Correspondence.

A Case of Rapid Development.

To the Editor of the SCIENTIFIC AMERICAN:

I was much interested in the article entitled "The Giantess Rosa Wedsted," in the SCIENTIFIC AMERICAN for April 15.

The article states that "by the time she had reached her fourteenth year, she had attained the *astonishing* height of 5 feet 7 inches."

Now, while I do not pretend to compete with this lady, I should like to say that on my fourteenth birthday, I measured 5 feet 6½ inches. And on my fifteenth I measured 5 feet 9 inches. If this is an *astonishing* height for one of my age, perhaps my case is worthy of notice. F. L. JOSLYN.

New Brunswick, N. J., April 21, 1905.

Sentiment Versus Sense.

To the Editor of the SCIENTIFIC AMERICAN:

When I visited Niagara Falls two or three years since, being fresh from the far grander spectacle of the incoming tide at Manhattan Beach, I should have felt myself poorly paid for my trip but for the inspiring study of the giant dynamos down the gorge. Here was something worth seeing indeed—the triumph of the human intellect! Not a great mass of dead matter tumbling in meaningless froth and noise, but matter impressed with mind and exerting its Titanic power with a grand and beneficent purpose. Success to the bold and intelligent projectors of all such schemes and avast with the sentimentalist who seeks to thwart them! Let them go and shed tears over the noble red man of the woods and the desecration of our noble, primeval forest with the sound of the woodsman's ax! However, I am consoled by the reflection that Bostonian æstheticism cannot affect the sturdy English sense on the other side. Niagara will be metamorphosed into something more significant than falling water in spite of dilettantism.

JOHN PRATT.

Seeing Stars in Daylight.

To the Editor of the SCIENTIFIC AMERICAN:

In the issue of April 1, Arthur K. Bartlett, in an article on "Astronomical Anomalies," doubts whether stars can be seen in daytime from the bottom of a deep shaft. In July, 1882, I was engaged in retimbering an old shaft, less than 200 feet deep, and about 6x10 feet in size, at Mineral Point, Col., at an altitude of about 12,000 feet. This shaft had no covering. The air was poor, and a candle would burn only dimly. We did considerable of the work with no other light than what came down the shaft. I distinctly remember that we could see stars almost any time in the day except near midday. We could also notice that we could not see the stars until after being down in the shaft for half an hour or so. I also remember that there was a particularly bright star that would pass over the shaft about 3 P. M. This shaft had a slight dip to the north of probably 10 deg. from the perpendicular. So, some astronomer might be able to figure out what star or planet it was.

I followed mining for over twenty years, and this was the only time I ever saw a star from a shaft, but these I remember very distinctly.

It is seldom that a mining shaft is so situated as to make observation possible, being usually covered with buildings or hoisting gear before any great depth is obtained. PARK B. BEATTY.

Halsey, Ore., April 15, 1905.

Seeing Stars in Daylight.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of April 1, 1905, appeared an article entitled "Astronomical Anomalies," and signed by Mr. Arthur K. Bartlett, in which he seems to doubt the possibility of viewing stars from the bottom of a deep well or shaft during daylight; and it appears as if he bases his opinions more on theory than actual practice. As he calls for verification of the disputed question, I herewith quote my own obhervations in that direction.

During my experience in the mines, where I was employed as an engineer, I have many times witnessed the sight of stars from the botttom of a shaft, some of these shafts being no deeper than 75 or 100 feet. The greater the depth, down to a certain point, the brighter the stars appear. After this point is passed, the mouth of the shaft becomes so small to the observer as to be almost invisible, thus shuttting off all view of the heavens.

I mention this, because there is a mistaken idea existing that one must necessarily be in the bottom of a shaft in order to properly view the stars. I have also noticed that stars may be seen in several places on the Colorado River, where the stream runs through deep and narrow cañons. The latter observation I first noticed at or about noon while eating lunch. Not being familiar with the names or positions of the stars, I am unable to name any that I ever saw, but those that lay within the scope of vision could be plainly seen. F. W. WILLIS.

Chatsworth Park, Cal.

That Stone Ball.

To the Editor of the SCIENTIFIC AMERICAN:

In the last edition of your valuable paper appears an article about the spontaneously-moving stone ball. My idea of the cause of this motion is not so much the sun, but the wind. If the socket which carries the ball is of such a shape as to support the ball in the center, and by a slight motion of the ball touches it with the outside edge, the wind which may cause a little trembling of the ball, will press the one side, opposite the direction from which the wind blows, and will try to roll the ball over this edge, but this being impossible, the slight turning away by the force of the wind will result in a minimum rolling of the ball at every strong push of the wind. As the several storms come from the north, the ball will turn toward the south. ADAM BRENZINGER.

New York, April 13, 1905.

The Moving Ball of Stone.

To the Editor of the SCIENTIFIC AMERICAN:

I note in the April 15 edition of the SCIENTIFIC AMERICAN an article in regard to a spontaneously-moving stone ball in the Marion, Ohio, cemetery. I am of the opinion that instead of the expansion and contraction of the ball, the expansion and contraction of the base on which it rests is the true cause of the phenomenon. In the daytime, when the sun is hot, the base expands. The ball therefore settles a little deeper into the socket, especially on the south side. Then as the base cools at night it would have a tendency to push the ball northward and upward because the expansion and contraction would be greater on the south side of base, hence causing the ball to rotate from north to south. As the sun does not strike the ball squarely on the under side, it would not have much effect upon it, as is the theory of State Geologist Edward Orton, Jr. J. W. BURGNER.

Veedersburg, Ind., April 16, 1905.

The Stone Ball.

To the Editor of the SCIENTIFIC AMERICAN:

I submit the following as an explanation of the rotation of the "Spontaneously-Moving Stone Ball," at Marion, Ohio, illustrated and described in your issue of April 15.

Beginning at sunrise, the side of the ball toward the sun is heated more highly than the opposite side. In consequence of this unequal heating and resulting expansion, the center of gravity of the ball advances toward the sun, and follows a curve during the day whose projection on a horizontal plane is somewhat elliptical in form. The center of gravity being thus removed to the south during the day, the effect is equivalent to adding a weight to the south side of the ball and thereby tends to effect the rotation observed. The slight jars and tremors occurring more or less constantly are sufficient to permit this constant stress to overcome the friction between the ball and its cup-like seat, and produce rotation.

The orientation mentioned below the illustration may be explained by unequal friction, as suggested by Prof. Gilbert. W. H. HOWARD.

Washington, D. C., April 17, 1905.

Another View of the Stone Ball.

To the Editor of the SCIENTIFIC AMERICAN:

In a discussion of the case of the "spontaneously-revolving stone sphere" at Marion, Ohio, reported in yesterday's issue of the SCIENTIFIC AMERICAN, W. H. Rayner, of Springfield, Ohio, a brother of the writer, suggested a cause that might be profitably considered in an attempt to satisfactorily explain the strange phenomenon.

In brief, the proposition offered is that a film of water collects under the sphere in the hollow where it rests on the pedestal, filling the spaces arising from imperfect fitting of the sphere to the surface of its resting place. In freezing this water congeals at the top exposure first and seals the remainder, which, when it solidifies, raises the sphere vertically by virtue of the well-known expansion of water in changing into ice. Now, when this film of ice *thaws*, it softens on the *south side first*, causing or permitting the sphere to tilt or roll in that direction a certain amount, using a point slightly north of the center of contact as a fulcrum. When the remaining ice thaws, the sphere tilts or rolls toward the north, using the previously-established point of contact as a fulcrum. It is apparent the rotative effect of the last movement will be less than the previous one toward the south, leaving the net result an increment of rotation from north to south. E. B. RAYNER.

Piqua, Ohio, April 16, 1905.

[The most effectual answer to this view is to be found in the fact that the ball moves in summer as well as in winter. The expansion of freezing water cannot therefore be advanced as an explanation.—ED.]

Grandfather's Clock.

To the Editor of the SCIENTIFIC AMERICAN:

I have read the articles "Grandfather's Barometer" and "Some Weather Indications" published in your issues of March 4 and April 1, respectively. I have given the subject of meteorology some consideration, and as my instrumental equipment was rather crude, I found it advantageous to accustom myself as far as possible to the natural weather indications. My most satisfactory storm indicator has always been an observation made at noon, upon some object, such as a small white cottage, located at a considerable distance to the north of me. At first this little cottage will present no great changes, but when one becomes accustomed to noting its appearance from time to time, it will become apparent that just before a storm the object of our scrutiny will appear fresh and well defined, whereas in generally fair weather, its appearance will be more somber. (Or one might say the intervening distance seems shorter before a storm.) In paragraph 5 of "Grandfather's Barometer," notice is taken of lights viewed at night from a distance, seen brighter before a storm. This seems to be along the same lines.

The possible explanation of this phenomenon is that as the atmospheric pressure is less during stormy weather than in fair, and hence less dense, its transparency is increased, allowing the object to be more distinctly seen. EDWARD F. CHANDLER.

Brooklyn, N. Y., April 11, 1905.

Engineering Notes.

The freezing system is to be adopted in the construction of the new tube railroad for Paris at the point where the track will pass beneath the Orleans trunk railroad. For various reasons the ordinary shield process will not be suitable. The earth is to be frozen to a temperature of 30 degrees below zero, so that the excavators may be able to cut the tunnel without incurring any danger of collapse before the metal lining has been placed in position. The workmen, however, will experience some inconvenience while working at such a low temperature, but the engineers are of opinion that this method offers the only solution of the problem, and that it will be carried out successfully.

The construction of the new yacht for King Edward VII., designs for which were invited from private firms, is to be undertaken by the well-known yacht builders, Messrs. A. & J. Inglis, of Glasgow. This new vessel is primarily intended for short cruises and entrance to harbors of comparatively shallow draft. The yacht will measure 285 feet in length by 40 feet beam, and be of 2,000 tons. A noticeable feature of the vessel is that it is to be propelled by Parsons marine turbines, which will be arranged in the orthodox manner, with one high-pressure turbine in the center, and a low-pressure turbine on either side. A cruising speed of 17 knots is anticipated, with an astern speed of 13 knots. Steam is to be raised in a battery of cylindrical boilers.

A great irrigation project involving an expenditure of about $25,000,000 has been authorized by the Secretary of State for India. The area commanded by the canals is about 6,250 square miles, although only a small part of it will be reached for a number of years to come. In this area it is estimated that about 3,000 square miles will be irrigated. The water will be taken from the Jhelum River, in which there is now unappropriated at the site of the headworks a flow of 5,600 to 7,900 cubic feet per second. It is believed that the investment of public funds in these works, great as the sum may be, is well warranted by the economic advantages of the undertaking and the reasonable assurance of ample interest payments.—Engineering Record.

Several improvements have been effected in the system of constructing the underground tube railroad with the ordinary shield, in connection with the London tubular railroad from West Kensington to Brompton Road. Improvements have been made with the cutting shield, and the system of driving it into the clay by the hydraulic rams. Instead of removing the clay by manual labor, which has hitherto been adopted, an electric cutter is now employed, with the result that excavation can be carried out much more rapidly and more economically. The cutter excavates the earth, which falls on an automatic conveyor, and this in turn dumps it into skips, which are drawn to the base of the shaft by ponies, and the ballast is conveyed to the surface by hydraulic lifts. This new shield excavates at double the speed of the former appliance, and necessitates only half the number of workmen. The segments of iron rings forming the lining of the tunnel, each representing a weight of six hundredweight, are also lifted and placed in position for riveting by an hydraulic erecter.