Correspondence.

THE NUMBER OF OUR ANCESTORS.

To the Editor of the SCIENTIFIC AMERICAN:

Your leading correspondent in the June 12th issue, who attacks the reasoning of a former correspondent who figured that each of us had 1,424 ancestors ten generations ago, is unconsciously amusing. He seems to forget, in saying that the victim of his sophistic sarcasm must be an only child, that more than one person may have the same ancestor, and that each person has more than two ancestors, as set forth in his illustration of the couple who married ten generations ago and now have 1,424 descendants. Those two were not the only ancestors of the present 1,424 descendants, for the marriage of relatives has not been so prevalent. The statement of his victim that each person had two parents, each of whom had two, etc., comes through his attempted refutation unscathed, and gives each of us 1,024 ancestors; the 400 extra ancestors given us gratis by the first philosopher were the result of bad arithmetic, and not of faulty reasoning. The satirist's statement that our eighth great-grandfather probably has 1,424 descendants is perfectly true, but it fails of his intention to disprove the mathematically accurate statement that each of us had 512 eighth great-grandfathers and an equal number of their better halves. He evidently has little in common with the ancient wise men, who he says simply "observed and applied facts," and his advice to his victim to have a "little sober thought" might well be a boomerang. It might be well for him to soberly consider for a minute how many great-grandfathers he had, and then observingly climb higher in his family tree. WILLARD D. EAKIN.

Washington, D. C.

LARGE VS. MODERATE-SIZED BATTLESHIPS.

To the Editor of the SCIENTIFIC AMERICAN:

As you have always been an advocate of large battleships, I was pleased to note that in a late number of your paper you took the ground that there was danger of going too far in the matter of size, and strongly hinted that the United States had already done so in the new ships authorized.

I believe that time will demonstrate that the huge ships now being built for the various navies of the world have already passed the point where size is an advantage. Money is the factor which finally decides the strength of a nation's navy, at least in number and power of ships. This being true, no navy can be stronger than the ability of the nation to build and maintain ships. Let us suppose one nation has a navy composed of six "Dreadnoughts." On the eve of a battle a steam pipe in the engine room of one of these great ships bursts. The damage to the ship is not serious, but it takes time to make repairs, and when the battle begins, the nation which has put all its power into six "Dreadnoughts" is short just one-sixth of its navy. Its opponent having put its money into smaller ships, has twelve for the same money, and meets with the same misfortune, but it is only short one-twelfth of its strength, and is therefore in better condition to meet the enemy.

These little accidents happen, and the best ships afloat meet with similar mishaps daily, and why not consider such things in building ships of war?

Again, I believe the relative power of such ships as the "New Jersey" and the "Dreadnought" will not work out in actual war as it does on paper. The "Dreadnought" offers a better mark than its smaller neighbor, and will receive more hits, and hits count even against the strong armor of ships.

We may be all wrong in our ideas, but it is generally safest not to put too many eggs into one basket, and this truth may apply to the navies of the world.

Manson, Iowa. T. D. LONG.

PIPES IN RAIL INGOTS.

To the Editor of the SCIENTIFIC AMERICAN:

While manager of the Washburn Steel Castings and Coupler Company, I had several difficult casting propositions; to wit, to secure sound castings without blowholes. One of the usual ways to overcome this difficulty is to use a larger riser, or head; and to secure enough molten metal from these heads to take care of the contraction in the cooling casting, is the question to be solved. It is customary to reduce the end or neck of the riser, where it meets the mold, so as to avoid heavy sawing in removing the feeder from the casting. But when this neck is reduced enough to make its removal practical, it is of such a small size that the sand will freeze or cool it and so cut off the necessary supply of molten metal in the riser or feeder. To overcome this difficulty, I designed a clay pot, patterned exactly on the order of a flower pot, but having a hole of sufficient diameter in the bottom for the hot metal to feed through. This pot was set directly on the pattern, and rammed up with the mold with the usual pouring gate. The result was that the hot metal, after filling the mold, passed up through the bottom of the pot until it was filled. In doing this it heated the clay of the bottom of the pot to practically the temperature of the steel. Then, as the casting cooled, the molten metal fed into the casting through this hole, at times drawing almost the entire inside from the riser, and giving an absolutely sound casting, connected to the riser by the neck, which being only two inches in diameter, was readily broken with a heavy sledge. This type of riser can be easily applied to rail-ingot molds by setting on the mold a metal casing, carrying a heavy fireclay pot inside, which not only retains the heat in the head and gives a sound ingot its entire length, but does it in a very cheap and practical way. EDWIN C. WASHBURN.

Minneapolis, Minn.

SIGNALING TO MARS.

To the Editor of the SCIENTIFIC AMERICAN:

The proposition to signal to Mars, made by an astronomer connected with one of our most famous observatories, has received much attention from the daily press and many of those not familiar with astronomy. It seems to the writer that some things have been overlooked which would render the experiment difficult, if not impossible. Since Mars will at opposition be above the horizon of any place only in the night, it will be necessary to provide artificial light for the flashes to him. This in itself will be an enormous undertaking. Yet it can be done.

The atmosphere of the earth is able to absorb 40 per cent of sunlight; so that in a clear air only 60 per cent of the rays of the lamps can pass beyond our atmosphere, and still less in the vapor-laden evening or night air. The effect of the refraction of the air would be to render indistinct the outline of any object, and thus to confuse the lights.

One professor, not of astronomy, happily, suggests black cloth laid in a pattern on a wide plain. It raises a smile. How can black cloth be seen on a plain in the night? As I said, Mars will be above the horizon only in the night at or near opposition. Hence a Martian will look at the dark side of the earth, and see only its blackness. Seeing black cloth under these circumstances would be like seeing a black man chasing a black cat in a dark cellar. Such a suggestion could not have originated with an astronomer.

Prof. Moulton, in his "Astronomy," page 327, says: "When we see Mars the best, the earth is 'new,' with respect to Mars, and invisible from that direction. The newspaper talk of communication between the earth and Mars by any imaginable means is utter foolishness." The language is strong, but seems to some to be justified. WILLIAM C. PECKHAM.

Adelphi College, Brooklyn, N. Y.

To the Editor of the SCIENTIFIC AMERICAN:

I desire to call attention to a statement that appears in your issue of June 5th, in which the writer, referring to a correspondent in your issue of May 15th, says a heliograph man makes the astounding statement that a mirror two inches square will reflect just as much light as a mirror ten feet square. He did not say any such thing. What he did say is, that a mirror that is two inches square will do just as much work as a mirror that is ten inches square, and explains his statement by saying a mirror can only reject the sun's image. A shaving glass or the water in a horsetrack would reflect the sun's image just as well as the water in a large pond or a lake. An artificial horizon, such as astronomers and travelers use to measure the sun's altitude, is not more than six inches in diameter. The mirrors of a sextant are not more than two or three inches in diameter. The mirror of the heliotrope that is used in the U. S. Coast Survey is not more than two inches square. For a description of the heliotrope, the reader is referred to Gore's "Geodesy." There is a difference between reflecting the sun's image and reflecting the image of the side of a house.

Prof. Pickering suggests that a number of large mirrors ten feet square be set up at a cost of $100,000 to make a preliminary experiment to determine the possibility of signaling to Mars. It must be remembered that these mirrors must be mounted like a heliotrope, and provided with very fine adjustments to be of any use, and each one would reflect its own image of the sun independently, and they would not transmit a signal any farther than a single mirror two inches square. The greatest distance that a heliotrope has been known to transmit a signal is 192 miles.

The moon when full reflects her own image to the earth; in like manner Mars reflects his image to the observer here, and appears as a mere point. His apparent diameter is about 10 seconds, and his distance from the earth is about 46,000,000 miles. It is a well-known fact that the stars are not where we see them. If you could project a straight line from the eye to Mars, you would not strike the planet by 10,000 miles. The heliotrope can only be used to transmit signals or messages from one well-defined point to another well-defined point where there is an observer to receive it, as from one station of a survey to another. Now, if you project a signal in a straight line from the observatory at Washington to an observatory in a great city on Mars, using the point where you see Mars as the point of direction, where would your signal or message be when it has traveled a distance from the earth to Mars? There are many other factors to be considered before we go to any expense to erect great mirrors to experiment on sending signals or messages to Mars, but it is not worth while to consider them here. JOHN FORD.

Swedesboro, N. J.

The Flight Exhibition of the Aeronautic Society at Morris Park.

On Saturday, June 26th, weather permitting, the first exhibition of the Aeronautic Society will be held at Morris Park race track on the outskirts of New York city.

The chief feature of the exhibition will be an aeroplane flight by Glenn H. Curtiss for the SCIENTIFIC AMERICAN Trophy. Mr. Curtiss won this trophy for the first time last year, and he hopes to set up a record that will not be surpassed this year by any other aviator contesting for the trophy, since the winner for 1909 will be the aviator making the longest flight. Photographs of Mr. Curtiss in flight appeared in our last issue.

Besides the exhibition flight by Mr. Curtiss, there will be a balloon race and a flight by the society's new dirigible. A hundred New York schoolboys will have a kite-flying contest. Several gliders will be towed around the track behind an automobile, and there will also be a wind wagon race, besides contests and exhibits of model aeroplanes.

Among the new full-sized machines that will be exhibited and that will perhaps attempt flights are two bi-planes and a monoplane. This is the first time people in the vicinity of New York have had an opportunity to witness real flights by an aeroplane. The society's new Curtiss bi-plane has already been tested and made flights at Morris Park.

The Celebration at Dayton, Ohio, in Honor of the Wright Brothers.

Last Thursday and Friday, June 17th and 18th, were devoted by the business men and residents of Dayton, Ohio, to a celebration in honor of Orville and Wilbur Wright. The chief feature of the celebration was a parade illustrating the development of transportation in America. This was headed by an Indian runner, and ended by a Wright aeroplane. So busily engaged were the brothers in putting the finishing touches on their government machine that they could hardly find time to attend the presentation exercises and receive the medals awarded them by Congress and the city of Dayton, as well as the diamond-studded shield voted by the Ohio legislature. The medals and shield were presented by Brigadier-General James Allen, Mayor Edward E. Burkhart, and Governor Judson Harmon, respectively. After thanking the donors Wilbur Wright made a short speech in which he said that although inventors sometimes complain of lack of sympathy and encouragement, he and his brother had not found it so, for at the very beginning of their experiments they had received offers of financial assistance from people who had nothing to gain. In his opinion, if worthy inventors did not get assistance it was because their needs were not known and not because of indifference.

As we go to press the brothers are starting for Washington, where they expect to make the first flights at Fort Myer in fulfillment of their government contract this week.

Where to Find the Scientific American When Traveling.

Those of our readers who may spend part of the summer in travel at home or abroad, will find the SCIENTIFIC AMERICAN on all the principal steamship lines and on most of the limited trains. Thus it is carried on the library cars of fifty trains on the New York Central Railroad, and west of Chicago it will be found on the trains of the Chicago and North-Western, the Burlington Route, the Northern Pacific, and on all the trains and steamers of the Southern Pacific Railroad. The Cunard, White Star, Hamburg-American, and other principal lines carry it regularly in their library saloons. This will prove a great convenience for our regular readers.

A correspondent draws our attention to a novel and daring method of bridge erection, which was successfully carried through by a member of the Jones Construction Company, San Francisco, in the replacing of a 125-foot span of a railroad bridge at Vancouver Island. The new span was built on flat cars, hauled into position on the bridge, and suspended from two gallows frames. The old span was then thrown into the river, 120 feet below, and the new span, weighing 60 tons, lowered into position. This was done without an engine or tackle block, by the simple expedient of slacking away the lines over the top of the gallows frames.