

rounded with hot stable-dung you will rapidly force on this popular vegetable; or, if every gardening appliance is not so ready to hand, you can utilise the dry leaves which just now are falling apace, and pile a large heap of them all round your sea-kale pots, though this, of course, is not so expeditious a method as the proper and more ordinary one of forcing. Next, if by any accident your crop of potatoes has not been all got up—for this is an October operation—delay not a day further in digging them. And then, by a little good management, salads—more particularly the smaller ones—can still be reared either under a hand-glass or in warm borders, where you can protect by litter: indeed, such as mustard and cress can easily be grown in the house—not the greenhouse, but the old home itself, where in a warm room the children would be interested and instructed by seeing how soon it grows.

Onions, too, that were sown at the end of the summer can be drawn quite small for your salads; for why are we to content ourselves with having only a profusion of salads in July and August, and hardly

any for the remainder of the year? Apropos of the onions, those that were some time ago gathered and stored ought to be gone over, and any that are rotten, soft, or damaged in any way carefully removed from the rest. And coming for a few minutes to the fruit garden: a visit to the shed or store-room where our apples and pears are stowed away ought to be made, and all the decayed and damaged fruit removed. As far as possible the apple-room ought to be in some extreme or out-of-the-way corner of the house, for their fragrance is so pungent and persistent as in some cases to amount to almost a nuisance. A rough and dry shed in the garden itself, with shelves along its top for fruit-storing, is a great convenience and an inexpensive luxury: it answers the purpose at intervals of a shoe and knife house, a lumber-room, tool-house, potting-shed, compost-room, and so on, while with open doors you can in April harden off under its protection many plants for after bedding-out. Indeed, it is almost a necessity in the garden, and on wet days many of your operations can be carried on with comfort under its shelter.

## THE GATHERER :

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, LITERATURE, AND SCIENCE.

Correspondents are requested, when applying to the Editor for the names and addresses of the persons from whom further particulars respecting the articles in the GATHERER may be obtained, to forward a stamped and addressed envelope for reply, and in the case of inventors submitting specimens for notice, to prepay the carriage. The Editor cannot in any case guarantee absolute certainty of information, nor can he pledge himself to notice every article or work submitted.

### A Watch Galvanometer.



The woodcut illustrates a pocket galvanometer for measuring electric currents of about an ampere or less. The construction of the apparatus does not essentially vary from that of the ordinary galvanometer of the laboratory or testing-room. The instrument is made so small that it easily goes into the pocket, and it is likely to be useful to electricians and ama-

teurs, especially now that electric lighting promises to become more general.

### Natural Spheres.

At a recent meeting of the Genevan Society of Physics and Natural History, M. Mallet exhibited balls about 4 inches in diameter, one black, of vegetable origin, the other white, of mineral origin, and both of almost perfect sphericity. The black ball had been formed in a very curious manner. It was found inside a piece of oak which had been used as a mill-wheel shaft. A cavity had formed in the wood through decay or some insect, and the dust of the wood cohering through moisture, as the shaft revolved, gradually grew during the lapse of years into a round kernel. The white ball was a calcareous pebble found with

many others in a grotto, through which a torrent flowed into the Rhone.

### Home Reading.

An effort is being made to establish a National Home Reading Circle, with the object of directing and aiding the private studies of the people, especially young persons, artisans, and general readers. Various courses of reading, approved by experts, will be recommended, and local centres organised, and encouraged to meet periodically for mutual improvement and recreation. Science, literature, and history will be the leading subjects.

### Eucalyptus Honey.

This honey is the product of the small black bee of Australia, which frequents the Eucalyptus-trees with which the colony abounds. The honey is of a golden colour and almost candied in our climate; but when heated it becomes quite syrupy. Its odour and flavour clearly indicate its source (the Eucalyptus essences forming about one-third of its bulk) and classify it as a honey not like any other. This product is interesting to us from the fact of being yielded by those remarkable trees, the Eucalypts, the anti-malarial and purifying properties of which have caused them to be transplanted to other parts of the world with a view to rendering habitable unhealthy districts. The Eucalyptus owes most of its therapeutical properties to a



volatile oil contained in the leaves, which oil acts as a febrifuge in fevers, especially typhoidal and malarial, and as a stimulant and anti-spasmodic in asthma, bronchitis, and whooping-cough. Eucalyptus honey, thanks to the energy and industry of the bee, is a product that contains, according to an analysis published in a French medical journal, all the essences to be found in the Eucalyptus-leaf, in combination with about sixty per cent. of sugar in its purest form. It is used as a homely and simple remedy for coughs, bronchitis, asthma, and whooping-cough, while in feverish conditions it has, it is stated, given satisfaction. Being sweet and not unpleasant in flavour, it is very acceptable to children, to whom it is administered either in hot milk, hot tea, or hot water; from one to four teaspoonfuls in either of the above-mentioned vehicles will cause in a short time a feeling of warmth to pervade the body.

#### An Employés' Time-Recorder.

This apparatus is intended to make a printed register of every servant's "number," the time of his coming and leaving for the day, the hours of his labour, and whether it is short time, full time, or overtime. As illustrated herewith, it consists of a lever clock showing two rows of figures, the upper indicating tens and hundreds, the lower units. The last are in duplicate, the left showing the time of arrival, the right that of leaving. Above the clock-case is a lever, which the servant touches in order to print the record, which is made on a travelling tape of paper with type and ink. The clock requires to be wound up weekly, and the ink roller to be moistened every month or so. As many as 42 records can be made on 12 inches of paper, and the machines are made to record different numbers of workmen.

#### An Electrical Slide-Rule.

Dr. J. A. Fleming has brought out a slide-rule which is likely to be useful in computing the energy utilised in electric lamps and motors. It consists of a rule having four scales, marked amperes, volts, candle-power, and watts. The first and fourth scales are engraved on the rule, the second and third on the

slider. There is also a brass slider having a reading point or index. If we know the current through a lamp, the volts at its terminals, and the candle-power, the rule gives us the watts per candle-power. If we know the watts per candle-power and the candle-power, we can also find the current corresponding to the volts at the terminals. If we know the volts and current, the rule will tell us the resistance of the lamp while hot, and also the candle-power approximately. Householders, as well as electricians, may profit by the rule.

#### Terra-Cotta Lumber.

A new building material called "terra-cotta lumber" was recently described by Mr. E. B. Harper at a meeting of the Victorian Institute of Architects. It is a porous brick made by mixing clay with sawdust in a sufficient quantity to serve as fuel in burning the brick, and thus rendering the latter porous. The term "lumber" is evidently applied to the material because it can be cut and worked with tools like timber. The pores assist in holding mortar; and when filled with pitch, make the "lumber" waterproof. The outsides of the material can also be glazed like other earthenware. Its weight is about half that of ordinary brick, and its resistance to a crushing stress about 840 lbs. to the square inch.

#### Full Fire-Pails.

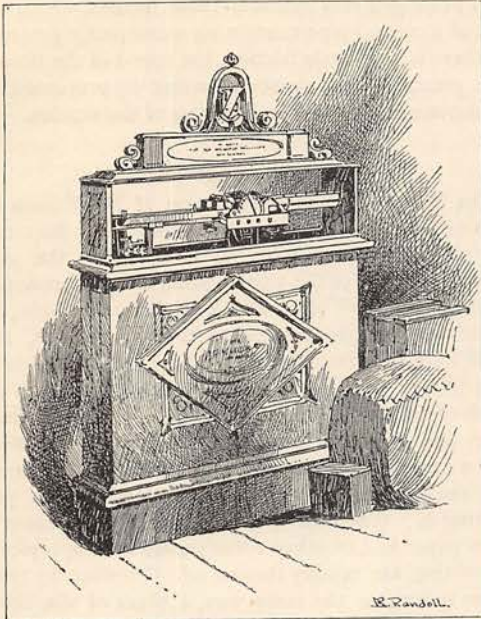
Fire-pails, full of water, suspended at various accessible points in all large buildings, have now become a recognised institution, and they have often been of very great and immediate service in cases of fire. Unless they are carefully attended to, however, the water soon evaporates, and just when they are wanted the pails may be found empty. In order to prevent the possibility of this, it has recently been proposed, by an American inventor, to cover each pail with an air-tight sheet of tin foil, which, whilst preventing the contents from evaporating, can, when necessity arises, be readily removed. In very cold climates difficulties may arise from the freezing of the contents of the pails, and to guard against this, it is suggested that the pails be filled with brine or some such liquid in place of water.



AN EMPLOYÉS' TIME-RECORDER.



## An Electric Weighing Machine.



The weighing machine or steelyard which we illustrate is the invention of Mr. Snelgrove, and is extremely ingenious. The whole cycle of operations is performed automatically, it being only necessary to put the thing to be weighed on the platform. The current is switched on, and the load balanced; the mechanism is afterwards put to zero, and the current switched off when the weighing is done. The figure corresponding to the weight is properly indicated to the attendant. The machine can be made in different sizes, to weigh a pound or fifty tons, as required. One of these weighers excited considerable interest at the Birmingham Electrical and Industrial Exhibition.

## The Potato as a Soap.

We may mention for what it turns out to be worth, a statement of *L'Industrie Parisienne* to the effect that boiled potatoes are used in a certain Parisian laundry in place of soap. Only water and the vegetable are employed in the washing; and the clothes, whether cotton or woollen, are said to be a credit to the establishment.

## Buhach.

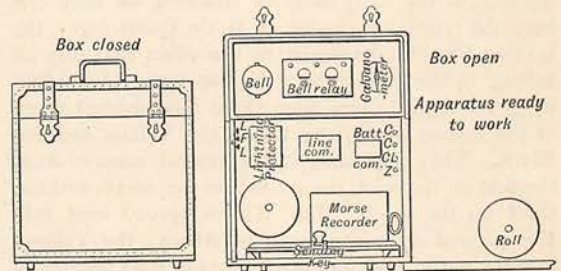
Buhach is a fine powder made from the flowers of the *Pyrethrum cinerariaefolium*, and much used in California for the destruction of insects. It was introduced into California by Mr. Mileo, a native of Dalmatia, and is now cultivated on a large scale by the Buhach Producing and Manufacturing Company, of Atwater, Merced County, California. The mills for grinding the flowers are situated at Stockton, near San Francisco. The pyrethrum grows to a height of 30 inches; the flowers are harvested in the end of May, dried in the sun, and ground to powder. They contain a volatile oil which makes the powder very destructive to insect life.

## Apple-Grafts on Old Pear-Trees.

Mr. Gladstone, the ex-Premier, recently drew attention to a fact which deserves to be well known. It is that pear-trees, when they become old and past bearing, may be successfully grafted with scions of apple-trees, and thus made to yield apples. Recent experiments in this direction have been very encouraging.

## A Portable Telegraph Office.

The Eastern Railway Company of France have introduced a portable telegraph office on their lines, to enable them to establish telegraphic communication at a point where there is no regular office. The example might be followed on some of our own railways, since it must prove useful in case of accidents or break-downs. The office is comprised in two boxes of moderate dimensions. The first, or office proper, is 1 foot 5 inches long by 1 foot 5½ inches high, and 8½ inches broad. It is arranged as shown in the figure and contains a Morse ink-writer, a sending key, a roll of paper, a vertical galvanometer, a bell relay, call-bell, two commutators, an ink-bottle, pencil, and a block of note-paper. There is also a battery of 24 Leclanché cells in ebonite cases, and a number of tools and spare materials, such as wire and writing implements. A scraper to clear the rails from rust is added in order that a good "earth" connection



may be obtained, when the apparatus is joined up between the telegraph wire and the ground, for signaling to the distant station.

## Mexican Cave-Dwellers.

Lieutenant Schwatak reports the discovery of a curious tribe of cave-dwellers in the unexplored regions of Northern Mexico. Their caves are similar to the abandoned cliff-dwellings of Arizona and New Mexico. A notched pole placed against the face of the precipice enables them to climb to the entrance, but they are expert climbers independently of this. These people are tall and spare of figure, and of dark red complexion, resembling the negro. They are very wild and timid in their behaviour, and are believed to be sun-worshippers. While upon this subject, we may refer to the remarkable discovery of human footprints in a stratum of volcanic rocks at Lake Managua in Nicaragua by Dr. Flint. The prints, of which a specimen is shown in the figure, are 9½ inches long and 4½ inches broad at the toes, and the foot which made them was probably about 8 inches



long. They occur beneath some twelve layers of tufa, sand, and pumice. Others were found by Dr. Flint on the southern slope of the Sierra de Managua. In one case they proved that the foot had been encased in a sandal or a moccasin. With regard to the question of age, Dr. Brinton, who has recently



investigated the subject, comes to the conclusion that, so far as is known at present, these footmarks cannot be removed further back in the scale of geological time than the present Post-Pliocene or Quaternary period. They present no evidence of belonging to an inferior type of man. With regard to the general question of the early races of America, we may cite here the recent conclusion of M. de Quatrefages, the leading French ethnologist, to the effect that they all belong to the fundamental Yellow type. According to this authority there were three fundamental types of the human stock: the White, the Yellow, and the Black. They originated in the central mass of Asia, the first on the west, the second on the north, and the third on the south. The Whites spread west into Europe and along the north of Africa; the Yellows into the north, east, and other parts of Asia, including the Malay peninsula and islands; the Blacks descended into Africa and Australia. The principal branches of the Whites are the Finns, the Aryans, and the Semites, but there are other "allophylian" Whites as yet unclassified, and these extended through North Africa even to the Canary Islands. Such are the latest results of ethnological research as communicated to the French Academy of Sciences.

#### A Hydraulic Railway.

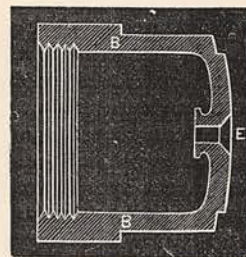
One of the amusements of Paris just now is the hydraulic railway, a rival to the switchback monstrosity. It is the invention of M. Girard, developed by M. Barré, and is laid down on the Esplanade des Invalides for a length of 200 yards. The train has no locomotive, and the carriages no wheels. It is supported on broad rails, rising above the ground by means of metal blocks. Before the train is started, water under pressure is forced through valves in these bearing-blocks, which are thereby lifted off the rails and rest on a film of water. The water-borne train is then propelled by the force of water-jets issuing from nozzles at intervals along the middle of the

line, and striking on pallets under the carriages. The train in its progress controls these nozzles, which are part of a central pipe containing water under pressure. As there is very little friction, the speed of the train is very great, and the waste of water is prevented by the automatic opening and closing of the nozzles.

#### The Mimeograph.

The Mimeograph is an invention of Mr. Edison for duplicating type-writing, autographs, music, drawings, and such-like documents. It is based on the well-known principle of the stencil-plate, and the apparatus consists of a steel plate with a prickly under-side, the points on it numbering 200 to the square inch, and made by cross-grooving the surface. The plate is  $1\frac{1}{2}$  to 3 inches wide, and long enough to extend the width of the stencil-sheet, which is of thin paraffined paper and laid over the grated surface of the steel. The writing is then made with a stylus on this paper, and the stencil obtained by the steel points perforating it. When the latter is placed over a sheet of clean paper and an inked roller passed over it, copies of the writing are readily thrown off. Printing by typewriter is done in the same way, a sheet of silk being placed between the stencil-paper and the points. From 1,000 to 1,500 copies can, it is stated, be made from one stencil-plate, and the type is not injured. A sub-committee of the Franklin Institute have examined the apparatus and awarded the John Scott medal to its inventor. It is reported that Edison is engaged in constructing a "far-seeing" machine, but as yet not even the principle of the apparatus has been disclosed. Meanwhile a French inventor has deposited a sealed packet at the French Academy of Sciences, which purports to explain a device for attaining the same object.

#### A Lubricating Axle-Box.



An axle-box so formed as to contain a lubricator is shown in section in the accompanying figure. It is the invention of M. D. G. Labbé, of Paris, and resembles an ordinary axle-box, except that there is a hole, E, for introducing the lubricator, and a sufficient space, B B, to contain the

latter, while the projecting rim or flange on the inside of the hole dips into the oil as the box revolves, and scatters it by centrifugal action on the end of the axle.

#### An Alternate Current-Motor.

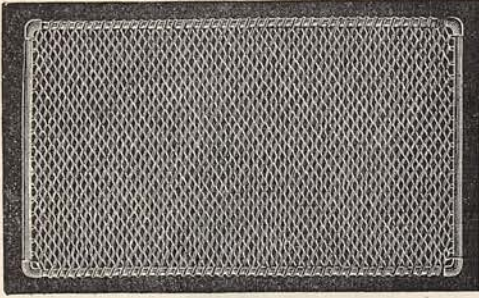
Hitherto there has been, with one exception (the Tesla motor), no machine for turning alternating electric currents into mechanical power. The lack, however, is now supplied in a satisfactory manner by a motor introduced by Messrs. Ganz and Co., the well-known Hungarian electricians. The machine is, according to recent trials, capable of transforming



from 70 to 80 per cent. of the current into mechanical power. It will now be possible to employ alternating currents for motive purposes as well as the continuous currents which have been solely used heretofore.

#### A New Wire Mat.

A wire mat, constructed on a new plan, has recently been introduced, and is illustrated in the figure. Cross



and diagonal wires are avoided, the wires being intertwined and locked together as shown. The mat is thus very light, the frame being of steel tube, and it allows the dirt to fall through. It requires little or no cleaning, and is likely to be useful in public carriages as well as houses or halls.

#### Iron Cement.

The following cement is recommended for mending iron rails, grates of stoves, and so on, by an American mechanical journal:—Take equal parts of sulphur and white lead, and incorporate with  $\frac{1}{2}$  part of borax into a homogeneous mass. To apply the composition, it is wetted with strong sulphuric acid, and a thin layer of it placed between the surfaces to be joined, they being at once pressed together. In five days the cement will be dry, and, it is said, the joint will be strong enough to resist the blows of a hammer.

#### An Automatic Lamp.

It is reported that the South Eastern Railway Company are about to introduce an automatic electric reading-lamp into their carriages. On putting a penny in the slot a five-candle power lamp will be available for the use of the passenger. It will burn for half an hour. Should the lamp be out of order the penny drops through the slot and is recovered by its owner. The whole of the lamps in a carriage are fed by one accumulator.

#### A New Method of Painting Porcelain.

The process of M. Bonnaud for designing on porcelain, china, or earthenware is intended to effect the results of hand-painting in a comparatively short time. It consists essentially in preparing the design in colours on a prepared glass, and transferring it to the porcelain surface. The glass is covered with a preparation containing bichromate of potash, and when dry is put in a printing-frame, and an unmounted photograph on

paper of the picture to be copied is laid over it. Exposure to the light gives the glass the power of taking up more or less of the mineral pigments which are afterwards applied to it in a dry state by the brush. Various tints are added in this way, and the picture is fixed. The brighter colours and higher lights are then put in, until the picture on the glass is complete. It is transferred to the porcelain by a special process, in a chemical bath, by means of a collodion film. The porcelain is then fired and the design fixed in the material.

#### Giants of the Forest.

According to a recent report of the Conservator of Forests to the Victorian Minister of Lands (Australia), the tallest tree in the Dandenong Forest is 300 feet high; that in the Black Spur Forest 302 feet high and 52 feet in circumference. At Mount Bawbaw there is a tree 470 feet in height, another in the Cape Otway range 415 feet, and one on Mount Conawarra-bool 336 feet high, and no less than 69 feet in circumference.

#### A Public Safety Signal.

A system of signalling which connects the policemen of a town with headquarters has been tried for some time past at Islington, as previously mentioned in the GATHERER, and has given much satisfaction. We are now able to give a fuller description of the system, which comes from America. Signal-boxes, each having a "number," are placed at different points of a policeman's beat, and electrically joined up to the police station. From these a policeman can send intelligence to the office either by a telegraph, which records the message, or by a telephone. Aid can thus be obtained at a moment's notice. Householders can also, under certain conditions, have the use of the signal-box, keys being provided for this purpose. In connection with the system a "patrol wagon" is provided, having stretchers, splints, and surgical appliances to be used in cases of accident.

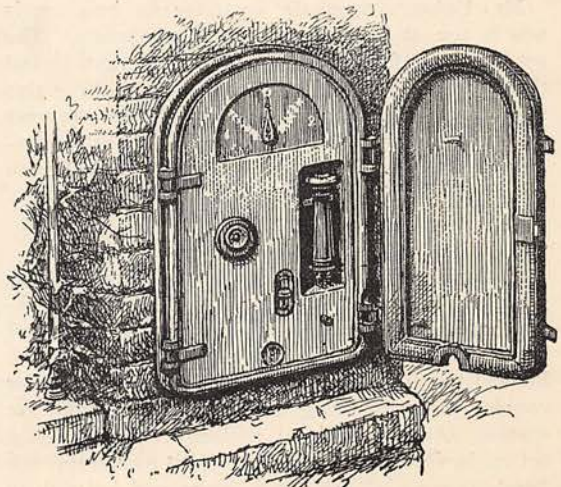
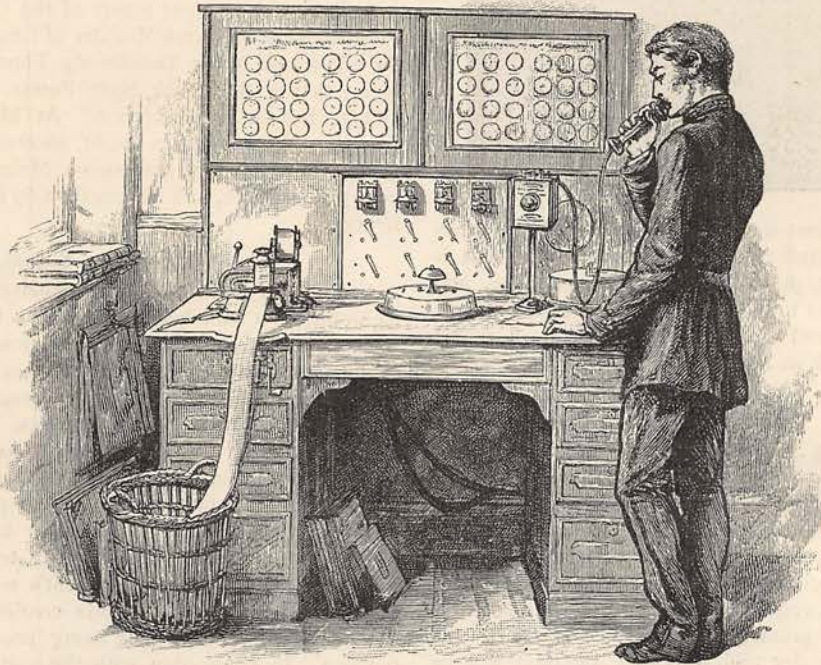


FIG. 1.



This wagon is always ready to start, and is manned by several of the police. Fig. 1 shows the signal-box open. It is merely an iron case holding the telegraph apparatus and the telephone, as well as the call-bell. The telegraph employed is a dial pattern, similar to the well-known domestic telephone of America. A dial or face, shown above, has several messages or requests printed on it, and all the operator has to do is to turn the hand or pointer of the dial to the "request" he wishes to make. Fig. 2 illustrates the corresponding apparatus at the police station.

range can be performed by means of this electric fire. Obviously the process is a very clean one, as the heat is pure and free from smoke and gases. From cooking to the table is an easy step, and we may mention here that a lady recently delighted her guests at a dinner party by marking their places with full-blown roses, on the petals of which they found their names delicately traced in a white line. This was effected by sending an electric current from the point of the stylus used in writing. It had changed the colour of the leaf.



A PUBLIC SAFETY SIGNAL.—FIG. 2.

#### The Magnetic Ore Sifter.

Mr. Edison's magnetic separator for iron ore is now in use at Bleichtersville in Pennsylvania. The ore is brought from the mine to a crushing-mill, and there ground, then sifted. From the sieve the grains fall through a hopper, past a powerful electromagnet 6 feet long and 6 inches in diameter. The iron particles are drawn to the magnet, and the dross falls into a heap to be wheeled away.

#### An Electrical Range.

At the Hotel Bernina, Samaden, the electric light is generated from the power of a waterfall in the neighbourhood, and as this power is always available and costs practically nothing, the management of the hotel have been advised to utilise the current for cooking purposes during the day, when no lights are wanted. An experimental cooking range has been set up, in which the electric current is passed through "resistance coils" of German silver, and heats them red-hot. All the ordinary cooking operations of a

#### Rolling Liquid Metal.

A rolling-mill for producing sheet metal from the molten metal, instead of from a billet or bar, has been at work for some time past in the can factory at Maywood, near Chicago. It consists of large rolls kept cool by circulating water, and these not only thin out, but cool the liquid metal into sheets.

#### A Store of Stories.

Mr. Marshall P. Wilder calls his volume of recollections, recently published by Messrs. Cassell and Co., "The People I've Smiled With." Doubtless the first effect of this publication will be to very largely increase the number of people who have smiled in company with the author, though he may never meet or see thousands of them. Throughout the volume Mr. Wilder has scattered a number of "bracers"—to use his own expression—such as he is wont to employ in his public efforts to make other people smile. To any one bound on a journey we recommend this easily read little work as a most admirable and suitable companion.