

THE GATHERER.

The Montsouris Reservoir.

Paris, bright, light, splendid Paris, has up to the present time been most miserably ill off as regarded drinking-water. We Londoners, grumbling at turn-cock and Company, and hankering after the translucent lymph of the Cumberland lakes, were at any rate in a vastly superior position to that of our French friends. We have thirty gallons a head—of hard chalk-water, it is true—for the swarming population of London. They had barely thirteen gallons, by far less pure and wholesome, for each unit in the much smaller census of Paris. Paris may be said to be

stone, the Montsouris waterworks are entirely below ground. The verdant meadow, silvered with daisies and golden with buttercups, which forms the roof of these prodigious vaults, is useful in keeping the water cool during the sultriest heats of a Parisian summer.

The reservoir itself, built of the most massive masonry, consists of two distinct storeys, each divided into two compartments. The upper galleries are filled with water eleven feet deep. The lower tier, not as yet replete to the brim, has been calculated to hold twenty-two feet of deep, clear water. No description



THE MONTSOURIS RESERVOIR.

naturally at a disadvantage where water is concerned. She stands in a vast basin of gypsum, and every well is necessarily sunk in a soil of which the main ingredient is plaster of Paris. Now plaster of Paris, or, as the chemist calls it, sulphate of lime, is partly soluble, and hence the water of the Parisian wells and springs has long been condemned as unfit for drinking purposes by scientific men. The vitiated water of the Seine, the chief source of supply, is so highly charged with organic matter that, seven years since, upon Napoleon's principle that dirty linen was best washed at home, the authorities prohibited any inspection or analysis of the dubious stuff that filled the reservoirs.

The magnificent Montsouris Reservoir, perhaps the grandest storehouse for water that has been constructed since the days of the Romans, and which promises to prove the greatest imaginable boon to thirsty Paris, took four years to build. Its site had to be excavated, with very considerable toil, in a lofty table-land which overlooks the French capital. Covered over with green turf, and enclosed by a high wall of hewn

can quite do justice to these cool, dim halls of well-cemented stonework, with their seemingly interminable range of iron pillars stretching far away, until they are swallowed up in the more than Egyptian darkness that prevails a little way from the aperture through which the daylight filters. To see the watery caverns as they deserve to be seen, a boat and a torch are needed.

The Black Chamber, or anteroom, into which, gurgling and seething, the arriving waters pour, is one of the sights also of Montsouris. The flood enters through iron pipes four feet and a half in diameter, but even before storage it is limpid and cool, for the utmost care has been taken to conduct it underground, and at a uniform temperature, all the long way from Champagne. What Paris is now beginning to drink is the river Vanne, which is heedfully brought by darkling ways, unfrozen in winter, unheated in summer, 140 miles from its point of interception in the north-east, to replenish the jugs and water-bottles of the French metropolis.

As if to justify its existence, Montsouris, or the

Mouse's Mountain, comprises a station for the scientific testing of rain-water, collected in properly-placed gauges within the area of Paris. Rain-water in a mountain country, or even in a thinly-peopled lowland, is no doubt very nearly pure. But clouds, after all, are only gigantic sponges which absorb and condense the evaporated moisture of earth and sea, and the black cumulus that gathers above the chimney-tops of a teeming city is apt to contain more than innocent oxy-hydrogen. Rain also performs the highly important duty of washing the air, the lower strata of which are full, not merely of smoke and mixed gases, but of floating germs, spores, microscopic fungi, and infinitesimal eggs. These are the mysterious yeasts and leavens, some animal, others vegetable, of which modern chemistry and the microscope have so much to tell, and these are swallowed up, and retained in suspension, by every drop of fast-falling rain.

That rain-water in cities contained much carbon was palpable to all. That, under similar conditions, it comprised a little sulphuric acid, and what analysts call "traces" of nitric acid, was also pretty well known. But no such formidable catalogue of impurities found in rain-water as that drawn up, a year ago, by the director of the Montsouris Reservoir, has ever yet been made public. The rain analysed was that which fell into the different rain-gauges of Paris during twenty-nine days of the month of May, 1876. It amounted, within the limits of the city and suburbs, to nearly 5,000,000 cubic yards, bringing with it ninety-eight tons of mineral substances. It was freighted, also, with 170 tons of organic matter, including a vast amount of nitric acid, saltpetre, and sulphuric ether, and no less than nine tons of ammonia, a potent shower-bath that would have been welcome had it descended on green fields and growing crops, but inappropriate as an addition to the wells, springs, and open reservoirs of a populous metropolis.

The contents of the Montsouris rain-gauges, when heedfully examined, were noteworthy in more respects than one. There were innumerable globules of iron, easily attracted by the magnet, and absolutely identical with larger masses of iron of undoubted meteoric origin. This iron had evidently been subjected to intense and sudden heat before its dispersed fragments were washed down in the rain-drops. There were other metals and metallic oxides, with lime, carbon, and silex, and alluvial earth—a world in miniature. The large microscope revealed the fact that not only germs, but living infusoria, the monsters of the water-drop, had been rained down upon unconscious Paris during the month of May. There, magnified to a thousand times their natural size, were our old familiar friends, the spinning rotifer, the wagging vibrion, and there too the petty tyrants of the puddle, the lithe snakeling and the blood-thirsty water-tiger. The very sight of this aquarium and its tenants is enough to make Parisians grateful for the ample supply of pure and unsunned water which the Vanne daily brings to the great reservoir of Montsouris.

A Hidden Quotation.

In the following lines a well-known quotation may be found, one word in each line :—

A CHILD'S PORTRAIT.

A little head of crisp-curled hair ;
 The really sweetest thing in noses ;
 A pair of laughing lips so rare,
 In beauty like two blushing roses ;
 Glad sunny eyes, whose smile is sweet ;
 A pair of busy twinkling feet,
 That patter round with joy and gladness—
 Our little pet, for whom as yet
 The hours are ever free from sadness.

W.

Warned of Coming Storms.

During the last six years the Meteorological Office has been able to give such information as would, if attended to, have enabled our coasting seamen to avoid the violence of almost all the serious storms which have visited our shores. Of some great gales, however, no timely warning has been given, and the reason for this is not far to seek. Most of our storms advance on us from the Atlantic, and we have no means of getting information of their approach before they swoop down upon us. If we could only obtain a series of reports from stations in the Atlantic—say at a distance of six hundred miles from our coasts—we should be able to forecast the weather with much greater success than at present. But it is to be feared that it would puzzle the most able of seamen to moor a vessel in a thousand fathoms of water, and connect her with the shore by a telegraphic cable. The experiment of a floating telegraphic station was tried in 1869, at the entrance to the Channel, in much shallower water than a thousand fathoms, and the result was not encouraging. Some scientific men—Mr. Morse, for example—have suggested a more ingenious way of obtaining information regarding the weather far out at sea ; they propose that instead of signal-ships there should be simply buoys provided with electrically self-registering apparatus, which might record its indications automatically at the nearest station on land. This has been ridiculed as the dream of over-sanguine science ; but such buoys would be a triumph of mechanical ingenuity, and certainly it would be better to make efforts in this direction than to condemn the crews of signal-ships to a dreary life in a waste of waters.

The Artificial Light of the Future.

For a long time past the most powerful light at present known—the electric—has laboured under great disadvantages in the shape of practical difficulties in the way of its use ; these difficulties, we are glad to hear, seem at length in a fair way of being removed. As many of our readers will know, the electric lamp in use up to the present time depends for its illuminating powers on the passage of the electric current between two carbon points, which are continually being consumed ; most elaborate mechanism is therefore needed to keep these points constantly at the same standard distance from each other, and until

lately, even the best inventions in this direction, besides being troublesome and inconvenient, have proved very defective. Hitherto, in addition, no means have been discovered of dividing the electric light, which is far too powerful for ordinary purposes, the lamp throwing direct rays of light of intense brilliancy in one direction, but making darkness doubly dark around. For these two chief reasons, this—perhaps the most economical of all lights—has been but little used up to the present time. A short time ago, however, a Russian, M. Jablonsky, invented a method by which the troublesome mechanism required to regulate the carbon points was dispensed with, the sticks of carbon being laid side by side and separated by an insulating material which was consumed at the same rate as the carbon points. Practical trials of these so-called "electric candles" at the Louvre in Paris were very successful, but M. Jablonsky seems to have set his mind on still further improvements. The next advance made by him was one by which the electric current was divided, so as to give eight lights instead of one from the same circuit. And now the carbon points are to be done away with altogether, the light being obtained by the passage of the electric current through the insulating material itself—a species of porcelain, termed "kaolin." This kaolin, though heated to incandescence, is not fused by the current, and it is said that a kaolin plate barely half an inch in length is sufficient for a small light burning ten hours. Practically light of any required intensity can be produced in this way, and the power of divisibility is almost indefinite.

Looking at the matter only from an economical point of view, it is to be expected that the electric light will soon to a great extent supersede gas; and when we consider its harmless character, and the many dangers attending the use of gas, no additional arguments are required to induce us to welcome gladly any invention by whose means this new artificial light may be brought into every-day use.

Taverns of Temperance.

How to induce working men to shun the fascinations of strong drink, and cultivate habits of sobriety, is one of the most pressing questions of the day. There cannot be a shadow of a doubt that, were they one and all enlisted on the side of temperance, our country would enter on a true golden age. People may talk of the woes of poverty, but one way to make money plentiful in every man's pocket is to have nothing to do with intoxicating liquor in any shape or form. We have already in these pages noticed several efforts made to oppose gin-palaces and public-houses, and we have now to call attention to the establishment in London of coffee-taverns on the same principle as a series of houses which have been worked with great success in Liverpool. The object of the promoters of these taverns of temperance is to provide the working classes in densely-peopled neighbourhoods with places of resort where they may find unintoxicating refreshment, plain food, warm well-lighted rooms, and the opportunity of spending hours of leisure removed from

the temptations of the taverns of intemperance. Till recently the gin-palace or beer-shop alone offered a welcome in light, warmth, and comfort. In either place the guest must drink "for the good of the house," and a bad customer has ever a cold reception. In the coffee-taverns, on the contrary, one may drop in, order a large cup of cocoa at a penny, and sit out a whole evening, should he so please. We were present recently at the opening of the first house of the kind in London, and our observations on that occasion lead us to anticipate for the venture a considerable amount of success. The coffee-taverns are to be opened to all men and women, from the earliest possible hour in the morning till late at night. In the larger houses there will be rooms available for the meeting of friendly and other societies. Arrangements have also been made by which working men and women can bring their own meals and have them cooked on the premises.

It must not be forgotten, however, that coffee-taverns will not do everything to remove intemperance from our midst. "Our firmest faith," says a contemporary, speaking of Mr. Chamberlain's Public-house Reform Bill, "is in that gradual improvement, unseen, or to be traced only in its effects, which raises men from the mental condition in which they are the natural slaves of drink, and renders them thereby capable of higher and less animal enjoyments." With this we entirely agree. The more the working classes become enlightened—using that word in its highest sense—the fewer there will be in bondage to the bottle. Some coffee-rooms have been founded with a view to uniting mere eating and drinking with mental and religious cultivation; but it is just in exceptional cases that such rooms will be found to thrive: indeed, those capable of managing them judiciously are, we fear, only sent into this world at rare and uncertain intervals. The work of making a lasting impression on the minds of working men is to be accomplished, as a rule, by other agencies than coffee-rooms.

A Key to the Chess-Board.

When the question is asked, "Do you play chess?"—the answer most frequently is, "I only know the moves." When the speaker is in a position to meet frequently with various other players, even this may imply some proficiency in the game; but if his or her opportunities of play are rare, it is seldom that much progress can have been made. The reason of this is not lack of chess literature, for that is now supplied by many newspapers, but want of means to use it. It is almost, in fact, as if one should be unable to eat in the midst of plenty, for want of hands to convey the food to one's mouth. This would not be the case, were it not for an impression which prevails, that to learn enough to enable one to understand the literature of the game would involve a great sacrifice of time. In fact that, as a character in a story pithily puts it, "Life is too short to play chess." That this idea is quite erroneous, we think a little attention to the following brief explanation will prove.

We will presume that the reader knows only the names and places of the pieces, and the moves.

The next thing to learn is the abbreviations by which the pieces, &c., are known—K for King, Q for Queen; R for Castle, or *Rook*; B for Bishop; Kt. for Knight, and P for pawn; also Ch. for check, and Sq. for square. To master this cannot take more than a very few minutes, and when that has been done all

FROM BLACK'S POINT OF VIEW.

Q R 8	Q Kt. 8	Q B 8	Q 8	K 8	K B 8	K Kt. 8	K R 8
Q R 7	Q Kt. 7	Q B 7	Q 7	K 7	K B 7	K Kt. 7	K R 7
Q R 6	Q Kt. 6	Q B 6	Q 6	K 6	K B 6	K Kt. 6	K R 6
Q R 5	Q Kt. 5	Q B 5	Q 5	K 5	K B 5	K Kt. 5	K R 5
Q R 4	Q Kt. 4	Q B 4	Q 4	K 4	K B 4	K Kt. 4	K R 4
Q R 3	Q Kt. 3	Q B 3	Q 3	K 3	K B 3	K Kt. 3	K R 3
Q R 2	Q Kt. 2	Q B 2	Q 2	K 2	K B 2	K Kt. 2	K R 2
Q R 1	Q Kt. 1	Q B 1	Q 1	K 1	K B 1	K Kt. 1	K R 1
Q R 8	Q Kt. 8	Q B 8	Q 8	K 8	K B 8	K Kt. 8	K R 8

FROM WHITE'S POINT OF VIEW.

A White square at the bottom right-hand corner, and the Queen on her own colour.

that remains is to refer to the above diagram, on which is printed the name of each square—from White's point of view one way upwards, and from Black's the other. The principle on which it is arranged is self-evident, and not being arbitrary is easily fixed in the memory. To prevent the possibility of mistake, it may be a good plan to take your chess-board, and copy on it the names of the squares as you find them on the diagram; but if this is found inconvenient it may be dispensed with. In any case, be careful to place the board with a white square at the bottom right-hand corner, and you will then find the Queen will be on her own colour.

When once this diagram is understood, nothing more is requisite to enable any one to play over a game; and we think but few readers will now be disposed to answer that "The game is not worth the candle." You may sometimes notice that one of the letters apparently necessary to designate a square is left out, but on looking again you will perceive that no mistake is possible in practice; for instance, if you see printed P B 4, you will find that (although this might mean either Pawn to King's Bishop's fourth, or Pawn to Queen's Bishop's fourth) only one of the squares in question can, on this move, be reached by a pawn, and the K or Q is therefore intentionally omitted as being unnecessary.

St. Kilda and the St. Kildans.

One may travel far and meet with no spot more remarkable in point of sublime loneliness than the

little rocky island of St. Kilda. This island lies off the west coast of Scotland, about sixty miles west of Harris; but, so far as isolation is concerned, it might as well be a thousand miles away from any habitable shore. It presents bold and lofty precipices to the sea, except at two points, at each of which there is a bay with a low shore. There are several small islets, the homes of sea-fowl, in the immediate vicinity. As St. Kilda lies in the midst of the Gulf Stream, it enjoys a mild enough climate, but the weather is often boisterous. Terrible storms occur at frequent intervals, and threaten to blow all the inhabitants into the sea. About eighteen years ago, a tempest of this kind fell upon and almost ruined them. Their houses were thrown down, and their scanty crops torn up and scattered to the wind. On the main island there are eighty or ninety head of black cattle, and a considerable number of sheep, amongst which is a Spanish breed, whose wool is highly prized. There are no trees. St. Kilda cannot even boast of a shrub.

But the St. Kildans interest us even more than their surroundings. There are between seventy and eighty of them; all the members of the lonely community being of Gaelic origin, and speaking the Gaelic language. They are an amiable and unwarlike, though in other respects a daring race—patient toilers, bold cragsmen and fishermen. They raise a little corn, barley, and potatoes, which, with fish, and the flesh of birds, form their staple food. Every family has a cow, but the cows are often in danger of starving for lack of fodder. The human beings on St. Kilda are often in about as great straits as the cattle, for the larder is not always full in these parts.

There is no regular communication between this island and the outer world, except by the factor's (or steward's) smack, which calls twice in summer to collect the rents and exchange commodities. A chance yacht calls now and again in summer, and remains for an hour or two; but for nine months in the year, including winter, the island is cut off from the rest of the world. Few of the inhabitants have been more than four miles from home in all their lives.

A visit was paid to the island, in 1875, by Mr. J. Sands. He remained there for several weeks, took quite a liking for the people, and, on his return to the mainland, put forth such exertions on their behalf, that he was enabled last year to take to them a boat of sufficient size to carry on trade with Harris in favourable weather. On this second visit, Mr. Sands remained eight months on the island, and was appointed by the simple-hearted islanders "representative man" in the world outside, and authorised to endeavour to get a steamer sent to the island twice a year. "The trade," says Mr. Sands, "is already larger than may be imagined, and, if an open market were accessible, would very likely be greatly increased. I have no doubt, if the inhabitants could obtain fair prices for their produce, and get supplies at a moderate rate, that they could well afford to pay for a steamer. At present, the trade is a monopoly, and a profit sometimes exorbitant is charged on what is bought and what is sold"

Here Milton Lived.

In the early part of this year the last of the numerous houses inhabited by Milton the poet was levelled to the ground. It was situated in Petty France—now Queen Anne's Gate—Westminster, and originally overlooked the Green Park, the back of the building opening into York Street. In this house, "the greatest of poets passed the happiest and the saddest years of his life. When compelled by ill-health, in 1652, to resign the situation of Latin Secretary to the Privy Council, he removed from Scotland Yard to Petty France, where, in communion with the first scholars of the age, he lived for eight years, surrounded by all the moral worth of his time. Here his first wife died in giving birth to her fourth child, and Milton, shortly after her death marrying again, here also lost, from a similar cause, his second wife, in twelve months after marriage. Lastly, it was in this house that he became totally blind."

In demolishing the house, the stone tablet erected to Milton's memory, and affixed to the wall by Jeremy Bentham, who afterwards occupied the next premises, was carefully preserved. It bore the following inscription: "Sacred to Milton, Prince of Poets." It is said that when Bentham took visitors to view the house he compelled them to kneel before the slab. This must have been meant as a grim jest. The eccentric recluse was no lover of poetry. As a duty, he once read Milton's works through, but he used to declare that all time spent either in reading or in writing poetry was sadly misapplied.

Dairy-Farming at Home and Abroad.

In our dairy-farming we are sadly in want of instruction. It is a serious defect, for in no other department of rural labour is a wrong method more ruinous and injurious. We might take a hint from the farming community of Bavaria, who attach great importance to the application of sound principles to the manufacture of dairy produce. Seven years ago a school was founded by the Agricultural Committee of the district of Southofen—encouraged by the promise of a small Government grant—for the instruction of youths in the dairy system of the mountain pasturage district of Algäu. In this school practical instruction is given in all that contributes to the manufacture of good cheese and butter, such as the proper treatment of the

cows, milking, discrimination between good and worthless milk, and the various processes which it ought to undergo. Theory is taught as well as practice; lessons are also given in simple bookkeeping and rates of exchange, and, where possible, some instruction in veterinary art is added. The course lasts from March to June, and many persons come from Austria and the neighbouring districts to attend the weekly lectures. The theoretical teaching is gratuitous, but the pupils have to find themselves in food and lodging, and to pay about 18s. a month to the owner of the dairy for the practical instruction.

Similar institutions exist in Switzerland, Denmark, and other parts of Europe; and it is suggested by Mr. Clement Hill, the British Acting Chargé d'Affaires at Munich, that their establishment in England, under the auspices of some leading agricultural society, might lead to a radical improvement in our dairy-farming. America is at present able to supply us with cheaper cheese than we can make at home. This is no doubt because dairy-farming is now pursued there on scientific principles. For butter, also, we are becoming more and more dependent on foreign sources of supply. There is no reason why this should be.

Middle Class Hospitals.

The need of a hospital for the middle classes has at last been felt by medical men, and many valuable suggestions as to the building and government of one for the metropolis have been made in the London papers. In France, Germany, and America there are hospitals of this kind, and all are highly successful. Mr. Henry Burdett, himself a physician, is advocating the erection of a similar building to the Maison Municipale in Paris, which contains about 600 beds, and where charges are made convenient to the means of the patient; and where, for an extra fee, a private room with a nurse may be obtained.

Surely there are thousands of poor gentlemen and ladies in London alone, living of necessity away from home and friends, who would, in time of sickness, be glad of the opportunity of retiring to a hospital where they may receive a superior treatment of their complaint, in addition to domestic comforts superior to those that are to be found in the common boarding and lodging houses of London.

