Correspondence.

The Behring Sea Tunnel.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of April 7 I read with much interest the article "Tunneling Behring Sea." I was over the ground in 1900, and think you are safe in saying that a tunnel is not the proper way to make the connection between Alaska and Siberia. But there is no reason why a ferry could not be run across Behring Strait.

It would have to be a special type of double propeller boat. The Eskimos go across the strait in their skin boats. The heaviest ice that is ever in Behring Sea is that which goes down the Yukon River in the spring. There is a current in Behring Sea that sets north, and takes all the ice into the Arctic. There is no reason why a large car ferry could not make regular trips. J. H. WOOD.

Stony Ford, N. Y., April 9, 1906.

[Some interesting details concerning the engineering difficulties that would have to be encountered in the construction of a railroad connecting Russian Siberia with Alaska *via* the Behring Strait is afforded by Mr. Harry de Windt, the well-known explorer, who is thoroughly conversant with the country through which the contemplated railroad would be built, as he passed through this region on his memorable overland journey from New York to Paris in 1901.

He states that it would be necessary to lay down over 3,000 miles of track. The chief obstacle is the Siberian "tundra," which a train would have to cross before reaching the Strait. Tundra is a native word signifying the vast expanse of swamp and marshland, interspersed with numberless stagnant lakes, which extends for thousands of miles across the Arctic zone in Siberia. In summer time the tundra is like a wet sponge, into which even a man sinks knee deep at every step, and consequently the natives seldom venture any distance from home save by lake or river. From May to October settlements are completely isolated by this vast ocean of swamp. It is only in winter, when the tundra has been covered with a layer of hard-frozen snow many feet in depth, that these people are able to move from one place to another in a dog or reindeer sled.

The tundra section of the line he estimates would cost about one hundred million dollars, for every wooden cross-tie would have to be imported into this treeless country. There is a general impression that, although the winter would probably impede the traffic, trains could easily run up to the Behring Strait during the summer, whereas this is the very season when the line would be rendered absolutely useless by floods and the yielding of the swampy treacherous tundra. As to the winter, during his three months' trip from Yakutsk to Behring Strait in dog and deer sleds, furious blizzards frequently piled up snow drifts twenty feet high and a couple of miles in extent in the course of a few hours.—ED.]

Stellar Universe in Miniature.

To the Editor of the SCIENTIFIC AMERICAN:

Having recently taken up the study of astronomy, I am much interested in the articles on that subject which from time to time appear in the SCIENTIFIC AMERICAN. Nothing perhaps is more difficult to the beginner than to form a just and adequate conception of the vast scale on which the stellar universe is constructed; and with a view to a diminution of this difficulty, I would like to suggest an imaginary illustration which I have found very helpful to that end.

Let us suppose a miniature representation of the heavens on a scale of one hundred millions of miles to the inch. On such a scale our sun would be represented by an incandescent particle, or minute globe (about one-hundredth of an inch only in diameter, but radiating its light and heat to a great distance around), the earth (a mere speck) would be located at a distance of about one inch from the sun, Mars at 1½ inches, Jupiter at 5, Saturn at 9, Uranus at 18, and Neptune at 28 inches. Now, in regard to the "fixed" stars, it is a somewhat remarkable coincidence that light (speeding at 192,000 miles a second) traverses in one year a distance which corresponds approximately to one mile on the above scale of one hundred millions of miles to the inch; therefore, Alpha Centauri (the nearest of the "fixed" stars), whose light takes about three and a half years to reach the earth, would be represented in our imaginary sphere by another incandescent particle—or rather (being double) by two such particles—at a distance of about three and a half miles from our own sun, with its attendant planets, and, in like manner, all of the other "fixed" stars would be placed at distances approximating in miles to the same number of years that it takes for their light to reach the earth, based on the determination of their parallax: thus Sirius would be distant about 15 miles, Vega 22 miles, Arcturus 28 miles, Polaris 45 miles, Capella 70 miles, and so on, in various directions. It will thus be seen that in order to represent, on this very diminutive scale, the starry sphere (of which our own solar system forms so minute, but not "insignificant," a part) it is necessary to imagine a sphere of many hundreds of miles in linear dimensions—to say nothing of stellar systems which perhaps lie entirely outside of our own, and which, even in our best telescopes, are lost in the depths of space.

If it be objected that this imaginary illustration impresses one most with a sense of the comparative vacuity of space, it may be observed that space is nothing to a Creator who is invested with the attribute of Infinity; and it may be fairly assumed that the stars are not, generally speaking, removed to greater distances than are required by those physical laws to which, in common with all created matter, they are obedient. HENRY J. EVANS.

1125 Paseo, Kansas City, Mo., April 18, 1906.

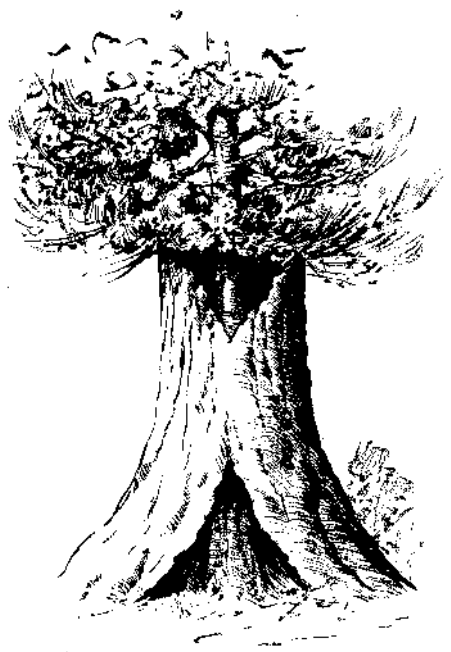
P. S.—Since writing the above, I have referred to the article, by Prof. Larkin, which appeared in the SCIENTIFIC AMERICAN of February 3, 1906, and taking the figures there given (which are based on a light velocity of 186,000 miles per second) I find that, if the earth be supposed at a distance from the sun of exactly one inch (which would give a scale of 93,000,000 miles to the inch) the fixed stars would, on this scale, be located at distances in miles corresponding with remarkable precision to their light years.

How One Tree Can Grow Within Another.

To the Editor of the SCIENTIFIC AMERICAN:

I inclose herewith a singular proof of your opinion as expressed in the accompanying cutting concerning the possibility of one tree growing inside another.

My wife and I discovered this phenomenon while making a walking tour in Japan in 1895. As is usual with natural curiosities in Japan, there was a small



A CURIOUS OLD CRYPTOMERIA WITH ANOTHER CRYPTOMERIA GROWING WITHIN IT.

Trunk said to be 65 Japanese feet in circumference and the trunk of the inner tree to be 9 feet in circumference. The outer trunk is about 30 feet high. The outer tree was destroyed by the eruption of Osama Yama 130 years ago. The inner tree is about 110 years old.

shrine with stone lanterns, and across the road a tea house for pilgrims. The trees were so curious that we stopped and had a cup of tea and a gossip with the voluble old landlady, while I made the accompanying sketch from a point of view from which it would have been difficult to have obtained a photograph on account of the bad light.

I obtained a photograph from the old woman, and I wrote up the data she gave me on the back of the photograph. I do not remember now the difference between a Japanese foot and an English foot, but it is very small, and to the eye the dimensions would correspond to English measure. F. M. HARBER,
Commander U. S. N. rtd., late Naval Attaché at Tokio.

14 Rue Cimarosa, Paris, March 2, 1906.

Earthquakes and Dam Construction at Panama.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of March 31 under editorial "Earthquakes and Dam Construction at Panama," you state that "there exists in an ancient church in the canal zone a masonry arch, which is so flat that by all the laws of equilibrium it should long ago have fallen in." I find in the Encyclopædia Britannica, vol. xviii., p. 208, that September 7, 1882, the façade of the cathedral at Panama was destroyed by an earthquake. I also have an impression that a very severe earthquake occurred there in the eighteenth century, but at present cannot verify it.

The Gamboa dam would be 50 feet higher than the dam at Gatun, but I can conceive of no reason why it could not be backed up by as great a thickness of earth and clay. Should the filling be composed of rocks in large masses immediately back of the concrete, then back of that the earth and clay continued, say, 300 feet at the base to 100 feet in thickness at the top, protected by rock fragments from scour in case the water is allowed to flow over the crest, I do not see why the Gamboa dam cannot be made as secure as the one at Gatun.

To my mind the greatest danger from earthquakes would lie in the locks themselves, unless made monolithic of reinforced concrete; to make them reasonably safe from earthquakes their sides and bottoms, unless they rest on rock, should be so thick that they would be more expensive to build than many dams like the one proposed at Gamboa.

If we are to have locks, why not adopt the high-level plan of Bunau-Varilla or Mr. Bates? But would it not be much better to patiently excavate the canal at sea level? SAMUEL F. ADAM.

Franklin, N. Y., April 9, 1906.

Automobile Notes.

The Vanderbilt Cup race will again be run in America this year, over the same course as was used last year on Long Island. The date set for the race is October 6, and the eliminating race which precedes it will take place on September 22. The first five cars that finish in the latter race will constitute the American team, and the choosing of the team will not be left to the racing board of the A. A. A., as it was last year. The requirement of a differential on the cars which compete has been withdrawn. The Darracq car, which won last year, had no differential and, according to the rules as they then stood, it should not have been allowed to compete.

At an automobile meet held on Ventnor Beach, at Atlantic City, during three days of last week, Walter Christie with his reconstructed double-end, direct-drive, 110-horse-power racer, proved his claim that he has the fastest American racer by carrying off all the speed records. On April 26, the first day of the meet, he lowered the best previous record of a mile from a standing start by 1¼ seconds. He covered the distance in exactly 53 seconds, or at a rate of speed of 67.92 miles an hour. The second day of the meet he beat the 30-horse-power Darracq racer, which won the last Vanderbilt cup race, twice in two heats of the mile race for heavy-weight gasoline cars. Although neither racer made very fast time, Christie covered the mile in 46 2-5 seconds, and beat the Darracq in the final by about two feet. On the last day Christie made a new record for the beach by driving his car a mile in 35 1-5 seconds, or at the rate of 102.27 miles an hour. His nearest competitor, the 80-horse-power Darracq, covered the distance in 39 seconds, or at the rate of 92.36 miles an hour. A stripped English Daimler touring car made a mile in 55 4-5 seconds, which was at the rate of 64.53 miles an hour. Other noteworthy performances during the week were the covering of a mile in 1 minute and 2-5 of a second, by the middle-weight Reo Bird racer, fitted with two 16-horse-power double-opposed-cylinder Reo engines; and the covering of a mile in 1 minute and 36 seconds by a 10-horse-power Maxwell runabout, using kerosene oil as fuel. This was better time than was made by another Maxwell car using gasoline, although the best time made by any of these runabouts was 1:25 3-5, the car being driven by Mrs. J. N. Cuneo. A considerable number of races were run by standard touring cars, but in none of these were any records of special interest made.

A Contest of Spring-Wheel Cars.

An automobile event of a novel character is the concourse of spring-wheeled cars which will be held in France over a distance of 1,200 miles. Starting from Paris, the cars will make the trip to Lyons, Marseilles, Nice and return. Eight days, with distances under 240 miles a day, has been decided upon, starting on the 18th of April. Two main classes of spring-wheeled cars are provided, and each class is divided into two sections. The first class includes wheels having elastic tires (no pneumatics) but no other elastic parts. In the second class are the spring wheels proper, having the elastic part between the hub and the tire. The first sub-section of each class takes in the cars whose total piston surface does not exceed 50 square inches, or for a four-cylinder motor a maximum cylinder bore of 4 inches. The total weight of the car in running order with the passengers and ballast is to be at least 3,300 pounds. In the second sub-section are classed the cars having a piston surface of 82 square inches, or a 5-inch bore for a four-cylinder motor. The total weight in this case is to reach 4,000 pounds. The competitors are to specify the character of the pieces which they expect to replace in the wheels along the route, and also hand in a drawing of the wheel and a complete tire or spring wheel as a specimen.

English shipbuilders in February launched 31 vessels, aggregating about 74,861 tons, as compared with 21 vessels, of 43,694 tons, in January, and 18 vessels, of 40,415 tons, in February last year. In the two months English builders have launched 52 vessels, of 118,555 tons gross, against 44 vessels, of about 93,152 tons, a year ago.