

THE GATHERER.

Steam as a Light Reflector.

We are all ready to admire the dazzling whiteness of a summer cloud high in the blue sky, or the swelling puffs of locomotive steam; but few of us consider that the cause is due to the reflective power of condensed water-vapour. Condensed steam or water-vapour is a powerful means of diffusing light, partly by reason of its high reflective property, and partly because it first absorbs the light at one place, then emits it elsewhere. A German inventor, Herr Brandau, has patented a means of practically applying it to artificial lighting. The steam is caused to pass through the interior of a glass globe, which is exposed to the beams from the source of light, and it diffuses a uniform brightness around. As a reflector for the electric light this method may yet prove very useful. Mr. Van der Weyde employs a reflector of white cotton to reflect the electric light, by which he takes his beautiful photographs, in a diffused state on the sitter; and the walls of workshops lit by the electric light are usually whitewashed in order to diffuse the light by reflection; but Herr Brandau's plan is the best of these, though of course it is the most expensive.

Greenland Exploration.

The interior of Greenland still remains a closed book to the geographer. Last summer some Danish *savants* attempted to penetrate that mysterious country, and agreed to ascend a high mountain, inland about forty miles. They started on the 14th of July, and for three-and-twenty days struggled against storms of snow, and hail, and thick fogs. On the 31st the weather cleared, and the mountain was ascended. But the explorers could penetrate no further. Ice in all forms extended as far as the eye could reach, and the travellers willingly left the shore of that Greenland where not a bit of green could be descried.

Wooden Books on Woods.

A most interesting as well as novel collection of books is to be found in a library in the province of Cassel. These volumes appear like so many wooden blocks, but each block is a complete history of the tree which it represents. For instance, an oak book is formed thus:—The bark is stripped from the back and the title inserted. One side—these books are all bound in “boards”—is formed from the split wood, showing the grain; the opposite side shows the varnished wood. Inside, as one might naturally expect, are the leaves; but the seed, fruit, the moss that grows upon the trunk, the insects that feed upon it, &c., are all represented as well. To these specimens is added a simple account of the tree, its usual location, and manner of growth, and no doubt other branches of its history.

Phosphorescent Timepieces.

We learn that some Swiss watch-makers have devised a phosphorescent preparation for dials, by

means of which the faces of watches are illuminated in darkness, and legible at the ordinary distance. A clock company has also invented, so it is said, a somewhat similar means of making timepieces and clocks serve the same useful purpose. On the authority of M. Olivier Mathey, a chemist of Neufchâtel, it is stated that phosphorescent dials are commonly made of thin cardboard enamelled like visiting-cards. They are covered with an adhesive varnish, or with white wax mixed with a little turpentine, upon which is finely dusted powdered sulphide of barium, a salt that retains its phosphorescence for some short period. This property is also shared by the sulphides of strontium and calcium, but these lose it more rapidly. In the course of a few days the phosphorescence begins to depart, but an hour's exposure to sunlight will easily bring it back again; or this object can be even better attained by the combustion near the dial of a few inches of magnesium wire, which gives forth chemical rays of a peculiarly restoring character. We are glad that M. Mathey considerably favours us with alternative modes of reviving the exhausted dial. If he had left us entirely at the mercy of the sun, it would be doubtful whether any enterprising tradesman would be bold enough to sell phosphorescent timepieces.

Steam for Heating Purposes.

The Holly system for the general heating of towns by means of steam circulating in pipes is an American scheme, which is being practically realised in New York and Detroit. In New York three miles of street mains have been laid, and upwards of forty large buildings are heated by the system of pipes, which derive their steam from one boiler five feet by sixteen feet in size. The pipes run through fifteen streets, and over a million cubic feet of space is warmed by the steam, which is supplied at a pressure of 30 lbs. to the square inch. The steam, in addition to its heating purposes, can be used for cooking food, washing clothes, and extinguishing fires; and hot water from the condensed steam can also be obtained. The cost is said to be much less than that of ordinary fuel.

Our Colony of Fiji.

From statistics lately published, it appears that English capital and energy are only required, to make the commercial prosperity of the Fiji Islands secure. The British occupation has already given a great impetus to tea, coffee, and sugar planting, as well as to all other kinds of agriculture; while the importation by the colonists of cattle and sheep for food purposes, and wool farming, promises to be a very successful enterprise. The value of the produce of the colony exported, including a few things from neighbouring islands re-exported, was £140,893 last year. These products are cocoa-nuts, cotton, sugar, maize, pearls, &c., which are bought up by England and Australia.

The imports, valued at £134,688, during the same period, consisted chiefly of drapery, live-stock, meat, hardware, and machinery. To all these advantages we may add the fact that the temperature is, so to speak, mild; the mean reading being 80° Fahr.—the lowest is 65°. The climate and soil are especially favourable for farming operations; and altogether we have reason to congratulate ourselves upon the prosperity of our little ocean colony.

Electricity and the Camera.

Electricity, which is extending its sphere of usefulness in so many different directions, has quite recently been invoked by the photographer. The beautiful photographs of Mr. Van der Weyde, taken by the electric light at night or in gloomy weather, are an instance of this service. It is also an advantage in photographing to be able to expose the sensitive plate to the object at the proper moment, without going near the camera for that purpose. This is especially the case when photographing babies, who are usually alive to the conspiracy going on about them. Mr. Cowen, of Porchester Terrace, Southport, has devised a simple plan whereby the shutter of the camera may be opened edgewise by means of a small galvanic battery, the current being put on by a press-button held in the operator's hand. The artist can thus engage the child's attention, and, unperceived, expose the plate at the proper moment. The accessory apparatus required does not interfere with the portability of the camera.

Answer to Double Acrostic on p. 128.

H ollan D
A lib I
R assela S
M errima C
O rland O ("As You Like It")
N esto R
Y e z D

Floating Bee-hives.

It has been reserved for an American honey-dealer to attempt, and to succeed in, a very novel experiment. Hitherto bee-masters have been contented to keep their hives in one place, but the enterprising individual we refer to constructed a vessel to contain two thousand hives. This boat he caused to be moved up and down the Mississippi. He started with the spring from Louisiana; during the summer the bees warmed to their work at Minnesota; and in the "fall" they came down again by degrees. So the busy little inhabitants of the vessel found an ever-changing honey supply in the flowering prairies bordering the mighty Mississippi. The bees were waited upon by skilled attendants, and the honey was taken at certain intervals. We have not heard what the total yield of honey amounted to, but we understand that some hives produced 2 cwt.

The honey was not so good as that produced by the hive-bee, because the species of bee employed was considered somewhat inferior to the true honey-pro-

ducer, and the two species do not agree. But there is no reason why the superior insect might not be taken out on the river for a season.

Unfortunately there is no other country so well adapted for such experiments. America possesses unparalleled water-routes, but a similar vessel might be tried amongst the West Indian Islands, or even on a limited scale upon European rivers. At any rate, the floating apiaries are worth consideration, and might be followed by good results in the increased production of a superior kind of honey. A modern bee-master might employ his floating capital to less advantage even in England.

Frozen Vegetables.

A German chemist, Dr. Paagel, has been investigating the effect of frost on the nutritive qualities of vegetables, such as cabbages, and other green food. The principal change in the plant caused by frost he finds to be the formation of sugar from starch-flour; and as sugar has a nutritive value corresponding to the quantity of starch-flour from which it is produced, he considers that no reduction in the nutritive value of the plants is caused by freezing. The plants should, however, be thawed in steam or tepid water before being used, and they should be used soon after being thawed, otherwise there is danger of putrefaction setting in.

Coal at Lake Nyassa.

A discovery likely to prove of great importance has been made in Livingstonia. We have it on the authority of Mr. Gunn, the Agricultural Superintendent of the Scotch Free Church Mission there, that coal has been found at Lake Nyassa. It appears that when Mr. Rhodes, who accompanied the late Captain Elton on his expedition, had ascended a gully a mile from the lake, he found specimens of pebble-coal. Fired with this discovery he continued his search, and was rewarded by finding three seams of "makala" coal, which the natives say is used on the steamers. Specimens have been brought to Livingstonia. If this coal can be procured in a sufficient quantity in the district, a valuable opening for British industry may be found in the mines.

Duplexing the Atlantic Cable.

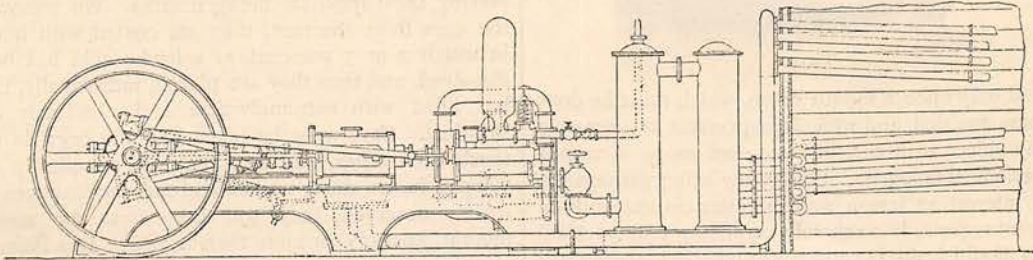
During the last three years the duplex system of telegraphing, whereby two messages—one from each end—can be sent along a wire simultaneously, has been applied to all the long submarine cables between England and India. The apparatus which has hitherto rendered this practicable is known as Muirhead's artificial cable, which is attached to the end of the real cable in the telegraph station. Early in last year Muirhead's system was applied to the French Atlantic cable, and now we learn that Mr. J. B. Stearns, an American, has also applied a method of his with success to the Anglo-American Atlantic cable from Valencia to Heart's Content. Thus,

without the necessity of laying a second cable, the number of messages which can be sent across the ocean is nearly doubled.

Everlasting Flowers.

Visitors to Covent Garden Market must have this season noticed the extraordinary increase in the displays of "everlastings." In the shops, too, some very tasteful bouquets of these *immortelles* have been exhibited. It is understood that by some ingenious process, of which we are not at present aware, the real flowers are desiccated, to appear in the natural form, and in all their native beauty. One method of drying the blossoms is, we know, by burying them beneath fine sand, and then by the gradual application of heat, the required transformation is accomplished. But this simple treatment cannot be applied to all flowers. It would astonish most of our readers to learn the enormous quantities of flowers which arrive in England, and curiously enough the largest demand for the

animal food from America. Their plan was to fix up the chamber of dead meat with ice, and cause a fan-blast, driven by a small steam-engine, to maintain a constant circulation of air over and through the ice, which supplied a uniformly low temperature throughout the whole compartment. But this method, admirable though it is, was not all that could be desired, for the air thus blown over the ice was so necessarily laden with moisture that most of the meat became damp, and consequently unsaleable. The inventors have, therefore, patented in Great Britain, United States, Canada, Germany, and France the refrigerating apparatus shown in the accompanying engraving. This apparatus consists of two horizontal steam cylinders, with their pistons connected by the usual connecting rods to cranks upon a shaft at right angles to each other. The piston-rods of the air cylinders are also carried through the cylinder-ends, and are connected to a double-acting air-pump. There are two air-expansion cylinders fitted upon the same



REFRIGERATION ENGINE.

dried blossoms is in the Black Country. France, Germany, Russia, and our South African Colonies, one and all, send us floral tokens of affection, while various grasses from Hungary and Italy and Southern France appear likely to rival the *immortelles*. These grasses can be applied to almost any purpose of floral decoration, with a most charming effect, after they have been bleached and carefully dyed.

There is no doubt that a very interesting branch of industry has sprung up amongst us, and we trust it may flourish as long as the "everlastings" themselves.

Refrigeration and Preservation.

A new process of refrigeration has been invented, by the application of which animal food, fruit, and vegetables may be imported and preserved for a considerable time without injury or decay. To produce in any given substance a great heat by artificial means has never been a serious matter, but to reduce temperature downwards to any considerable or useful degree has always been a process attended with much difficulty. Nevertheless, there have existed urgent demands for such a process in the pursuit of various industries, and although many systems were in use, none were found to answer all requirements. A well-known firm of importers of American meat have during the last three months, by their system of refrigeration, imported no less than eight millions of pounds of

sole-plate, and between the air-pump and steam cylinder, and the piston-rods are attached to the same crank-shaft as the steam piston, and have cranks set at different angles. The piston-rods of the air cylinders are also carried through the cylinder-ends, each having a double-action of the same capacity as those driven by the steam cylinders attached to it. With two cold-water pumps these comprise the working part of the whole apparatus. When working, the machine extracts air out of the meat chamber by the aid of its air-pumps, and in them it is compressed, in contact with a small injection of cold water, to about 30 lbs. per square inch. From a communication we have received from one of the patentees, we gather that the Anchor Line steamers are already being fitted with this apparatus, and that several practical tests have been made, which have resulted in proving the invention to be perfect in every way. No alterations have been found requisite, and in making the tests no single hitch occurred, which proves that both theoretically and practically the invention is a success. May we not, therefore, expect in the future, by the aid of this system of preservation, fruits, animal food, vegetables, and other produce of the earth placed on our tables whenever they may be required, whether in or out of season, and also expect to see the same apparatus extended to the further use of ventilating and cooling our concert-halls and various other public buildings?

A New Drawing-Pencil.

In many schools throughout the country, there is a kind of "home lesson" which is usually held in great estimation by teachers. We refer to what are called "fancy exercises"—exercises, that is, which are pre-

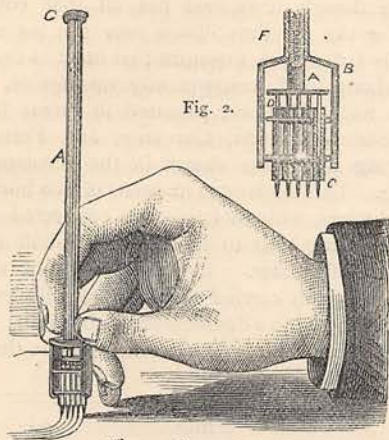


Fig. 1.

scribed only once a month or so, which must be done at home unaided, and which must consist of a drawing of any object, or a carefully executed map. A map is the periodical favourite. Geography being perhaps the most interesting lesson, and the atlas consequently in constant request, it is scarcely surprising that youthful hands should desire to emulate the contour-drawing and colours of cartographers. Approving of such contests as we do, it will not be amiss if we place before our readers an illustration of a novel drawing-pencil, which is specially adapted for helping our young friends in "putting in" the shore or coast lines in their efforts at mapping. Fig. 1 shows the pencil in use, while in Fig. 2 we have a sectional representation, which clearly indicates its construction. A is the stem or body of the pencil, and it has at its end a fork arrangement B, that carries a number of tubes, C, for containing the leads. Several wires, D, project into the tubes, and are fastened to a rod that slides within the tube A. This rod is adjustable by the screw F (whose milled head, G, is at the top of the stem A) and it has for its object the pushing forward of the leads as they decrease. Though the pencil has been particularly designed for representing parallel lines in maps, it can be used in any class of drawings where several parallel lines are required.

Artificial Caoutchouc.

"Kerite," or artificial caoutchouc, invented by Mr. Day, of New York, is made by mixing 27 parts of cotton-oil with 30 parts of coal-tar, and heating them in a cauldron for several hours at a temperature of 150° C. They are then blended with 30 parts of linseed-oil, 12 parts of sulphur, and 5 of ordinary wax or solid paraffin, and the whole heated for five or six hours longer at a somewhat lower temperature than the above, to prevent carbonisation. The mass is then allowed to cool, and is moulded into blocks for future

use. The price is about one-third that of natural caoutchouc, and similar objects can be made of it. Telegraph cables made of "kerite" received honourable mention at the Paris Exhibition.

Cleaning Filters.

The eminent chemist, Mr. Matthieu Williams, has discovered that carbon filters may be readily cleansed by simply pouring a solution of permanganate of potash through them until it comes out as red and bright as when it was poured in. Of course water must then be filtered through, to carry off the residual solution remaining in the pores of the carbon.

How to Preserve Eggs for a Twelvemonth.

There is nothing so excellent as a fresh egg, or so execrable as a stale one, and, considering how many good eggs go wrong every day, it will certainly be worth our readers' while to note the following process, to which Dr. Phipson has called attention, for preserving them fresh for many months. On removing the eggs from the nest, they are coated with butter in which 2 or 3 per cent. of salicylic acid has been dissolved, and then they are placed, individually, in a box filled with extremely fine and absolutely dry saw-dust. Care must be taken that the eggs do not touch each other, and that they are completely enveloped in saw-dust; and should these precautions be strictly observed, they will keep fresh for several months, possibly for more than a year. Dr. Phipson tested the process for two years with most satisfactory results. What we have hitherto said applies to the preservation of the whole egg, but there is also the plan of M. Berg, for preserving the albumen (or white) of the egg for photographic purposes. The white separated from the yolk is evaporated in zinc pans or porcelain cups, at a temperature of 113°. The solidified albumen thus procured is reduced to dust in a mill. The yolk is whipped up by machinery into a light mass, and then spread on zinc plates and evaporated to dryness, at a temperature of 176°, and then pulverised. The powder so obtained keeps for a long period, the white being employed for the purposes to which albumen is applied in the industrial arts, and the yolk for domestic purposes. Both the cook and the photographer, therefore, ought to take an intelligent and lively interest in these proposed methods for keeping eggs fresh for a twelvemonth, or for preserving the valuable parts for a similar time.

The Voice of the Earthquake.

The seismograph is a valuable instrument for graphically tracing on paper the vibrations of the earth which accompany an earthquake or an eruption of Vesuvius; but Professors Palmieri and Michel-Etienne de Rossi have recently united the microphone with it in such a way that the earth's vibrations can now be heard distinctly, although they are quite inaudible to the naked ear. Professor Rosetti has also obtained some surprising results of a similar kind at the Observatory of Vesuvius, which will shortly be published in a pamphlet on the "Italian Vulcan."

Water as a Motive-Power.

A firm of engineers have recently introduced an invention designed for the purpose of utilising water as a motive-power in a different manner, and to a greater extent, than it has hitherto been employed. "Bailey's motor" works under the ordinary pressure of the water sent through the street mains, and may therefore be easily applied wherever such a supply exists. In appearance it is somewhat similar to an ordinary horizontal steam engine. It has an oscillating cylinder, with parts so arranged that the motion of the cylinder cuts off the supply of water at the end of the stroke, a reciprocating action being thereby obtained, and imparted to the fly-wheel by the ordinary crank arrangements. There are no loose valves or tappets in connection with the motor, and all the fixing it requires may be done by a plumber, as there is nothing more to do than to connect the machine with a pipe from the street main. One of the motors is said to be working very successfully at the bottom of a colliery shaft near Bolton, the power being supplied by the water pumped up from the pit by the steam-engine. A large number of laden waggons are drawn up an incline with great ease by this means. The motor has also been utilised for sawing timber, printing newspapers, and many other purposes.

A New Anæsthetic.

Nitrous oxide, or laughing-gas, as it is commonly called, was discovered to have the power of producing insensibility by Sir Humphrey Davy at the end of last century, and since that time it has been widely used by dentists and chiropodists in the painful operations of extracting teeth or corns. The process consists in causing the patient to breathe the pure gas until he becomes insensible. Nitrous oxide is not so dangerous as chloroform, nor so exhausting to the system. Chloroform associates itself chemically with the body, but the gas merely remains dissolved in the blood, and, when it is no longer inhaled, it is quickly breathed out again by the lungs. But there is one serious drawback to its use, namely, the fact that its application cannot be prolonged for fear of asphyxia or fainting being incurred. Now, however, this defect has been overcome by a French physiologist, M. Bert, and insensibility induced by its means can be indefinitely extended. The patient is caused to breathe, not pure nitrous oxide, but a mixture of equal parts of nitrous oxide and air, under a pressure of two atmospheres. By this device the normal quantity of air is supplied to the patient as well as the requisite dose of gas. The results obtained from experiments on dogs show that the breathing and circulation goes on normally while the animal is rendered quite insensible by this method, and on withdrawing the gas, it recovers all its faculties after a few breaths. This is an important discovery, but it has the practical failing of, at present at least, requiring a special chamber to be constructed for the operation. In the case of hospitals, however, this will not be difficult to obtain.

A Repeating Match.

A patent has been taken out for a repeating match—that is, a match which can be struck a great many times and yield a light each time. The match consists of two rods of inflammable composition placed side by side in two compartments within a suitable case. In order to strike the light a scraper is moved by hand along a platform across the open ends of the two rods. The scraper removes a certain quantity of its substance from each rod, and mixing these together, the light is produced. One stick is composed of three parts of chlorate of potash and one part of clay, thoroughly mixed, and formed into a thick paste by the addition of water, then dried. The other stick is made of three parts of amorphous phosphorus and one part of clay prepared in the same manner.

A New Garden Sprinkler.

Gardening has ever been a highly popular and agreeable recreation. It has long been favourably regarded for its beneficial influence upon the human frame, but even as a pleasant means of amusement it acquires more favour every year. No doubt there are

certain drawbacks connected with it, as with most other forms of recreation. The watering-pot, for instance, is a regular nuisance; but *that*, at all events, need no longer plague the heart of the weary gardener, for an apparatus has been invented for reducing the toil and trouble to a minimum. Our engraving al-



most explains itself, but a few words of description may be necessary. The vessel for containing the water is cylindrical in shape, and is to be filled at the tap, at a hole in the top, over which is screwed a small cap so as to keep the liquid effectually imprisoned. This barrel is then placed on the back and securely strapped over the shoulders. As the back bears the burden, the weight is spread equally over so large a surface that it is comparatively unnoticeable. At the bottom of the vessel there springs out on each side a tap, to which is attached an india-rubber tube, having at the end a sprinkling nozzle. A nozzle is grasped in either hand, and the water is scattered in fine spray upon plants or flowers or trees, in any direction, and to a considerable height. The vessel contains a perforated

plunger, which is operated by a hand-lever from without, and which is used for agitating the liquid when any insect-destroying poison has been added to it, so as the more thoroughly to distribute it throughout the mass of water. It is not unlikely that this apparatus would be very useful in the case of a burning chimney, as it could be readily filled with water, which could be directed up the chimney to some height, probably far enough to speedily get the fire under control.

Telegraphic Shore-Lights for the Thames.

In reporting on the late lamentable collision between the *Princess Alice* and the *Bywell Castle*, the Board of Trade gave it as their opinion that no red or green beacon-lights should be used on the banks of the Thames, so long as red and green lights were also used as the port and starboard lights of ships, because of the risk of vessels mistaking the bank lights for those of ships. Their advice will probably be taken, and in anticipation of this Sir William Thomson, the great Glasgow physicist, advocates the adoption of his system of flashing telegraphic signal-lights for the Thames banks. This system consists in eclipsing each light so as to cause a series of dark intervals or occultations rapidly succeeding each other in the order of some letter in the Morse telegraphic alphabet. This alphabet, as is well known, consists of two elementary signs technically called a "dot" and a "dash," the dash being three times longer than the dot. Each letter of the alphabet is, in telegraphy, signalled by a combination of these dots and dashes; thus A is represented by a dot followed by a dash (· —), B by a dash followed by three dots (— . . .). Now, with the lights, a short eclipse of, say, half a second would be equivalent to a dot; and a longer one of, say, 1½ seconds would be a dash. A dot eclipse followed by a dash eclipse would signify the letter A, and the pilot would know this as the distinguishing letter of a certain shore light. If the letter was repeated by the light every 15 seconds, the mariner would never have long to wait for a verification of his position. Lights on the north bank of the river might give only dot eclipses, while those on the south bank gave a mixture of dots and dashes, and thus the distinction of banks would be at once apparent. This system of Sir William Thomson, with a simple mechanical eclipse, was first applied to the Holybank Light in Belfast Lough a year or two ago, and more recently it has been employed on the Clyde, with a gain of penetrating power in the white light used over the former coloured ones, and in freedom from mistakes by pilots.

Double Acrostic.

A poet, lexicographer, and sage,
Whose fame decreases not from age to age:
His life was written with most tender care,
Fame's garland will its author ever wear.

Far north on Greenland's icy shores
This humble town you'll find,
A refuge from snow for Esquimaux,
And a shelter from storms unkind.

His heart was filled with deep and poignant grief
Because his lady fair could love him not;
But a sweet maid, disguised, gave quick relief,
He wedded her, and all his cares forgot.

Fierce stands the warrior and bars the way,
The hostile troops, unaided, keeps at bay,
And saves Imperial Rome that anxious day.

Momentous ever-present season ! !
If we would use the soundest reason
And truest wisdom, we should well employ
The present, which alone we can enjoy.

Where now our troops the fight sustain
In passes deep, on desert plain
He fought with valour forty years ago ;
Like chaff before the wind he swept the foe.

Have you heard that this bird
Is the symbol of learning,
With its wise open eyes
So grave and discerning ?

Dressed as lonely player she appears
And soon entrances her estranged lord ;
The love-spell works—no further need for fears :
Music hath charmed—again she is adored.

Soap and Fever-Germs.

The advantages of cleanliness have often enough been insisted on, but if in the opinion of some obstinate mothers they have wanted a good clinching argument to drive them home, that defect can now be supplied. For, in the light of scientific research, it would appear that cleanliness is absolutely essential to physical well-being, so that repeated injunctions must acquire increased force and value if looked at from a sanitary point of view. Some of the most malignant forms of disease are also highly contagious. It is said that 50,000 typhus-germs will thrive on a spot the size of a pin-head, while in their desiccated or dry condition these germs or spores can be carried anywhere, like thistledown, by every wind that blows. This dreadful ubiquity of the most fatal types of disease clearly indicates that such preventives as we may happen to possess should be zealously and continually put in force. Fortunately there are measures of an almost prohibitive character within everybody's reach. It is a known fact that the poisonous matter causing such diseases as typhus-fever and small-pox is deprived of activity at the boiling point of water. This is well established, and indeed the process of disinfection by heat rests upon it. We believe that Dr. Joseph Richardson, of Philadelphia, maintains that water of the temperature of 120° will boil the germs to death. But not only can these terrible spores be killed by boiling water, but soap chemically poisons them. It is evident therefore that a free use of soap in daily ablutions is not only a first requisite of bodily comfort and cleanliness, but is also one of the greatest safeguards against the most virulent diseases. It is a singular thing that the most malignant types of disease with which mankind are scourged are at the same time of a very infectious nature. It is equally singular that these terrible disorders can be effectually prevented by the simplest, commonest, and cheapest of all remedies, the daily use of soap and water.