

Correspondence.

THE NUMBER OF OUR ANCESTORS.

To the Editor of the SCIENTIFIC AMERICAN:

The search for truth is said to be often of more benefit than its attainment; and I am glad to see that a solution of the problem is beginning to emerge out of darkness, thanks to Mr. Eckles's letter in your issue of August 21st, although it only lifts a corner of the curtain.

He proves what I have thought all along, that people are far more closely related than is generally supposed, but there is another side to the problem he does not touch.

Consider the five or six distinct races of mankind, and the different nations of the world; such isolated people as the Japanese, Chinese, South Sea Islanders, Eskimo, Thibetans, and many detached tribes of India, Africa, and the other continents and islands. Must there not be thousands, not to say millions, of people living to-day who have not the least commingling of blood in their veins for thousands of years at least?

Suppose we say that there are only twenty different people, a very conservative estimate, and take one from each as totally unrelated to the others for say one thousand years past, and reduce the number of their estimated progenitors (1,094 millions) to 10 per cent to meet Mr. Eckles's blood-relationship (a very generous allowance, as the isolation of groups works both ways, and tends to keep distant communities apart), and we arrive at 2,000 millions living at that date against the 1,500 millions of to-day.

Los Angeles, Cal.

A. K. VENNING.

WHAT IS HEAT LIGHTNING?

To the Editor of the SCIENTIFIC AMERICAN:

I note in your issue of August 28th a communication from Mr. A. Graham of Topeka, Kan., regarding the classification of lightning. I had the opportunity several years ago of proving that the so-called "sheet" or "heat" lightning is nothing more or less than a reflection, as he states, of the regular "chain" lightning.

I had a discussion with the man in the telegraph office in a small town on a railroad running directly east and west, regarding what he called "heat" lightning. I maintained that it was lightning flashes so far away or so high in the clouds, that we could neither see the flash itself nor hear the thunder.

During the whole summer we watched the storms very closely; practically all of them came from the west; so we were able, by calling up the operators in the different stations, to tell just what was actually occurring, and in every single instance we could find other operators near us reporting "sheet" lightning, while those at twenty-five, thirty, forty, and even fifty miles off were reporting regular lightning, accompanied with thunder.

It is the writer's opinion, based upon the observation of that summer, that there is but one kind of lightning, viz., that which we see reaching from cloud to cloud or from cloud to earth when the storm is near by. The same kind, in fact, that we can ourselves produce on a miniature scale between points of a spark plug in an automobile engine cylinder. The appearance of so-called "heat" lightning is very easily produced on a cloudy or foggy night, by the jumping of a trolley wheel from its wire, thus making an arc that throws its reflection on the clouds.

Pontiac, Mich.

A. R. WELCH.

HOW FINGER AND THUMB MARKS WERE DISCOVERED THROUGH A PHOTOGRAPHIC PROOF.

To the Editor of the SCIENTIFIC AMERICAN:

A few weeks ago a photographic proof upon a piece of gelatine printing-out paper was given to the writer to tone with other photographic prints, in the usual chloride of gold and borax toning baths. No particular attention was paid to this print. It was treated the same as the others, namely, washed well, toned, fixed, and washed well again for half an hour.

The prints were all squeezed upon thoroughly-cleaned ferrotype plates. When the prints were dry they were lifted in the usual way, by inserting the tip of a jack-knife blade at one corner, and pulled off. Every print came off perfectly clean, leaving no impression upon the ferrotype plate, except the proof that had been toned. Upon examining the part where this proof had been dried, it was discovered that quite a number of mixed finger marks were clearly discernible upon the ferrotype plate, although not visible in the print. The explanation appears to be this: Gelatine being a colloid body, the greasy matter, lactic acid, and sodium chloride contained in the perspiration of the skin became impressed and retained upon the gelatine surface, although not sufficiently to become visible to the human eye. Traces of lactate and chloride of silver being formed, became partly washed out previous to toning, and completely dissolved upon fixing, but the greasy matter remained. This too would become more perfectly retained when the gela-

tine came in contact with water; the result being that the greasy matter, not being affected by any of the chemicals used in toning and fixing, became manifest when the print dried down upon the ferrotype plate, leaving this greasy matter upon the japan, thus giving an admirable clue in the line of detection.

New York, N. Y.

A. J. JARMAN.

ELECTRICAL FIREBALLS: WHAT ARE THEY?

To the Editor of the SCIENTIFIC AMERICAN:

This question, that I sent to the English Mechanic and which was published in that journal on July 30th, page 618, letter 576, brought out a number of very interesting answers in subsequent numbers of the same paper, notably in those of August 13th and August 20th; and if your correspondent, Mr. A. A. Graham, who writes the article on "Lightning" in the SCIENTIFIC AMERICAN for August 28th, will take the trouble to read the letters mentioned, in the English Mechanic, he may have occasion to modify his opinion regarding "electrical fireballs."

Mr. Graham says: "The recorded instances of fireballs are so rare and questionable, with no evidence of their electrical nature, that the information is not sufficient to enable one to form even a belief in their occurrence."

While entertaining very much the same belief as Mr. Graham, I received a letter from a very intelligent lady, who is spending the summer in a bungalow situated in the pine woods bordering on Buzzard's Bay, Massachusetts.

She writes as follows: "I was awakened about 2 o'clock by hearing rain, and rose to close the windows. The darkness was appalling. There was a flash of lightning and a loud peal of thunder, and as I got to the window I saw a luminous ball descending, some distance away, and when I looked again some minutes after, there were numerous luminous bodies along the roof of a house about fifty feet away; but these lights were stationary, and I watched them till the first streaks of day."

Of course, we know very well what the immovable lights were. The St. Elmo fire, an electrical appearance, is quite commonly seen on the masts and spars of vessels, and on projecting points of high buildings; but the fireball is a very different affair, and there seems to be abundant evidence of its occurrence, that is, if such scientific men as Arago, Humboldt, Flammarion, and E. B. Dunn of the U. S. Weather Bureau may be considered good authority; and in addition to these, letter 59 in the English Mechanic of August 20th, from Edwin Holmes, a member of the Royal Astronomical Society, who describes a fireball that he witnessed himself, may serve to satisfy Mr. Graham that such things as fireballs are not entirely deceptive appearances; and I would be very glad myself to hear from readers of the SCIENTIFIC AMERICAN what they know about them.

New Rochelle, N. Y.

J. D. HYATT.

DOES MUNICIPAL OWNERSHIP PAY?

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of August 21st, second column on page 123, you speak of the effect that the electrifying of the London tramways has had on the passenger receipts of the Great Eastern Railway of England. You make the following statement:

"The Council Tramways are a municipal undertaking, and while giving good service, have been run hitherto at a loss, the deficit being paid out of the rates."

As a matter of fact, the report presented a few months ago by the London County Council on the results of the year 1907-8, showed that the gross receipts were £1,663,000 (\$8,315,000), which was a surplus on working of £493,000 (\$2,465,000) and a net surplus after payment of interest on capital outlay and providing for the repayment of debt of £45,406 (\$227,030). The latter amount was carried to the renewals fund.

There has been such a persistent attempt to depreciate municipal ownership throughout the United States, that it is hard to find justice given the subject. This attempt to mold public opinion through the press has been largely brought about by a "press bureau," maintained for that special purpose. While I am personally of the opinion that municipal ownership in the United States would result in failure (because of the deplorable amount of graft and corruption in the administration of municipal affairs) yet it does seem as though municipal ownership *per se* should be given fair show.

Chicago, Ill.

ARTHUR J. CRAMP.

EDITORIAL ADDENDUM TO LETTER.

We appreciate the tone as well as the substance of this correction, and regret that we had not noticed the later report quoted. The note was based on a general impression, which was however correct as to the deficits in administration of the L. C. C. tramways in former years. While we are desirous of treating the question of municipal ownership as impartially as

possible, however, we would point out that even in the report mentioned, the net surplus was carried over to renewals fund, with the probability that it would be more than used up in the ensuing year. The only justification of municipal trading, in our opinion, is that it should be carried on at a profit, the profit going to the relief of the rates. Since the above-mentioned surplus was not so used, it can hardly be considered as a profit; besides which, it does not represent interest upon the capital expenditure of the Council at a rate upon which any private corporation could survive.

SUPERSENSITIVENESS OF THE BLIND.

To the Editor of the SCIENTIFIC AMERICAN:

In a recent issue of the SCIENTIFIC AMERICAN, I noticed an article on the supersensitiveness of the blind, in which cases were cited of remarkable acuteness of the remaining four senses. The article in question calls to mind a notable experience I had in New York city in 1896.

It will be recalled by thousands of people that the late Charles Broadway Rouss, the blind merchant of that city, offered one million dollars to anyone who would restore his sight. The offer was sensational and was widely circulated in every civilized nation. Thousands of letters, written in many languages, poured into the big Broadway store suggesting remedies, and the blind merchant was besieged by many offering treatments for the restoration of his sight. Rouss, although blind, was a busy man, always at his desk directing the affairs of his great establishment. He was too busy to take treatments, he declared, and so he selected a substitute whose name was Martin and who was alike blind from atrophy of the optic nerve. He was too poor to pay for treatments and was glad to act as a substitute for the millionaire who agreed to defray his expenses. It was understood that Rouss would undergo any treatment that would benefit Martin.

I made arrangements with Rouss for the treatment of Martin and, accordingly, Martin came to my residence every day for about two months. The treatment was electrical from a primary battery of my own invention. The files of the New York World of July 31st, and Journal (since changed to American) of August 1st, 1896, will show that my treatment of the case became quite sensational. I believed that Martin had made some slight improvement and might regain his sight. I finally gave up the case, however, deciding with all oculists that atrophy of the optic nerve is incurable.

Martin was a native of New York city and had been blind nine years. He was of a fearless and impetuous disposition, and went about over the city without a guide. He passed up, down, and across the great thoroughfares frequently and only a few times collided with a bicycle, which vehicle he detested. I was with him on occasions when I marveled at the perfect freedom with which he walked along the crowded streets, showing not the slightest timidity and requiring no aid whatever from me.

Once I left my residence on 22nd Street near Eighth Avenue with Martin for a walk through the city to Third Avenue and thence down town. In passing he would name with great accuracy the streets and notable buildings. His eyes showed no indication of blindness and no one suspected that he was blind. I was amazed to see him cross Broadway at 14th Street with perfect ease, and imagine my astonishment when he shied around some timbers that had been set up across a sidewalk to prop the wall of a building, undergoing repairs. He got off and on street cars without a blunder and made his way across crowded streets without betraying his blindness. He used no cane nor did he feel his way with his hands. Had I not known that he was actually blind I would have believed he was feigning.

I asked him how he knew his way and avoided collisions, and he invariably told me he did not know. He only knew that he cared nothing for his life, and often remarked that he would rather be dead than blind. He seemed to be guided by what I shall term a miraculous instinct superinduced by a subconscious mental condition. I am inclined to the belief, in the absence of a better theory, that he was directed by what Hudson terms "the subjective mind."

Arbuckle, Cal.

WALTER W. FELTS.

Owing to the careful adjustment and regulation of temperature necessary in bacteriological incubators, a new incubator has recently been built which will be heated by electricity, and which it is expected will thus overcome the difficulties with gas-heated incubators. Incandescent lamps are used in the new heater to maintain the required temperature. A new mercury regulator controls the lamps. The instrument was tested quite recently for a run of forty-five days, and the variations in temperature during this time were practically nothing. The incubator is formed with a triple wall, providing a water jacket and an air space, and is covered with asbestos finished in white enamel.