Correspondence.

Do the Rings Indicate the Age?

To the Editor of the Scientific American:

I have just read in the Leavenworth (Kan.) *Standard* of a huge walnut log now at the World's Fair, from Leavenworth County. The dimensions are not given, except that it is 16 feet long. It weighs 30,000 pounds. It is claimed to be the largest walnut log on the continent, if not in the world. On a transverse section of the log 572 concentric rings may be counted, and from this it is claimed that the tree was 572 years old when it was cut down. Do the rings indicate the age?

N. T. ALLISON.

Columbus, Kan., April 29, 1893.

It has been well established by cutting trees of known age that the rings indicate the annual growth. —ED. S. A.

Improved Country Roads and Electric Transit.

To the Editor of the Scientific American:

I read with some interest your page article on "Country Roads and Electricity." The subject of improved roads has the support of intelligent citizens as well as the wheelmen. Though I believe the county system the best solution of our road problem, I argued before the Senate Finance Committee in favor of a State system of two roads each way through every county, because it is necessary by some such radical measure to give the impetus and furnish each community with the object road. As for the imputation contained in your article as to the folly of so expensive an undertaking, if you will perform the mathematical problem of the proportionate share of such a system on each thousand of assessed valuation, you will find that the ten millions provided for by the Richardson bill, with carrying charge, and cost of repair figured at three hundred per mile, and sinking fund obliterating the principal in twenty-five years, with no account of increased valuation, distributed upon our four thousand million State valuation, would be about two cents per year per thousand dollars valuation for the twenty-five years. We could build 3,000 miles at ten thousand a mile, the proved cost of the Richmond and Queens County Telford roads, for thirty millions, being for the same period approximately a tax of six cents per thousand dollars valuation. The increased valuation of the State in this period would be likely to offset cost of new construction. Would it not be worth while for this State to have so comprehensive a system of improved roads, with their resulting effect and benefit to each community and the State at large? Every argument in your article is equally an argument for the improved road. Those of us who are moving in this surely have enough to overcome without meeting, as is indicated in your article, the argument that we are blocking progress. I believe that in the future extended systems of electric roads will go out into the country as soon as the population warrants it. I believe also that the improved road will lead to an increased country population and one much more progressive and likely to embrace better forms of communication, as, *e. g.*, electric—but such electric roads must run upon the sides and not upon the roadway. It would be a monstrous use of the roadway, which is only tolerable on the ground of convenience and necessity in the cities, and which has no place in the more enlarged and freer dimensions of the country road. It would undoubtedly cost more to lay the rails properly upon a macadamized road. It is equally true that it would cost practically double to do the same in any roadway to the construction necessary to make a more satisfactory road with T rail along the side of the country highway. A good macadam roadway for driving and ordinary traffic, bordered by an electric road, neither interfering with the other, affords an ideal system of intercourse between places, and one that does not mar the beauty of the highway nor its common use. Such exists here between Rochester and Charlotte, on the boulevard, so called.

I trust that a paper of your character will not hinder the agitation for good roads, which are a crying necessity of this State, by such arguments as are put forward in the article in question.

JOHN A. C. WRIGHT.

Wire-Wound Guns.

The British Admiralty, says the *Army and Navy Register*, has just adopted the new wire-wound, quick-firing six inch breech-loading gun for the navy. The new weapon is forty calibers long and weighs seven tons. It will fire an elongated projectile weighing 100 pounds a distance of over four miles. It is such a quick-firing gun that at long range when fired with cordite it has three or four shots in the air at the same time. Forty of the new guns have been manufactured at Woolwich and are being issued and mounted in ships in the British navy. The new gun is a breech-loading rifled gun having a muzzle velocity of 2,600 feet per second.

In this connection it is interesting to note that it is expected trials will be made at Sandy Hook, during April and May, of two wire-wound American cannon. One is the Woodbridge ten inch gun built at the Watertown arsenal under the supervision of the inventor, Dr. W. E. Woodbridge. The gun consists of a continuous steel tube, overlaid throughout its rear half with a cylinder of closely fitted steel staves, the whole wound with tinned steel wire, to be soldered or brazed in an oven. The whole length of the gun is divided into three sections by steel rings or bands, and forward of the staves the wire is wound directly upon the steel tube.

Another wire-wound gun, the Crozier ten inch rifle, designed by a young officer of the Army Ordnance Department, whose name is given to the gun, is nearly ready for trial. It was built at the Watervliet factory and consists of a steel tube, overlaid from breech to muzzle with a practically continuous covering of steel wire, wound in layers, with a jacket cylinder enveloping the steel wire over the re-enforce, and a continuous layer of steel hoops covering the wire from the trunnion band forward to the muzzle. The coils of wire are electrically welded, end to end, so that the gun is wound with a continuous strand of wire. The breech mechanism is of the usual service type.

The ordnance experts have taken every precaution in constructing these wire-wound rifles to overcome the most obvious weak point of this type of gun, which lies in insufficient longitudinal strength. The friends of the wire-wound weapon look upon it as a formidable rival of the so-called built-up guns. The wire-wound gun does not necessitate the handling and finishing of the great forgings required in the built-up constructions. It is also claimed that such a gun could be built both more quickly and more cheaply.

The New York and Chicago Twenty Hour Train.

The New York Central has given out a definite announcement of its new train to Chicago, which will begin running May 14. The time of leaving New York is 3 P. M., and of arrival in Chicago 10 A. M., making the running time 20 hours actual, 19 hours apparent time. There is to be an east bound train also, which will run at the same speed, leaving Chicago at 2 P. M. and arriving in New York at 11 the next morning. The distance through is 965 miles. About 10 miles at Chicago has to be traversed at reduced speed, so that the fast running must be done in about 19½ hours in a distance of 955 miles. This will mean just about 49 miles an hour, as against the 50·7 miles an hour of the Empire State Express. The train will probably consist of three sleeping cars and a combination smoking and baggage car, except when a dining car is taken on. This will probably be, going west, from Albany to Syracuse and Toledo to Chicago.

As every one knows, the New York Central and the Lake Shore make up the most favorable route between New York and Chicago for high speed. From New York to Albany the grades are very easy, although there are a good many curves for the first half of the distance. From Albany to Buffalo the curves and grades are not only very easy, but there are separate tracks for freight trains all the way. The only serious exception to this is the three mile ascending grade out of Albany, going west, where a helping engine has to be used. The Lake Shore has even a larger percentage of straight line than the New York Central, there being one tangent 70 miles long. This road is also practically double track throughout, there being, we believe, only one 14 mile stretch (between Toledo and Elkhart) where the second track is not finished. Track tanks have been put in at five different points, so that the trains will make regular stops only at Erie, Cleveland, Toledo and Elkhart. We believe there are one or two drawbridges between Cleveland and Toledo at which trains have to come to a stop, but the numerous grade crossings of railroads along the line are said to be all provided with interlocked signals.

In the matter of safety at facing point switches the Lake Shore, is, however, far behind the New York Central. The latter has distant signals of some kind at practically all such switches, but on the Lake Shore nearly all the switches are entirely unprotected except by the ordinary target and lamp. In fair weather and daylight most of these switches are probably visible several hundred feet away, but in fogs and storms and, to a less degree, in the uncertainties that always exist from sundown until dawn the next morning, the enginemen of these trains will have a perplexing dual responsibility—to obey the rules and yet make time. The Lake Shore road is arranged on the principle so commonly followed in the level portions of the country, that distant signals are needed only at obscure points, and that this definition means points which are always obscure, and as on most other roads, especially in the West, even this principle is in many cases neglected. Where trains run regularly at the high speeds we are now considering, the true principle is to treat all switches and other like dangerous points as though they were always obscure, that is, provide distant signals for them.

The new "flier," it will be seen, differs from the Empire State Express in several respects. It undertakes to keep up this remarkable speed more than twice as long, the rate, however, being a trifle slower. It will run about two-fifths of its trip in darkness, whereas the other train has daylight all the way except for two months in the winter. With three sleepers it will be a heavier train, even without the dining car. And last, but not least, it will depend for its profit largely, and probably chiefly, upon through passengers, which are comparatively few, while the remarkable prosperity of the Empire State has come from passengers who travel only from one stopping place to the next. It is said that the competitors of the Vanderbilt lines demand that the fare by the new train be made $30 through—fifty per cent above the regular rate.—*Railroad Gazette.*

The Incandescent Gas Light.

The brilliancy of gas light is greatly increased by causing a mixture of burning gas and air, as in the Bunsen burner, to impinge upon a lamp wick with which certain mineral substances have been combined. Nearly all the metals of the cerium and lanthanum groups have been experimented upon, and at the present time the following minerals are employed in this manufacture: Monazite, which contains 70 per cent of the oxides of cerium, lanthanum and didymium, in combination with phosphoric and silicic acids, thorite and orangite, which contain a large percentage of thorium oxide, gadolinite and orthite, minerals which contain 35–45 per cent of yttrium oxide in combination with zirconia and oxides of the cerite metals. From McKean's experiments the accompanying table has been drawn up to show the variation in the color of the light emitted from wicks or mantles made from these oxides in different proportions:

Color.	Ceria.	Didymia.	Erbia.	Lanthana.	Niobia.	Thoria.	Yttria.	Zirconia.
White	—	—	—	40	—	20	—	40
	—	—	—	60	—	—	—	40
	—	—	—	—	—	80	20	—
Yellow	2	—	—	40	—	28	—	30
	3	—	—	50	—	—	—	47
Orange	—	3	—	40		30		27
Green	—	—	30	20	—	50	—	

The oxides of lanthanum and thorium are used to a greater extent than the other oxides, and the green color which is a marked characteristic of some of these mantles is due to the presence of erbium oxide. The oxides of didymium, niobium, and yttrium are seldom used, and have no very marked influence on the general color of the light.

The intensity of the light emitted by the various metals has also been recently investigated. Mantles of the different oxides were prepared in a similar manner, and used in the same burner. Gas was supplied to the burner at the rate of 85 liters per hour under a pressure of 25 mm., and the intensity of the light determined in terms of the standard "Hefener" lamp.

The following figures were obtained:

Mantle.	Standard.	Color.
Thoria	31·56	Blue white.
Lanthana	28·32	White.
Yttria	22·96	Yellow white.
Zirconia	15·36	White.
Ceria	5·02	Red.

The best light effect is obtainable from a mixture of two-thirds thoria and one-third yttria, while, if the blue tinge of the color is not objected to, the maximum amount of light is obtained from a mantle made only from thoria.

The Largest Dredger in the World.

The Naval Construction and Armaments Company recently launched from their shipbuilding yard at Barrow a twin screw hopper and sand pump dredger named Brancker. This vessel has been built to the order of the Mersey Dock and Harbor Board, who have been so satisfied with the experiments made in cutting a channel through the Mersey Bar that they have determined to proceed with dredging operations there, so that steamers of the largest tonnage may be enabled to enter the river in any state of the tide. A vessel on a gigantic scale was designed by Mr. A. G. Lyster, under the direction of Mr. G. Fosberry Lyster, engineer to the board, the following being a general description of her dimensions: Length between perpendiculars, 320 feet; breadth, moulded, 46 feet 10 inches; depth, moulded, 20 feet 6 inches; gross register tonnage, 2,560 tons. She is built of steel to Lloyd's highest class, and has amidships eight large hoppers, four on each side of the vessel, having a total capacity of 3,000 tons of sand. A well is formed up the center of the ship between the hoppers to allow the working of a sand pump suction tube, 3 feet 6 inches diameter, through the bottom of the vessel. This tube is raised and lowered by hydraulic power, and when lowered can dredge to a depth of 45 feet. Two large centrifugal pumps, having suction and discharge pipes 3 feet in diameter, capable of raising 4,000 tons of sand per hour, are driven by two sets of triple expansion engines. The vessel will be able to fill her hoppers with 3,000 tons of sand, proceed to the depositing ground and get back again to the scene of operations in one hour. The Brancker is the largest dredger in the world.