The GATHERER
An Illustrated record of Invention Discovery & Science

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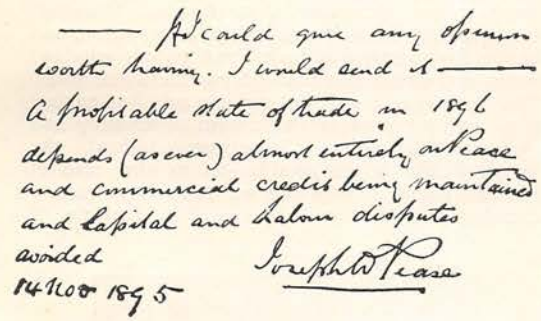
## WHAT TO EXPECT IN NINETY-SIX.

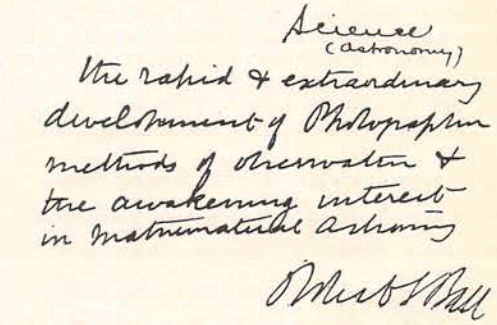
THERE is no need for that venerable gentleman "Old Moore," or for the ancient Zadkiel, to tremble in his prophetic shoes. The forecasts in this paper are not of that sibylline character, but are the outcome of skilled observation and special experience in those departments of work and play in which we have sought the guidance of well-known experts, to whom we are greatly indebted for their courteous replies.

To "a nation of shopkeepers," as we are termed



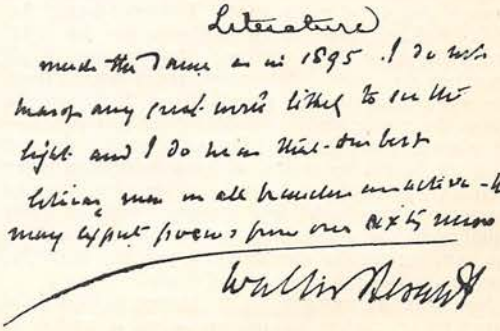

*(From Sir J. W. Pease, Bart., M.P.)*

by our shoulder-shrugging neighbours 'cross Channel, the business outlook is a matter of universal interest. On the whole, the opinions we have received are very reassuring. Sir Albert Rollit, M.P., President of the Associated Chambers of Commerce, believes that the general prospect for 1896 is "more favourable than from 1890 to 1895; but improvement will be gradual, as in the more recent past. Moreover," he adds, "I do not look for the recurrence of such large returns upon capital as in former times. Profits are more distributed, labour having obtained a larger share." From Sir Joseph Pease, M.P., comes a cautious and altogether characteristic note: "A profitable state of trade in 1896 depends (as ever) almost entirely on peace and commercial credit being maintained, and capital and labour disputes avoided." In Sir Alfred Hickman's opinion the commercial prospect is "decidedly promising. We are reasonably sure of a good year in the iron and allied trades." The general feeling is one of hopefulness, tempered by just a touch of the reservation which a recent depression inevitably leaves behind it.




*(From Professor Sir Robert S. Ball, F.R.S.)*

Intimately connected with our commercial enterprise at home and abroad is the great shipping trade, on the prospects of which we learn that Mr. R. S. Donkin, M.P. for one of the most important maritime constituencies in the North of England, is unequivocally despondent. "Excess of tonnage" appears to be the cause of his anxiety. It is more cheering to turn from these forebodings of evil to




*(From Sir Walter Besant.)*

Excellent provided
the weather is favourable

W. G. Grace

(*From Dr. W. G. Grace.*)

the brighter prospects which some of our leading emigration agencies hold out to us. "Emigration," writes one expert, "has been somewhat neglected of late, but the general revival of trade in this country is bound to have a good all-round effect. We find the growing tendency is towards South Africa." Thus Mr. A. L. Atkinson, of the International Emigration Association: while Mr. Wilson Gates, of the Self-Help Emigration Society, thinks the general outlook "fairly good, especially in relation to Canada and South Africa. Agriculturists and domestic servants are much wanted in Canada."

There are signs of still-increasing activity in the sphere of intellectual labour. We may confidently look for valuable additions to scientific knowledge. Sir Robert Ball, the Cambridge Professor of Astronomy, believes that one striking feature of the coming year will be "the rapid and extraordinary development of photographic methods of observation, and the awakening interest in mathematical astronomy." Concerning literature, Sir Walter

Encouraging. The Australians are sure to send over a very good team including several players not yet seen on this side. It will probably be a difficult matter, now that there are so many first class counties, to find time for all fixtures as the Australians will play many matches, indeed it seems almost an impossibility to play 5 England v Australia matches as they wish
A. C. MacLaren.

(*From Mr. A. C. MacLaren.*)

Besant regards the outlook for ninety-six as being "much the same as in 1895. I do not hear," he adds, "of any great work likely to see the light, and I do hear that our best literary men in all branches are active. We may expect poems from our sixty minor poets, novels from the novelists whom the public know; probably some new man—we always get one new man—will spring up and take the world by storm, without doing the older men any perceptible harm." If demand creates supply, we may look for a literary "output" quite equal to, if not exceeding, that of ninety-five; for the reading public continues to widen, and the average reader reads more and more.

We have as much right to be recognised as a nation of cricketers as to be called a nation of shopkeepers. Our national game is now no longer confined to the one sex, and it has been imported into every English-speaking country in the world. We have asked our Cricket King what anticipations he has of the coming cricket season, and Dr. Grace's answer is—"Excellent, provided the weather is favourable," and no reasonable being could expect a more definite augury in the face of the proverbial capriciousness of our English skies. Mr. Alcock holds a similarly favourable view, while Mr. MacLaren, the record bat of 1895, not only echoes this encouraging forecast, but adds, "The Australians are sure to send over a very good team, including several players not yet seen on this side."

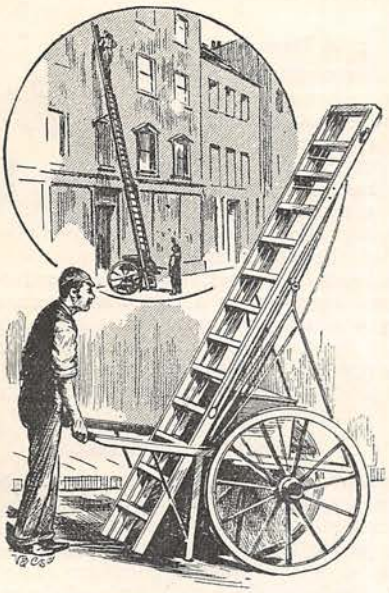
From this rapid peep through the prospect-glasses of some of our ablest men, we may run up the probabilities for 1896 as favourable to enterprise, work, and sport. These forecasts will have done some service if they enable any despondent reader to lift up his head and face the future in a more hopeful spirit. No discreet person will attach to these opinions an absolute prophetic value they do not possess, and which the authorities who have expressed them would not claim. "You rascal!" cried Handel to one of his chorus; "you told me you could read at sight." "Yes, sir," was the reply; "but not at *first* sight." Our experts do not profess to be able to read the future at first sight; and as for "second sight," they cheerfully leave the monopoly of that gift in the hands of Messrs. Moore and Zadkiel.

### The Study of Frost Pictures.

Rough sketches and mere outlines are often much more interesting than finished drawings because they leave more to the imagination, and hence the pictures of Jack Frost on our window-panes and pavements are highly attractive to many. They are vague and ill-defined as a rule, but on that very account possess the charm of mystery and perpetual discovery. Sometimes, indeed, the verisimilitude is remarkable—as in the case of the ice-bound ship which we reproduce from a drawing sent us by Miss Georgina Browne, of

A FROST PICTURE OF AN ICE-BOUND SHIP.

Redhill, who observed it on a window pane on the morning of February 7th, 1895. The observation of frost figures can be made a scientific study as well as a pleasing exercise for the imagination, and it appears to us that other young



TELESCOPIC LADDERS.—FIG. 1.

ladies might profitably follow the example, either from the artistic or the scientific point of view, of Miss Browne during the hard frosts which keep them indoors. It is needless to say that fidelity to the original is absolutely necessary in such drawings—indeed, photographs would be better—if they are to have any scientific value and add to our knowledge of the crystalline forms of water. The conditions of the weather and glass under which the crystals are produced ought, of course, to be carefully noted, and the observer should endeavour to find out the natural secrets of the process, so that anyone could artificially produce similar effects. The study of crystals and their formation is far from being of trivial import in science, however it may seem at first sight. Nothing is unimportant in science, because Nature is a whole, and if we thoroughly understood any of her effects we should understand the whole, or at least get fresh light upon it. The sketches and results might be communicated by the observers to the local natural history societies or to the scientific journals, and it goes without saying that they would make an interesting album for preservation after the manner of a private herbarium.

### Telescopic Ladders.

Ladders built on the telescopic principle of shutting in and drawing out to various heights have been introduced, and are exceedingly useful. They are of different sizes and patterns, and a fair idea of them will be gathered from our illustrations. Fig. 1 represents a type which is useful for private purposes, and when strengthened with steel wire can serve as a fire escape; while Fig. 2 shows a larger model adapted for the service of public buildings, warehouses, and so on.

### Ice Cones.

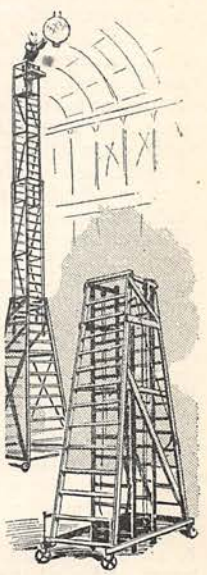
During the severe frost of last winter a curious phenomenon was observed on the frozen surface of Lake Neuchâtel, in Switzerland. Cones of ice over six feet in height were formed, each having a crater large enough to hold a man. Professor Dufour of Morges, who has given a description of the cones, has not been able to account for their formation.

### A Portable Bed.

Even in winter there are many occasions when an extra bed is required in the house at very short notice, although more frequent opportunities for the use of such an article naturally occur in the summer, when families are in temporary and often restricted quarters, or when parties are camping out. A folding bedstead called the "Compactum" has recently been patented, which has many qualities to commend it to housekeepers and holiday-makers. The framework acts on a familiar extending principle, and the bed is formed of canvas stretched upon it and secured by an ingenious adaptation of clips upon the framework. The bed can be erected in a very few minutes, and taken down as rapidly; and to make it available for use, comparatively little in the way of bed-clothing is required further than one or two rugs and a pillow. As showing the compactness of the invention, we may say that the bedstead when fixed up measures 6½ feet by 2½, and when packed makes a parcel 3 feet long, 5 inches deep, and 5 inches wide.

### Clouds and the Weather.

Observations made at Blue Hill, United States, have shown that the clouds which precede rainfall are usually the high cloud sheet (alto-nimbus), the low ragged cloud sheet (nimbus), long rolls of cloud giving intermittent showers, and a lowering cloud of the cumulus (or cumulo-nimbus) type. After rain strato-cumulus in long rolls below, with in general cirrus or cirro-stratus clouds above, are commonly seen. Clouds, it appears, are fairly good signs of rain for twenty-four hours in advance, but not for longer. We may add here that the strange meteor seen by Mr. J. A. H. Murray, at Oxford, and by others elsewhere on the evening of August 31st last, was in all probability a "fireball," but it is not quite clear whether it was a meteoric stone or a display of "globe lightning." The singular trembling or "wobbling" of the moon witnessed about the same date, and described in the *Times*



TELESCOPIC LADDERS.—FIG. 2.

newspaper, was doubtless a peculiar effect of the refraction of light by currents in the atmosphere.

### A Touch-Recorder for Pianos.

In playing the piano, after a certain skill has been attained it becomes very difficult for the master to distinguish the inequalities of touch on the part of his pupil, and hence MM. Binet and Courtier have invented an apparatus for recording them, which we illustrate in Fig. 1. It consists essentially of an indiarubber tube, T, which runs beneath the keys

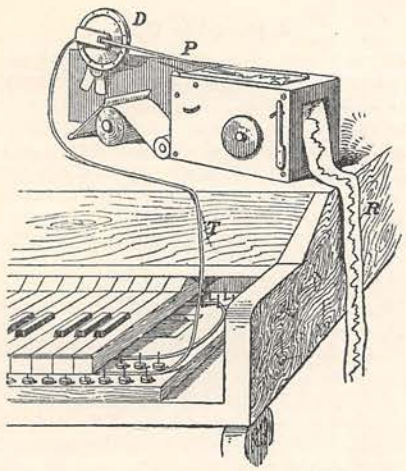
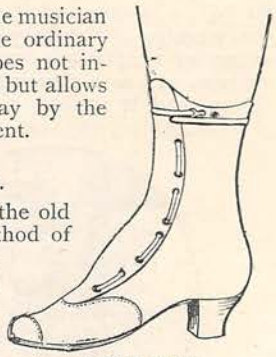



FIG. 1.

and communicates with a drum, D, so that when a key presses on the tube a pulse of air causes the drum to expand, and make the pencil, P, draw a corresponding pulse, or wave, on a ribbon of travelling paper, R. The play of the keys is thus recorded on the paper and can be studied at the time or subsequently, without any interference with the player, who is not embarrassed by the tube. The apparatus can be applied to any piano without altering its external appearance, and in the record shows the faults of the player. Although these are inappreciable to the ear it is of great service in teaching. The inventors also claim that a register of this kind will enable composers to indicate slight changes in the time which cannot be marked on written music.—Another invention, which may be useful to musicians who possess a talent for improvisation, is the music recorder of M. Rivoire, which we illustrate in Fig. 2. It is entirely mechanical in its action, the keys when played working a system of levers, which press marking wheels against the travelling band of paper, P, shown beneath the keyboard, and mark it with horizontal lines corresponding to the notes. A little practice is sufficient to enable the musician to read these marks like ordinary music. The device does not interfere with the player, but allows him to be carried away by the inspiration of the moment.

### A New Boot.



A NEW BOOT.

An improvement on the old and time-honoured method of fastening boots in front with a "tongue," to keep out the dirt and wet, has at length been made. As our engraving shows, one side of the upper is folded over the other, like a flap, and they are fastened together by a lace which runs through the eyelets, and hooks into a hole in the top of the boot. By this comfortable device the boot can be easily removed from the foot or tightened upon it through simply loosening or pulling the lace.

### The Tints of Pearl.

We have been taught to believe that the beautiful iridescence of pearls and mother-of-pearl is caused by striations or fine grooves on the surface of the nacre, just as the iris of a dove's neck is due to the striations of the plumage; but according to Mr. C. E. Benham, although a little of the colour is produced in this way, most of it is caused by interference of the rays of light by reflection from the outer and inner surfaces of the thin layers of nacre forming the substance of the pearl. The colours of a pearl have therefore a similar origin to those of a soap bubble, or the iridescence of ancient glass which has been scaled by time.

### A Panoramic Camera.

In a recent GATHERER we drew the attention of our readers to a remarkable little magazine camera, called the "photo-jumelle," from its resemblance to an opera- or field-glass. Thanks to a suggestion of M. Mascart, the well-known physicist and member of the Institute of France,

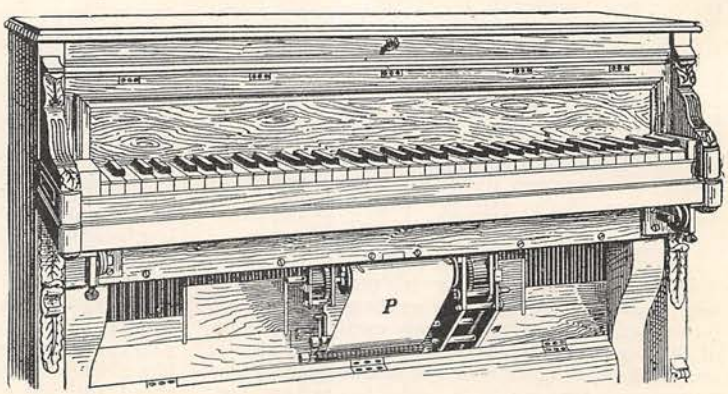



FIG. 2.—A MUSIC RECORDER FOR IMPROVISERS.

A PANORAMIC CAMERA.

this ingenious apparatus has now been adapted to take panoramic views all round the horizon. For this purpose it is mounted, as shown in our engraving, on a tripod like that of a surveyor's theodolite or levelling instrument. Milled-headed screws enable the camera to be adjusted in a horizontal position by means of a pocket level, and as it turns freely round a vertical axis projecting above the head of the tripod, as many as twelve pictures can be taken round the horizon in a few minutes. Many beautiful panoramas of the Alps and other fine landscapes have been taken with the apparatus, which cannot fail to recommend itself to artists, tourists and travellers.

### The Depth of the Ocean.

By slow degrees we are getting to know the contour of the sea bottom almost as well as we do that of the surface of the land, but it cannot be said that we have found the deepest water on the earth. Depths of 15,000 to 27,366 feet have been reached in the North Atlantic from time to time, and one of 27,930 feet was discovered in the North Pacific off the eastern coast of Japan, where there is a remarkable gulf or depression. All these measurements have, however, been outstripped by one recently taken south of the Friendly Isles in the South Pacific by H.M.S. *Penguin*. A depth of 29,400 feet had been marked when the sounding wire gave out before the lead had reached the bottom. A fresh sounding will therefore have to be made before we can tell the full depth of water at this spot.

### Singing Mountains.

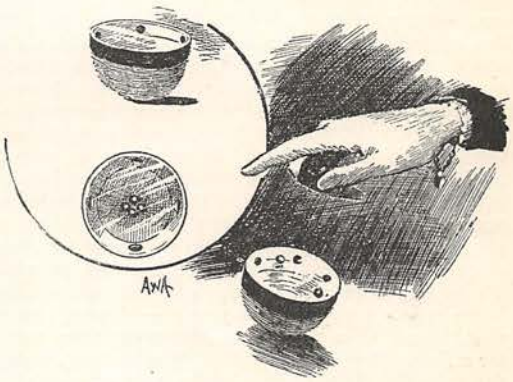
Darwin was one of the first to call attention to the mountain El Bramador, in Chili, which emits a peculiar sound at times; and in the midst of Pyramid Lake, Nevada, there is another which utters a musical note, which, in certain states of the wind, begins like the jingling of countless silver bells and ends with a loud strain, resembling the low notes of a pedal organ. These sounds are attributed to the friction of the wind and the movements of sands, as in the case of the "singing sands" of Lob-Nor, in China, the island of Eigg, in Scotland, and elsewhere.

### The Largest Forest.

Canada has a forest in the Labrador and Hudson Bay district which extends at least 1,000 by 1,700 miles; South America has one in the basin of the Amazon which is 2,100 by 1,300 miles; Central Africa has a forest region 3,000 miles north and south, and of unknown width east and west. Perhaps, however, all these are cast into the shade by the Siberian "urmans" or "targas," which are vast woods of pine, larch, and cedar at least 3,000 miles from east to west, and 1,000 miles from north to south. They are so thick and gloomy that the natives call them "places where the mind is lost."

### The Ball Puzzle.

Our engraving shows a new French puzzle which will serve to enliven the winter evenings. It consists of a cup or bowl containing four balls, and having four holes to receive the balls near its rim inside. A transparent cover of celluloid keeps the balls in the cup, and the problem is to put all the balls in the holes. The difficulty arises from



THE BALL PUZZLE.

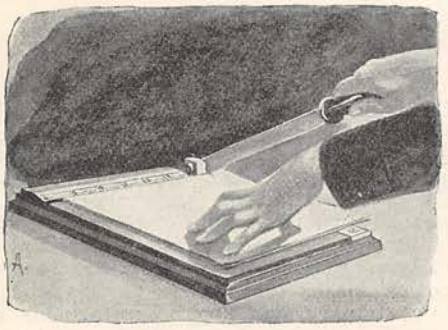
the fact that when the cup is inclined so as to get a ball in its hole the other balls drop out of theirs. The proper way is to utilise centrifugal force, and turn the cup like a teetotum. The balls will then drop into the holes of themselves.

### "Verses, Wise or Otherwise."

This is Miss Ellen Thorneycroft Fowler's own title for a pleasant little volume of verse which Messrs. Cassell have just issued. Some, if not all, of the poems have been published one by one in our own and other pages, and many readers who made their acquaintance in that form will, no doubt, be glad of an opportunity of securing them in this more permanent guise.

### A New Paper-Cutter.

The little device which we illustrate is intended for cutting the edges of paper, and especially prints. It consists of a board which is marked with a scale



A NEW PAPER-CUTTER.

of inches and provided with a steel edge against which the knife descends. The paper to be trimmed is laid on the board, and the portion to be removed is allowed to project over the steel edge. When the knife is brought down the paper is cut away.

### Some Seasonable Volumes.

Those children must be past pleasing who are not pleased with the new volume of *Little Folks*, which has been issued in time to serve as a most appropriate Christmas or New Year's gift. It is full of good and varied reading, brightly illustrated, and prettily set forth. With the January number the magazine is to open a new series, in which its space will be considerably extended, and its attractions made even greater than they are already. For very young readers Messrs. Cassell issue "Bo-Peep," a simply written and abundantly illustrated volume, which should find a welcome in every play-room.—The January number of *The Quiver* is, like the November part, with which the volume opened, specially enlarged by the addition of a pictorial supplement. The annual volume for 1895 is now ready, and will commend itself to all who are in search of a miscellany of good and wholesome reading for old and young.—Messrs. Longmans send us a volume of charming fairy tales for children, by Miss Elizabeth Wordsworth, under the title of "The Snow Garden, and other Fairy Tales."

### South Africa.

Few subjects have been more to the fore during recent years than that of South Africa, its people, its products, and the relations of the Imperial Government to the Colonial and other Administrations. Mr. Basil Worsfold, whose book upon "South Africa" has just been published by Messrs. Methuen and Co., brings to bear upon his subject personal acquaintance with life in more than one of the districts of which he treats, and an intimate knowledge of the history and constitution of each. His book, unambitious as it is, has therefore a distinct value at the present time, when so many people are interested directly or indirectly in the rapidly developing resources of these new lands. Several of the chapters—notably that upon the literature of South Africa—show an altogether fresh point of view.

### Our Prize Competitions.

Particulars of the first series of new Competitions for 1896 were given on page 76 of our December issue, in which Prizes were offered for the best and second-best Serial Stories of 40,000 words—for the best summaries of "A Missing Witness," when this story is completed—for the best Snap-Shot Photographs of out-door scenes—for the best-worked hemmed linen handkerchiefs—and for the best got-up gentleman's collar. The Rules and Regulations were set out fully in our last number, together with the respective dates when the work is to be sent in. For the convenience of our readers, however, we append here a short note of the dates:—

PRIZE STORY OF 40,000 WORDS (£50 and £30—due June 1st, 1896).

SUMMARY OF SERIAL STORY (£1 1s. and 10s. 6d.—due July 30th, 1896).

SNAP-SHOT PHOTOGRAPHS (£5 and £3—due May 15th, 1896).

HEMMED HANDKERCHIEFS (£1 1s. and 10s. 6d.—due February 17th, 1896).

GOT-UP COLLAR (£1 1s. and 10s. 6d.—due January 16th, 1896).

## AMONGST FLOWERS AND POULTRY.

EVERYTHING is quiet in the garden, and what little work there is to accomplish may be frustrated by severe frosts. Towards the end of the month finer weather sometimes comes, and then is the time to fill up gaps amongst the cabbages, and in favourable weather make a sowing of early peas. If bulbs still remain unplanted, give them immediate attention, and it would be better to pot them now than trust to the mercies of an English winter. If the growth of October-planted bulbs is spearing through the ground, place over them a covering of spruce, branches, or litter.

Window plants must be sponged more frequently in winter than in summer. There is more dust from the sweeping of the rooms, and it is unsafe to open windows to expose them to cold currents of air. No plant excels Aspidistra lurida, the "Parlour Palm," for the winter; its leaves are leathery, presenting an even, shining surface from which dust is easily wiped off with a sponge dipped in lukewarm water. Though called a "palm," the Aspidistra is not so, and far removed from that great family of foliage plants. We have written before of this window adornment. It is rather expensive, but a few shillings are well spent upon it, as it increases in beauty with age, and is not harmed by a few draughts of cold air even in the winter. Much disappointment too frequently occurs with purchased flowering plants, especially in the spring. They are made to sell, forced up in heat, and the altered conditions of life upset them entirely.

Poultry must be very carefully tended during this month, especially in very severe weather such as often occurs at this season. One cannot expect pullets and hens to lay satisfactorily if at all neglected, and to secure a good return in eggs in winter the yard should be stocked with March-hatched pullets.