

refined and studious-looking; he—shrewd, practical, and commonplace. Could there be any common ground of feeling between these two?

No such doubt troubled him, apparently; he spoke to her freely and familiarly, and joined her in her walk round the lawn.

"I am come to say good-bye to you," he said. "I may not see you again before you leave. When do you go?"

"The day after to-morrow, if I can get everything settled," Mary answered. "I believe I am going to let the house furnished for a year, so I need be bothered with no sale just now."

"What do you mean to do for the year, then?" Jack enquired, a trifle anxiously.

"I have no plans," Mary said simply. "You know I am going to the Daveys, at Norwood, for a visit, but what will happen after that I have not the least idea. My guardians are so considerate as to wish me to choose for myself; and I shall not hurry myself to make a choice. I've all the world before me where to choose, so I must take time about it."

"You're a lucky girl, Mary," he said briefly, and added, "and I am an unlucky man. It's rather long odds—a man against the world."

"No more than many men have to battle with," Mary said, not choosing to enquire into the meaning of this enigmatical sentence at the risk of appearing unsympathetic.

Jack looked at her askance for a little light whereby to frame his next speech; but not finding any, he proceeded cautiously, "Do you think a man would have any chance in such a case, Mary?"

"It would depend on himself a good deal," said Mary, with mischief rising in her face, "and a good deal on circumstances, doubtless. But men who are persevering and determined generally carry the day, don't they?"

"I wish they did," said Jack fervently. "Mary, you know what I am talking about. You must have known that I could not let you go off to London without asking you if you could ever return my love—if you could ever think of me as a husband. I daresay I seem more like a brother to you than anything else, as I have known you so long; but I have loved you all the time, Mary, and sometimes I hoped that you loved me. I had been wanting to say this for a long time before your father died; but then he got ill before I had an opportunity, and afterwards I did not like to bother you about it. And now you are free to make a choice, as you say, and—Mary, can you give me a little hope?" he said, pleading with his voice and eyes; "just a little, and I am sure I will win you in spite of everything." No answer; so he went on, still more urgently, "You will see a lot of fellows

a great deal cleverer and handsomer and all that, than I am, I've no doubt; but I'm quite sure nobody can love you half as well as I do, Mary. All these years I've loved you, and every year I loved you better; and I'm sure I could make you love me."

"Oh, Jack, I'm so sorry," Mary said at last in real grief; "I don't love you like that, though I have always liked you immensely. But I've no love for you, Jack; I'm afraid it's quite out of the question, though it seems horribly cruel to say so."

Jack's hopes immediately rose. Mary said it so gently and sorrowfully, that he felt confident of persuading her that she would soon love him—liking was such a little way from loving in his estimation.

Accordingly, he used every art of persuasion at his command to bring her over to his way of thinking—and failed. She was more gentle than he, but with a persistence equal to his, maintained that she never could love him, however much she liked and respected him.

Jack Adams's ideas of human nature were somewhat limited, and he couldn't for the life of him understand why a girl's liking shouldn't turn into love; the process seemed to him as easy and natural a growth as that of a turnipseed into a turnip—given a good soil, sun, and moisture, one couldn't fail to grow a respectable turnip. He felt confident he could prove himself to be a generous and devoted lover—and what more could a girl want? But the only concession he could get out of Mary was, that he might write to her now and then, and that she would tell him when she engaged herself to another man. With that he was obliged to be content.

He would have gone away quite confident if he had known what a struggle Mary's victory had cost her. It is not in the nature of a girl to listen to a tale of love without a stirring of the heart-strings, especially if the man is in deadly earnest, and an old friend into the bargain. Two instincts were warring in Mary's bosom as she listened to Jack; one loudly calling for recognition, the other keeping up a persistent monotone, which finally triumphed. One made her long to take this love to her heart, to satisfy its vague aspirations towards a fuller life, to dispel the sense of void and isolation which oppressed it; the other sternly told her that she would find no rest here, no content, no sympathy for the higher part of her nature, which would henceforth have to walk alone amid peril and uncertainty, or probably be crushed and annihilated by superior opposing forces.

The latter triumphed, but Mary felt no sense of triumph as Jack Adams walked out of the gate and out of sight. A feeling of

utter loneliness and isolation overpowered her, and she upbraided herself bitterly for estranging, perhaps, the only heart that had any affection for her. She had had so little affection hitherto in her young life, that the slightest token of it touched her deeply. Her childhood had been strangely solitary; it had never known a mother's love, never had brother or sister playmates—only a father, who had loved her very well in his way, a way which left her to herself and the housekeeper before she went to school, and, since school was over, to herself, and her books, and music.

To these she turned for consolation and employment in the absence of all human interest, and they opened up to her eager aspiring nature such a boundless vista of interest and activity, that she toiled at them patiently and unweariedly for nearly two years, and bid to become an unhealthy recluse and bookworm, when she was suddenly interrupted by her father's illness and death.

Though there had been no close bond between them, it was the only human tie she had ever had, and the severing of it could not but shake her nature from its foundations. She felt absolutely alone in the world. Her only relative was a brother of her father's, who had lately settled in a small village on the north coast of Devon as rector thereof, and who seemed to her an utter stranger. Jack Adams she had known from her childhood; but now she had estranged him too, for no reason whatever, she told herself bitterly, as she still paced up and down the lawn. In fact, she could give no reason for what she had done. It was the first time the problem of life, shared with another, had been presented to her in an actual form, and, as usual, she had no solution ready worked. But instincts are a safe guide, if one has learnt to distinguish between the baser and the nobler; and after some thought Mary quite absolved her conduct to Jack that evening.

"It is no use," she said at last. "I should have been unhappy for life for the sake of a temporary happiness. He could never have satisfied me. He merely wants a goods-and-chattels wife, a sort of household fixture, both useful and necessary; a part of his property like his horses and dogs, all ministering to and depending on him, radiating round him, the centre and head. It never seems to occur to him that there is another existence beyond all this—a world of thought and feeling which we should be able to share together." Then her thoughts turned to the friends she was going to visit at Norwood the next day; but we will just see for ourselves what they are like.

(To be continued.)

## SUN-DIALS.

By S. F. A. CAULFEILD.

### PART I.



SUN-DIALS are associated in my mind with the sunny old terraced gardens of some ancient manor-house, gorgeous with flowers, which blossomed in wild profusion in the quaintly-formed plots enclosed in box

borderings, and peeped through the successive balustrades, draped here and there with ivy, and beautified with gold, red, and silver-hued

lichens. I think I can see the lizards peering out of the crevices and amongst the tufts of hart's-tongue fern, or darting along the top and down the central steps—for sport, and not for fear; for the quiet step of its fellow occupant of those sunny terraces would not alarm it; and it would stop on its happy way to listen if attracted by the gentle whistling of a tune. On one of these same terraces stood the old sombre-looking dial. How wondrously hot the grey pillar felt, baking under the cloudless sunshine of those genial old-time days, when I laid my ungloved hand upon it!

I certainly had to shade my eyes to inspect its upturned face. We rarely see such summers nowadays. Afflicted with some kind of plague-spot, our cool and clouded suns smile on us in a dubious, fitful way, sad as the smiles of age, long dimmed with the glazing films of many years.

Not far from the mossy walls of the ancient manor garden stood the massive and venerable village church, a raised footway to which ran past the carriage gateway, and was paved with flat, irregular stones. I entered the old lichgate, and there, in the midst of the moun-  
dly

churchyard, a sister dial, sunk in the long rank grass and hemlocks, met my eye. It was a standard, like its fellow—useless now, tilted on one side in the changing level of that silent city. High on the square church tower a trustier monitor still cast its solemn shadow with a grim persistency upon its cold stern face. How many, young and old, looked up to note the hour, whose very names have been worn away on the recording stones below! As the glowing colours, bright on shrub and tree, that gladden awhile the dying year, so the lichens, red or golden, touched up, as by an artist's hand, these sad memorials of the dead and gone.

The use of clocks and watches has long superseded that of these old dials; but amongst the latter we sometimes find those that still have a lesson to teach and a tale to tell, although not of the nature for which they were primarily designed. I refer to the quaint and pious mottoes inscribed upon them, in the religious faith of which they resemble those which belong, with appropriate charges, to our ancient family escutcheons. What remarkable lessons of Christian faith and of moral obligations they often read to the sceptical and degenerate successors of these noble and chivalrous knights of the olden times!

"He being dead, yet speaketh." It were well that, in the never-ending making of "many books" and writing of articles, this statement of the inspired writer of so many centuries ago were laid more deeply to heart. How much less that is frivolous, misleading, and profane would be left as a testimony against them!

On the subject in question it is more than probable that those of "our girls" know quite as much as I propose to tell them. Of course if they wish for an exhaustive treatise, they could procure certain works devoted to the subject; but the majority of those who read this magazine have neither money to purchase nor leisure to read them; and some of them, likewise, are written in French. Thus, for the sake of these latter amongst our readers, I have gathered together some historical notes, so as to give a sketch, as condensed as might be, of a subject hitherto quite new in these pages.

The science of dialing was undoubtedly known at a very remote period, and was, furthermore, handed down from the East. It is otherwise designated that of gnomonics; and the first of all astronomical instruments was a gnomon, or vertical pillar. The earliest example of which we have any historical mention is that of Ahaz, about B.C. 742 (2 Chron. xxii.), which is likewise named by the prince-martyr Isaiah in his prophecies. According to Homer, there was a sun-dial in the island of Syra on which the annual course of that luminary was indicated. Those of my readers who are acquainted with the *Odyssey* may remember the allusion; and Homer is believed to have been a contemporary of Hezekiah (see 2 Kings xx. and Isaiah xxxviii.) I will not interrupt the course of my history of this ancient appliance in reference to a mysterious event which has presented a great difficulty to many minds, but I shall add a note on the question of the phenomenon (recorded in reference to the shadow on the sun-dial of Ahaz) at the end of my second, and concluding, part of this article.

It seems probable that, although our first record of such dials was that concerning the Hebrew king, he derived the knowledge of them from the Chaldeans or Babylonians, as they appear to have been the first who had any scientific system for the computation of time. Of the use of dials we next read historical records at a period of some 200 years after the Biblical reference before-named. The earliest produced was due to their astronomer Berosus, about the year 540 B.C.

It was a very simple one, though huge in size, consisting of a concave hemicycle (or hemisphere), and it was placed on the top of an observatory (for the Chaldeans were great star-gazers, and had early ascertained the principal circles of the sphere, the position of the poles, etc.); and from this observatory the hemicycle cast great shadows on the wall beneath it.

Doubtless the early Egyptians, with all their wonderful learning, discovered astronomical methods for recording the division of time; but no representation of a dial has been shown on their sculptures, so far as hitherto examined. At the same time it is reasonably supposed that the many obelisks erected in that country were employed for that purpose, and may be regarded as gnomons.

Of course if these pillars and obelisks served, in any measure, as dials for the correct measurement of time, it could only have been in a very limited degree—marking the time of sunrise and sunset only. At the present time the natives of Upper Egypt who do not possess watches have some knowledge of the principle of the dial, for, planting a palm-rod in an open space—a circle of stones being placed round it—the shadow of the palm falling on these stones successively notifies to these little-tutored peasants the several hours or divisions of the day.

I said that the very early Egyptians, dating back, according to Professors Rawlinson and Dawson, to no less than 2760 years B.C. (that is, about 700 years and upwards before Abraham migrated from Mesopotamia to Canaan), the Egyptians left no representations of such instruments for the measurement of time. But at a later period, Ptolemy, in his *Sintaxis*, discusses their manufacture by means of his "analemma," an instrument by which they were enabled to solve problems in astronomy.

It seems that the form of dial originated by Berosus was that of a semicircular excavation made in a square flat stone, the inclination given to which, when completed as a dial, was such as to suit the climate and situation in which it was employed. Such as these are the great examples to be seen in India, which were constructed after the Chaldean design.

Those amongst my readers who, from time to time, enjoy an enchanting hunting-ground in the British Museum, may remember to have seen the Græco-Egyptian dial which Mr. Scott Tucker discovered in Alexandria at the foot of Cleopatra's Needle in 1852. If not, I direct their attention to it; while, for those who are unable to pay a visit there, I will describe it. The form is that of a square stone, with a half-circle scooped out of it. It would seem as if the sculptor had commenced to hollow out a circular bowl, but left one half untouched, the solid stone making a straight division across the circle, cutting it sharply across, just as the bow-string cuts across the half-circle formed by the bow when it is fully drawn. This dial represents the form of that introduced into Greece by the above-named Chaldean astronomer Berosus.

I believe that Hindoo astronomy claims to have made observations at a far more remote period than any of the other nations of antiquity, dating, as it is said, to some 3000 years B.C. But whether any mementos still exist of appliances for the measurement of time I have not so far made investigations.

Herodotus declared that the Greeks derived the use of the pole and gnomon from the Babylonians, who date back to a period of 2300 years B.C., and the division of the day into twelve parts, and the pole showing the hour. Being acquainted with the science of geometry, they understood the construction of sun-dials.

But others say that it was Berosus, who went to Athens in the time of Alexander the Great, who instructed the Greeks in the science of gnomonics. The question of what kind of dials of an inferior kind they possessed prior to the visit of the great Chaldean astronomer is one of minor importance.

In the Tower of the Winds at Athens there are eight vertical declining dials, and the tower itself is one of the most interesting of all the monuments existing as representing ancient gnomonics. The structure is octagonal; on the several sides the principal winds are respectively represented, and are surmounted by as many dials, turned severally to the four quarters (north, south, east, and west), and the remaining sides of the octagon to the intermediate quarters. Although said to have been erected by Cyresthes (Andronicus), it is believed that they were of subsequent construction; possibly later than the time of Vitruvius, by whom it was described; perhaps of Pericles, or Hipparchus. Judging from the advance in scientific knowledge, so obviously demonstrated in their construction (so affirm the learned in these matters), even a still later period may be assigned to them. I cannot speak from personal knowledge, but I understand that these show much the same idea of the ancient gnomonics as that derived from the dial found at Delos, and described by Delambre. Four more dials are still extant at Athens, *i.e.*, those of Phœdras, one of very unusual shape and characteristics, the date of which is not known. It was discovered at Portici in 1755, and bears the form of a ham of bacon.

And now the allusion to Portici reminds me that I must lead you further west, and take a view of some of the ancient dials in Italy. Probably a greater number of the travelled amongst my readers are better acquainted with the antiquities of this historic land than of Greece; nevertheless, its ancient dials may not have been presented to their special notice. The most interesting shall be enumerated according to their several dates, which are as follow:—One found at Tivoli A.D. 1746, is believed to be that of Cicero, as he refers to a dial which he sent to his own house near Tusculum, and of which relic a memoir was published at Venice by P. Zuzzeri, a Jesuit. Two dials were discovered in 1751 at Castel-Nuovo, Naples, and Rignano; at Pompeii another was found in 1862. Of the whole number, the last named is believed to be the most ancient by G. H. Martine, the author of a dissertation on the dials of the ancients. He says, that it was originally constructed for the latitude of Memphis, and thus may possibly be Egyptian, and very likely have been manufactured in the school at Alexandria. Another, and which was the first erected in Rome, was imported by Papius Cursor, who had taken it from the Samnites and set it up on the Temple of Quirinus, when time was divided into hours. In the year 261 B.C. another was introduced, and placed on a pillar in the Forum by Valerius Messala, having been taken by him from Catania, Sicily. The first of Roman origin was constructed by order of Marcius Philippus, A.D. 164; but this after all appears to have been of foreign workmanship, and due to a stranger rather than to a native Roman artist.

If you read any history of horology you will find that the first apparatus invented for the marking and due measurement of time, after that of the sun-dial, was that of the clepsydra, which measured the hours by the pouring of water from a graduated vessel. This water-clock was devised by Scipio Nunsica, and introduced into Rome in the year B.C. 158, or thereabouts. The apparatus underwent much improvement by the addition of an index and a wheel with teeth; and after this, a descending weight enabled the inventors to dispense

with the use of water to turn the wheel, and to this weight a regulator had to be added. But as I propose to speak of clocks and watches in a second part of my history of the primitive indicators of time, I must say no more at present of the devices of subsequent invention.

Men must have suffered extreme inconvenience in the Western world before dials were introduced from the East, and it is only wonderful that some satisfactory methods for marking the days and hours, and so being able to arrange for combined business transactions and social meetings and engagements, were not devised at a far earlier date. At Rome, the citizens were reduced to the poor expedient of noting the shining of the sun upon a duly selected spot—before the advent of sundials—and causing the event of its reaching the meridian to be notified by a watchman appointed for that purpose, who cried aloud for the benefit of all within hearing. But as there are dark and rainy days in Rome, as elsewhere, he must not unfrequently have had to make a rough guess to make up for the lack of the appointed indication. But even on sunny days allowance had to be made for the natural changes of aspect from one season to another.

Those persons who travelled in Holland and in Switzerland, some twenty or thirty years ago, may remember how a watchman used to go his nightly rounds with lantern and heavy staff, with which he pounded on the hard ground at every step. He seemed thus to beat time, in a rough sort of way, to his cry of the hours, as they successively passed, reported on the state of the weather, and chanted an old time-honoured ditty of a pious character, combining precept and prayer. I used to delight in hearing him stumping along the silent, quaint old streets, and rejoiced that he was keeping a watch against fire in the village of Hospenthal.

But Switzerland has her ancient dials, though not wherever needed; and, in any case, at night they could have served no purpose in the absence of clocks or criers.

From a work edited by Edmund Fillingham King (*Ten Thousand Wonderful Things*), I quote an example of the old watchmen's ditties. In lieu of a striking clock in the church tower or some public building, and perhaps as often to supplement one, they called the hours during the night. The one I quote was employed at Hernhuth, Germany.

"Past eight o'clock! O, Hernhuth, do thou ponder;  
Eight souls in Noah's Ark were living yonder.

'Tis nine o'clock! Ye brethren, hear it striking;  
Keep hearts and houses clean, to our Saviour's liking.

Now, brethren, hear! The clock is ten, and passing;  
None rest but such as wait for Christ's embracing.

Eleven is past! Still, at this hour, eleven,  
The Lord is calling us from earth to heaven.

Ye brethren, hear! The midnight clock is humming;  
At midnight our great Bridegroom will be coming.

Past one o'clock! The day breaks out of darkness;  
Great Morning Star, appear! and break our hardness.

'Tis two! On Jesus wait, this silent season,  
Ye two, so near related—Will and Reason.

The clock is three! The Blessed Three doth merit

The best of praise from body, soul, and spirit.

'Tis four o'clock! When three make supplication,  
The Lord will be the fourth on that occasion.

Five is the clock! Five virgins were discarded,  
When five with wedding garments were rewarded.

The clock is six! and I go off my station;  
Now, brethren, watch yourselves, for your salvation!"

Two lines only were sung out at each hour in every street, seven o'clock being, strangely enough, omitted; for in winter the darkness of night has closed in all over Germany, as in most parts of Europe, before that hour.

And now, before finding our way homewards, we must retrace our steps a little to Arabia, and then take ship to the far East—to China and Japan. Had I been able to give any information coming down to us from very remote times, I should have placed these countries in a more prominent position in reference to the subject of this interesting research. But such information as I can give is all summed up as follows.

What knowledge was possessed by the Arabians of either astronomy or gnomonics they appear to have derived from the Greeks, and they studied the "analemma" of Ptolemy. At about the beginning of the thirteenth century, one of the Arabian writers and scientists, Abul-Hassan, introduced the reckoning of time by equal hours, and likewise taught the tracing of them on dials. He invented, amongst others, a new description of dial, called "khaphir," or the hoof of a horse.

Any reader of this article who has visited the Celestial Empire, will remember to have seen dials placed on the walls of houses, and on the door of the palanquins. How long the Chinese have been acquainted with the science I do not imagine to be known. Their neighbours of Japan carry about small bronze ones, as we do our watches; but they do not appear on gnomon pillars, nor on their houses, although an exception may be found on a watchmaker's shop in Yokohama.

Some effort to mark the course of time has left its traces or its traditions over most of the world, if not so constructed as to mark the several hours of the day, nor of sunrise and its setting, at least to note the time of the equinox. We read that the aboriginal natives of Peru were able to determine the latter named periods by means of dial-pillars, on which they lavished much costly decoration, but of which they were deprived by their ignorant, fanatical, and ruthless conquerors the Spaniards, who took it for granted that they were idols, and destroyed them!

The peasant population in all parts of the globe have devised ingenious methods by which they may tell the hour, or at least regulate their seasons of rest and labour. For example, approaching nearer home, the natives of the Pyrenees employ a small boxwood cylinder, which on the removal of the top reveals a blade that turns on a pin, and thus acts the part of a gnomon. This instrument they adjust to the figures and letters engraved on the wood.

Travellers on the continent of Europe might easily make a collection of sketches of foreign and most interesting dials, the mottoes on which would be worth recording; but were I even more travelled than I am, and my collection a large one, I could not give

many examples in the brief limits of two articles.

In the Canton of Uri, near Altdorf, at a village named Erstfelden, in the valley of the Reuss, you may see a dial on the wall of the church. Those who travel in Switzerland cannot fail to observe that scene-paintings on the walls both of churches and houses are very common; and these are representations of sacred figures and subjects, legends, armorial bearings, and historical events. In the case under present description the painting is somewhat remarkable. The dial seems to have heraldic supporters, for two skeletons, one on each side, hold it up. It is circular in form, and the gnomon proceeds out of the face of the sun, which surmounts it. The motto is inscribed above it, and beneath are the crossbones, and an inscription too much defaced to be deciphered, but the following is perfectly preserved:—"Wachet; denn ihr wisset nicht, um welche Stunde euer Herr kommen wird" (St. Matt. xxiv. 42).

At Aynho another good motto appears, *i.e.*, "Yet a little while is the light with you. Walk while ye have the light;" and the warning is an apt one, whether regarded as having reference to the waning of the daylight on the dial, or to the brief season of life and the light of life in the soul. "Yet a little while am I with you," said the Light of the World, "to guide your steps by My Gospel of Peace to that far-off land where your sun shall no more go down."

Had I sufficient space, I could give you a brief notice of certain interesting examples of sun-dials in France, Germany, Austria, the Tyrol, Switzerland, and Italy; but as I wish to describe a few in our own land, which is very rich in them, I will only mention one, bearing a very beautiful motto, before we make our way to our island home. I refer to a dial belonging to a suppressed monastery near Florence; and I must take chance for its having escaped the notice of a good many visitors, like myself, to that charming city and its lovely neighbourhood, for the motto on the wall of this old convent is worth recording, of which the translation runs thus—

"My life is in the sun; God is the life of man;  
Man without Him is as I am without the sun."

Before laying all our own archæological treasures in this department of combined science and art before you, I should note the fact that they are of many different kinds. You must yourselves have observed certain of the varieties, as that some are horizontal, others vertical, vertical-declining (which do not face any of the cardinal points), the inclining, or oblique (making oblique angles with the horizon), an equinoctial dial (parallel to the equator), and a polar dial, or one traced on a plane, perpendicular to the meridian, and passing through the poles. There are also ring dials, and universal dials on a cross. Here I may observe that, besides the hours by which we reckon time, there are three other modes of computing it, *i.e.*, the Babylonian, Jewish, and Italian. The latter begins at sunset and runs on to sunset, thus counting twenty-four hours consecutively. The Babylonian hours, on the contrary, commenced at sunrise, and ran on to twenty-four; while the Jewish mode reckons from sunrise and counts to sunset, making twelve equal parts.

After giving descriptive sketches of dials in England, as I hope to do (merely a few representative examples), I propose to complete our researches into the ways and means of reckoning time by a reference to hour-glasses, water-clocks, and others, together with the earliest forms of watches. But these must all be referred to my second, and concluding, article.

(To be continued.)

"Why do you think so?" enquired Rolfe, greatly surprised.

"That is beyond me to tell. Some secret power or instinct guides me to the choice."

Rolfe crossed to Jeanie's side, and told her Bullen's opinion.

"Fairly caught!" said the colonel, with a laugh.

"Oh, father!" exclaimed Jeanie, looking startled.

"Do try! Oh, do try, Jean!" cried Beth. "It will be such fun, and I will walk by your side and watch the twig. Do try!"

"Courage—courage, my darling!" whispered the colonel. "Think of all that is involved. Should you succeed, it will doubly assure those who are still doubtful."

Rolfe led her to Bullen, who directed her how to hold the twig. Thus armed, with Beth by her side, she began her walk from the place where her father stood. Immediately she approached the spot indicated by Bullen, the movements of the twig became so violent that, affrighted, she let it fall and hurried back to the colonel. Rolfe then called the workmen, who had not been within hearing.

"Can you make any guess as to the depth of the water?" he asked of their foreman.

"I should judge it to be about the depth of eleven feet," he replied.

"Your opinion tallies with that of Mr. Bullen. Then we must bore."

The men set to work with hearty goodwill, the people crowding so near in their excitement that it required the aid of two or three policemen from among the crowd to preserve order and freedom for their efforts. As they reached the depth of ten feet seven inches up sprang the water in a strong jet, rising above the heads of the people, and, shaken by the breeze, descended in a shower upon all near. Uproarious demonstrations of enthusiasm, laughter, and general shaking of wet garments ensued. The old cedar seemed literally alive with the unrestrained cheers and clapping of hands by its occupants.

The share-list was eagerly called for,

quickly filled up, and the result made known to the colonel. The whole capital required amounted to £60,000, of which all but £10,000 had now been subscribed. The colonel had not yet subscribed. For a moment he hesitated; then, seeing the probability that, besides the income from the shares, there would be also increased value given to the estate, he signed his name for the remaining shares. He then addressed a few earnest words to the people about Bullen, saying, "I had arranged with him beforehand to pay a sum that satisfied him, but I think that you will all agree with me that this is a case for more generous treatment. I propose, then, that all of us here who are interested as shareholders, or simply for the welfare of Penzarton, should mark their appreciation by a contribution in his favour. I will begin with a cheque for ten pounds."

A general acclamation followed. One shareholder observed, "May I be excused for remarking that much of the success may depend upon the collector? May I then, without giving offence, propose one whom all will gladly accept and respond to heartily?"

"Couched in that spirit, certainly you may," replied the colonel.

"Then I trust Miss Stanard will once again, on this occasion, fulfil a duty that must be pleasing to her, since many of the poor she so well cares for will be greatly benefited by this new water supply."

"What say you, Jeanie?" gently enquired the colonel, bending towards her.

"If you think well, I will do it, father," she replied, her face flushing at the thought of the publicity entailed.

"Where shall we find an alms bag?" loudly asked Rolfe, anxious to divert the general attention from Jeanie.

"The colonel's hat!" shouted the people, with laughter. "Let's have the colonel's hat—it'll hold plenty!"

The colonel accordingly took off his hat, and put the ten pound cheque into it as he said in clear tones, "Gold or cheques equally acceptable; the latter will do in pencil, or the amounts may be simply mentioned, and Mr. Rolfe, our clever young engineer, will take note of promises as my daughter passes round."

There was an immediate opening out of all those who were desirous to contribute, into a single-file circle; while Jeanie, carrying her father's hat, passed slowly round, accompanied by Rolfe and Beth, who considered her attendance indispensable to her sister's courage.

The results announced by Rolfe to the colonel amounted to £38 10s.

"You've missed the lady in black," called out a voice from the crowd.

Jeanie immediately crossed to where Mrs. Bartlett was sitting, and returned with the promise of a cheque for £10.

"The total is now £48 10s.," called out Rolfe.

General and enthusiastic rejoicing followed.

That evening, for the first time since the death of Benjamin Stanard, there was a festive gathering at the castle; including a few of the colonel's friends and some of the leading Penzarton shareholders, who had been invited to dinner in honour of the new undertaking.

Mrs. Bartlett could not, however, be persuaded to make one of the dinner-party. She had broken through her habit of complete seclusion to be present at the experiment; but, that done, she drove home from the castle as quietly as she had arrived in the morning.

When the dinner-hour drew near, Jeanie watched the hands of the clock with anxious impatience, waiting for Rolfe's reappearance, to talk over with him the events of the day, and their probable consequences in the future.

As Jeanie and the colonel were busily engaged in the reception of the guests, a note from Rolfe was put into the hands of the latter, saying that a telegram from his employers had just reached him, requesting his *immediate* presence in London to superintend some new work, and expressing earnestly his regret at losing so enjoyable an evening as he had looked for.

This the colonel handed to Jeanie; but neither had the opportunity to comment, as the guests were now rapidly arriving.

(To be continued.)

## SUN-DIALS.

By S. F. A. CAULFEILD.

### PART II.



BEFORE entering on the subject of our English dials, I may give a brief notice to another method of computing time, of very early origin.

The use of the hour-glass was invented at Alexandria in about the middle

of the third century; and people used to carry them about in lieu of the yet unknown watches. You must often have observed that in old engravings of hermits and monks an hour-glass is represented, together with a skull, a book,

and a crucifix. Pulpit hour-glasses were introduced after the period known as the Reformation, when very long sermons were the fashion, which sometimes outstepped the patience of the congregation. So, to spare them too severe a trial of endurance, an hour-glass was attached to the pulpit, to keep the long-winded preacher within fairly reasonable limits. There was, and possibly still remains, a very handsome specimen of a pulpit hour-glass in the parish church of what was, many years ago, my own great-aunt's place (Mrs. Heneage, *née* Cope), Compton-Bassett. An illustration of it, dating back to the sixteenth century, will be found in *The Book of Days*. An ironwork and ornate kind of lantern, surmounted by a fleur de lys, encases the glass,

supported at the end of an iron rod projecting from beside the desk, and from the centre of this rod there was a large fleur de lys on a long vertical stem. It was at Compton-Bassett House that my father was brought up, and therefore the place has a special interest for me. Another illustration is given of a pulpit hour-glass in the same work above-named. It is taken from the "lonely church of Cliffe," on the Kentish coast, between Gravesend and the Nore. It seems that the pulpit is of carved wood, and there is a shield on the wooden bracket supporting the stand for the glass, bearing the date 1636—two years later than that on the pulpit. We are also informed of an entry in the church book of St. Katherine's, Aldgate, of one shilling



THE SUN-DIAL.

paid for an hour-glass "that hangeth by the pulpit" (1564), and a bequest of another glass, (1616), "with a frame of irone to stand in."

And now to return to the history of dials. I will give a few examples to be found both in London and various parts of the United Kingdom, only regretting that many well worth naming must be left out of my list.

There are sun-dials in Ireland that are stated to belong to the seventh and eighth centuries. Their form is peculiar—flat vertical slabs of stone set up in ancient graveyards, like tomb-stones, and their special use was, apparently, to mark the canonical hours for prayer. In this respect they served the same special purpose as those on the Mahomedan mosques, which, moreover, were supplied with indicators to remind the worshippers of Mecca. It may suffice to note their existence, without a description of any in particular.

There are a few curious dials still extant in London, and amongst them that in the garden of Clement's Inn, Strand, may be worth a visit. It represents a Moor, life-sized, and painted black, kneeling on a raised stand of four graduated stone steps—after the ancient models—and supporting a dial on his head. It is supposed to have been brought from Italy, and placed there by John Holles, second Earl of Clare, who made the Clare Market, and built and improved so extensively in that neighbourhood. The statue is believed to be of bronze, though disfigured with paint. Speaking of these same Earls of Clare, I may observe that a tumulus in the churchyard of Trelleck, Monmouthshire, which in ancient times was surrounded by a moat, was surmounted by the keep of a castle belonging to them. It stands in the village, and in the churchyard there is a sun-dial, erected in 1689, upon three sides of which the three distinctive wonders of the locality are depicted. First, the before-named tumulus, thought to be Roman, with inscriptions as to the great number of persons buried there; the second wonder consisting in three stone pillars, of eight, ten, and fourteen feet in height respectively, recording the victory of Harold on that spot: and lastly, bearing a representation of a well and two cups. Whether the three pillars were erected by the victorious Harold, or were of still more ancient date, and due to the Druids, is a matter of question.

I cannot attempt to multiply examples, and take into my brief sketch a long and satisfactory list of our own English dials; but a few must yet find a place in these columns, and amongst them the very unique one which is doubtless pointed out to the visitors of the Scilly Islands. It consists of a cannon, standing firmly on end, and its mouth, which once thundered forth its message of friendly salute, of warning, or of death, now mutely tells a very different tale. A dial-plate covers it, and an iron tongue silently casts its tiny shadow over the plate, and marks the relentless march of time. If you visit St. Mary's, go to Star Castle Fort, and there you will find it. It would be interesting to learn that cannon's previous history.

No resident in this vast metropolis of ours, nor any acquainted with Edward Walford's most interesting history of old London, could be ignorant of the name of one locality designated the Seven Dials. In former times I have driven through that queer old disreputable-looking quarter, the repository for birds, squirrels, dogs, cages, curiosities, and dirt, and always wondered where the seven dials were, and vainly seeking for some dilapidated vestiges on the corner walls of every street converging there to a common centre. I might have searched till the present day, and abandoned the quest far sooner than I did, had I earlier informed myself on the question by a reference to *Evelyn's Diary* (October 5th, 1694). There it is recorded

that the seven dials were all represented on one pillar, the several faces turned towards each street respectively, and were severally constructed, of course, to suit the different aspects taken. The style of the pillar was Doric, and each dial measured a square foot in dimensions. It was constructed by a Mr. Neale, and the old relic is still in existence; but you must go out of London to find it, for having been taken down in the vain hope of finding treasure buried beneath it, in 1773, it was carried away, and set up at Weybridge, on the village green.

Another of our London dials, and one of a curious character, since it was so contrived as to act without a gnomon, was made by a Mr. John Leak, and set upon a Composite pillar at the corner of Leadenhall-street, when Sir John Dethick, Knight, was Lord Mayor. The dial was a globe, so placed as to be half in sunshine and half in shadow. In Joseph Moxon's old work on astronomy and geography, printed and sold by him A.D. 1659, at his shop, "the Signe of the Atlas," there is an engraving of this old dial, which also combined a fountain. There were four figures, apparently of women, and about half life-size, standing just above the plinth, below the column, and above the fountain; and on a slab on one side of the square four-sided plinth (raised on steps from the ground) was a long inscription. What information it gave I cannot say—what solemn monitions. The whole structure performed its work and its silent mission, however, and has passed away with those whom it served.

I will now take leave of town, and conduct my readers on a country tour, to draw their attention to some of the old-time mementos of this character to be found by rambles both in the north and south of England.

Stanwardine Hall, near Baschurch, Salop, was the seat of the Corbet family, related to friends of mine. It is a fine Elizabethan structure, now used as a farmhouse; but the dial, one of pillar form, may be seen in front of the hall, on which the Corbet arms are still to be seen, with the date "Anno 1560." The silver plate upon it bears the inscription:—

"He that will thrive  
Must rise at five.  
He that hath thriven  
May lie till seven.  
He that will never thrive  
May lie till eleven."

On the left side the couplet is inscribed:—

"In the houre of death,  
God be merciful unto me."

And on the right side, the lines:—

"For as Tyme doth haste,  
So life doth waste."

To myself, as a member of the most ancient and venerable of all existing Orders—the Knights Hospitalers of St. John of Jerusalem—perhaps the dial at Millrigg, Culgaith (near Penrith), may have a special interest. Millrigg was taken from the Order by Henry VIII. and given to a gentleman named Dalston. There he resided, and there he died A.D. 1692. The Knights Hospitalers had succeeded the Knights Templars, to whom the house originally belonged, together with the manor of Temple Sowerby. But when the religious houses were dissolved, and knightly communities, as well as those of the monks, were despoiled of their property, the Dalston family was presented with that of the nursing as well as military Order of Hospitalers.

To return to the ancient dial at Millrigg. It has four sides, two of these bearing inscriptions of a singularly quaint character.

The play on two words, one in English, but the other in French, points to the travels of these Crusaders through France, and to their acquaintance with that language. The motto consists of a dialogue between the dial and the passenger on the one side, and on the other the summing-up of the sage monitor's conclusions from the reply received:—

"Diall.  
Staie, Passinger.  
Tell me thy name,  
Thy Nature.

Pass.  
Thy name is die  
All. I a Mort all  
Creature.

Diall.  
Since my name  
And thy nature  
Soe agree,  
Thinke on thy selfe  
When thov looks  
Vpon me."

I have been in Yorkshire, but never at Leyburn; and I am indebted to Mrs. Gatty for the beautiful motto over the door of a schoolmaster's house at that place, but of which she does not name the date. At all events, the orthography gives evidence that it is not ancient:—

"Time is, thou hast; see that thou well employ.

Time past, is gone; thou can'st not that enjoy.

Time future, is not; and may never be.  
Time present, is the only time for thee."

I have more than once paid visits to friends in Derbyshire, and while there made excursions to places of interest in that beautiful part of the country; amongst others to Bakewell Church, a very fine structure, and containing some remarkable monuments. High up on the wall there is an oval-shaped dial, dated 1796, on which is inscribed the passage of Holy Writ:—

"In such an hour as ye look not for,  
The Son of Man cometh."

Before taking leave of this county, where there is so much to admire and to linger over, I must give another example of a dial, which is to be seen at Eyam, where I used to visit friends who owned the ancient manor-house, with its terraced gardens and tapestried rooms. The village is of historic interest, rendered so by its remarkable and touching records of the Great Plague of 1666, and of fortitude and passive heroism, never before nor since surpassed. I saw and sketched the house where the plague first broke out, and spent an evening in the old rectory house, inspected the ancient parish register to see the entries of those who perished, and noted that only one marriage took place during the three years of that awful visitation, and (to my satisfaction) that the loving couple survived it. In the churchyard is a beautiful Runic cross, and the tomb of the heroic Mrs. Mompesson, wife of the equally heroic and devoted rector, and of these and the church I also made a sketch. On the south porch of the latter there is a dial, bearing the inscription of various places, to signify their several differences of time from our own; also the tropics of Cancer and Capricorn are denoted upon it, together with the motto:—

"Induce animum sapientem. 1775";

which, being interpreted, means, "Put on a wise mind." The names of the churchwardens of that time are likewise inscribed upon it.

I observed that some dials are constructed

in the form of a cross. We have a considerable number of them, but none bear a better motto than that to be seen on one near Lichfield, in Shenstone churchyard. The cross surmounts a pillar, and is placed in a leaning position, and the shadows are cast on the figures engraved on the sides of the shaft by the arms of the cross. It is not one of the ancient examples, but the lady who erected the dial had drunk deeply into the same pious and poetical spirit which imbued her predecessors in performing similar good work:—

“If o'er the dial glides a shade, redeem

The time; for lo, it passes like a dream.

But if 'tis all a blank, then mark the loss  
Of hours unblest by shadows from the  
cross.”

The above-named cruciform dial is, as you will observe, vertical in its position; but it is sometimes employed horizontally, as, for example, at Hurstpierpoint, Sussex. There it is placed on the schoolhouse, and its motto is a good one, inscribed in Latin, but translated for the benefit of general readers, and runs thus:—

“The way of the Cross is the way of light.”

You may often see an upright four-sided stone in country graveyards and market-places, on the top of which is a dial of later date apparently than the pillar supporting it. The latter is, in fact, only the broken stump of a cross, the top, with the arms, having been destroyed by order of Queen Elizabeth, in her zeal to do away with a religious emblem of that character; but I myself imagine that some of these demolitions of crosses were due to the Puritan soldiers.

The so-called Queen Mary's Dial, at Holywood, is erroneously so entitled, since it was erected by Charles I., and presented by him to Queen Henrietta. He had it made by one John Mylne, at a cost of £408 15s. 6d., Scotch currency.

One of the ring dials to which I before referred is in the possession of Mrs. Dent, of Sudeley Castle, which was found at Kemerton Court, Gloucestershire. The numerals are inscribed inside it, and it is designed to be hung up in some place where a ray of sunshine can pass through a sliding hole, and down upon the right number.

Before concluding this notice of English dials, I must name one more, dated 1658, and known as Sir Francis Howard's dial. It is to be seen on the lawn at Corby Castle, not far from Carlisle, his seat. He was the grandson of Thomas, fourth Duke of Norfolk. It is one that has a special interest to me, for family reasons, as Sir Francis married, secondly, a daughter of Sir Henry Widdrington, of Widdrington Castle, Northumberland. The dial is four-sided, and bears a shield on each. The emblems of the Passion, the cock that crowed, and many other objects connected with our Lord's trial and crucifixion, appear on one of the four shields; the arms, impaled, of Howard and Widdrington, on another; on a third the family initials, and on the fourth the motto. And what a world of intense feeling underlies the last exclamations, three times repeated, and which no addition of strong and more explanatory words could possibly intensify. The imagination of a reflective mind is left to supply these, and to realise the whole of what is implied, though unspoken.

“Deathe, Judgment, Heaven, Hell—upon this moment depens Eternitie. O Eternitie! O Eternitie! O Eternitie! 1658.”

What more can I add to this that would not serve to weaken its powerful appeal to the imagination and the conscience?

I said that after the sun-dial the clepsydra was introduced, which measured the hours by the pouring of water from a graduated vessel (158 B.C.), improved upon by a toothed wheel

and index, and then by a descending weight to drive the wheel in lieu of water. Afterwards the construction of clocks began. In 999 the monk Gilbert assumed the tiara, having invented a graduated mechanism to improve on former contrivances for the marking of time.

The first clock that appeared in Europe is supposed to have been that described by Eginhard, Secretary to Charlemagne (742—814), and presented to him by Abdalla, King of Persia. Quoting from him, you must know that it was a “Horologe of brass, wonderfully constructed, for the course of the twelve hours, answered to the hour-glass, with as many little brazen balls, which drop down on a sort of bells underneath, and sounded each other.”

With the invention of the first escapement, the construction of clocks proper may be said to have begun. A clock erected in Paris in the year 1379, by Heinrich von Wick, was one of the most famous of the early structures; but we had one, set up in Old Palace Yard, in the year 1288. An English clockmaker, named Harris, perceived the possibility of the regulation of the action of the escapement by means of a pendulum; but it was Huyghens, a Dutch physicist, who first constructed a pendulum clock and set the escapement wheel horizontal—hitherto set vertical—and the pallets he attached to the horizontal rod from which the pendulum hung. Thenceforth England took the first place in developing the science.

In the time of Diana of Poitiers (1499—1566), the obsequious court adopted every description of lugubrious device in the articles of their jewellery, out of compliment to her mourning as a widow. Thus even their watches were made ghastly, by taking the form of skulls, the top of the cranium serving as a lid to cover the face beneath it. Happily, these unattractive forms passed out of fashion, in all jewellery early in the seventeenth century.

The pendulum spring was invented in 1770, and the French took the lead in making improvements in mechanism, weight, and size. There was a watch encased in a cross, and worn hung to the girdle, called an “Abbess watch;” others of the same kind were engraved with representations of the Passion, and figures of Faith.

It was in 1584 that watches first came over from Germany. Some were exceedingly large, contained in a handsome case, and were hung as an ornament round the neck. These early specimens needed to be of great size, as they had catgut springs. The forms of ancient watches were often quite grotesque, and the dimensions were in time reduced. Some were no larger than a walnut, richly chased, and enclosed in a pear-shaped case. A silver watch, *temp.* Elizabeth, was formed like a duck when floating on the water, and the feet tucked up out of sight. There was a ring at the back of the neck, to which the chain was attached. The lower part of the duck, when opened, disclosed the dial plate, also of silver. This was encircled with a floriated design (gilt), and angels' heads, and the wheels turned on rubies. An interesting specimen was that presented by Louis XIII. to Charles I. It was oblong, with the dial on one side and St. George and the Dragon on the other, and was of silver, richly gilt, and much enamelled in a variety of beautiful colours. The case was a handsome one, and the watch was very perfect in its decorations, inside as well as out, and the maker's name, “S. Vallin,” is to be seen. This interesting relic is still preserved, and the reader may have seen it in the late Stuart Exhibition in the New Gallery, Regent Street.

And now, in taking leave of the subject of sun-dials, I must redeem my promise of replying to any suggestions of difficulty in reference

to the extraordinary phenomenon recorded concerning the dial of Ahaz. I quote from a work entitled *True Philosophy*:—

“When it is a question of any act performed by the Creator, you must either deny His existence, or take for granted His omnipotence. Then, if you accept the latter, that He should cast a shadow on the sun-dial, a miraculous shadow not to be accounted for by ordinary causes, or that He should delay the course of this little world—an atom in His great dominion of worlds on worlds—must seem, as it actually must be, a matter of equally trifling difficulty. The one act of supreme will and infinite power is quite the same as the other.”

Over and above this view of the case, it may interest the reader to know that Herodotus, the father of profane history, declares (according to the traditions of the priests of Egypt, from whom he received the information), that “in very remote ages the sun had four times departed from his regular course, having twice set where he should have risen, and twice risen where he ought to have set.”

Now the existence of such a statement, related and credited as history by the learned in those ancient days, is a very remarkable fact, coinciding, as it does, with the two narratives given in Holy Writ. However accounted for, such extraordinary phenomena are clearly attested as having been seen at some certain periods, marvellous to the historians, but none the less absolutely believed and attested. I now quote a communication from one of our most learned and able controversialists of the day, Mr. B. Harris Cowper, to whom I referred on the question.

“Josh. x. 12, etc.—The incident recorded here involves a double difficulty. The Hebrew itself is obscure, and includes a quotation from another book, the Book of Jasher—lost. But no doubt a supernatural intervention is described, and one to be received as a matter of faith. The physical phenomenon is of course inexplicable, unless it denotes the apparent prolongation of daylight, which could be produced by retarding the earth's motion on its axis, or by modifying the refractive power of light. Your own suggestions, therefore, practically accord with mine.—II. Kings, xx. 11. The statement here, and in Isaiah, is explicit, and I think the miracle probably was due to the second of the causes suggested, *i.e.*, the modification of the refractive power of light. All miracles are referable to the supremacy over natural laws which He who ordained them maintains, and proves when and how He pleases.”

If you believe that the Supreme Being was capable of creating what we call “natural laws,” it can be no greater difficulty to believe that He has power to change those laws, or to modify them according to His own supreme will and Divine pleasure, condescending, as He does, to the necessities and comprehensions of His finite creatures. He spoke to men in ancient times “by signs and wonders” suited to their condition; this He has declared in the written revelation vouchsafed to their descendants. May not this suffice to those who are compelled to accept as facts, so much in their own mysterious threefold being that is to them inexplicable, and that in spite of all their profound scientific investigations? Yes, and throughout all nature how much is there which they are as utterly unable to deny as to explain?

Let it be enough for you, my readers, that while “we now see through a glass darkly,” there is a glorious day coming for those content to “enter into the Kingdom of Heaven as little children,” “when we shall know, even as we are known,” by “Him whom, having not seen, we love.” “Blessed is he that hath not seen, and yet hath believed.”