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 Darning-Weaver.

A darning-aid has recently been introduced by a Birmingham firm, and is illustrated in our woodcut. The fabric to be darned is stretched over a wooden block, and a couple of hooks inserted in the work. The worsted is then laid as a warp backwards and forwards between the weaving-hooks, as shown, and the woof is put in by hand. At each lay of the woof the weaving-hooks are reversed by the finger, and the woof made fast at each end to the fabric itself. The darn which results is very close, and it is done in half the time required by the ordinary method. Tapestry, ribbon-work, and such-like, may also be executed with its help.

A Straight Railway.

The longest reach of railway without a curve is said to be a length of the new Argentine Pacific Railway from Buenos Ayres to the foot of the Andes. For 211 miles this line is without curve or cutting, or embankment deeper than a yard. The plain across which it runs is without timber, and metal sleepers have been used. The line will ultimately cross the Andes, and connect with the system of Chili.

A Perpetual Calendar.

A revolving calendar has lately been registered by Mr. G. S. Crisford, by means of which, given only the Sunday letter, the calendar for any month in any year, from A.D. 1600 onwards, may be readily found, or the day of the week upon which any given date will fall ascertained at a glance. In principle it is very simple, being, as it is, dependent upon the fixed laws which govern the construction of the yearly calendars, but it will probably astonish many people to see the extent to which these laws may be tabulated, and the clever manner in which Mr. Crisford has availed himself of them.

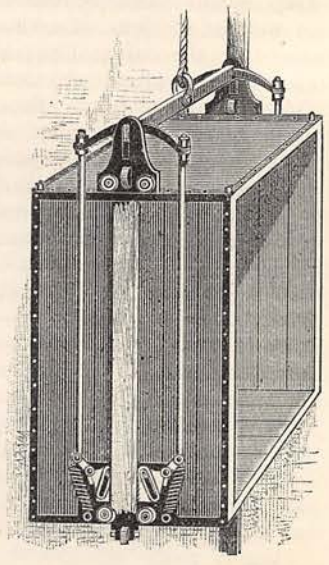
For Walkers and Standers.

People who have to stand for long periods during the day, or who walk long distances, often suffer considerably from a swelling of the feet. They would, probably, derive some benefit by using a powder which has been introduced in the German army for sifting into the stockings of the foot-soldiers. It consists of three parts of salicylic acid, ten parts of starch, and eighty-seven parts of pulverised soapstone. This powder keeps the feet dry, prevents chafing, and heals any sore spots.

Compensation Braces.

Some new braces which have been recently patented have many points about them to commend them. With their use buttons disappear from trousers, and their place is taken by narrow strips of brass which are attached by rings to the spring clips at the ends of the braces, with the result that any ungainly creasing of the cloth is avoided. But the peculiar feature of these braces is at the back, where the two shoulder-straps are joined by a tubular band of leather, upon which slides the back piece of the braces, thus allowing for free play when either shoulder is raised or lowered. There are very few men who would not feel the advantage of these compensation braces.

A Safety-Rope Lift.



Lifts actuated by ropes are again coming into favour, owing to certain disadvantages attending the use of hydraulic lifts; for example, the absence of water-power sufficient, or the necessity of sinking a well to a depth equal to the height of the lift. Mr. E. T. Cleathro has introduced the rope-lift which we illustrate. The cage is suspended by a steel-wire rope passing over a pulley on the top of the lift, and thence down to the winding apparatus, which may be situated in any convenient position. The cage

is started in the ordinary way by pulling a side rope ; and it stops automatically at the end of its range. Moreover, it is provided with a safety appliance, which prevents it dropping if the rope should break. This apparatus is shown in the figure, and consists of two toothed castings pivoted in such a manner, and held back by spiral springs, as to clear the guides of the cage. When the rope slackens or breaks, however, these castings are forced against the guides, which are caught by the teeth, and the cage is thus jammed in its passage.

The Nicaragua Canal.

The proposal to build a ship canal from Greytown on the east coast of Nicaragua, Central America, to Brito on the west, and thus enable vessels to pass from the Atlantic to the Pacific without circumnavigating South America, has at last been sanctioned by the United States Government. The total length of the route is 169·8 miles, of which 56½ miles are through Lake Nicaragua, 84½ by river and basins, leaving only 28·8 miles of actual canal. There will be six locks—three on the Atlantic and three on the Pacific portions of the canal. The San Juan River, which is the outlet of the lake on the east side, will require to be deepened, and otherwise engineered. The depth of the canal will be 30 feet, and it will be capable of carrying the largest vessels afloat. The cost of the work is estimated at 65 million dollars, and it is expected to be finished and open for navigation in 1895. The climate, though bad in the swampy seaboard, is better inland. The country is stated to be rich in minerals, and but sparsely populated with white men, Indians, and negroes.

The Preservation of Pianos.

The popular idea about pianos is that they ought to be kept very dry, but the latest statement on the subject is that this notion is entirely fallacious. It is said that cold and dampness do not injuriously affect pianos to anything like the extent that dryness does, and this is the reason. The sounding-board—the very life and soul of a piano—is purposely forced into the case, at the time of manufacture, so tightly that it bulges up in the centre. The wood of which it is constructed is supposed to be as dry as possible, but, naturally, it contains *some* moisture, and acquires more on damp days. But when a piano is situated in an over-heated dry room, all the moisture evaporates, the sounding-board loses its "bulge," gets flabby, and eventually cracks. Even if this last does not happen, the tone is said to lose its resonance. The proposed remedy is to have a living barometer in the room in the shape of a growing plant : while the plant thrives, so will the piano, since the plant is bound to have a necessary supply of water. Another remedy is to keep a vase, with a sopping wet sponge in it, near or under the piano, all the time that the room is heated.

Agatised Wood.

A block of agatised wood weighing 4,200 lbs. was recently on view in New York. It measured 33 inches by 34 inches by 4½ inches, and came from the petrified forests at Chalcedony Park, Arizona, near Corriza. This petrified wood is now used to make table-tops, mantelpieces, and so forth, in America. The polished surface resembles a black and yellow marble, but the stone is, of course, much harder than marble.

A New Library Indicator.

Mr. Bonner, of Ealing, has devised an indicator for showing subscribers to a library and the librarians the books in or out on inspection. It consists of a frame in which little blocks of wood having the numbers of the respective books are inserted. Fig. 1 illustrates a block, having its five sides coloured respectively black, red, blue, green, and brown, from left to right, and the number of the book printed on each. Fig. 2 shows a part of the frame with the blocks in their receptacles, and the corresponding names of the books on the left. Now, if a blue side is shown to the public it signifies that the book is in the library ; and the librarian sees this also from the black

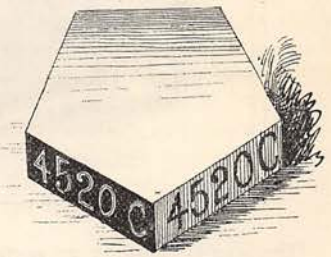


FIG. 1.

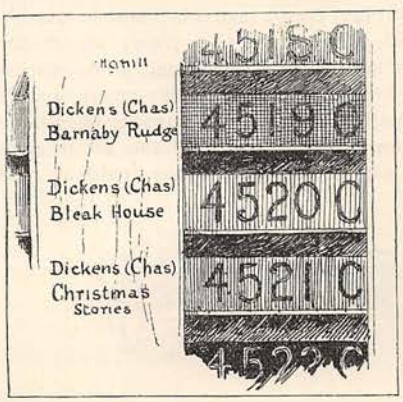
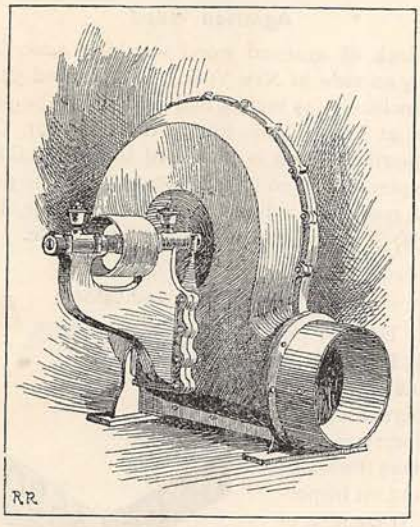


FIG. 2.

side of the block being exposed on the left of the block behind the frame. Again, if a red side is shown to the public it tells that the book went out the current week, and the librarian knows this also from the brown side being shown on the pentagonal block behind the screen. In this way the four weeks of the period allowed by the library are indicated. In place of the usual ticket, Mr. Bonner proposes to have a "form" pasted in the cover of the book, with the subscribers who have read it entered there, so that a history of the book's movements may be preserved. An indicator such as we have described is a saver of time, and likely to be useful in these days of public libraries.

Antiseptic Ventilation.



The idea of charging air supplied to buildings with antiseptic vapour is due to Mr. Burroughs, who has recently appiled it to the ventilation of premises in Snow Hill Buildings, Holborn Viaduct, where it can now be seen at work. The method of ventilation adopted is that of Mr. B. F. Sturtevant, introduced into England from America, where it is already largely employed. It consists in forcing fresh air from the purest available source outside, into the building by means of a rotary fan or air-blower. This fan, which is illustrated above, can be driven by the waste steam from an engine on the premises, and at the same time heated by the steam. The temperature thereby given to the air is regulated by the simple device of mixing cold air with it in the proportions required. Flues or pipes convey the warmed air to the various parts of the building where it is required; and the outflow from the pipes is controlled by simple regulators. Thus both the temperature and supply are under the complete control of the persons in the building. The advantage of forcing the fresh air into the building under a slight pressure are that cold draughts from without are excluded, and the vitiated air is forced outwards by every available opening. In a building supplied with electric lighting apparatus, the waste steam of the dynamo engine is utilised to warm and ventilate it at the same time. By inserting in the flue trays of porous material such as cotton waste, soaked in essence of eucalyptus, globules, pinol, or any other antiseptic and aromatic extract of a volatile nature, the air in its passage to the various rooms of the building, or it may be to any one particular room, is impregnated with antiseptic vapour. For hospitals the system is evidently well adapted, and very complete, since it may include the electric light, warming, and antiseptic ventilation in one process. For private individuals suffering from diseases of the breathing organs, it is also equally applicable, whether in the office or the home. While upon this subject we may also mention the antiseptic respirator of Mr. Burroughs, here illustrated. It is called the "pinol inhaler," but of course, other essences than pinol, such as eucalyptia, may be used with it. The device consists of a glass tube made of a cigar shape with a mouthpiece at one end, by which the person using it sucks in each breath. We may also call attention to the "tabloid" system of taking medicines, introduced by Mr. Burroughs. Medicines of all kinds are prepared in the form of small dry tabloids or "drops," each being a dose. These tabloids can be arranged in portable cases; and we may add that Mr. H. M. Stanley was provided with such a medicine chest on his last journey to relieve Emin.

AN ANTISEPTIC RESPIRATOR.

A Simple Binder.

A new binder has recently been brought out by a Lancashire firm, which seems likely to prove very useful, especially for the preservation of manuscript notes and sheets of music. It is made in various sizes, but the principle of action is the same throughout. Fitted in the back of the stout cloth cover is the binding rack, which consists of a series of parallel grooves, in which fine cords are strung. Each cord is knotted at the top, and the knotted end is turned down behind the rack, and held securely between it and the back of the cloth case when the locking clips, attached for that purpose, are closed. To insert a new sheet in the binder all that is necessary is to open the clips, lift one of the cords, and pass it over the sheet; then fold the end of the cord behind the rack, and fasten the clips. One great advantage that this binder offers is that any single sheet may be removed, without disturbing the rest, and replaced with equal ease in its original position.

An Engine-Room Telegraph.

An electric engine-room telegraph of a successful kind has been invented by Mr. J. B. Wallis, and introduced on a number of H.M.'s ships—*Camperdown*, *Rodney*, and others. The apparatus consists of a dial with a hand, which is moved to the points on the dial representing the orders to be transmitted to the engine-room. This dial stands on the bridge, and is under the control of the officer on duty. The movement of the handle by him rings an electric bell in the engine-room to call the engineer's attention to another similar dial which is provided for him, on which he reads the order transmitted to him. By an ingenious arrangement the engineer signals back that he has understood the order correctly, and the officer acknowledges the message by again ringing the bell. A similar apparatus has also been devised by Mr. Wallis for telegraphing from and to the engine-room the number of revolutions which the screw is making a minute : an indication of the speed useful in evolutions at sea. The same principle has further been applied by the inventor to the construction of a steering telegraph, by which the commander can direct the man at the wheel.

An Electric Blow-Pipe.

It has long been known that the electric arc light between two carbon rods, + and —, Fig. 1, can be drawn out to a point at right angles to its former direction by bringing a magnet near it. This fact has been applied by Prof. S. Sheldon, of Harvard University, to produce an electric blow-pipe for metallurgical purposes. An electro-magnet is used to deflect the arc; its north pole, N, being brought very near the latter. The pole drives the arc, A, away from itself to a fine point of "flame," which instantly fuses copper wire and other metals.

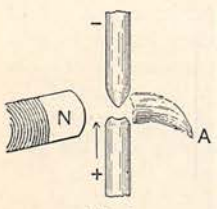
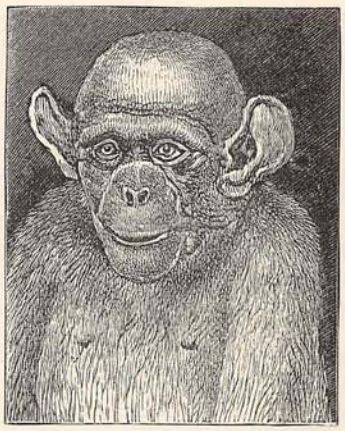


FIG. 1.


FIG. 2.

The current flows from the + to the — carbon, in *the direction* of the arrow. While on this subject we may also describe the portable blowpipe shown in Fig. 2. It is a brass tube ten inches long, with a cock at one end to regulate the supply of air. The flame is fed by benzoline, which is filled in by the nozzle. With this appliance a flame can be obtained twelve inches long. The apparatus can be worked in any position, and is likely to be useful to engineers and others. A pilot light always burning renders it available for intermittent work.

The Bald-Headed Chimpanzee.



The Zoological Society has recently acquired a young specimen of the bald-headed chimpanzee (believed to be the *Anthropopithecus calvus* of Du Chaillu). The well-known chimpanzee "Sally," already in their collection at Regent's Park, is a larger specimen of the same species. The skin of the face is clay-coloured, and the ears naked, large in size, and standing out, as represented in the accompanying sketch of the animal's head and shoulders. The body and head are scantily covered with blackish hair. There are also specimens of the orang, and silvery gibbon, now at the Zoological Gardens.

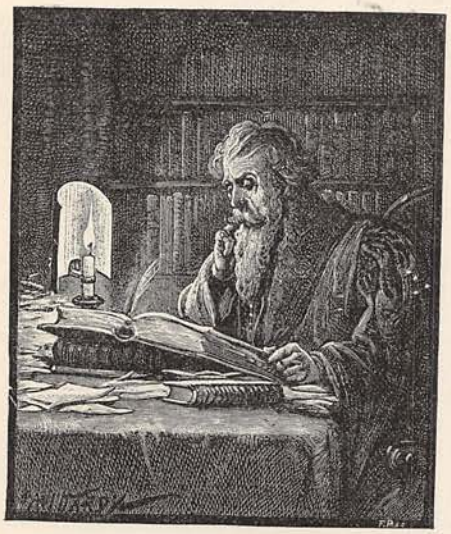
A New Mincing Machine.

The "Rex" chopper is the name of a new mince-meat machine, which a Gorton firm has lately patented. In outward appearance the "Rex" does not differ materially from former machines intended for household use, and it does its work by means of a single screw feeder working against a thread of rather different angle, and forcing the meat through a perforated plate at the end of the machine, which would seem to be one of its distinctive features. Several of these plates with different-sized perforations are provided for different classes of meat and suet—which last, by the way, the machine chops admirably. The minced meat is turned out of the machine in a loose pile or shower, and not in a caked mass, as is sometimes the case. An attachment is provided which adapts the machine for use in sausage-making, and altogether the "Rex" machine is one of the strongest and best-finished machines of its kind we have seen.

Sunlight and Trees.

The latest report of the United States Forestry Department gives some interesting particulars as to the influence of light on trees. Light is necessary for the development of the chlorophyll, or green colouring

matter, and for the life of all green plants, especially trees. Trees nearly always develop best in the full enjoyment of light; but their capacity for growing in shade varies considerably. Yew will thrive in the densest shade, whereas a few years of overtopping will kill larch. The beech will grow in partial shade where the oak would languish and the birch die. When planted in moist places all species are less sensitive to the withdrawal of light. In the open, maples, elms, and sycamores grow well and make a good shade, while in a dense forest they thin out and show a scanty foliage. Conifers, such as spruces and firs, have the greatest capacity for growing in the shade, and preserve their foliage in spite of the withdrawal of light. It has been found that those leaves which develop under the full influence of sunlight are larger and tougher, besides having a larger number of stomata, or breathing pores, than those less exposed to light. Experiments are to be carried out on this subject in the United States. We may also mention here a novel mode of studying timber, which has been introduced by Mr. R. B. Hough, of Lowville, New York, U.S.A. He employs frames of cardboard containing three thin slices of the wood, each 2 inches wide by 5 inches long and from $\frac{1}{80}$ to $\frac{1}{200}$ inch thick. These show the wood along the grain, across it to the heart, and tangentially. The effect of light coming through the thin slip is to show the structure and quality of the timber, even better than if one were looking at a mass of it.



A Reflector for Candles.

The figure illustrates a useful little reflector that can be readily affixed to a candle, so as to direct its light, and also shield the eye from the flame while using it. For reading music, chess-playing, and many domestic purposes, the reflector should be of good service.

A Simple Knife-Cleaner.

A simple knife-cleaner has recently been patented by Mr. C. David. It consists merely of two oblong blocks; one, rather longer than the other, is screwed to a board, and the second is loose. The fixed block is covered with kamptulicon, and upon it the blade of the knife to be cleaned is laid, and rubbed with the loose block, which is covered with buff leather, coated with a patent preparation. The kamptulicon on the fixed block serves to prevent the knife from slipping, while the leather of the loose block carries the plate powder with which the cleaning is accomplished. This simple knife-cleaner has one obvious advantage over many of its predecessors, in that it allows the side of the blade which is being cleaned to be seen during the operation.

India-Rubber Pavement.

India-rubber as a paving material has been introduced into Hanover, where it is used in paving the Goethe Bridge. The Berlin Corporation have also tried it in that city. The new pavement, of which the particulars are not disclosed, is stated to combine the elasticity of india-rubber with the resistance of granite. It is less slippery than asphalte, and said to be unaffected by heat or cold.

Water-Gas as a Power.

Water-gas is now used as a motive-power at the Leeds Forge, and found to be economical. The generators employed are capable of producing from 17,000 to 18,000 cubic feet of gas per hour, at a cost of 4s. 4d. per 1,000 cubic feet. Besides its use in gas-engines, and for metallurgical purposes, water-gas can also be made to yield a light by means of the Fahnejelm comb, which consists of a number of small rods of magnesia suspended by a wire over the gas-burner. The flame of the gas makes the rods glow. At Leeds Forge a consumption of 5 cubic feet of gas per hour yields with this burner a light of 22 candle-power. As there is no free carbon in the gas, less heat is given off than with ordinary coal-gas, and the furniture of a room suffers less. To detect a leakage of the gas it is mixed with an odoriferous gas, being itself odourless.

Buoyant Woodite.

A new form of woodite, capable of floating in water, has been brought out as a substitute for cork or cellulose. It is even lighter than cork, and non-absorbent of water; moreover, it will not take fire under the action of bursting shells, hence it is believed to be well fitted for use in filling the water-tight compartments of ships. On December 13th last thirteen rounds of 6-pounder shells, each containing a half-pound bursting charge, were fired by the Naval Construction and Armaments Company at half a ton of the material. Three rounds burst within the mass, but there was no sign of heating or ignition of the material.

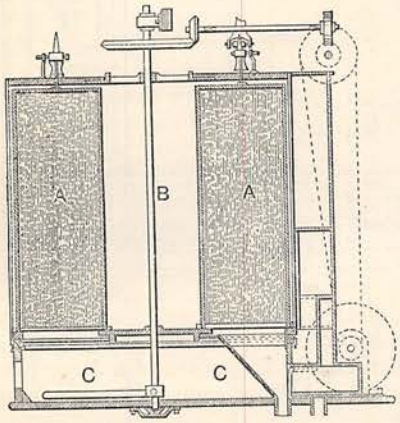
Meteoric Diamonds.

According to a statement in a recent number of the *American Naturalist*, Professor H. C. Lewis exhibited, at a meeting of the Philadelphia Academy of

Natural Sciences, a specimen of meteorite containing diamonds. Carbon in a crude form has been reported in meteorites before now, and there need not, therefore, be anything incredible in diamonds being discovered in one. Recent experiments of Mr. Norman with carbon rods heated to a high temperature by the electric current under pressure in a closed cylinder, resulted in the formation of a grey dust harder than emery, and scratching glass, which appeared to be a form of diamond.

A New Dust-Collector.

The Ince dust-collector for purifying the air of flour, paper, and other mills, is illustrated herewith. The machine consists of a rotary drum, having its



circumference divided into segments, each covered with cloth, and at some little distance from its neighbours. The drum rotates on a vertical axis, as shown in the figure, which represents a section through it; A and A being two of the cloth-covered segments, and B the axle. A chamber, C, beneath, sucks in the dusty air which passes up through the revolving drum, where it is filtered by the cloth, and delivered by means of hoppers to be thrown outside. The machine is made in different sizes, the smallest occupying a floor space of 3 feet 3 inches by 3 feet 10 inches, and the largest 10 feet by 10 feet 10 inches. The height of the latter size is 10 feet.

A Giant Tree.

An enormous specimen of the *Sequoia* is reported from California, where some explorers found it in the Kameah Valley. Not having a measuring line with them, the exact circumference could not be ascertained, but it was measured with a rifle about 4 feet long, and was found to be about 176 feet in girth as far above the ground as could be reached.

Some Tasty Dishes.

Our lady readers will remember our references to former works on different branches of cookery by Mrs. De Salis, and they will doubtless be glad to join us in welcoming the two latest additions to the series of handy little manuals, which is now complete. "Puddings and Pastry à la Mode" is the title of one, and "Cakes and Confections à la Mode" of the other, and both are published by Messrs. Longmans. The recipes are evidently intended primarily for those whose tables are well supplied, but most middle-class housekeepers might glean with advantage from them.

Three Favourite Books.

Among the latest additions to Cassell's "Red Library" is the ever-popular "Ingoldsby Legends," which certainly makes one of the most attractive volumes in the series. Harrison Ainsworth's "Tower of London," and Fenimore Cooper's "The Pioneers," have also been added to the list. Until this volume came into our hands we had not seen Harrison Ainsworth's story for many years, and a hasty glance at its pages has recalled several old acquaintances, notably the dwarf Xit. If there are any of our readers who do not know Xit, let us recommend them to make his acquaintance without delay.

"The England of Shakespeare."

As Mr. Edwin Goadby says in his preface, "No adequate biography of Shakespeare is possible, and hence the general craving for a study of his surroundings, which shall be faithful without being tedious, and historical without being ordinary history." This is what Mr. Goadby's little work, "The England of Shakespeare" (Cassell), is intended to be, and no lover of Shakespeare will complain that it does not succeed in meeting a want that was generally felt. The present edition is accompanied by a number of illustrations that serve still further to explain the real condition of our country in the poet's era. Probably few general readers have any idea how vast are the changes which England has undergone in all its aspects, but to rightly understand the poet's work it is well to realise them, and this Mr. Goadby makes easy.

A Book about Wales, by a Welshman.

Woe betide the unhappy man who dares to speak in the presence of Welsh people of Wales as a mere appendage of England! or to judge of Welsh folk and Welsh ways by English standards! What differences between the two peoples still exist, or did exist quite recently, may be learned from Mr. T. Marchant Williams's proudly-titled story, "The Land of my Fathers" (Longmans). Professedly written with a variety of purposes, the work can only give very sketchy pictures, even of the limited portion of Welsh life it attempts to portray. Whether a story is the medium best adapted for the discussion of the vexed problem of "payments by results" is, at any rate, open to question. Judged simply as a matter of story construction, "The Land of my Fathers" is not successful, for the narrative, especially in conversational passages, is jerky in the extreme. But, if only to make acquaintance with the schoolmistress, Enid Vaughan, the book is worth reading.