

heart. Now, after the lapse of years, Time had equalised things, and the young matron of twenty-eight and the girl of twenty-two were still devoted friends and confidants also. Nellie was regarded as an adopted sister both by her old schoolfriend and her husband, Herbert Fraser, who had been quick to recognise the sterling character of his wife's favourite.

Whenever it was possible to include Nellie in the house-party at Wrayford, she was sure to be there; but often other duties obliged her to refuse the invitations she would have been glad to accept. For once, however, she came to the Frasers' with a clear conscience as to work, and the prospect of a month's holiday. Riding was a favourite exercise with the girl, but she could seldom indulge in it. Knowing this, her host's sister, Mabel Fraser, who was going to Scotland with a shooting party, left her beautiful mare, Lucy Grey, for Nellie's special use and benefit.

It sometimes happens that the mistress of a fair country house cannot altogether please herself in the choice of guests, and it was so on this occasion. Mrs. Fraser would not willingly have included Miss Elce amongst her autumn visitors, more especially during Nellie Hope's stay. She knew that the one was proud of her position as an only daughter and heiress, exacting towards others, and inclined to look down upon sweet Nellie as an inferior, because she not only added to the

family income by the exercise of her talents, but took no trouble to hide the fact.

Had it been possible to do this, Nellie would not have dreamed of making a secret of her occupation. She was only too glad and thankful to be of use to the dear, widowed mother who, after her husband's sudden death, had found the battle of life all too hard for her. Nellie's great musical gifts were used as a means of bread-winning, and in a few years, the younger members of the family would take a share in the work. There would be less anxiety and expense and the income, too small for present needs, would suffice for comfort when school bills had no longer to be met.

It would have been difficult for Nellie Hope to understand that the mere accident of wealth could cause the girl, who possessed it without having won it, to look down upon another who, though comparatively poor, was well born, highly educated, and bore an honoured name. And surely, the possessor of a sweet, unselfish nature is happy in being unable fully to understand its opposite.

Nellie loved to give pleasure and seldom stayed to count at what cost to herself, if only someone else were the happier and gained by her loss. It must be owned, however, that she was beginning to be unpleasantly conscious of Miss Elce's selfishness with regard to Lucy Grey. The first time she rode her she had asked Nellie's permission, which had been

cheerfully given. The second, she merely said, "I see you are engaged with the little people, and I know they will not part with you, so I will ride Lucy Grey this morning and keep her exercised for you."

Nellie gave no assent, but Miss Elce took her silence to mean consent, and cantered off without giving her a second glance. Since then Miss Elce had not troubled herself to name the matter, but had quietly appropriated the pretty animal and given private orders to a groom that Lucy Grey was to be saddled for her by a certain hour, as Miss Hope would not require her again that week at any rate.

She slipped a coin, not the first of the kind, into the groom's hand. It was a gold one, and such gifts were not common from lady visitors at Wrayford. So the recipient pocketed the money, remarking to himself, "If there's a mistake about it, the other young lady has got an English tongue in her head, or she could speak to the mistress. I was told that Miss Hope was to have the riding of Miss Mabel's mare, but if she lets the other one have her and says nothing, it's none of my business."

The gold coin had magic in it, and as Tom Greig turned it over in his pocket, he was asking himself whether half the amount should be spent on a present for his sweetheart, or the whole saved for the purchase of an article for the new home which he hoped to offer her ere long.

(To be continued.)

THE MYSTIC ART OF WRITING;

OR,

THE DAWN OF LETTERS.

By EMMA BREWER.

PART I.

"Whence did the wondrous mystic art arise
Of painting speech and speaking to the eyes?
That we by tracing magic lines are taught,
How both to colour and embody thought?"



It is wonderful and almost miraculous that people in one part of the world can, by means of pen, ink, and paper, communicate their thoughts to others living thousands of miles away without speaking a word or travelling a yard away from their writing-table.

This power of writing, or speaking to the eye, has been so long practised and known that we

scarcely give a thought to its origin.

Like many other privileges we enjoy, writing has been brought to perfection by the intellectual efforts of the peoples of former ages; but with all the thought and knowledge brought to bear upon the subject, none of the great and learned of the earth have been able to speak with certainty as to the real inventors or the exact time of the invention, and not a few have supposed it to have been of Divine origin.

There was a period when there were no alphabets as we understand them, and we cannot help asking how the people of that age conveyed their thoughts one to the other, or, even now, how various tribes in the far East, who are still ignorant of the art of writing, communicate one with the other.

The answer is—by means of material objects and by pictures. For example, when Darius crossed the boundary of Scythia, the King of Scythia threatened him, not by means of a written letter, but by a symbol consisting of a mouse, a frog, a bird, an arrow, and a plough, which was sent by a special messenger. After much consultation among the clever men, the symbol was thus understood: "Unless, Persians, you can turn into birds and fly up into the sky, or become mice and burrow under the ground, or make yourselves frogs and take refuge in the fens, ye shall never escape from this land, but die pierced by our arrows."

Again, when tribes threatened rebellion, they sent a stick with notches cut by a knife, or a cord with knots, and to the stick or the cord they fastened certain symbols; for example, a feather, calcined wood, a little fish, etc. The notches indicate the number of hundreds or thousands of soldiers; the feather, that they will arrive with the swiftness of a bird; the burnt wood, that they will set fire to everything on their way; the fish, that they will throw everybody into the water.

In the age of communicating by pictures, that of a pipe represented "peace"; a vine, "friendship"; a bird with outstretched wings, "haste"; a fire, "the family circle"; ascending smoke, "fire"; a man with his two feet in the water, "a fuller"; a woman and a broom, "a wife"; a dog, "fidelity"; a lion, "courage." Of course, these crude attempts to express thoughts and record facts were bound in time to assume syllabic sounds, because, as a people grew intellectually and commercially, this method of exchanging thought was too limited in its power of expression, and too difficult and complicated for everyday use.

Unless any fresh discovery should be brought forward in these days of excavations to upset

the theory, it is generally believed that the Phœnicians invented what we call letters from Egyptian hieroglyphics or word-paintings, and that they were the first people to express sounds or words by letters.

It is interesting to notice that each letter of our alphabet retains certain characteristics of the primitive picture from which it descended. Thus "A," our first letter, signifying an ox, represents in its most ancient form the rude outlines of the head of the ox. It was originally written with the top downwards, the cross being extended through the sides to represent the ears (1) and the expanded parts above the cross the horns. "B," our second letter, signifies in all ancient languages a house. In the Ethiopic alphabet it is a tent propped up by one pole (2). In Syriac it looks like a Bedouin Arab's tent (3); and in the Samaritan it is not unlike a rude outline of a house (4). And so, if space allowed, we could go through the whole alphabet.



The work of inventing and bringing to perfection the sounds and forms of our letters was one of gigantic intellectual proportions not confined to a single people or period—which we in these days can scarcely realise. "As easy as A B C" is a proverb which would astound the ancients if they could hear it.

As to the time of the invention of writing we can only quote Sir Isaac Newton, that "letters were known some centuries before the time of Moses." Job, who lived 1520 B.C., certainly understood writing and the methods employed. He says: "Oh that my words were now written! oh that they were printed

in a book!" Again, "That they were graven with an iron pen and lead in the rock for ever!"

Moses, who lived 1450 B.C., together with the children of Israel, appear to have understood how to carry out the orders given them. To the first the direction was, "Thou shalt make a plate of pure gold, and grave upon it like the engravings of a signet, 'Holiness to the Lord.'" To the latter: "Thou shalt write them upon the posts of thine house and upon thy gates." "Set thee up great stones, and plaister them with plaister, and thou shalt write upon them all the words of this law."

Of course, it was not so easy in the early ages to write down thoughts as it is now, because, in the first place, writing was used only for great occasions, therefore the practice was too limited to allow of fluency, and, secondly, the materials on which the ancients wrote were cumbersome and difficult to prepare, while we have everything at hand in abundance and at small price. The struggle for life—that is, perfect life—is just as true in writing as in other things.

The materials on which people have written during the ages have varied considerably. For example, stone, lead, bricks, wood, metal, marble, clay, wax, leaves, bark, parchment, papyrus, skins of serpents and other creatures, the horns of reindeer and elks, shoulder-bones of mutton, and small shells have all been used by various peoples at different periods between the invention of letters and now. And to prove this, the ancient Persians wrote their records on skins; ancient Chaldeans engraved their astronomical observations on bricks; the Hebrew Scriptures were written upon goat-skin dyed red; the ancient Ionians wrote on sheep and goatskins. The skins of fish were

often employed as writing material. It is related that the *Iliad* and *Odyssey* of Homer were originally written upon the intestines of serpents in characters of gold, forming a roll of a hundred feet in length. This is said to have been burnt in the fire at Constantinople in the fifth century. Writing on lead was practised even in Job's time, and as late as 1699 a book entirely of lead was bought in Rome. It was about four inches long by three inches broad; its six leaves, covers, rings, hinges, nails, and even the stick inserted into the rings to keep it all together, were entirely of lead. It contained Egyptian figures and some unintelligible writing. There was, at the same time, in Rome a book made of marble, the leaves of which were cut to a marvellous thinness.

The Danes, like all other ancient peoples of the world, registered their more valuable translations and histories of their ancestors upon rocks, or upon parts of them hewn into various shapes and figures, while unimportant writings were engraven on beechwood, called by the Danes "bogwood." Thus they and other northern nations derived the name, "book." Many of their old calendars are written upon bones of beasts and fish. The horns of reindeer and elks were polished and shaped into books of several leaves.

The Scythians used splinters or billets of wood on which to write their thoughts.

The ancient laws of Solon,* preserved in Athens and written in verse, were cut on tablets of wood which were quadrangular, and so contrived as to turn on an axis and thus present their contents on all sides to the eyes of passers-by.

* He was one of the seven wise men of Greece; he died at the age of 80, B.C. 558.

In the Sloanian Library at Oxford there are six specimens of ancient Arabic writing on wood, about two feet in length and six inches in depth.

The Chinese in early days wrote on thin boards and upon bamboo.

It was an old Roman law that the edicts of the Senate were to be written on tablets of ivory, and for that reason were called *Libri Elephantini*.

The great library of Nineveh consisted of clay tablets. Tablets of leaves were often covered with wax or plaister and so written on.

In one of the comedies of Aristophanes a debtor tried to elude the payment of his debt by melting with a burning-glass the waxen tablet on which the transaction was recorded while the creditor was looking over the account.

In the year 485 A.D. the remains of St. Barnabas are said to have been found near Salamis with a copy of St. Matthew's Gospel in Hebrew laid upon his breast, written with his own hand upon leaves of thyme wood.

This method of writing upon leaves was a very common one among the ancients. Even now we use the word "leaves" to express parts of a book.

The Koran of Mahomet was recorded at first by his disciples on palm-leaves and on shoulder-of-mutton bones, and kept in a chest by one of his wives.

The Greek philosopher Cleanthes, being too poor to buy writing materials, wrote the lectures and discoveries of his master Zeno on small shells.

There is still a great deal of interesting matter on this subject, which we hope to give in a second article.

(To be concluded.)

OUR PUZZLE POEM REPORT: SUNDROPS.

SOLUTION.

SUNDROPS.

The sun drops in the west behind the hill,
Too soon, too soon, our vale is cast in shade,

We see no after-glow our sense to thrill—
The sun-god in his fiery cavalcade.

They on the hill see these from golden bowers;

A valley of forgotten sunsets ours.

But, sweetheart, in the darkened garden, see,
The evening primrose opes its golden bloom;

It kills like magic the obscurity,
And chases from the mind all trace of gloom.

Then let us twain be like the sundrops bright,

And yield to darkened lives some tender light.

PRIZE WINNERS.

Eight Shillings Each.

H. Alexander, 35, Bidston Road, Birkenhead.
Amy Briand, 47, Hanley Road, Finsbury Park, N.

Emily Cranwill, 113, Lower Seedley Road, Pendleton.

L. Duncan, Bromborough, Birkenhead.
Edith E. Grundy, 105, London Road, Leicester.

Ellie Hanlon, 1, Otranto Place, Sandycove, Co. Dublin.

E. St. G. Hodson, Twyford, Athlone.
Annie M. Hutchens, 60, Merton Road, Wandsworth, S.W.

A. C. Sharp, Lymington, Hampshire.
Ellen R. Smith, 11a, Union Court, Old Broad Street, E.C.

C. E. Thurgar, 7, Essex Street, Unthinks Road, Norwich.

Ellen Kureel, 66, Unthinks Road, Norwich.
G. S. Wilkins, Westcroft, Trowbridge.

Very Highly Commended.

Annie A. Arnott, Edith Ashworth, Leila M. Bowen, Renée Button, M. S. Bourne, Rev. J. Chambers, F. Chute, M. A. C. Crabb, Mrs. G. H. B. Cumming, Marjorie Davies, Emma Holgate, M. A. Lowe, Ethel C. MacMaster, Nellie Meikle, Annie B. Ormond, Mrs. Prestige, J. M. Pugh, H. F. Richards, Gertrude Saffery, Isabel Snell, Fred. W. Southey, Sadie Stelfox, Norah M. Sullivan, Ellen C. Tarrant, C. F. Walker, Emily C. Woodward, Elizabeth Yarwood, Helen B. Younger.

Highly Commended.

Eliza Acworth, Annie J. Cather, M. J. Champneys, Elizabeth A. Collins, Mrs. Crossman, E. G. Crossman, Ethel M. A. Darbyshire, Marie C. Deane, Mrs. F. Farrar, Martha A. Fitzwilliam, Mrs. Garforth, Mrs. W. H. Gotch, Percy H. Home, E. Lord, Annie B. Ormond, Hannah E. Powell, Nina E. Purvey, Edward Rogulski, S. Southall, Minnie Wilkins.

Honourable Mention.

M. S. Arnold, E. F. Baumgartner, E. Bagles, A. Bellhouse, Lily Belling, Eva Muriel Bensin, Elizabeth M. Caple, Leila Claxton, L. Clews, Helen M. Coulthard, Elsie O. Cudlipp, Constance Daphne, Lilian M.

Dean, Mrs. Frank Dickson, Marie E. Hancock, Arthur W. Howse, Meta Kelway, A. Kilburn, W. C. Lee, W. Shaw Leest, Carlina V. M. Leggett, Janet Leslie, John Marshall, S. Mason, E. Mastin, St. Clair C. Poole, May Merrall, Edith V. Olver, Charles Parr, Ada Richards, F. Schlesinger, Janet Scott, Marriott Smiley, Gertrude Smith, Constance Taylor, Queenie Tyssen, W. Fitzjames White, D. C. Wilson-Ewer, Emily M. P. Wood, Edith M. Younge.

EXAMINERS' REPORT.

This was generally voted to be a difficult puzzle, but there were a few perfect solutions all the same.

One of the blemishes which were useful to us in our efforts to distinguish between the good and the best was the substitution of "sweet earth" for *sweetheart*, an equally good interpretation of the puzzle, but very doubtful sense.

As to the punctuation, a dash was necessary after "thrill," unless the fourth line be enclosed in brackets. This was generally inserted, but we were shocked to notice the frequent absence of a comma after "But" in line 7. We also came across many very unnecessary mistakes, as, for instance, "in" for *from* (line 5); "sundrops" for *sunsets* (line 6); "needy" for *darkened* (line 12), and so on. Possibly they were all "slips of the pen," but ruthless examiners can take no notice of such mysteries.

We have several letters (mostly abusive) before us to which we should like to reply, but time and space are limited this month, and they must wait.

my husband is one of those rare men with whom a first love becomes enshrined. Not the girl herself, but the ideal self as he first thought of her and loved her, had never been dethroned, and I am glad, not sorry: to have the affection bestowed upon me would have seemed to have been unfaithful. His care for me was all tenderness and thought, but she—she, as he knew her first, had something which I lacked."

The sick woman spoke in low soft tones; the words fell as a muffled peal of bells upon Hannah's heart: all unconsciously she wept.

"How I pity that poor girl," at length she said. "Perhaps she, too, could tell her tale of disappointed trust, of love waiting to be claimed; but we have talked enough. Sleep, dearest lady, to be your best when he returns, and spare me now, that I may creep away, for I am weary."

"Not until you sing me the hymn I so well love."

And Hannah cleared her tear-filled throat and sang—

"They have reached the sunny shore
Over there.
All their pain and grief are o'er,
They will never sorrow more,
Over there.
They need no lamp by night
Over there.
Their Saviour is their Light,
And they walk with Him in white
Over there.
Oh! we'll join that happy band
Over there.
But we wait our Lord's command,
Till we see His beckoning Hand,
Over there."

Hannah had not heard a footfall, nor had the sick woman raised her eyes to the door so softly opened and as gently closed.

There was silence when the hymn finished; then Hannah rose from her knees and said, speaking slowly in her ear in a voice a little raised—

"Farewell, best and kindest friend. It is midnight, and 'he' will be here directly. You do well to value your noble, priceless husband. . . . God spare you to him for many a long year."

She stooped down and kissed the hectic-tinted cheek, then added—

"Remember it was you who came to me as God's messenger of mercy; but for your teaching I might to-day be one to sit in darkness and in the shadow of death. I thank you with joyful thanks."

The Squire, standing within the closed door, had taken a step forward, thrilled by the voice. Nothing could disguise that. In singing it was full and round and tender; in speech it was melodious, with the tones of a rich contralto.

As Mrs. Lawrence rose from her knees and turned towards the door, Wilson Curzon, with a look of indescribable surprise upon his handsome face, put out his hand and said, in a voice deep with impassioned feeling—
"Hannah!"

And the little schoolmistress, completely startled and thrown off her guard, said simply—
"Wilson!"

And thus they met after long, long years of separation. No words were spoken, no explanations offered on either side. At the very moment when they looked each other in the face the doctor and the night nurse arrived, ushered in by Mrs. Morris, the housekeeper.

The Squire moved to the invalid's side, and "Mrs. Lawrence" escaped before there was time to miss her.

* * *

Hannah, sleeping late the following morning, after a restless night, was aroused by the tolling of the bell. Distinctly came the double beat, proclaiming the dead to be a woman; then the strokes for years, which numbered ten beyond the Squire's.

A little note came later from the Squire.

"My beloved wife passed away at dawn. She was conscious to the last; but the doctor gave me no hope from the first moment of my arrival. She spoke much of you and desired her 'dearest love.'"

"I intend to go abroad, so soon as I have laid my faithful wife to rest. I would crave a brief interview with you at the rectory before the sea again divides us.

"Meanwhile, believe me to be

"Yours sincerely,

"WILSON CURZON."

The asked-for interview, although promised, did not take place. Hannah was ill. She had fallen a victim to a prevalent epidemic which, at that time, closed the school for some four months.

It was not until the following autumn that she saw the Squire (upon his return from his travels), and then it was to say with her lips what had been already briefly written a few weeks previously, that by-and-by she would give up teaching, and, as Wilson Curzon's wife, take up her residence at the Hall.

In an earlier letter Hannah Lawrence Brown had confessed she had no claim to call herself "Mrs. Lawrence," giving a brief outline of her life since her father's death; and Wilson Curzon, reading between the lines, was fully prepared to hear, when opportunity came, that "the past," with its supposed deception, was a myth. They were both still in life's prime, and Hannah will never regret the months spent in that pretty Berkshire country as the village schoolmistress.



THE MYSTIC ART OF WRITING;

OR,

THE DAWN OF LETTERS.

By EMMA BREWER.

PART II.

"No single achievement of man is more important than the art of writing."

PREVIOUS to the discovery of the art of alphabetic writing, the means of noting events, exchanging thoughts and keeping accounts were so curious and complicated that they needed special teachers and education to be able to make use of them.

Put yourselves in the place of the ancients, and think how difficult it would be to convey your inmost thoughts to friends at a distance in a series of crude pictures on a brick or stone or tablet of baked clay. Or think of receiving a love-letter in such a fashion. Yet had you lived in the ages before writing was known, it is more than likely you would have received your sweetheart's letters and offer of marriage in this same unwieldy manner. Indeed the oldest love-letter in the world of which we

have any knowledge is one containing an offer of marriage to an Egyptian Princess, written 3,500 years ago. It is in the form of an inscribed brick, and is therefore not only a very old love-letter but a most substantial one; a contrast indeed to the poet's,

"Writ in honey dew upon a lily leaf
With quill of nightingale."

Neither one nor other would be appreciated in these days, I fancy.

As to keeping accounts, it is difficult for some of us even now when everything is made comparatively easy, but what we should have done in the old days, I do not know. Imagine keeping the accounts of a large business firm by means of knotted cords, or the statistics of the population by coloured string, or estimating a man's possessions by the knots, loops, and colours on certain cords. Yet had we lived in the ages of long ago, we must have used these complicated methods, for they were the only

sure and accurate ones available; but then I suppose they would have formed part of our education, just as arithmetic does now.

Legend places the tying of knots in strings for noting events and keeping accounts at about 2,800 years B.C., and is of opinion that in very ancient times knotted cords served the Chinese for the administration of affairs. I wonder if our tying a knot in our pocket-handkerchief when we want to remember something is a survival of this custom?

In a certain island not so very long ago a rope 400 fathoms long (800 yards) was used as a Revenue book. It was divided into several portions, corresponding to the various districts of the island, and the strands were of coloured threads, each having its own signification. The tax-gatherers, by means of this cord, kept an accurate account of the hogs, pigs, and pieces of sandalwood at which each person was taxed.

Even as late as 1872, an Indian judge says,

"I well remember while trying my first case, between a grasping Mahajun and a Southal, how astonished I was when I ordered them to produce their accounts. The Southal took from his back hair a dirty piece of knotted grass-string and threw it on the table, requesting the Court to count that as it had got too long for him. Each knot represented a rupee, a longer space between two knots represented a year."

The ancient Egyptians were evidently familiar with the methods of tying knots in cords, for the purpose of calling to mind certain matters of information, for one of the Egyptian hieroglyphics is a knotted and looped cord.

We are overwhelmed when we think of the difficulties with which the ancients had to contend in their correspondence and in the keeping of their accounts; and we look about us to see how it is that we are so much better off in that direction than they.

First and foremost we owe our greater facilities to the discovery of alphabetic writing by the Phœnicians—a discovery which is regarded as the oldest existing monument of civilisation. It was a form of writing so perfectly simple that it came within the understanding of all, and when at length it was accepted by the two great peoples of antiquity—the Greeks and the Romans—it was only a matter of time before it passed to the nations of Northern Europe, and became the system of almost the whole civilised world.

This discovery of alphabetic writing made it possible to record events, transmit thoughts and pass on to future generations the history, literature and science of a country, but not with the ease and facility we at the present time enjoy.

Of course the heavy cumbersome character of the materials used in the early times must have prevented the rapid and ready expression of thought by writing, even when the Phœnician system became known. It is therefore quite natural to suppose that when the ancients longed to set down their ideas they would look about them for suitable materials on which to write them, and these would depend greatly upon their surroundings. For example, those who lived in tents would be likely to use the skins of the buffalo, the antelope, or other creatures, while those who lived on the borders of forests would utilise the large leaves and inner bark of some of the trees.

It is interesting to note that the Hindoos continued the use of leaves of trees for writing material until within the last century, and that even now books of leaves are not uncommon in the South of India and in Ceylon. If we may judge from the name of leaf being still supplied to paper books, it may have been that leaves were formerly the principal material used.

The interior bark of trees is of very ancient use, and its Latin name, *liber*, seems to intimate that its use among the Romans was as ancient as the art of writing itself. In one respect the bark was superior to the leaf, for it could be rolled into a volume* while the leaf would crack if subjected to the same process.

Birch-bark records are still kept by some Indian tribes, and in Cashmere. The largest specimens are made by securing together a large number of pieces of bark. On these the people record songs, histories and love-letters, most graphically and skilfully.

Parchment and papyrus occupy very important positions in the history and development of alphabetic writing, and to these we are greatly indebted for the facilities we now enjoy.

The invention of parchment for writing

material has been generally attributed to Eumenes, King of Pergamos (third century B.C.), though some attribute it to a much earlier date.

He was the founder of an extensive library in which the new manufacture was largely introduced.

Josephus states that the copy of the Law presented by the seventy elders to Ptolemy Philadelphus near 300 B.C. was written upon parchment or vellum, and excited the astonishment of the king by its extraordinary fineness as well as by the cunning manner in which the different skins were sewn together and the exquisite writing in letters of gold.

The use of parchment and papyrus paper, which came from Egypt about the same period, and was as much in use as the former, did much to diffuse literature.

This paper was scarcely what we understand by the term; it was a mass of torn fragments of vegetable matter evenly spread out and joined together by their own adhesiveness, being full of saccharine matter.

It was first made in Memphis, and at a very early date it formed an important branch of commerce, and its manufacture was carried on by the Egyptians in Alexandria during a long period, but its supply was always less than the demand.

The material which the ancient Egyptians themselves used to write upon was a delicate membrane obtained by unrolling the fibrous stem of the papyrus, an aquatic plant once very common on the Nile, but now almost extinct. The material thus made was apparently very delicate and fragile, but in reality was most enduring, as may be seen by the many specimens still extant.

It has been suggested that in Egypt linen was used as a writing material long before papyrus, but it was never common, although a good deal of hieroglyphic writing has been discovered on linen mummy cloths.

Before the invention of paper, the Chinese used silk and cotton cloths as writing materials, then they made paper of the inner rind of the bark of a tree called chu-ku, which is something like our mulberry tree, although its fruit more resembles the fig.

Paper made of rags was probably invented by them and introduced into Europe by the Arabs about 50 years B.C.

Paper, as we understand it, in the course of time superseded papyrus; it was made wholly of cotton and was called *Charta Bombycina*. It is supposed to have been introduced about the end of the ninth century, and not a year too soon, for owing to the scarcity of writing materials and the high price demanded for them, the Greeks pursued the almost sacrilegious practice of erasing the valuable writings of ancient authors written on parchment in order to get space for their own.

The abundance, therefore, of cotton paper happily put a stop to this barbarism. Although used extensively for all books and writings, it was not deemed sufficiently durable for important documents, for which purpose parchment was still employed, and subsequently it was discovered that linen rags made better paper than cotton rags.

This introduction of a cheap and abundant material for writing was another step towards the facilities we now enjoy.

Naturally each change or advance in writing materials necessitated a change of implements, those in former use being too rough and sharp for writing on parchment and paper. A manuscript is influenced by the fact of the material being costly or abundant; even the implements used give certain characteristics to it, and it is not difficult to distinguish the chisel, the brush, the reed, the stylus or the quill when glancing at it. A manuscript is in fact like the speech of which it is the

vehicle, viz., the expression of human character, and therefore typewriting can never take the place of handwriting.

The implement answering to our pen was the reed, a sort of bulrush which grew in many parts of the East; such reeds cut in the manner of a quill are still used by those nations that write the Arabic characters.

The quill or *penna* did not come into use until about the year 600 A.D.

As to inks, the first used was probably composed of soot or lampblack mixed with some sort of size or gum water. The value of this ink appears in the many papyrus manuscripts discovered at Herculaneum, which, although burned and buried for nearly eighteen centuries, are still legible, the ink remaining, as it were, embossed on the surface and appearing blacker than the burned paper.

A sort of ink is mentioned even in the time of Moses (Num. v. 23), and in Ezekiel ix. 2, 3, the ink-horn is mentioned, and Jer. xxxvi. 18, "I wrote them with ink in a book."

It is still the custom in the East to carry the ink-horn stuck in the girdle, not only by the scribes, but by ministers of state who wear it in the same manner as a symbol of office.

Chaucer in his "Somper's Tale" has these lines:—

"His fellow had a staffe tipped with horne,
A paire of tables all of iverie;
And a pointed polished fetouslie,
And wrote alwaie the names, as he stood,
Of all folke that gave him any good."

The ink of the ancients differed very little from that which the Orientals employ at the present time, which is better adapted than ours to the formation of their written characters, and this is true of the Hebrew also, the letters of which are more easily and properly formed with this ink than our own, and with reeds rather than with quill pens.

Had the Ancients studied the wasp they might have had the use of paper for writing long before.

The substance of which the walls and cells of a vespiary—a nest or colony of wasps—are constructed, has been ascertained to be nothing more nor less than paper formed of wood raspings mixed with a sort of size worked to a paste and subsequently spread into sheets by the wasp fabricator.

If you live in the country, you may frequently see a wasp busily working with its jaws upon an old paling or window frame; it seems a small matter, but it was by noticing this circumstance that Réaumur discovered the wasp to be a paper-maker, and was enabled to trace the subsequent processes of her manufacture.

It seems that after rasping the tree or old palings the wasp takes her burden of wood-fibre and enters a hole in the bank or elsewhere and proceeds to knead it into a paste, and supposing that her nest is already in course of construction, she will spread a covering of this substance on the roof of the chamber, strengthening it with repeated layers. This being done to her satisfaction, she proceeds to make a hanging floor or terrace of the same substance she used for the roof, making it secure by rods of the same paper, only somewhat stronger.

This floor or terrace is circular, and composed of an immense number of cells made of the paper already described, each cell being a perfect hexagon.

These are not used as honey-pots as in the case of bees, because wasps do not make honey, but are simply appropriated to the rearing of the young; each cell is really a paper cradle. The bee-hive has been called a waxen palace, and the wasp's nest a paper cottage.

* Volume is derived from the word *volumen*, a name given to papyrus rolls.