

EARTH AND THE PENDULUM.

Demonstration to Prove Rotation of This Little Planet—Experiments Made by Foucault.

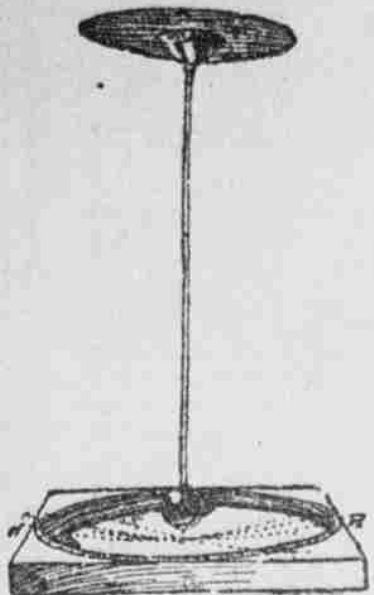
It is fifty-one years since Foucault, the French astronomer, gave his famous demonstration of the earth's rotation, in the Paris Pantheon, after which our National Capitol was modeled. From the great dome he set a pendulum—a wire tipped with a cannon ball—swinging over a table, anchored by a ridge of sand. A pin attached to the bottom of the ball marked the path of the pendulum in the sand at each swing across the table. As a pendulum in motion is not moved a hair's breadth from its course by the revolving earth, the table

seconds of time the point X moves to Z the pendulum will be oscillating in the same vertical plane as before, but the marks on the table will revolve and the line X C M will be in the new position Z C N. If we are not cognizant of the table's motion, the pendulum's vibration will appear to move the other way. In one complete revolution of the table to the left the plane of the pendulum's vibration will appear to make a complete revolution to the right.

If a pendulum then is suspended above the North pole of the earth in twenty-four sidereal hours the earth will revolve and the pendulum vibrating plane will appear to go round in the opposite direction at the same time. So also at the South pole.

In any latitude between the equator and the pole the time of a complete revolution of the pendulum's swinging plane, as it appears to the observer, will be somewhere between twenty-four hours and infinity. The law of change is such that at the Pantheon in Paris, in latitude north 48 degrees 50 minutes 40 seconds, the sidereal time, or 31 hours 47 minutes 14.6 seconds of mean or ordinary clock time.

Foucault worked out the theory and tried experiments in his laboratory which were very satisfactory. So much interest was taken in the subject that with the aid of Arago, a plan was devised to swing a pendulum under the dome of the Pantheon that the proof might be made visible to all interested. The apparatus was mounted in 1851. The length of the pendulum, from the suspension point of the wire to the center of oscillation of the ball, was 218 feet, and the ball weighed sixty-one pounds. A fastener in the center of the ball, which was a small iron rod, was fastened to a circular form



Foucault's Pendulum Experiment.

was seen slowly turning, by the pendulum's track on the sand. Foucault's experiments were stopped by the coup d'état of Louis Napoleon December 2, 1851.

Recently, however, Camille Flammarion has renewed interest in the subject and the other day he swung a plane wire pendulum 220 feet long carrying a fifty-six pound iron ball, with a stylus attached for marking the earth's movement on the sand. The exhibition, again in the Pantheon, was of such importance that eminent men delivered addresses to the large assembly of scientists and public officials present, and a report of the proceedings was sent by cable over the world.

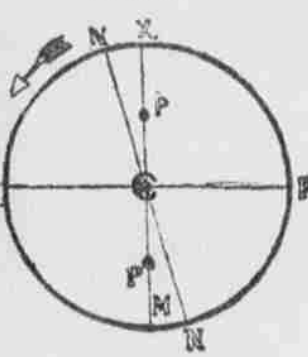
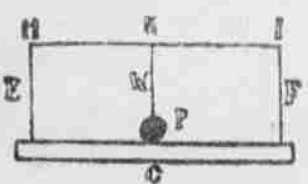
In view of the popular interest awakened by the subject Prof. John K. Rose of Columbia university explains the experiment in detail. His account of the various astronomical conjectures and demonstrations leading up to Foucault's exhibition in the Pantheon, together with what has since been achieved in that direction, makes an interesting story.

The great astronomer and geographer, Ptolemy (150), did not consider that the



CAMILLE FLAMMARION.

FIG. 1.

VIEW FROM ABOVE
FIG. 2.

DIAGRAMS.

rotation of the earth on an axis was possible," said Prof. Rose. "He thought the velocity would be so great that the air would be left behind, and even if the air was carried around bodies floating in it, it would be left behind. Copernicus (1500), having better knowledge of the distance of the stars, argued that if the stars revolved about the earth in a day their velocities would be almost infinite. The 100,000 of the daily revolution of the earth he considered much more probable than the daily revolution of the celestial sphere.

The discovery of the telescope enabled Galileo and others to show that sun, moon, Jupiter, etc., revolved on axes and Jupiter and Saturn had satellites which went around them. Analogy, therefore, confirmed the idea of a rotating earth.

"During the last century experimental proofs have been devised to prove this rotation. Foucault's pendulum experiment in the Pantheon in Paris is the most striking proof. His experiment depended on the fact that if a heavy ball is suspended by a wire and then allowed to oscillate, like a pendulum, the plane of vibration will not change.

"Suppose that over a round table, like that illustrated in the diagram, capable of revolution, without jar, there is suspended vertically above the center (C) a heavy ball (P) by a wire. Gently pull the ball to one side (as B) and let it go. It will oscillate in a vertical plane, of which X C M is the trace on the table. Now revolve the table as the arrow indicates. If in a few

around the central point. The time of one complete revolution of the plane of vibration of the pendulum was about 31 minutes of arc. "The air carries a motion of the pendulum ball and would seem to bring it to rest. In order to overcome this resistance Foucault devised an ingenious electric apparatus which accelerated by magnetic attraction the motion of the iron ball at the center of every swing. This apparatus made it possible to cause the pendulum to swing for as long a time as was desired.

The circle of the Pantheon was about six feet in circumference. The experimental proof was received with great applause, and since that time it has been repeated at a number of places. In May, 1851, the experiment was tried at the cathedral in Rheims, and again in June, 1858, at the cathedral in Amiens. Foucault also devised an experiment proving the earth's rotation, using a gyroscope. During the summer of 1880 there was exhibited an experiment at the Paris astronomical observatory which, with the aid of a lantern, showed the earth's rotation on the screen. It seems strange that even today there are many persons who believe in a flat earth and an earth that does not rotate on an axis.

"The Foucault experiment could be successfully exhibited in many places in this country. The pendulum might be swung under the dome of the Capitol at Washington or in the library at Columbia university or under the dome of General Grant's tomb."

HOUSTON'S NEW BUILDING

TEXT OF THE LETTER WHICH WAS SENT TO THE CONGRESS.

Reasons Why It Is Cheaper to Purchase Suitable Lot and Erect Thereon a Building Commensurate with Needs.

(Special Correspondence of the Post.) Washington, December 11.—Following is the text of the report on the Houston post-office case, as submitted to congress: Federal Building at Houston, Texas.—A letter from the secretary of the treasury, the postmaster general and the attorney general, submitting a report as to the Federal building at Houston, Texas, December 9, 1902.—Referred to the committee on public buildings and grounds and ordered to be printed.

Treasury Department, Office of the Secretary, Washington, December 8.

Site: In compliance with a provision of section 22 of an act of congress approved June 6, 1902, increasing the limit of cost

of certain public buildings, etc., we have the honor to report relative to the Federal building at Houston, Texas.

The building is located on the south corner of Panna and Franklin streets, on a lot fronting northwest 125 feet on the former and northeast 100 feet on the latter. The ground was purchased in 1887, the government paying \$7000. The actual purchase price, however, was \$14,000, certain citizens contributing the difference.

The building is basement and two stories in height and is constructed of red brick with red sandstone and terra cotta trimmings. It covers an area of 3107 square feet and takes up all the lot excepting a fire limit of forty feet on the two sides opposite the street frontages. It was completed in 1891, the cost of construction being \$82,500.73.

Practically the whole building is occupied by the postoffice. The roof space is barely sufficient for present needs and in two years will be inadequate. In fact, some of the divisions are now overcrowded. The worst feature, however, is that the mailing division, for lack of room on the first floor, has been moved to the second floor. This is objectionable, because it makes proper supervision difficult, and especially because it interferes with the quick and convenient delivery of mail.

The gross receipts of the postoffice have increased from \$40,671 in 1895 to \$139,000 in 1900. The deputy collector of internal revenue occupies a room on the second floor, which is also used as a dormitory for railway mail clerks. This arrangement is very objectionable, but better quarters in the building are not available.

The civil service board, for lack of better accommodations, holds examinations in a part of the basement, which is really a part of the boiler room. It is entirely unsuitable for the purpose. Accumulations of the United States courts and court officers are provided in a private office building at an annual rental of \$1800, exclusive of light and heat.

Houston is located on what is known as Buffalo bayou, at the head of tide water, forty-eight miles from the Gulf of Mexico. Extensive improvements are being made under the control of the war department, having in view the deepening of the channel to twenty-five feet to within a few miles of Houston, which will increase the shipping water considerably. But even at present the water transportation is quite extensive.

The population of Houston, according to the census of 1900, was 44,833, against 27,507 in 1890.

The business interests of the city are very extensive, comparing favorably with cities three or four times its size. There are six National banks and one private bank, with deposits aggregating \$10,000,000. The business done through the Houston clearing house last year amounted to over \$400,000,000. The amount of cotton from this city exceeds \$25,000,000 per year, and other industries, such as lumber, sugar, cattle and rice are not far behind.

Manufacturing concerns, some of them quite extensive, are located in the city. The supply of fuel for the city is abundant and cheap. The city has solved the fuel question for this part of the country, and the increase in the manufacturing business can be expected. The assessed valuation of property in the city is \$10,000,000. The city is a center in Houston and more are in the course of construction. Several of them have headquarters in the city.

Taking all the circumstances into consideration, Houston can not fall to increase rapidly, and the present census will show a population exceeding probably 100,000. In view of these conditions, we are of the opinion that a general policy will prove a wise one in the building of new buildings in that city that are projected at the present time.

Two methods have been under consideration of providing additional accommodations. One is the purchase of additional land fronting 150 feet on Franklin street by 105 feet deep and the erection of an extension thereon. The other is to dispose of the present property and erect a new building in another and more suitable location.

Under the former method the land would cost about \$20,000 and an extension of about 100 feet by 150 feet would cost about \$10,000. While this method is less expensive, it is open to the objection that the interior arrangement of the building is so little adapted for enlargement that the accommodation of a court practically the whole interior would have to be reconstructed also in order to be adequate. It should be, and is likely to become quite objectionable in the near future.

The latter method, consisting of the erection of a new building, would seem to be the best policy, and ultimately the most economical and satisfactory.

The city blocks are of uniform size, 200 feet square, and while an entire block would be preferable, about two-thirds of a block, or 150 feet by 100 feet, would be sufficient for the building. A suitable lot of this size in a desirable location can be purchased for about \$70,000.

There would be required a building basement and two stories in height, covering an area of about 12,500 square feet. Such a building of frame construction would cost about \$200,000.

Cost of additional land, 150x125 feet \$40,000

Construction of extension, 140,000

Total, \$280,000

Cost of land, 250x150 feet, \$70,000

Construction of building, 200,000

Total, \$470,000

As an offset against this may be considered the amount for which the present lot and building can be sold. This is estimated at \$70,000. Respectfully,

E. M. Shaw, Secretary of the Treasury;

H. C. Payne, Postmaster General;

R. C. Richardson, Attorney General.

The speaker of the House of Representatives.

Types of the New West.

John M. Houston in Leila's Weekly.

Geographically, the new West coincides with the old. It is met at the St. Louis, appearing the obnoxious, irritated traveler comes from the East. He will, sure enough, catch glimpse of it through Southern Indiana and across Illinois, where there is likely to be a loosening of talk in the Pullman, and a kind of taken-for-granted young-a-genius-fellowship that is alien to the New York and Buffalo train.

But the big union station at St. Louis waits for the Eastern traveler into isolated groups and breaks down their reason. From St. Louis wait the obnoxious traveler may study his type within first breaking a silence through the habitual barrier of polite ambling.

For the man of this new empire is busy; he is open to new influences; what the old stranger has to say as he drops into the seat beside him may affect him and his audience. He is not a man of a half a thing in spending half an hour talking about the discomforts of travel and the varieties of landscapes which are information to be gained of the process of manufacturing shoes, or the study of Latin in the Eastern colleges, or the fertilization of this soil.

Honorably,

Chicago Tribune.

There is such a commonplace sort of man ever get the title of "Colonel."

Native—he is not a mister. Liked the fellow that the quarter the Colonel Jones in a far square, standup fight.

It's Your Duty

To be strong and healthy, especially when such a commonplace sort of man ever get the title of "Colonel."

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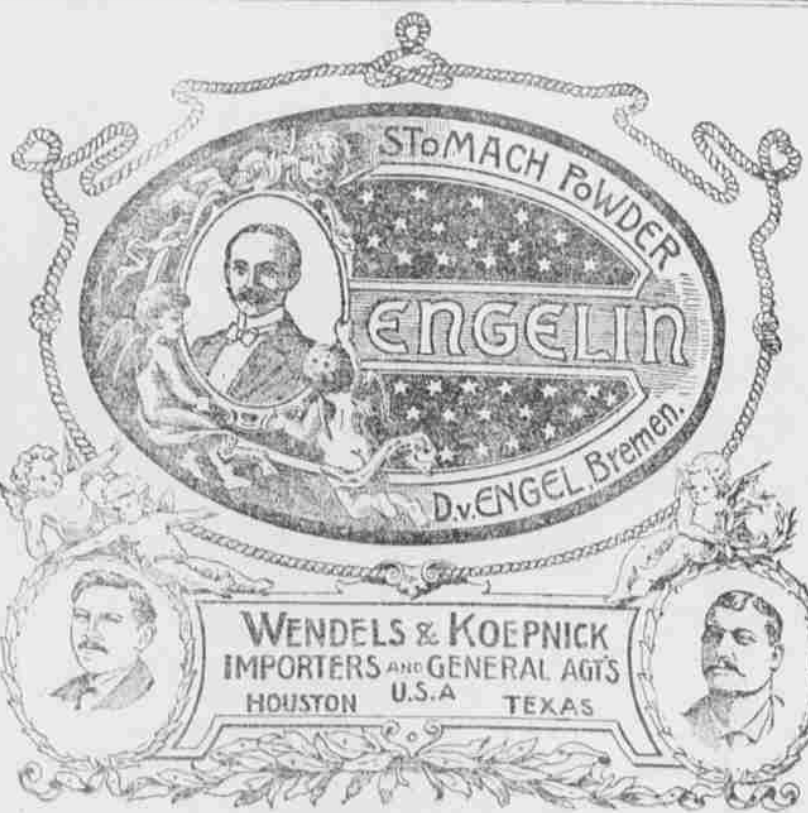
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F. F. Cassimere, all colors, regular price 35c; Removal Sale price, yard 20c
F. F. Worsteds, all colors, regular price 25c; Removal Sale price, yard 15c
Manchester Worsteds, all colors, regular price 15c; Removal Sale price, yard 12c
French Flannel, for shirt waists, regular price 50c and 75c; Removal Sale price, yard 35c
Red and White Flannel, regular price 25c; Removal Sale price, yard 20c
Red and White Flannel, regular price 35c and 40c; Removal Sale price, yard 25c
Heavy Gray and Navy Flannel, for skirts, regular price 75c; Removal Sale price, yard 45c
Ladies' Tailor-Made Suits, in broadcloth and serge, regular price 10.00 and 15.00; Removal Sale price, each, 6.00 and 8.00
Jackets, regular price 4.00, 6.00, 10.00 and 15.00; Removal Sale price, each, 2.00, 2.50, 5.00 and 7.00
Skirts, black only, fine goods, regular price 4.00, 6.00 and 8.00; Removal Sale price, each, 2.00, 4.00 and 6.00
Silk Skirts, regular price 6.00, 10.00 and 15.00; Removal Sale price, each, 4.00, 7.00 and 9.00
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Men's Suits, clay worsteds, regular price 7.00; Removal Sale price 4.00
Men's Suits, clay diagonal, regular price 15.00; Removal Sale price 10.00
Men's Ulsters, heavy goods, regular price 7.50; Removal Sale price 3.75
Men's Overcoats, tan and black beaver, regular price 8.00; Removal Sale price 5.00
Men's Overcoats, fine melton, regular price 12.00 and 15.00; Removal Sale price 9.00
Boys' Overcoats, sizes 6 to 11, regular price 2.50; Removal Sale price 1.75
Boys' Overcoats, sizes 6 to 11, regular price 4.00; Removal Sale price 2.25
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