those who pass them along. A good story should never be spoiled by that.

JONATHAN WRIGHT

PLEASANTVILLE, NEW YORK,
January 18, 1921

REPLY TO PROFESSOR HORN

MANY times has the undersigned been found to be in error on historical questions. It is not easy to write during a period of over thirty years without occasionally committing mistakes. Even Newton once said, "It's impossible to print the book without faults." However, it is due to myself to state that not all the errors attributed to me are errors in reality. In not a few cases the critics themselves are in error. But never, before the appearance of Professor D. W. Horn's letter (SCIENCE, January 14, 1921), have I been accused of "Romancing in Science." Had Professor Horn been less excited and more contemplative, he would have written differently. My account of Galileo was prepared a quarter of a century ago. Were I to re-write it, I would make some slight changes. "Prior to Galileo it did not occur to any one actually to try the experiment" relating to acceleration. More recent research reveals that Galileo, like most great scientific men, had his forerunners. I say that Galileo publicly experimented "one morning." This may have been the correct time of day, but I am not now able to verify the statement. Galileo "allowed a one pound shot and a one hundred pound shot to fall together." From Galileo's "Dialogues Concerning two New Sciences" it appears that he did perform this experiment, but I am not sure that these were the particular weights used when experimenting before the university assembly. I have gone over sentence by sentence the passage quoted by Professor Horn and the above are the only changes which seem to me perhaps necessary. I repel as unjust the charge that I am "romancing in science."

Dr. Partridge rendered a service in calling attention to Galileo's experiments at the Tower of Pisa. However, I still think that the Doctor overstated his case, was wrong in implying that Galileo made only one experiment, and without sufficient reason called in question the accuracy of Viviani's "Life of Galileo"—a life which Favaro, after very many years devoted to the study of Galileo, has found to be remarkably reliable. Of course, part of the discussion hinges on the word "exactly." No description of an experiment can be exact in every detail. However, if essentials suffice, then our knowledge of Galileo's experiments on falling bodies is exact, for we know exactly the purpose of the experiments, as well as the mode of experimentation, namely, the dropping of different weights of a variety of materials—mention being made of some of the materials dropped.

Professor Horn quotes: *Fortis imaginatio generat causum.* I agree, but whose *casus* is it really?

FLORIAN CAJORI

UNIVERSITY OF CALIFORNIA

A CORRECTION

TO THE EDITOR OF SCIENCE: The times are actually worse than I realized when writing recently about "Romancing in Science." The opening quotation should have read "O tempora," instead of "O tempus." The peculiar appropriateness of this quotation is apparent, for the correction came to me (from New York) as part of an *anonymous* letter!

DAVID WILBUR HORN

BRYN MAWR, PENNSYLVANIA

MEMOIR OF G. K. GILBERT

THE undersigned is engaged in the preparation of a memoir of the late G. K. Gilbert, to be published by the National Academy of Sciences, and would be obliged if geologists and others who possess letters from him or who recall incidents that throw light upon his character would submit them for incorporation in the story of his life. His great contributions to geological science are published and fully accessible; but the smaller non-scientific matters which give the life of a man its finer savor can be learned only by personal communication from his friends. A good number of such communications have been already received; they are of so great

interest that many more are desired. As an example the following may be instanced: A well-known scientist in whose home Gilbert was a frequent guest, warmly welcomed by father, mother, and children, writes that one of his boys, when a little fellow, became so fond of the visitor that he for a year or so wound up his evening prayer with an added petition of his own invention—"O Lord! bless father, and mother, and Mr. Gilbert, and some ladies." It is often written of an eminent man that he was fond of children, but it is rare to find testimony as spontaneous and convincing as this to show that children were fond of him.

W. M. Davis

Cambridge, Mass.,
January 27, 1921

QUOTATIONS

THE PRINTING OF ASTRONOMICAL OBSERVATIONS

Printing has become so expensive that it will be necessary to revise some of our existing practises, and especially that with regard to original observations. There is an undoubted convenience in printing original observations just as they are made, for, however carefully they are discussed at the time, the general advance of astronomy may later provide an improved basis for discussion. Thus, old observations of position, such as those of Bradley or Groombridge, gained much from the growth in knowledge of instrumental errors, and old observations of variable stars have been rediscussed with advantage now that better magnitudes of comparison stars are available.

There is no reason to anticipate finality in improvement, and it is therefore a convenience to have the original material widely accessible; but one may have to pay too dearly for this convenience, and it looks as though the recent advance in prices had brought this contingency about. We have have to be satisfied to store a fair copy of the original observations in some accessible place, such as the library of the Royal Astronomical Society or of a well-known observatory. Perhaps it would be better to store two copies, one of which might be freely lent on demand, but not the other. There is, moreover, this to be said in favor of this more economical policy—it is not *always* the case that these original observations improve in value with time. No doubt they improve just at first, but something may happen which compensates the advantage of lapse of time; even Bradley's observations are to-day of historical rather than scientific interest, in comparison with modern observations, as Boss maintained stoutly years ago and others reluctantly admitted later. Micrometer measures of clusters by such careful observers as Pogson and Baxendell are to-day really not worth discussing; a couple of photographs at a few years' interval give better proper-motions—far better—than could be deduced by the use of these early micrometer measures. Hence the policy of holding up the printing of observations may in *some* cases obviate the need for printing at all; but if it is adopted, I would strongly urge the alternative of depositing a fair copy in some well-known library. And I may, perhaps, quote a particular instance to point the moral: recently I was interested in a particular variable of which maxima had been recorded by a particular observer nearly half a century ago; I got into communication with him, and found that he had given up observing and so far forgotten his own devoted work as to deny at first that he had ever made such observations! But he was good enough to ransack his papers, found the observations, and very kindly sent me a copy of them. They were of great value, and though perhaps it is going too far to say that they might have been lost, still it must be admitted that there was some risk of this disaster. Hence I should repeat the maxim deduced from my own experience and previously given in the form "when you have made five years' observations publish them" in a new dress:—"*Either* publish them, *or* deposit a fair copy in some well-known library, publishing an intimation to that effect."

As I have made reference to this increased cost of printing, may I call the attention of