charge had never been considered in connection with the atom save in relation to chemical and molecular effects.

The last statement I shall criticise is the following: He says (p. 888, 3d par.):

"It is now pretty well established that the ether energy having to do with electrical attraction and repulsion is dependent upon a sort of *shearing distortion* of the ether unaccompanied by any sensible diminution of volume, that this ether distortion is what is known as *electric field*, that the propagation of this energy constitutes *electrical waves*, and that the movement of the ether which comes into play during the establishment of this shearing distortion, or which comes into play while distortion at one place is relieved and distortion at a contiguous place is built up, is what is known as *magnetic field*."

Surely not!! So far from being established, Dr. Franklin cannot adduce the slightest particle of evidence for it. Though Maxwell and Lodge have used this theory, yet both Lord Kelvin and Professor J. J. Thomson have suggested exactly the opposite theory, and Heaviside has pointed out (Electromagnetic Theory, Vol. 1), that the theory which Dr. Franklin states is 'pretty well established' is at present as hard to reconcile with the facts as the other theory, so that the weight of authority would appear to be fairly evenly divided. And one of our greatest living physicists, J. J. Thomson, uses the opposite theory, of late exclusively. Moreover I have elsewhere pointed out that the variation of μ with the first power and of k with the second power is conclusive proof that the opposite theory is true.* If we chose to be unconvinced by this, then there is not the slightest evidence one way or another, and Dr. Franklin can add considerably to his already brilliant reputation by producing some evidence in favor of his statement.

REGINALD A. FESSENDEN.

* Those who are acquainted with my work on the nature of electricity and magnetism may remember that the proof that magnetism was a shear was based upon the following:

(*a*) The determination of the fact that either k or μ must be a density, thus confirming Williams's result.

(*b*) The demonstration of the fact that whichever one of the two k or μ is a density, must depend upon the first power of the corresponding force, whilst the other must depend upon the second power of the corresponding force.

(*c*) The experimental determination of the fact that μ varies with H whilst k varies with F^2.

A second proof was then indicated, depending upon the nature of the Lagrangian terms involved in the change of k and μ in elastic phenomena.

I have now to add a third. Briefly stated it is as follows: Since either k or μ is a density, then either H must be a shearing stress and F a velocity or *vice versa*. It is next shown that in the electric current we have a non-conservative system, and from quite general principles it is shown that it is the non-conservative system which must involve the velocities. And it is shown that under no circumstances could the equation expressing the amount of the I^2R loss be of the form it is if F were a shear, since in that case an operator which experiment shows is attached to an electric term would be connected with a magnetic term instead.

A BIBLIOGRAPHIC CATCH TITLE FOR THE YEARS 1900 to 1999.

IN a note published in SCIENCE, May 11th, I called attention to a bibliographic matter which I wish to return to again.

Some twenty years ago I adopted the plan of placing all bibliographic titles at the end of an article in a single list with authors' names arranged alphabetically and each author's papers arranged chronologically. As an essential part of the plan, the citation in the text consisted simply in giving the author's name and the last two figures of the year of publication preceded by an apostrophe. To avoid ambiguity, in case two or more cited papers were published by an author in one year, the abbreviated dates were followed by a lower-case letter used as an exponent. This plan has been kept up since then in the 'Contributions from the Zoological Laboratory at Harvard College.' Owing to its simplicity and the evident advantage which it gives the reader by acquainting him at once with the date of the paper cited, this plan has come into rather common use.

The apostrophe used to mark the omission of the first two figures of the year-date could not be used without ambiguity for dates subsequent to 1899, and I have consequently urged in the note

referred to that the apostrophe should be used to indicate an omitted 18, never an omitted 19. It then occurred to me that a comma might be similarly used to denote the omission of 19; but there seemed to be such important objections to this, that I dismissed the matter without further thought until, a few weeks ago, I received a letter from Mr. R. Pearl of the University of Michigan, in which he urged the desirability of adopting some method of abbreviation, and suggested the use of a period. There are, however, quite as serious objections to a period as to a comma. After some correspondence on the matter it has seemed to both of us that the *colon* so used would afford the best solution to the problem; but in order to avail ourselves of other possible suggestions, we desire to call attention to the matter in SCIENCE.

The signs hitherto considered and some of the more obvious objections to them are the following: The *comma* would be objectionable because in almost every citation two commas—one for punctuation, the other to mark the elision—would be brought together, and no proof-reader could be expected to accustom himself to the anomaly; thus in a recent publication, if the dates had been 1993, etc., instead of 1893, etc., the use of the comma would have given this undesirable result: "In Anurida, as in Orthoptera (Wheeler, ,93; Heymons, ,95[b]) and Lepisma (Heymons, ,97[a]), etc." The *period* is so commonly used as a decimal point, that .93 or .97[a], for example, would be misleading. It would clearly be of some advantage to have a character that should stand, like the apostrophe, on a line with the tops of the figures; but the various signs which usually have that position, as the asterisk, obelisk, etc., have such a fixed usage, as a means of referring to footnotes, that it seems unwise to employ any of them for this purpose. An *inverted period* would be open to the objection that a defective apostrophe could not be distinguished from it. The *dash* takes up too much room; the *hyphen*, though shorter, is not better in this respect than the colon, and has the disadvantage that, in the case of papers occupying more than a single year in publication, it now has to serve for omitted digits which might, or might not, be the figures 19, for which we should wish it invariably to stand.

So far as I recall, there is only one usage, except that of ordinary punctuation, to which the colon has been put that would be liable to interfere with its use for the purpose contemplated here. It has been used to separate the number designating a volume from that designating the first page of an article in that volume —a substitute for the letter *p*. Since in the proposed usage the colon would stand between the name of the author cited (not a number) and the last two figures of the year in which his paper was published, I think no ambiguity could arise. If, however, serious objections to the use the colon, or a better plan, occurs to any one interested in the matter, both Mr. Pearl and the writer would be glad to profit by suggestions communicated through SCIENCE or directly.

E. L. MARK.

HARVARD UNIVERSITY,
December 13, 1900.

ASTRONOMISCHER JAHRESBERICHT.

EACH year there is being issued under the editorship of Professor Dr. W. Wislicenus, from the press of Georg Reimer, an Astronomischer Jahresbericht, or annual review of all kinds of *astronomical publications*, including writings on geodesy and navigation if not too remotely connected with astronomy. This work is carried on under the supervision of the Astronomische Gesellschaft. The first volume contains the publications of 1899, and consists of xxiv + 537 pages, 8vo. This was issued in the spring of 1900.

In the interests of publishers, of readers and of the nation which he represents, the associate-editor for the United States desires to make the compilation and review of American publications on the above named subjects as complete as possible. To this end he invites authors and publishers to favor him with the title and place of publication of each book or article issued during 1901 and each subsequent year or a copy of the same if convenient that it may be reviewed for this purpose. The reviews are merely explanatory—not critical.

HERMAN S. DAVIS.

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