

July 21, 1921.

Mr. Lee Foster Hartman,
Editorial Rooms, Harper's Magazine,
Harper & Brothers
Franklin Square, New York, N.Y.

Dear Sir:

Received your letter of June 8th, and must apologize for not having answered before. I am however sending you enclosed three articles: "Electricity and Civilization"; Einstein's Theory of "Relativity"; and "From Competition to Cooperation".

As regards to the first article, on "Electricity and Civilization". I believe it might be illustrated with a few photographs, which I could secure, such as a typical high power electric transmission line, , one of the huge 50,000 HP steam turbine electric generators, and electric train, etc.

I note that you had an article on Einstein last year; I overlooked it and cannot find the number of the magazine at present, which contained it; I believe however that the enclosed article may differ from the previous one by being still more popular, that is, being intelligible to readers of no mathematical or technical knowledge. At least I tried to make it so.

The article from "Competition to Cooperation", deals with the present industrial situation about in the same viewpoint as the little book "America and the New Epoch", which you published for me five years ago, except that in the present article I take cognizance of the profound changes which have taken place in the world due to the war and its consequences, and it might therefore

be of interest to your readers.

Now regarding an article on "Lightning". When Ben Franklin flew a kite before a thunder storm and brought down the lightning and proved it to be electricity, the explanation of lightning appeared simple: the thunder cloud as conductor becomes charged with electricity in some manner, and when the charge is high enough, it jumps as electric sparks, that is, lightning, to ground. This simple explanation seemed sufficient and was generally accepted, as long as our knowledge of electrical phenomena was not sufficient to numerically check its correctness. It was only by the investigation of the last ten or fifteen years, that our knowledge of electrical phenomena has become sufficient (by the investigation of Mr. Beek in my laboratory, Professor Whitehead of John Hopkins, and Mr. Ryan at Stamford University), to attempt a calculation of lightning phenomena, and then we found that the simple explanation, which seemed sufficient formerly, is not tenable, but that lightning is a far more complex phenomena, is an equalization of electric stresses within the physical and electrical heterogeneous structures of the cloud, and discharges between cloud and ground are exceptional only. Very little on this has yet been published, and I am preparing some scientific papers on the subject, and should like to try, whether I can explain this new information on the origin and nature of lightning in a short popular article, though I do not know yet whether it can be done.

I note that you can allow from eight to ten thousand words for an article on "Science and Religion" and am collecting and arranging the material. Would you make this one article, or distribute it over two successive numbers of your magazine?

Another subject in which I am greatly interested, is "Industrial Preparedness". Every time our nation was forced into war, we were utterly unprepared, with the result that the cost of the war in lives and money was excessive. For years we were drifting into the World War, and nevertheless when it came we again were unready, and now we wish to forget about the war as quickly as possible, undoing everything that was done and while we all hope there will be no further war, the probability is that there will be wars again, and that again we will be caught unprepared, and may not always be so fortunate as to have time to get ready after the war has come. But however much many may think it desirable and necessary to be reasonably prepared, and agitated towards this, our national temperament is such that we will again neglect preparedness. The question then is, which are the features, in which unpreparedness is most serious and most dangerous. That is, assuming - whether desirable or not - that our nation will do the least possible amount of work, and spend the least possible amount of money for preparedness, in which direction should this be spent? that is, in which direction should we concentrate our efforts, as the most essential things, and those which we cannot make up in a hurry when necessity comes. It is in this direction and from this viewpoint, that I should like sometime to treat the subject.

To illustrate: In the eighteenth month of war, thus starting all unprepared, we gathered an army of several millions of men, trained and equipped this army, transported it across the ocean and even built the ships on which to transport the army. But an army is a helpless

mob without ammunition, and no matter how great a nation's man power, without an unlimited amount of high explosives it is helpless in modern war. To produce high explosives, that is, nitrates, all the available scientific engineering and manufacturing talents of the country was called upon, unlimited means were available, and nevertheless when after eighteen months of war, the Armistice came, not a single ton of nitrates had yet been produced in the United States, but the first nitrate plants were just getting ready to produce. Thus if we had not been allied with England, and England controlled the oceans, and thus our nitrate supply from Chile, we would have been helpless, unarmed. This is one of the serious features, which is very little realized and little known: I know it as I was connected with this problem. And now all these nitrate plants are shut down and falling into ruins.

I do not know whether this subject would be of interest to your readers, or whether you also take the stand that the war is over, and the less we think about it and future wars, the better.

There may be a few other subjects which I believe might be of interest, and as you suggest in your last letter, you might work out a tentative series of articles and announce them, if you care to do so.

Yours very truly,

CPS:R