbandry, ye are God's building." "Here are precious stones growing up into a holy temple in the Lord."

But we deny Jesus Christ as the one who taketh away the sins of the world, if we do not, after accepting the truth, reveal to the world the sanctifying effects of the truth on our own characters. If we are not better men and women, if we are not more kind-hearted, more pitiful, more courteous, more full of tenderness and love; if we do not manifest to others the love that led Jesus to the world on his mission of mercy, we are not witnesses to the world of the power of Jesus Christ. Jesus lived not to please himself. He gave himself as a living, consuming sacrifice for the good of others. He came to elevate, to ennoble, to make happy all with whom he came in contact. Those who receive Christ will put away all that is uncourteous, harsh, and rough, and will reveal the pleasantness, the kindness, that dwelt in Jesus, because Christ abides in the heart by faith. Christ was the light that shineth in darkness, and his followers are also to be the light of the world. They are to kindle their tapers at the divine altar. The character that is sanctified through the truth adds the perfect polish.

Christ is our model; but unless we behold him, unless we contemplate his character, we shall not reflect his character in our practical life. He was meek and lowly in heart. He never did a rude action, never spoke a discourteous word. The Lord is not pleased with our blunt, hard, unsympathetic ways toward others. All this selfishness must be purged away from our characters, and we must wear the yoke of Christ. Then we shall become laborers together with God, and shall be fitting up for the society of heavenly angels. We are to be in the world, but not of the world. We are to be representatives of Jesus Christ. As the Lord of life and glory came to our world to represent the Father, so we are to go to the world to represent Jesus. He says, "I sanctify myself, that they also might be sanctified through the truth." "Thy word is truth." We need, then, to become familiar with the word of God; to study and to practise it in life. Then will the word become to us personally the power of God unto salvation.

MRS. E. G. WHITE.

No one lives to himself alone. Sometimes it is said of sinful persons who are good-natured toward their fellow-men that they harm no one but themselves. This is a false saying. Some one is touched by the evil of every evil life and by every wrong deed, no matter how trivial it may seem to be.

OUR minds are small because they are faithless. If we had faith in God, our hearts would share in his greatness and peace. We should not, then, be shut up in ourselves, but would walk abroad in him.—*George Macdonald.*

HE that has a pure heart will never cease to pray; and he who will be constant in prayer shall know what it is to have a pure heart.—*La Combe.*



### CLOSE OF SCHOOL YEAR ON PITCAIRN.

(Read by Miss Hattie Andre.)

JUST one short year ago to-day,  
When we, with faces bright  
Met here to give the parting song,  
Our hearts were glad and light.

We sang, "Ho, ho, vacation days,  
With all their joys, are here;"  
And forward looked without a cloud  
To dim the growing year.

We sang, "Should faithful teachers and  
Dear schoolmates be forgot?"  
Then pledged our word they never will;  
True heart-loves perish not.

What tender recollections come  
As now we backward look,—  
The smiles we wore, the songs we sung,  
Are writ in Memory's book.

We stood together, side by side,  
We feared no darkening gloom,  
Nor dreamed that some from that fair band  
Were ripened for the tomb.

Our hearts beat high, our hopes were bright,  
That when,—vacation o'er,—  
Our studies called us once again,  
We all would meet once more.

Vacation passed,—its fleeting joys  
Soon vanished in the past;  
We met again, each face as bright  
As when we gathered last.

One month of school-work had not passed,  
Ere sickness, fierce and dread,  
Began to lay its victims low,  
As rapidly it spread.

And then, ah! soon the sickness dire,  
With its malignant hand,  
Hewed down, as with a sickle keen,  
The members of our band.

And once again school duties closed,  
But not with feelings glad;  
And not with faces gay and bright;  
For every heart was sad.

For one by one, by Death's fell hand  
Our numbers were laid low;  
And mournful sorrow filled our hearts,  
As sad we watched them go.

Over the painful dying scenes  
We draw with tender touch  
A veil 'neath which our hearts may weep;  
For still we sorrow much.

The sad, sad year whose opening scenes  
With hopes were glad and bright,  
Closed in a gloom that darkened all  
The radiance of its light.

Once more we met, but O, the pain  
That filled each aching heart!  
And as we viewed the vacant seats,  
Afresh our tears would start.

For, nevermore, beneath this roof,  
We, one unbroken band,  
Shall stand again our songs to sing,  
And clasp each other's hand.

Together, never once again,—  
No more with joy to greet  
Each one the other with glad smiles;  
No more on earth to meet.

And now we gather here to day,  
The past forever gone;  
The present time alone is ours;  
The future, how unknown!

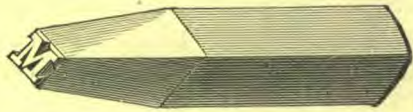
We know not what awaits us here,  
Whether of good or ill;  
But, fearlessly, our way we tread,  
Knowing God guides us still.

Perchance our way in life shall lie  
Through sorrow and through tears,  
Or scarce a gloomy shade shall fall  
To dim the coming years.



**HOW PRINTING-TYPES ARE MADE.**

PROBABLY but very few of the readers of the INSTRUCTOR know how the metal types which printers use are made, or even of what material they are composed. But this is nothing strange; for hundreds of newspaper and book men, and



PUNCH.

even type-setters themselves, practically know but very little concerning the manufacture of the type with which newspapers and books are set up.

A prominent type-founder in Chicago awhile since published an interesting description of how type is made, and the same with additions was issued in a neat circular by William C. Gage, of this city; and it is through his courtesy that we are enabled to present the illustrations given in this article.

Type metal is a composition of lead, tin, antimony, and copper, all of which metals are necessary to give the required ductility, hardness, and toughness. No other composition



DRIVE.

has ever been found which so well answers all the purposes for type-making, although aluminum, gutta-percha, and some other substances have been tried.

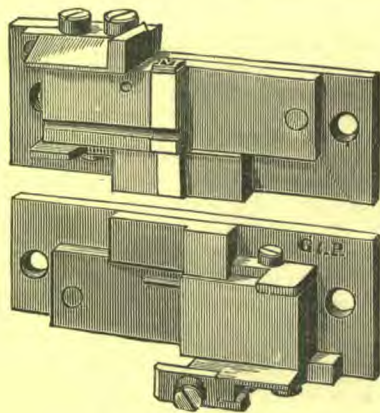
"The first step in the making of type is cutting the letter desired, on



MATRIX.

the end of a piece of fine steel, forming the punch, which is afterward hardened. This is an operation requiring great care and nicety—there being comparatively few adepts at it—so that the various sorts in a font may be exactly uniform in their width, height, and general proportion to each other. A separate punch is required for each character in every font of type, and the making of them is the most expensive portion of type-founding.

"During the process of its manufacture, the punch is frequently tested or measured by delicate gages, to insure its accuracy. When finished, a smoke proof is taken, and if the

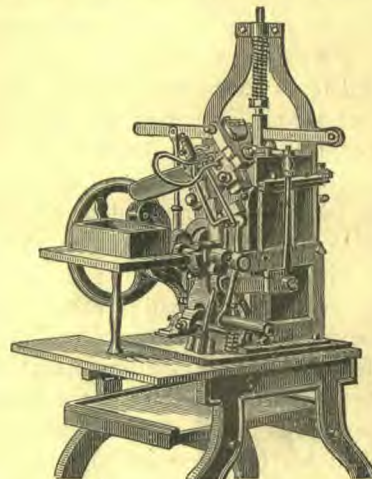


MOLD.

letter is pronounced perfect, it is driven into a piece of polished copper called the drive. This passes to the fitter, who makes the width and depth of the faces uniform throughout the

font. They must then be made to line exactly with each other. [The reader will notice how perfectly the letters in a line of print line with one another.] When thus completed, the drive becomes the matrix, wherein the face of the type is made.

"This undergoes other processes in fitting and finishing, to make it true and square with the body of the type. Matrices are also made by the electrotype process, for the purpose of copying and multiplying certain faces without incurring the great expense of cutting new punches. The mold in which the body is formed is made of hardened steel, in two parts; one part is fastened to the machine and is stationary, while the other is movable, so that it may be adjusted for the proper width of the letters, as one is wider than another. The necessity of perfect accuracy in these molds is



TYPE-CASTING MACHINE.

manifest to every printer who knows that types must be mathematically square, else they could not be used.

"The matrix and mold are combined, and then adjusted to the type-casting machine, which is set at work manufacturing types at the rate of from one hundred to one hundred and seventy-five a minute.

"The type-casting machines in general use in this country and in Europe are of American origin. The *American Printer* gives the following description of their operation:—

"The metal is kept fluid by a little furnace underneath, and is projected into the mold by a pump, the spout of which is in front of the metal pot. The mold is movable, and at every revolution of the crank in the hand of the



UNFINISHED TYPE.

workman it comes up to the spout, takes a charge of metal, and flies back with a fully-formed type in its bosom; the upper half of the mold lifts, and out jumps a type. The spring in front



FINISHED TYPE.

holds close to the mold a copper matrix; the letter *a*, for instance, stamped in the matrix, sits directly opposite the aperture in the mold, which meets the spout of the pump; and when a due proportion of *a* is cast, another matrix with *b* stamped in it takes its place; and so on throughout the entire alphabet.

"In casting small fonts, where frequent changes are made in the molds, the machines are driven by hand power; but when the fonts are large, such as those made for the daily newspapers, steam is used as the propelling power, and the industrious little machines, with scarcely less than human intelligence, go thumping along at their work, requiring but little care or attention, except when changes in the matrices and molds become necessary. The only practicable method of making types is by casting them singly. All attempts at making them by swaging, cutting, or casting

fifty or more at a time, have proven utter failures.

"The types are not finished when they leave the machine. There will be found attached to each letter a wedge-shaped jet, somewhat similar to that on a bullet cast in a hand mold. The loose types are placed upon tables, around which are seated nimble-fingered boys or girls, who pick them up at the rate of from two thousand to five thousand an hour, at the same time breaking off the jets. A bur still adheres to the shoulder of the type, and this is taken off by the rubbers, who rub the sides of the letters on fine steel files, manufactured expressly for this purpose. Some type-founders have this work done on sandstones, and by the process called "bunching," to save expense, but the printer need only to place one type by the side of another to detect at once the difference and the inferiority of the work.

"The kerned letters then go to the kerning machine, where they are dressed without disturbing the kern, or overhanging part of the type. The types next go to the setters, who set them in long lines ready for the dresser. He slips them into a long stick (dressing rod), turns them on their face, fastens them on a bench adapted for that purpose, and with a plane cuts a groove in the bottom which removes the bur left in breaking off the jet, and leaves each type with a pair of feet to stand upon, and then dresses off the under and upper sides.

"The picker (who is generally the dresser) now takes the type in hand, and, with the aid of a magnifying glass, picks out each defective letter, which is returned to the melting kettle. The types are then broken up into shorter lines, and put up in pages of about four and one half by six inches in size, when they are sent to the dividing room, where they are divided into fonts, each having its due proportion of the various characters, and made into pages or parts of pages. Afterward they are wrapped in papers, labeled, and sent to the wareroom, where they are packed, marked, and shipped to the purchaser, or put upon shelves to await orders."

A recent invention, the Automatic Type-perfecting Machine, performs the manipulations necessary to make and finish type. This process has many advantages over the old method, as the type is made with very great accuracy. The type is cast absolutely true at the start, and in the finishing process it passes through gaging cutters that finish it smooth and perfect.

G. W. AMADON.

**ORNAMENTING GLASS.**

THE following is an example of the means of carrying out the inventor's process: A coat of acid resist is laid upon the glass; from the parts forming the background to the design, the "resist" is removed with a stencil; soda and hydrofluoric acid are then poured upon the surface. Hydrofluoric acid is next applied; the resist is then removed, and the glass is cleaned. The glass is next coated with stain, and by means of a stencil, the ornament is freed from the stain, which remains as a protection from the background. The stain is then burned into the glass. The glass is then taken from the kiln, cleaned, and the required outline traced upon the glass, the background being filled with acid resist. The solution of soda and hydrofluoric acid is again poured on, so as to leave a white "mat" on the whole ornament, leaving the outline, which is protected by the resist, clear. The shading-in is then done, according to the ordinary process of the trade.—*Scientific American*.

But with brave hearts we travel on,  
Content, should ill befall,  
To trust our future in the hands  
Of Him who orders all.

To-day we meet, to-day we part,  
Our hearts not free from pain;  
We know not, as we say "Farewell,"  
If here we'll meet again.

So farewell teachers, schoolmates dear,  
Farewell bright scenes now fled;  
Farewell, a last farewell, to those  
Who sleep among the dead.

ROSA A. YOUNG.

MUSIC IN ISRAEL.

ISRAEL had both musicians and singers. Music and musical instruments were used in the worship of God in all ages. We read in the fifteenth chapter of Exodus that wonderful song of deliverance, sung by Moses and the children of Israel. "I will sing unto the Lord, for he hath triumphed gloriously: the horse and his rider hath he thrown into the sea. The Lord is my strength and song, and he is become my salvation: he is my God, . . . and I will exalt him." This song was given to the children of Israel by the Spirit of God, and that same spirit inspired the singers; so we may conclude correctly that the harmony was perfect.

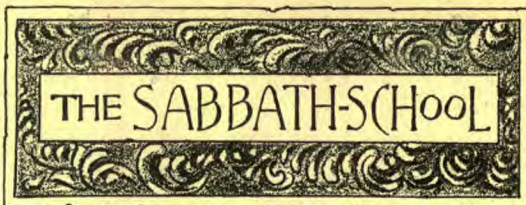
"And Miriam the prophetess . . . took a timbrel in her hand; and all the women went out after her with timbrels." The timbrel here spoken of is a simple tambourine used with cymbals.

God's people praised him with music and song. When Solomon had finished the work of the house of the Lord, he assembled the elders of Israel, and all the heads of the tribes. Then the Levites took up the sacred ark, and all the holy vessels, while music, as described in 2 Chron. 5: 13, 14, played a prominent part in the occasion. Notice the perfect time of musician and singers: "It came even to pass, as the trumpeters and singers were as one, to make one sound to be heard in praising and thanking the Lord; and when they lifted up their voice with the trumpets and cymbals and instruments of musick, and praised the Lord, . . . then the house was filled with a cloud, even the house of the Lord."

The trumpet here spoken of was straight and made of silver, terminating in a bell mouth, made according to the directions given to Moses, by the Lord, and was used to call an assembly or proclaim the march. God designed that those who praise him with music and song should do it beautifully. "Praise him upon the loud cymbals: praise him upon the high sounding cymbals," "with song," singing psalms and making melody in your hearts. In that last grand scene when God's remnant people shall have gained the victory, the song of Moses and the Lamb will be sung. Then will we have harps of pure gold, crowns of life, and beautiful white robes given to us by Jesus himself. ANNA V. RUTHVEN.

THAT gold should exist in the ocean is an induction that Dr. Henry Wurtz claims to have presented in 1866, and in 1872 the discovery was announced by E. Sonstadt. A careful computation with the best data obtainable, on the basis of nine tenths of a grain of gold to a ton of sea water, about the proportion assigned by Sonstadt, shows that the great ocean should contain gold to the amount of over eighty quadrillion dollars. The getting of some of this by electrolysis, Dr. Wurtz now predicts, will be one of the problems of the future.—*Invention.*

WHERE necessity pinches, boldness is prudence.



LESSON 3.—THE WORLDLY SANCTUARY  
(CONTINUED); MATERIAL FOR  
THE BUILDING.

(January 19, 1895.)

MEMORY VERSES.—Ex. 26: 1, 7, 14.

HINTS FOR REVIEW STUDY.—1. Did you learn how long the tabernacle was? If not, you would better figure it out. Better figure it out anyway; some one may have told you wrong. The necessary information will be found in Ex. 26: 16, 18. Was it thirty, forty-five, or fifty feet long? Remember to reckon a foot and a half for each cubit. 2. Was the tabernacle twelve feet wide or fifteen? Can you find out from Ex. 26: 22-25? Of course you see how high it was. Verse 16 tells you. 3. What kept the boards from falling down? Did they have more than one means of support? What were they? 4. When the boards are all set up, what kind of looking structure have you? Mark off its dimensions in the yard. Measure its height on the side of the house.

SUGGESTIONS FOR STUDY.—1. Now that we have set up the boards for the tabernacle, let us step inside and examine it. What do you see above? Nothing yet? Well, this lesson will tell you with what it was covered. Read Ex. 26: 1-14. Then read on until you finish the chapter, noticing the last seven verses particularly. 2. When the coverings are all on and the vails in position, imagine what the effect would be if you should enter with a light. How would the sides look? the ceiling? the curtains? Would you need a light?

MATERIALS FOR BUILDING.

1. Of what was the top of the sanctuary to be made? Ex. 26: 1.
2. What was worked in these curtains? Verse 1.
3. What was their length and breadth? Verse 2.
4. How many were coupled together to make one curtain? Verse 3.
5. How were these two curtains joined in one? Verses 4-6. (See note 1.)

THE COVERING OR TENT OF THE TABERNACLE.

6. Of what material was the first covering made? Verse 7. (See note 2.)
7. Of how many curtains was it composed? Verse 7.
8. What was the length and breadth of each? Verse 8.
9. How many were to be coupled together? Verse 9.
10. What was to be done with the sixth, or extra curtain? Verse 9.
11. How were the two compound curtains fastened together? Verses 10, 11.
12. What was done with the half of the curtain which remained? Verse 12.
13. What purpose did the extra length of the curtain serve? Verse 13.
14. Of what was the second covering made? Verse 14. (See note 3.)
15. Of what was the third and last covering composed? Verse 14. (See note 4.)
16. Of what was the door of the tabernacle made? Verse 36.
17. By what were these curtains supported? Verse 37.
18. What was made to divide between the holy place and the most holy? Verses 31, 33.
19. Upon what was it hung? Verse 32.
20. What is this vail called? Heb. 9: 3.
21. When erected, which way did the sanctuary face? Ex. 26: 22, 36; Num. 3: 23, 38. (See note 5.)

NOTES.

1. *Taches*.—These were clasps which hooked into the loops, and joined the curtains together. The word is rendered "clasps" in

the Revised Version. The clasps for the linen curtains were made of gold, while those used for the curtains of goat's hair were made of brass. Ex. 26: 6, 11.

2. "To be a covering upon the tabernacle."—It will be noticed that this expression conveys the idea that this curtain of goat's hair did not form a part of the tabernacle proper, but was a covering for it. The Revised Version renders it, "for a tent over the tabernacle." This expresses the thought still more plainly. The Common Version and the Revised Version both say, "Couple the tent together," in verse 11, and both versions say that "he made curtains of goat's hair for the tent over the tabernacle," in Ex. 36: 14. We would also call attention to the fact that, while in Ex. 26: 6 it says the linen curtains "shall be one tabernacle," in verse 11 it says, when referring to the curtains of goats' hair, that the *taches* "couple the tent together, that it may be one." Also in verse 13 it speaks of the "curtains of the tent," and in verse 14 the rams' skins are called "a covering for the tent."

3. *The roof of the tabernacle and the tent*.—There is no general agreement among Bible scholars as to how the curtains were placed over the upright boards which constituted the sides and west end of the tabernacle. As the question is not one of practical importance, and we have no reliable data concerning it outside of the Bible, we will not occupy space presenting the various views on the subject that have been advocated.

4. "Badgers' skins;" "seal skins."—*Patriarchs and Prophets*. "The skin of the dugong, a kind of seal, still found on the Red Sea, and known to the Hebrews as the 'tahash.' The leather made from this material is even at present used for sandals and shields in the Sinai peninsula, and was anciently in demand for the winter tents of soldiers, from being impervious to water."—*Geikie's Hours with the Bible, Vol. II, p. 292.*

5. The Lord evidently had a design in having the sanctuary and temple face the east. Sun worship was the great rival of the worship of the true God, and its worshippers always worshiped the sun toward the east. Those who came to the sanctuary or temple to worship must come to the door or front of the sanctuary, with their faces toward it, for in that sanctuary God's presence was manifested. In so doing they would turn their back upon sun worship and all the idolatry that centered in it; whereas, those who apostatized from God and worshiped the sun toward the east, as was their custom, turned their back on God and his worship, and this the Lord counted as the greatest abomination that could be committed. Eze. 8: 5-16.

A NEW YEAR'S THOUGHT.

Do you know the Scriptures better than you did a year ago? You ought to. Have you more places in your Bible to which you can go as the bird goes to her retreat? You ought to. Are there more precious spots in the Bible than there were once? There ought to be. Suppose some one had intrusted me with a great matter, and had given me written instructions as to how to conduct it; and suppose that when I felt like it, I went and read a sentence, and then, after a week, half a dozen sentences; I should have only the most fragmentary knowledge of the instructions. But how many Christians treat the Bible thus!—*Wayland Hoyt, D. D.*



## SNOW MEN.

"COME, Tommy and Charlie and Willie and Dan;  
The school is out now, let us finish our man;  
Never mind 'bout our dinners; we never could eat  
While our poor old snowman has n't got any feet!

"Let us call his name 'Adam'; and, then, I believe,  
While we are about it, we'd better make 'Eve.'"  
"I'm goin' to make Abel," said little Tom Joy;  
"For I know they'll be lonesome without any boy."

So Tommy and Charlie and Willie and Dan  
At once all agreed to the wonderful plan,  
And all set to work without further ado,  
Until "Adam and Eve" and their little boy, too,—

Three comical figures, with garments of snow,  
Like three marble statues,—stood all in a row.  
Ah, dear little men, in your innocent play!  
I think of my childhood, and love you to-day;  
And I pray from my heart that your spirits may  
grow  
As pure and as white as these statues of snow.

MRS. L. D. AVERY-STUTTLE.

## A TRUE SOLDIER.

NELLIE GORDON turned with a sigh from the window where she had been watching her brothers at play.

Presently her mother entered the room, and saw the cloud on Nellie's usually bright face.

"What is the matter, little daughter?" she asked.

"O, I've been watching the boys playing soldier," said Nellie, "and I'm most wish I was a boy too, because then some day I might be a real soldier."

With unusual tenderness Mrs. Gordon drew the child to her, for Nellie's father had been a "real soldier," who had given his life to serve his country, and the same brave spirit animated his little daughter.

"Nellie, dear," she said, "you can be a soldier, and have for your captain One who always wins the victory."

"O, mother, tell me how?" said Nellie, delighted at the prospect of having her dearest wish realized.

"I believe my Nellie already loves the Lord Jesus," replied Mrs. Gordon, "and wants to serve him."

"Yes, mother," she said soberly, "but what about the battles?"

Lovingly the mother talked of the struggles with sin and temptation, and how the enemy tries to conquer, but the victory is sure, with Christ on our side.

Nellie's face shone with happiness as she said: "I mean to be a brave, true soldier in the army of Jesus, and maybe I can help some one else, too."

A strange opportunity soon came to Nellie. On her way from school one afternoon she saw a crowd gathered about a neighbor's door, and with childish curiosity, drew near to learn the cause.

"Poor man," she heard one woman say to another, "he was too drunk to see the danger,

and they do say he is mortally hurt; he has always been his own worst enemy."

They were talking about John Hardy, Nellie discovered, and she ran home to tell her mother the news.

That evening, having begged permission to take him a few flowers from their pretty garden, she carried them to the house, and Mrs. Hardy allowed her to give them, herself, to the sick man.

The poor woman's heart was very heavy, for, excepting this one terrible habit, he had been a good husband, and now, it seemed, he was going from her, and, worst of all, with his sins unforgiven. Nellie slipped quietly into the room, and put her flowers near the sufferer; then, seeing he was awake, she came closer to him, and laid her soft, cool hand on his head.

"I am so sorry," she said; "the pain must be dreadfully bad." Then, remembering her promise, she whispered, "Mr. Hardy, why do n't you ask Jesus to help you fight your enemy?"

The man looked at her half-angrily, then muttered, "I guess it would be no use, I've been too bad; besides, it's too late now."

"O no!" said Nellie; then as another

strong faith and courage, and bravely she stood true to her colors.

One day as she met Mr Hardy on the street, he stopped her, saying, "Nellie, a mission has been started in one of the worst parts of the city; will you come and help us fight the enemy in his own stronghold? There are sin-sick, perishing ones who have never heard of our Saviour's love, and we want to carry the cross of Jesus into the midst of all the sin and misery, and tell them of Him who is mighty to save."

Nellie hesitated a moment, then answered, "Yes, I will go, and help all I can."

She found other noble Christian women among the band of workers, and bravely they labored together to seek and save the lost ones. Many sad hearts learned to love the sweet girl, who listened with such tender sympathy to the story of their sorrows, telling them always of the Great Deliverer who stood waiting to help them.

One day a message came from far across the seas for more laborers in that part of the Lord's vineyard. Nellie with some others readily responded to the call, and bravely went forth, bearing the banner of the cross.

Loving letters come back telling of glorious victories, and Mrs. Gordon's heart rejoices that her daughter has indeed become a true soldier of the Lord Jesus Christ.—  
*Florence Clarkson, in Ram's Horn.*

## CAST A LINE FOR YOURSELF.

A YOUNG man stood listlessly watching some anglers on a bridge. He was poor and dejected. At last, approaching a basket filled with wholesome-looking fish, he sighed, "If now I had these, I would be happy. I could sell them at a fair price, and buy me food and lodgings."

"I will give you just as many and just as good

fish," said the owner, who had chanced to overhear his words, "if you will do me a trifling favor."

"And what is that?" asked the other.

"Only to tend this line till I come back; I wish to go on a short errand."

The proposal was gladly accepted. The old man was gone so long that the young man began to get impatient. Meanwhile the fish snapped greedily at the baited hook, and the young man lost all his depression in the excitement of pulling them in; and when the owner returned, he had caught a large number. Counting out from them as many as were in the basket, and presenting them to the young man, the old fisherman said, "I fulfil my promise from the fish you have caught, to teach you, whenever you see others earning, you need waste no time in foolish wishing, but cast a line for yourself."—*Selected.*

REMEMBER this, my young friend: you lower your own self every time you are guilty of an unworthy action because some one else is. Be true to your best self always, and no one can drag you down.

THE best remedy for idleness is hard work.



"ALL SET TO WORK WITHOUT FURTHER ADO."

brave thought came, she added, "I'll ask Him to do it, and tell him how sick you are."

In spite of his pain, John Hardy listened to that prayer, and as he heard the sweet, childish voice pleading with the friend of sinners, for him, strange feelings awakened in his sin-hardened heart.

"May I come again?" Nellie asked, as she rose to go.

"Yes, if you like," he answered.

So, very often the child visited him, unconsciously helping him in his terrible struggles.

At length, after weeks of suffering, he recovered from the injuries which had so nearly proved fatal, and, better still, the heart which had been so bruised and battered by sin, was made clean and whole, and the life, so wonderfully preserved, was henceforth to be spent in the service of Nellie's Captain.

He had been the leading spirit among his boon companions; now he meant to try to lead them into the better way, and greatly were his efforts blessed.

Several years passed, and Nellie, now grown to young womanhood, was fulfilling in her noble, unselfish life all the promise of her childhood.

Many a tempted one had been helped by her



### SECONDARY SCHOOLS IN ENGLAND.

THE school system of England is entirely different from ours. England's "public schools" are not at all the same kind of institutions that we know by that name. An English public school is more like a great academy than anything else. Secondary education,—that above the primary grades,—is left to take care of itself. The state furnishes to the people nothing but the rudiments of learning. The gap between the primary school and the university is filled by private schools, private tutors, the public schools, and in a variety of other ways.

Many boys are educated, or "prepared," by clergymen. They have the whole attention of their instructor for a part of each day. This is, we may imagine, a very pleasant way to study. The pupil accompanies his teacher upon his walks and rides, studies botany and natural history in the woods and fields, and classics in his teacher's library. The private tutor is also well known in many English households of the upper classes. Under his guidance the young student is prepared for school. In some cases the tutor gives way in time to the clergyman, who, of course, is a highly educated man; and the acquaintance of Greek and Latin authors is made under his direction.

The public schools are not supported by the government. They, like the universities, were established by endowments. Such are Rugby, Eton, and Harrow. The dormitory system is in full operation in those schools. Restrictions surround the pupil on every hand. He is not yet of age, and must be under tutors and governors. He is a boy. By and by, when he goes up to Oxford or to Cambridge, he will be a man, and will be about as free as a student can be; but he must bide his time, go through the grind, and look well to his examinations.

Among these schools are some which bear peculiar names. There is in London, for instance, the Merchant Tailors' school. Such names mean nothing now, except that they are reminders of the old days of guild labor. Then the guilds of craftsmen performed not only the office of our trades unions, but they occupied also the place of the modern insurance company, and the charitable organizations of the present time. Some of the guilds became immensely rich, and out of the funds schools, among other things, were endowed.

Akin to these schools are the military schools, where especial attention is given to preparing boys for army service. Much time is of course devoted to drill, and discipline is on military lines.

But the great multitude of English children are not educated in the public schools. It is for them that the "private adventure" schools exist. In every city there are hundreds of private schools, some of them large and some not so large. Some of them are more classes than schools, in point of size and publicity. Thousands of persons all over England make their living at teaching; and, unfortunately, it is to the immediate interest of these people to oppose popular education. For this reason, perhaps, the cry for free high schools is a very recent one. All grades of efficiency, it need scarcely be added, are represented by the pri-

vate schools. Some are good indeed, and some are not to be spoken of.

It would be interesting to trace out the history of the call for free high schools,—or rather, cheap high schools, for England does not yet believe in free education. But it is too long a story. The gist of it is that Germany seemed to be outdoing England in manufacture, especially in such lines as required intricate machinery,—machinery dependent, moreover, upon the attendance of a scientifically educated workman for its successful operation. Furthermore, chemistry and the arts needed men of scientific training. The English young man was not sufficiently well educated to study science with profit. So the men on school-boards, who were not educators, but business men, became interested in an extension of the scope of the free school. The people in general began to demand something of the sort. Parliament appointed a commission, and perhaps cheap high schools will be a fact by the next generation.

One of the leading members of the royal commission has just finished a tour of inspection in this country, his purpose being to study our system of public high schools. The English do not look upon the matter of education as we do. To furnish the people with free high schools seems to them, even now, a questionable departure from the doctrine of individualism, and the support of universities by the state is, in their view, pure socialism.

C. B. MORRILL.

### "PUT YOUR HEART INTO IT."

LONG, long ago there lived in a German town a man whose trade it was to make violins. He was tall and thin, with a long, white beard and a grave, reserved face, which, however, was often lighted up by a singularly beautiful smile. He was indeed much respected by the townsfolk, who were proud, too, of the fame he had acquired; for there were no violins like Gaspard's throughout the whole world. There seemed in truth to be something about the construction of them which no one, not even his own apprentices, could succeed in imitating. Often one of the latter would finish a violin exactly after Gaspard's own model—nothing seemed wanting to the eye; and hoping, yet fearing, the youth would carry it to his master. Then the old man would take the instrument with a kindly smile, and draw the bow lightly across the strings. Alas! the sound was always thin, sharp, and grating; and Gaspard, picking up one of his own violins, would bid the lad note the difference between the two. Full, clear, and melodious,—now with a triumphant swell, now with a tender, long-drawn note like a sigh of the wind,—the music would float out into the old street, and the passers-by would stop to listen, saying, "Hush! there is Gaspard tuning another violin!"

"What is the secret, master?" cried one of his cleverest workmen in despair.

The old man's answer was always the same: "Put your heart into it, my lad; that is all!"

Time passed, and at length there was mourning in the old German town; for Gaspard was dead. And then the secret was revealed, for immediately all his violins lost that extraordinary sweetness and depth of tone which had so distinguished them. They were good violins still, but a change had passed over them, and they would never recover their lost power. Gaspard had put a little piece of his own heart into each instrument, they said, and when he died, the heart of the instrument died also.—*Selected.*

### OUR LANGUAGE.

IN SEVEN PARTS.—PART IV.

#### Its Birth.

THE beginning of English, as a distinct language, dates from the landing of the Saxon invaders on the shores of Kent in 449. It has undergone many changes in the centuries which have intervened.

The invading tribes appear to have called themselves "Englisc," from which the word "English" comes. To the country of Britain they applied the name "Anglia-land," or England of modern times.

For convenience in the study of the development of our language, the time is marked by four divisions,—the Anglo-Saxon, the Transition, the Middle English, and the Modern English periods, extending from 449 A. D. to the present year. During these periods changes were brought about as the result of conquests, by the voluntary addition of words from different languages, and also grammatical changes of inflection,—the variation of nouns and pronouns to indicate number and case, the comparison of adjectives, and the conjugation of verbs.

The Anglo-Saxon period extended from 449 to the year 1000. In the sixth century the people of the island embraced Christianity under the preaching of St. Augustine, and thereafter all church services were conducted in Latin. In this way many ecclesiastical terms were introduced into the language, which were taken from that tongue. Until the Norman Conquest in 1066, it is estimated that about six hundred Latin words had found their way into the Anglo-Saxon tongue.

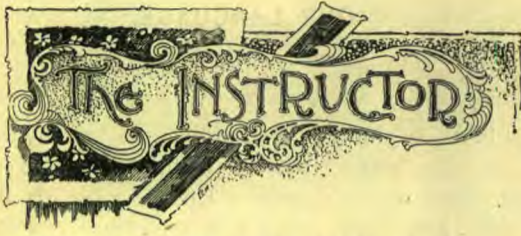
The Saxon conquerors were not left long to enjoy their ill-gotten possessions; for in the eighth century hordes of Danes, or Norsemen, subdued them, and placed Canute the Great, a Danish prince, on the English throne. As the result of this conquest, many Danish words were introduced; but it is very difficult to determine which they are, as Danish and Saxon are closely related, both being of Teutonic parentage. Geographical terms of Norse origin are preserved in words ending in "ey" (island); as *Jers-ey* (originally *czars-ey*, *Cæsar's island*), *Orkn-ey* (northern island), etc. A few Celtic words were also admitted in conversation, but were not preserved in writing; and very old manuscripts of this period are said to contain but few words belonging to that language. Dr. Nichols states that only one hundred and seventy-eight words in our language are unmistakably of Celtic origin. A few geographical names come from that source, such as *Avon* (a river), *Esk* (water), *Leven* (smooth), *Thames* (broad water), *Ben* (mount)—*Ben Lomond*, etc. Many words were introduced into the Saxon language from the Latin and Norman-French during a part of this period.

The next is the Transition period, reaching from 1100 to 1362.

The Anglo-Saxon tongue, modified by the addition of words from the different sources named, continued in general use up to the time of the Norman Conquest in 1066. In the tenth century a body of Norsemen compelled the king of France to give up a tract of country in the northern part of the kingdom, which was called Normandy. The Normans accepted the religion, and adopted the customs and language, of the French. They became a refined and literary people, amply repaying the French for the trouble caused by the first settlement.

A. R. WILCOX.

LIFE is a school, from the cradle to the grave.



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HE does well who does his best.

GOD has no use for people who simply play at religion.

EVERY man who does honest work gets double pay for it.

THE man whose head is in the cloud, will often be found standing with his feet on a brother's neck.

THERE must be liberty in life. A life that knows only to serve by the rules and methods of others, has not the vitalizing power of originality within.

HAPPY is the man who has learned to do his work conscientiously, and then, without anxious questionings or haunting fears, leaves the results wholly with God.

#### IMPROVE THE MOMENTS.

THE apostle Paul exhorts the Ephesians to redeem "the time, because the days are evil" (chapter 5: 16), and surely if ever there was need of redeeming the time, it is right now; for the world has become exceedingly evil and wicked.

But how can we best redeem the time?—By applying ourselves to that which is most conducive to our highest welfare—our temporal and spiritual well-being. Men have, for mere temporal glory or earthly gain, become prodigies of industry, and achieved wonders; how much more should we, in lieu of the eternal and incomparably higher advantages offered us through the gospel!

Let us take a few of the many well-known examples of men who were careful to utilize every moment of their precious time, to give us a new impetus in our efforts rightly to use the precious moments granted us so graciously of God.

Benjamin Franklin, by wisely improving his spare moments, and even curtailing his hours for eating and sleeping, enriched his mind with vast stores of useful and desirable knowledge. "To gratify his thirst for [useful and instructive] reading," says his biographer, "he would often sit up the greater part of the night."

H. K. White learned Greek on the way to and from his work, though of a frail constitution and in delicate health.

Hugh Miller, a stone-cutter, found in spite of his hard trade outside of his working hours sufficient time for reading and writing to become one of the most celebrated writers of all Scotland. Two years after his unhappy death (1856) the *Edinburgh Review* in a biographical article, paid him the following merited tribute:—

"Hugh Miller must undoubtedly be regarded as one of the most remarkable men whom Scotland has produced. . . . The in-

terest of his narrative, the purity of his style, his inexhaustible faculty of happy and ingenious illustration, his high imaginative power, and that light of genius which it is so difficult to define yet so impossible to mistake, all promise to secure for the author of the 'Old Red Sandstone' the lasting admiration of his countrymen."

Elihu Burritt mastered eighteen different languages by improving his spare hours snatched from his busy occupation as blacksmith.

It is said of Alexander the Great, who had conquered the world at the age of thirty-two, that he had instructed his chamberlain to shout every morning into his bed-room, "Remember that you must die!" thus to be reminded daily of the fleetingness of life and time itself. Immediately he would arise promptly every time from his bed, and hasten to complete his toilet, lest he should lose a precious moment by leaving it unimproved.

How vast and varied were the labors of the apostle Paul, of Martin Luther, John Wesley, and scores of others; but these men could not possibly have accomplished as much as they did, had they not most conscientiously and well improved every moment of their precious time.

To the believer time is doubly important, for the simple reason that all eternity depends upon what use he makes of it now; because God himself is to account him a faithful steward of the golden moments and opportunities intrusted to his care, if he is ever to enter the eternal city of God. In view of this fact, how are we spending our spare hours and costly minutes from day to day? Do we make them tell for eternity all we can? A. K.

#### THE RECENT TRANSIT OF MERCURY.

A MORE superb day than Saturday, November 10, could not have happened for the transit of Mercury. Though a slight northerly wind was blowing, it did not materially affect the observations. The air was warm and balmy, and was unusually steady for a Mount Hamilton day.

My observations of the transit were confined to the twelve-inch, with which all four contacts were observed, and fifty-three independent measures of the right ascension and declension diameters made. Forty-eight measures of the position of Mercury on the sun's disk were also obtained.

The unusually good conditions prevailing gave an opportunity to look for evidences of an atmosphere to Mercury, and for any unequal shading of his disk.

Neither at contacts nor while on the sun's disk could any luminous ring be detected. The disk was uniformly dark, round, and sharply defined during the intervals of best seeing.

The white spot reported at some previous transits as having been seen on the disk of Mercury was not visible, and has doubtless been an optical phenomenon, unless it was turned away from us at these observations.

It was noticeable that the disk of Mercury was not black—it seemed to be lighter than the sky about the sun. A micrometer wire placed over the planet was apparently more in contrast than when against the sky outside the sun's disk. The wire seemed to be about twice as black as Mercury, while on the sky there was but little contrast. This illumination of the disk could scarcely have been due to earth light, and I therefore assume that it must have been purely optical.

An attempt was made to see the planet before its entrance onto the sun, but nothing could be seen of it. Nor was that portion of it visible which was not yet on the sun, during the interval between first and second contacts.

At the first internal contact the black drop formed, but the geometrical contact could be easily decided. This black drop, which was only slight, lasted for about nine seconds after contact.

There was no black drop at the internal contact going off—definition then being excellent.

In the first half of the observations six inches aperture was used. This was reduced to five inches toward the last, as the heat became so great as to crack the sun cap.—*E. E. Barnard, in Popular Astronomy.*

#### THE ATMOSPHERE OF MARS.

SPEAKING of the atmosphere of Mars, Percival Lowell says in *Popular Astronomy*, that we have proof of its existence, and reason to believe that it is at the surface of the planet about half as thin as ours is on the summits of the Himalayas; that in constitution it is probably similar to our own, except that it is more heavily charged with water vapor; that it is nearly if not quite cloudless, and that rain or snow are almost unknown phenomena on Mars, dew or hoar frost ill supplying their place; finally, that in the day time, at least, it is almost perpetually fine weather on Mars.

"One deduction from the extreme rarity of the air," he continues, "we must, however, be careful not to make: that because it is thin, it is incapable of supporting intelligent life. That beings physically constituted like us could not exist there with any comfort to themselves, is more than likely. But lungs are not inseparably linked to logical powers, as we are sometimes shown in other ways; and there is nothing in the world or beyond it that we know of to hint that a being with gills might not be a superior person notwithstanding. Doubtless a fish who had had no experience of man would conclude life out of water to be impossible. In the same way to argue intelligent life beyond the pale of possibility because of less air to breathe than that to which we are, locally, accustomed, is, as Flammarion happily puts it, to argue not as a philosopher, but as a fish."

## SPECIAL

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