

THE MARCH OF PLANETS AND MOONS

There Are Few Exceptions to Its General Direction — The Many Different Senses in Which the Word Direction May Be Understood. (By Garrett P. Serviss)

Kindly give information on the following questions:

First—Does the earth revolve about the sun from west to east in accordance with its own revolution on its own axis?

Second—Do the planets all revolve about the sun each in the direction of its own revolution. In other words, does the earth or any planet revolve about the sun in a direction counter to its own revolution?

Third—Do the planetary moons revolve on their own axes or are they like earth's moon in this respect?

These questions all appear to be very simple, but I certainly do not know the answer to them, and I believe that the average person, like myself out of school for many years, might like to be brightened up on these subjects.

SIDNEY STEVENS.

Millinocket, Me.

1. Yes, the revolution of the earth around the sun like its rotation on its axis is performed from west to east. This "direction" is purely conventional, and the notion of it arises from our sense of the circular motions to which it is due. To a man looking down upon one of the poles of the earth (the "north"), the rotation would be supposed above the other pole (the "south") the rotation would be from left to right.

Take a small globe out of its bearings and set it spinning from "west to east," as indicated by its geographical features; then turn each pole alternately toward your face and you will perceive the curious apparent reversal of its rotation, due entirely to your referring it to your inner sense of direction.

Just so, the revolution of the earth and the other planets around the sun would be from right to left for a person looking down upon the solar system from a point north of its plane, and from left to right for one who regarded it from the "south" side.

You get a similar effect by looking at a spinning wheel alternately from opposite sides. To a man on one side of a road the wheel is running to the left; to a man on the other side it is running to the right, but the one man's "right" and the other's "left" are purely personal impressions which do not define the actual motion of the wheel. Hang the observer up by the heels and what was right becomes left.

But note that "west" and "east" are not referred, like "right" and "left," to our personal impressions, but to the rotary motion of the earth. Thus west and east have the same sense on both sides of the equator, and the earth's rotation takes place from west to east for all the earth's inhabitants, no matter in which hemisphere they live. This is because mankind have agreed to consider the direction of the sunset west and that of the sunrise east. Nevertheless, with regard to fixed outer space, where west for us is east for our antipodes. Just as right and left are impressions of direction referred to the human brain as a source, so west and east are impressions of direction referred to the rotation of the earth, and both are correspondingly restricted in their application.

2. All the planets, without exception, revolve around the sun in the same direction, and all, except two, rotate on their axes in that direction, "west to east." The two exceptions are the outer planets, Uranus and Neptune. There is some doubt about the exact inclination of the axes of these planets to their orbits, but the axis of Uranus appears to lie nearly in the plane of its orbit, so that its rotation is performed almost at right angles to its motion around the sun, while the axis of Neptune is tipped so far over "backward" that its rotation occurs from east to west. The rotation of the planet revolves around the sun from west to east. For Uranus a very curious result follows, because every summer, in either hemisphere, the sun must pass nearly through the polar zenith, the ecliptic lying across the middle of the polar zone, while in winter the sun is never seen within that zone.

In the satellites of the planets we have a few more examples of opposition to the general direction of motion in the solar system. The four satellites of Uranus follow the example of that planet's rotation in revolving around their primary nearly at right angles to the plane of its motion around the sun, while the one satellite that Neptune is known to possess also imitates its master by revolving from east to west. In addition to these, there are three other satellites, including the two outermost of Jupiter's nine, and the one most distant of Saturn's nine, which, unlike their sisters, revolve from east to west. It is significant that just as the only planets that contradict the general law of rotation in the solar system are the most distant ones from the sun, so the only satellites that contradict the general law of revolution in the systems to which they belong are the most distant ones from their planets.

3. To your third question a perfectly definite answer cannot be given. Observations have not absolutely determined whether or not the satellites generally rotate on their axes. As far as it goes the evidence, mainly inferential, is that they all (or all the large ones) probably rotate, like our moon, only once in the course of a revolution. This would result in their keeping the same face always toward the primary, as happens with the moon, and it would probably be a consequence of tidal friction.

Notwithstanding the exceptions that have been mentioned, the motions both of revolution and rotation in the solar system are so overwhelmingly in the same direction that this coincidence is generally regarded as furnishing evidence almost irrefutable that, in its beginning, the system had the form of a whirling nebula, out of which the chaotic elements of the sun with his planets and the planets with their satellites were formed by the gradual emergence and predominance of law and order.

DROPS 12 STORIES TO DEATH. Wilmington, Del., Jan. 6.—Apparently thinking she was stepping into her elevator, but instead stepping into the shaft, Mrs. Rosa Bryce, 33 years old, an elevator operator in the duPont building here, fell twelve stories, about 3 o'clock yesterday afternoon and was killed instantly.

Use McNeil's Cold Tablets. — Adv.

Store Closes Regularly On Saturdays at Six

Bowman's

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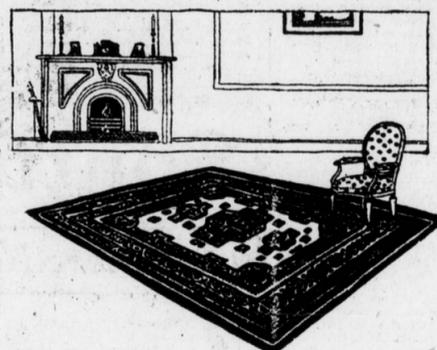
With Still Further Advances Probable In Rug Market It Is Economy To Buy Now At

Bowman's Annual Sale Of Rugs, Linoleums And Carpets

When you consider that there have been two raises in price by the manufacturers since the armistice, you can readily see that there is no immediate prospect of rug prices going down.

But this large assortment of floor coverings unsurpassed in this vicinity for quantity and quality of makes was mostly bought before the war prices began to soar, consequently the regular selling prices are even lower than we could afford if we bought the same quality Rugs from the mills today.

In many instances these special sale prices are therefore less than the present cost of production



Wool Faced Tapestry Rugs

Of excellent quality and beautiful Oriental, floral medallion and all-over patterns. 6x9 ft. \$10.00, \$12.50 and \$16.50. 6.9x12 ft. \$22.50. 7.6x9 ft. \$12.50, \$16.50 and \$21.00. 8.3x10.6 ft. \$18.50, \$22.50, \$30.00. 9 x 12 ft. \$20.00, \$22.50, \$25.00. 9x15 ft. \$42.50.

Colonial Rag Rugs

In hit and miss patterns— 24x36 inches, 95¢. 27x54 inches, \$1.00 and \$1.50. 36x72 inches, \$2.00, \$2.50 and \$3.00. 25x50 inches, \$7.25. 30x60 inches, \$1.75 and \$2.25. 7.6x10.6 ft., \$8.00 and \$10.00. 9x12 ft., \$10.00 and \$15.00.



Ten Wire Tapestry Rugs

Made by Roxbury Carpet Company in beautiful all-over and medallion patterns. 7x9 ft., \$22.50. 9x12 ft., \$35.00. 8.3x10.6 ft., \$32.50. 11.3x12 ft., \$45.00. Axminster Rugs. In luxurious deep tufted patterns: 4.6x6 ft., \$ 8 . 5 0 , \$12.50. 9x12 ft., \$35.00, \$42.50. 12x13.6 ft., \$52.50. 8.3x10.6 ft., \$25.00, \$27.50, \$32.50. 11.3x12 ft., \$47.50, \$50.00. 12x15 ft., \$62.50.

Body Brussels Rugs

Made by the M. J. Whittall and other good makers. 4.6x6 ft., \$15.00. 6x9 ft., \$21.00, \$24.00. 9x12 ft., \$37.50, \$54.00. 11.3x12 ft., \$72.50. 4.6x7.6 ft., \$18.50. 8.3x10.6 ft., \$31.50, \$50.00. 27x54 inches, \$9.00. 36x63 inches, \$9.00.

Wool Wilton Rugs

In blue mahogany and tan patterns. 4.6x7.6 ft., \$22.50. 6x9 ft., \$27.50, \$42.50. 8.3x10.6 ft., \$57.50.

Whittall Wilton Rugs

Embracing all the new colors and patterns. Royal Worcester, 9x12 ft., \$83.50. Anglo Indian, 9x12 ft., \$95.00. Anglo Persian, 9x12 ft., \$110.00. Other sizes in proportion.

Fiber Rugs

Made of heavy Kraft fiber; weatherproof and sunfast. 6x9 ft., \$7.50. 8.3x10.6 ft., \$11.00. 9x12 ft., \$12.50. 6x12 ft., \$9.50. 9x9 ft., \$10.00. 9x15 ft., \$16.50.

Royal Wilton Rugs

Made by the John and James Dobson in beautiful corduroy, mottled and medallion patterns of high grade worsted yarn; one size only. 9x12 ft., \$57.50.

Printed Tapestry Rugs

With mitted borders in conventional patterns; 9x12 ft., \$15.95.

Grass Rugs

Beautiful Japanese grass rugs, stenciled patterns in brown, green, blue and red. 6x9 ft., \$6.50. 6x12 ft., \$9.00. 9x12 ft., \$11.00.

Willow Grass Rugs

In blue, green and brown patterns. 6x9 ft., \$7.00. 8x10 ft., \$11.00. 9x12 ft., \$12.50.

Crex Rugs

In green, brown and blue patterns. 54x90 inches, \$7.00. 6x12 ft., \$11.50. 8x12 ft., \$13.00. 9x15 ft., \$17.50. 6x9 ft., \$10.00. 8x10 ft., \$12.50. 9x12 ft., \$13.50. 12x15 ft., \$25.00.

Velvet Rugs

Wool faced; some seamless in floral and all over patterns. 6x9 ft., \$21.00. 7.6x9 ft., \$22.50. 8.3x10 ft., \$30.00, \$25.00. 9 x 12 ft., \$27.50, \$32.50, \$35, \$37.50. 11.3x12 ft., \$35.00, \$42.50, \$45.00.

Table Oil Cloth

Best quality — 1 1/4 yd. wide, slightly imperfect. 19¢ yd.

Cork Linoleum

In beautiful patterns for baths, kitchens or any room — best quality. 95¢ sq. yd.

Inlaid Linoleum

Cut from the full rolls in newest patterns, \$1.45, \$1.75 and \$2.25 sq. yd.

Carpets

Excellent patterns in tapestry carpets for halls, stairs or rooms at 85¢, \$1.35 and \$1.69 per yd. Velvet carpets, \$1.75 per yd.

Wool and Fiber Carpets

With borders for halls or runners. 22 1/2 inches wide, 50¢. 27 inches wide, 55¢.

Rag Carpets

Made of sterilized rags closely woven, 36 inches wide. 55¢, 89¢, 98¢, \$1.19.

Rubber Stair Treads

Fancy mouldered patterns — bordered all around. 7x18 inches, 17¢. 9x18 inches, 19¢. 9x18 inches, 22¢.

Window Shades

Good quality oil shades in green, ecru, brown, white on good rollers. 36x6 ft., 80¢. 36x7 ft., 95¢. Hand made oil shades on guaranteed rollers. 36x6 ft., \$1.15. 36x7 ft., \$1.35.

Scatter Rugs

In Axminster, velvet and tapestry. Axminster 22 1/2 x 36 inches, \$1.65, \$2.00. 27x52 inches, \$2.95. 27x54 inches, \$3.00, \$4.00. 36x72 inches, \$6.00, \$7.50 and \$9.00. Velvet 24x48 inches, \$2.50. 27x54 inches, \$3.00, \$4.00. 36x72 inches, \$5.25, \$8.50.

New Process Linoleums

In tile and Mosaic patterns of blue, green, brown or tan; two yards wide; 49¢ sq. yd. (bring measurements.)

Inlaid Linoleums

In useful lengths of tile and Mosaic patterns; 95¢ sq. yd. (bring measurements.) KAUFMAN'S—First Floor.

Men's Underwear Special

Heavy fleeced lined union suits — a special lot; another one of our advantageous purchases.

A well-fitting garment with plenty of warmth, giving the wearer comfort.

An exceptional value specially priced, \$1.95.

Women's Underwear Special \$1.55

A white cotton ribbed, fleeced lined union suit, high neck, long sleeve, ankle length. A shapely garment of medium weight, good clean merchandise.

Silk Stockings Specially Priced

We are closing out prior to Inventory an assortment of twenty strand silk stockings, heavy and durable, double silk foot, double lisle top. One of the best styles we have carried this season.

Your choice of black, white, gray, cordovan and Russian tan at the unusual price of \$1.55.

BOWMAN'S—Main Floor

January Sale of Wool Flannels

Just in time for the winter weather that is ahead of us.

Wool shirting flannel in light and medium and dark gray, navy and khaki, also Shepherd plaid. Guaranteed all wool — cut from the piece at the special price of \$1.19 and \$1.29 per yard.

Red and White flannel, all wool, \$1.19, \$1.29 and \$1.50 per yard.

Outing Flannels — 36 inches wide in light patterns, blue and pink striped; good quality and heavy nap, 32 1/2¢ yard.

Unbleached Canton Flannel — 27 inches wide; good weight and will bleach easily, 30¢ yard.

BOWMAN'S—Second Floor

Headquarters For Dinner Sets \$8.50 to \$150.00

Numerous decorations from which you can select any number of pieces desired. BOWMAN'S—Basement.

Kenlet Kits

Made for the men at the front to retail at considerably more than you can buy them for now.

Fill them yourself for your travels; price, 50¢ and 75¢; filled, \$2.00 to \$5.00. BOWMAN'S—Basement.

Oil and Gas Heaters

Oil heaters, \$5.25 to \$10. Cylinder gas heaters, \$2.50, \$6.25.

Gas heater with copper reflector, that adds cheer to the room, \$5.00 to \$5.50.

Gas radiators, with jeweled front, \$3.98 to \$13.50.

Lawson gas heaters, \$6.25 to \$25.00. Gas heaters that can be put on gas jet giving heat and light at same time, 85¢ to \$1.25. BOWMAN'S—Basement.

Our January Silk Sale

Still Commands the Attention of the Thrifty Buyers

Although this sale started with inclement weather; the response was quite enthusiastic. The quantities are so generous that all lines are still complete and new ones added daily.

- 36-inch black silk — 10 different weaves such as taffetas, satins, messalines, etc., \$1.85 yd. 36-inch black silk, taffeta and satin, \$1.39 yd. 40-inch Crepe de chine. — 40 colors — plenty of white, navy or flesh, \$1.39 yd. 36-inch fancy silks, \$1.45 yd. 36-inch Harrisburg made, fancies, \$1.95 yd. 40-inch colored meteor, \$2.50 yd. 40-inch printed Pussy Willow, \$3.25 yd. 36-inch silk and cotton Foundation, 48¢ yd. 36-inch silk and cotton crepe, 59¢ yd. 36-inch silk and cotton poplins, 89¢ yd. 40-inch silk and wool poplins, \$1.69 yd. 50-inch black silk plush, \$6.50 yd. 36-inch velveteens, \$2.85 yd.



Lunch Cloths Specially Priced

Lunch cloths, 58x58 — these cloths are made of a very fine satin finished Damask in beautiful patterns. Special price Tuesday only, \$1.15 each. BOWMAN'S—Second Floor.

Blanket Bathrobes at Close-Out Prices

We have a few blanket robes left from our Holiday stock, which we are closing out in some cases less than cost. Full sized robes, jacquard patterns. An exceptional value, specially priced at \$6.75. BOWMAN'S—Main Floor.

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BOWMAN'S—Basement.

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