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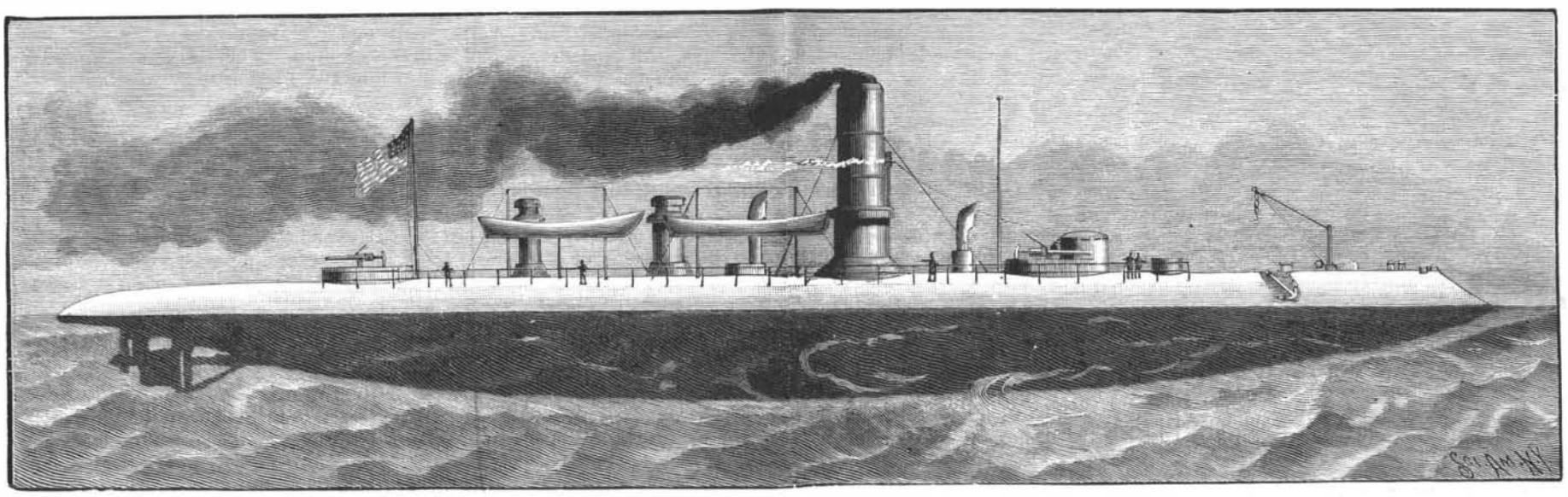
THE HARBOR DEFENSE RAM KATAHDIN.

A vessel which stands alone in its class, the first vessel of our new navy built solely to be used as a ram, and one which is laid out on original lines as compared with work in a similar direction in foreign navies, was launched at the Bath Iron Works, Me., on February 4. Not belonging to any of the classes of vessels for which names are provided by law, it was christened Katahdin, after Mount Katahdin, the highest mountain in Maine. A distinguished company of guests was present at the ceremonies attending the launching, including the Assistant Secretary of the Navy, James R. Soley, Senators Hale and Frye, Thomas A. Edison, and the members of the Maine Legislature in a body. The launch was a success, the vessel sliding gracefully and easily into the water.

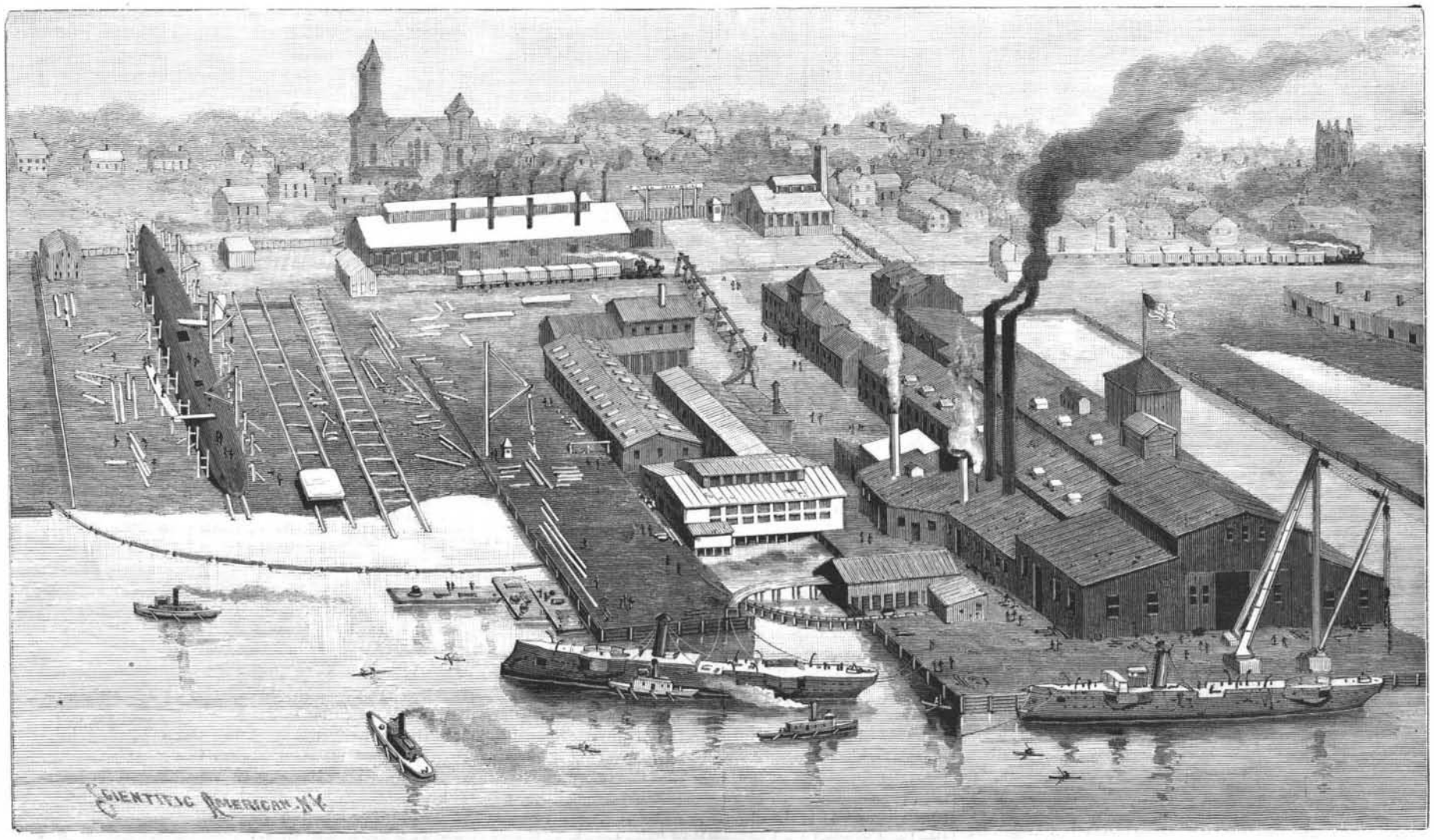
The Katahdin is a twin screw armor plated vessel, built from the designs of Rear Admiral Daniel Ammen, and is based upon the personal experience of the admiral in the use of and the defense against rams in our civil war, 1861-65. The plans were made in the Bureau of Construction and Repair, under the supervision of Commodore T. D. Wilson, in consultation with Admiral Ammen, and the machinery was designed in the Bureau of Steam Engineering, under the supervision of its chief, Commodore George W. Melville. The bids for her construction were opened at the Navy Department on December 20, 1891. There was one bidder only, the Bath Iron Works, and on January 28, 1891, the contract was awarded to this company to build and equip the vessel and machinery and to place the armor for $930,000, to be completed by July 28, 1892.

On March 27, 1891, the Navy Department approved the proposition of the contractors to lengthen the vessel eight feet, the corresponding increase in the displacement (133 tons) to be utilized in increasing the coal supply and providing a battery of four 6-pounder rapid-firing guns for defense against torpedo attack, the original design having no battery whatever. The type and size of the boilers were also modified. With these changes the dimensions of the vessel are as follows: Length over all, 251 feet; length on the normal water line, 250 feet 2 inches; extreme breadth, 43 feet 5 inches; breadth on water line, 41 feet 6 inches. The total depth from the base to the crown of deck amidships is 22 feet 10 inches, and the normal draught of water is 15 feet, the corresponding displacement being 2,155 tons. The lower portion of the hull is dish shaped up to a sharp knuckle, which runs all around the vessel 6 inches below the normal water line, the angle of the knuckle amidship being about 90 degrees. Above this knuckle the shape of the hull is a circular arc, with a radius amidship of 39 feet, rising from 6 inches below to 6 feet above the normal water line. This curved deck is armor-plated throughout, the thickness of the armor tapering from 6 inches at the knuckle to 2 inches at the crown of the deck. Above this deck is a conning tower of 18-inch plate, a smokepipe and ventilators, and two light barbettes, within which the guns will be mounted, and skid beams for carrying the boats. Longitudinally from the point of the ram to the stern the lower portion of the hull is shaped in a fair curve, but the upper portion is straight from the head of the stem to within about thirty feet from the stern, from which it rounds

(*Continued on page 100.*)



THE HARBOR DEFENSE RAM KATAHDIN, LAUNCHED FEBRUARY 4, AT THE BATH IRON WORKS.



THE BATH IRON WORKS AND SHIPBUILDING YARD, BATH, ME.

THE HARBOR DEFENSE RAM KATAHDIN.

(*Continued from first page.*)

down to the knuckle. An armor belt, from 6 inches to 3 inches thick and 5 feet deep, extends below the knuckle.

The hull is framed by continuous longitudinal girders, both below and about the knuckle, which, gathering together at the bow and stern, make a rigid structure. A continuous water-tight inner bottom two feet from the outer skin is carried nearly the whole length of the vessel and up to the armor shelf on each side. The vessel is really designed upon the longitudinal bracket system, the frames and beams being intercostal—that is, placed between the ribs. The double bottom is divided and subdivided by longitudinal and transverse frames, so that there are seventy-two water-tight compartments. The inner hull is further subdivided by water-tight bulkheads, both longitudinal and transverse.

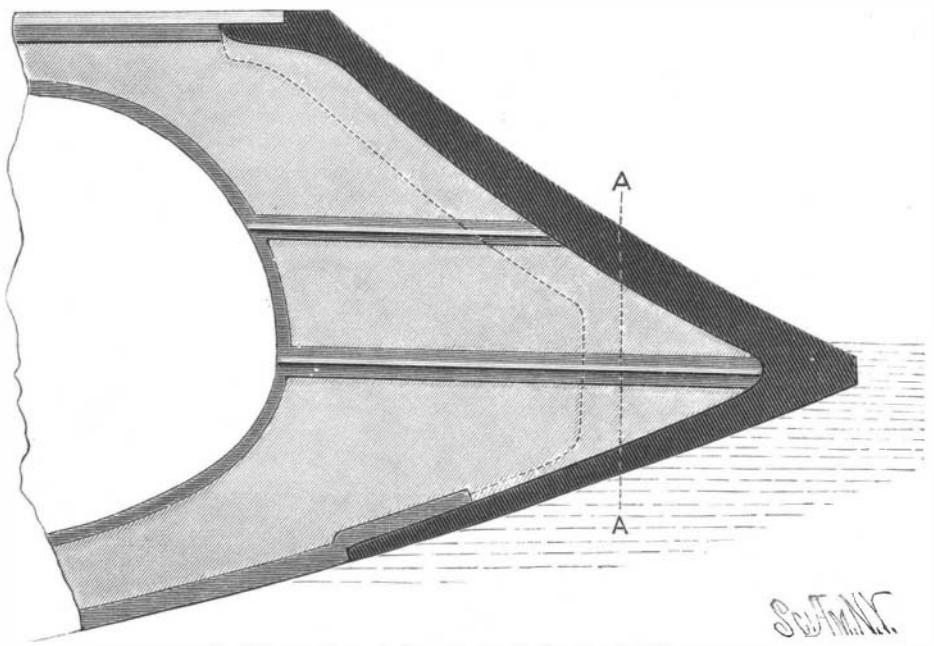
The ramhead is of cast steel (see cut), extending back eleven feet in a vertical line, and it is supported by longitudinal braces in such a way that the force of the blow delivered by it is designed to be distributed through the vessel. The maximum estimated speed, at full power, is seventeen knots, and the impact of the ram is designed to be equivalent to the blow of a hammer weighing over two thousand tons moving at this rate of speed—a blow which, if fairly delivered, would crash through the sides of any vessel afloat.

The motive power consists of two sets of horizontal triple-expansion engines, and there are two double-ended and one single-ended cylindrical horizontal five-tube boilers placed in water-tight compartments. The estimated maximum horse power is 4,800. There will be a complete installation of electric lights, sufficient for lighting all parts of the vessel. It is arranged that the vessel may be submerged to her fighting trim by means of fourteen 8-inch Kingston outboard valves, one in each transverse water-tight compartment of the double bottom, and sluice valves are fitted in the vertical keel and water-tight longitudinals in these compartments. When not so submerged the vessel is designed to have sufficient freeboard for coasting service.

The accommodations for both officers and men will be roomy and as comfortable as can be made on any vessel of similar build. The quarters for the officers will be on the after berth-deck, just abaft the engine-room bulkhead, and the wardroom has seven staterooms and a pantry. The forward berth-deck is designed entirely for the crew, but there is an apartment abaft the officers' quarters which may be used as additional berthing space for a portion of the crew.

The Bath Iron Works and Shipbuilding Yard, where the Katahdin was built, extend over a large area, on the banks of the Kennebec River, twelve miles from its mouth, the depth of water here being ample for vessels of the greatest draught. Several vessels of our new navy have been launched from this yard, two of which are shown at the docks in our first page illustration.

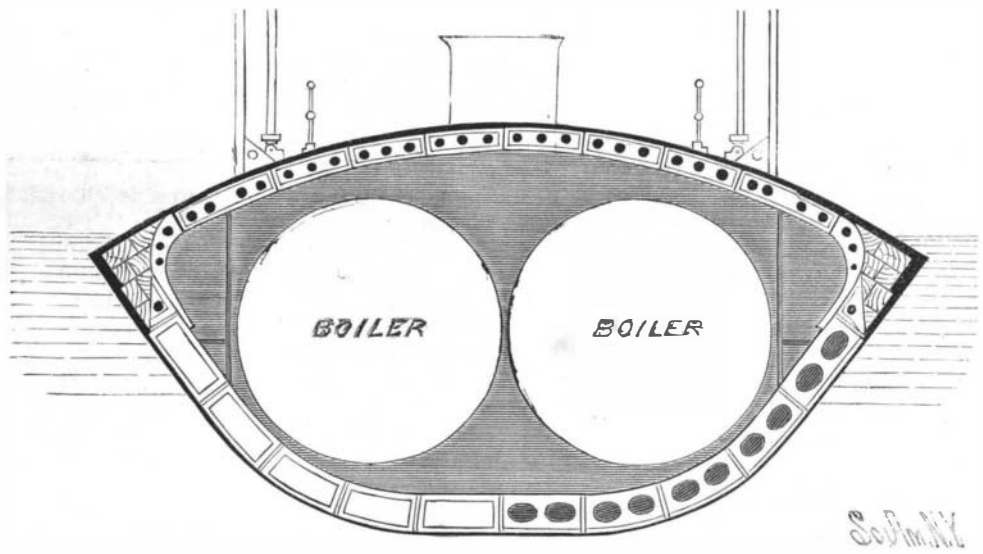
The yard is amply equipped with the most modern appliances in its extensive forge, machine and carpenter shops, and on one of its three launching ways may be seen the Katahdin, as drawn by our artist prior to the launching.



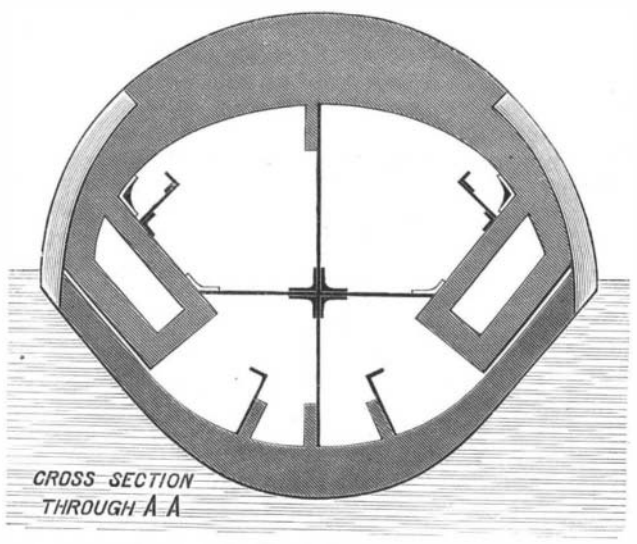
RAM KATAHDIN—LONGITUDINAL SECTION OF STEM.

Asbestos Porcelain.

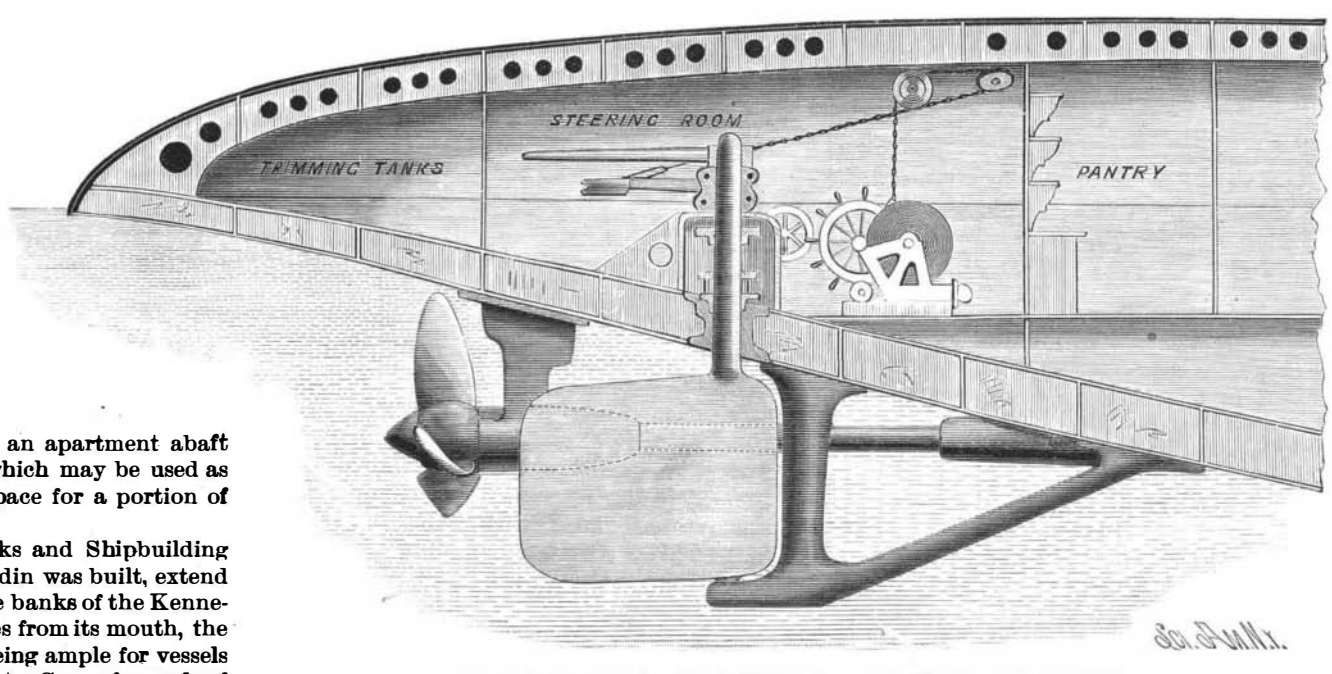
M. Garros is the inventor of a new substance somewhat resembling ordinary porcelain, but which possesses, as he claims, many advantages over that substance. The fibers of asbestos are exceedingly fine, their diameter varying between 0·00016 millimeter and 0·0002 millimeter, and consequently a very fine powder can be obtained from these. If it were possible to amalgamate these small particles without the addition of any foreign substance, it is evident that a substance could be obtained which would be porous in nature, but with pores so fine that they could hardly be seen under the microscope. This substance is formed by pulverizing the asbestos, a process which is rather difficult if the ordinary mortar is used, but which is comparatively easy when the proper apparatus is employed. From this powder a paste is made by mixture with water, and this paste is kneaded, diluted with water, dried and kneaded again, and then moulded into the proper form. By heating the objects in a crucible to a temperature of 1,700° Centigrade, a porcelain is obtained with a translucency comparable to that of ordinary porcelain, and for this reason the inventor has given the name of asbestos porcelain to the substance. If it is heated for 18 hours at a temperature of 1,200° Centigrade, then porous asbestos porcelain is obtained of a light yellow or white color, if care be taken to wash the asbestos powder with sulphuric acid. Professor d'Arsonval states that porous cups made of asbestos porcelain used in electric batteries have much less resistance than the ordinary porous cups, and it has been found that this substance is about 2·75 times a better insulator than the porcelain in common use at this time.—*Electricity.*



RAM KATAHDIN—CROSS SECTION AMIDSHIPS.



RAM KATAHDIN—CROSS SECTION NEAR POINT OF RAM.



RAM KATAHDIN—PROPELLER AND STEERING APPARATUS.

Why Lost People Walk in Circles.

The fact that people lost on a desert or in a forest invariably walk in a circle is due to slight inequality in the length of the legs. Careful measurements of a series of skeletons have shown that only ten per cent had the lower limbs equal in length, thirty-five per cent had the right limb longer than the left, while in fifty-five per cent the left leg was the longer. The result of one limb being longer than the other will naturally be that a person will unconsciously take a longer step with the longer limb, and consequently will trend to the right or to the left, according as the left or right is the longer, unless the tendency to deviation is corrected by the eye.

The left leg being more frequently the longer, as evidenced by measurement of the skeleton, the inclination should take place more frequently to the right than to the left, and this conclusion is quite borne out by observations made on a number of persons when walking blindfolded. Further, on measurement of the arms, it is found that in seventy-two per cent the right arm is longer than the left; while in twenty-four per cent the left arm is the longer, showing that a considerable majority of persons are right handed and left legged. The inequality in the length of the limb is not confined to any particular sex or race, but seems to be universal in all respects.—*Exchange — name unknown.*

WE have received a sample of the latest improved "Landry" pupilometer made by the well known firm of E. Kirstein's Sons Co., of Rochester. This pupilometer gives correct measurement from the center of each eye to the center of the face.