proved for a while, but died, however, later. He refers vaguely in his New York City lecture to an evidence, which at best must have been very inconclusive at this early period,[3] that some hitherto unknown food elements must be present in a complete dietary. He refers to this in 1906[4] as follows:

> But further no animal can live upon a mixture of pure protein, fat and carbohydrate, and even when the necessary inorganic material is carefully supplied, the animal still can not flourish. The animal body is adjusted to live either upon plant tissue or other animals and these contain countless substances other than the proteins, carbohydrates and fats. Physiological evolution, I believe, has made some of these well nigh as essential as are the basal constituents of diet; lecithin for instance, has been repeatedly shown to have a marked influence upon nutrition, and this just happens to be something familiar, and a substance that happens to have been tried. The field is almost unexplored, only it is certain that there are many minor factors in all diets of which the body takes account. In diseases such as rickets, and particularly scurvy, we have had for long years knowledge of the dietetic factor, but though we know how to benefit these conditions empirically, the real errors in the diet are to this day quite obscure. They are, however, certainly of the kind which comprises these minimal quantitative factors that I am considering. Scurvy and rickets are conditions so severe that they force themselves upon our attention, but many other nutritive errors affect the health of individuals to a degree most important to themselves, and some of them depend upon unsuspected dietetic factors.

If we analyze this statement we must admit that Hopkins showed unusual perspicacity at this early time. On the other hand, he showed no evidence that he knew to what class of substances these mysterious agents could be referred. His mention of lecithin, for instance, makes him attribute a particular rôle to already known substances that has been undoubtedly misleading. If we compare this statement of Hopkins of 1906 with the statement of Bunge of 1891, *viz.*, "Mice can live well under these conditions when receiving suitable foods (milk), but as the above experiments demonstrate that they were unable to live on proteins, fats, carbohydrates, salts and water, it follows that other substances indispensable for nutrition must be present in milk besides casein, fat, lactose and salts," we must admit that Hopkins did not advance the question much since the work of Bunge.

As regards my own rôle in the vitamine field the only claims I can put forward are: (1) the recognition of the existence of several vitamines; (2) the right conception about the importance of vitamines for nutrition; (3) the first chemical study of vitamine B (1911), which unfortunately for the problem has not been improved on yet; (4) general stimulation of researches in this field through expressed ideas, experimental and summarizing work.

We come to the conclusion, therefore, that the discovery of vitamines can not be attributed to a single man. Among the pioneer workers in this field can be named: Bunge, Röhmann, Stepp, Eijkman, Schaumann, Suzuki and others. And the most that one can concede to Hopkins is that he was one of the pioneers. His distinguished services in the field of biochemistry and physiology (discovery of tryptophane, the chemistry of the muscle, the discovery of glutathion) together with his charming personality have made him, even without the title of discoverer of vitamines, one of the leaders in the biochemical world.

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[3] *J. Ind. Eng. Chem.*, 14, 64, 1922.

[4] *Analyst*, 31, 395, 1906.

CITATIONS OF SCIENTIFIC LITERATURE

MAY I make a comment and ask a question with reference to the recent notes on citations of scientific literature that have been appearing in SCIENCE?

Furfey (February 26, 1926, pp. 231 f.) makes many excellent comments. To his remarks upon the use of *"op. cit."* I should like to add the comment that, much as uniformity is to be desired, clarity is even more important. There is something to be said for footnotes, since they allow the author to add important but casual information and content where a parenthesis or a parenthetical digression would break the main thought. Where references are to be given in footnotes, then it becomes obvious that they should be immediately available. For an author or editor to insist on uniformity with respect to *"op. cit."* means that often the most careful scrutiny of many preceding pages must be undertaken to find references. Plainly in such a case the reference ought to be repeated. On the other hand, the page which makes numerous references to the same articles should certainly not have the reference repeated upon it. There might be some rule, like a rule to repeat the reference every four pages and to use *"op. cit."* otherwise, but in general it seems to me better to let good judgment prevail over reason, and to decide in Ms. when the precise reference can easily be found and when it will be lost among others. My plea here is against arbitrary uniformity by authors or editors.

My other question concerns the place of the date in a citation. Leffmann's (February 26, 1926, p. 231) and one of Merrill's (November 6, 1925, p. 420) instances place the date separately from the volume and pages. It seems to me to be much better for the date

to appear between the citation of volume and the citation of pages, because the nature of the date-number nearly always distinguishes it from the smaller numbers for volume and for pages, and one does not then have to use bold-face type or ordinarily to print "vol." or "v." I remember, however, once bringing tears into the eyes of a librarian by suggesting that the pages be separated from their volume by the date. It seems so logical to follow this order and to make for so much greater clarity that I can not understand why bibliographical practice is ordinarily against it. Can any of the readers of SCIENCE tell me why the date should not be interpenetrated between volume and pages?

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A UNIFORM, clear style for footnote citations is unquestionably desirable and no one is in better position to realize it than the editors of journals receiving contributions from a wide range of authors. These very same journals also have a wide range of readers to whom uniformity and fulness of citation will be a boon.

The danger to be avoided in the systematization of footnotes is over-abbreviation. Certainly, Arabic numerals are preferable to Roman because of the greater ease with which they are read; but when it comes to using cryptic formulas such as PSBA, JAFL, BAMNH, PCAS, AJS, ACM, etc., in referring to publications, it seems that we sacrifice clarity for the sake of saving half a line of type and give many a reader a crossword puzzle instead of a clear citation. Ink and paper are cheap. Why not use enough of both to make footnote citations uniform, clear, unambiguous and understandable to every reader?

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RAILROAD PASSES FOR SCIENTIFIC WORK

WITH the development of scientific research, many field investigations are carried on. Since science is poor, it would be desirable to have railroad passes to further this work. This laboratory has made plans to investigate some of the results, on the human organism, of a surgical operation. Such work will have to be done in the field, necessitating travel for which we have no funds.

The Interstate Commerce Commission, which regulates the issuing of railroad passes, provides free transportation to "persons exclusively engaged in charitable or eleemosynary work." It makes no mention of the matter of scientific research. Evidently, scientific research is a question which the Interstate Commerce Commission has not considered. Is scientific research charitable or eleemosynary? Possibly a large part of research might be so called since there is no remuneration paid to college professors carrying on such research as an extra load to teaching. The results of much such research evidently are bestowed gratuitously on succeeding generations.

This laboratory has approached one railroad and they express their willingness to donate a pass if they can be sure that such action will be within the law.

It seems that it would be desirable that this question be considered by men of science and some statement be made to the Interstate Commerce Commission in order that this latter body may take some action.

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SCIENTIFIC BOOKS

Mosquitoes of Surinam—A Study in Neotropical Mosquitoes. By C. BONNE and J. BONNE-WEPSTER. Royal Colonial Institute of Amsterdam, Department of Tropical Hygiene, 1925, 558 pp., 31 pl.

DR. BONNE for a number of years was government bacteriologist of Surinam. He and his talented wife, Mrs. J. Bonne-Wepster, greatly interested in all sanitary matters, conceived the idea as early as 1916 that they would make a careful study of the mosquitoes of that region, and the present fine volume is the result. It took many years in the course of its preparation and a number of years more to secure its publication. They began to correspond with the writers in the summer of 1916 and to send in specimens for identification. Later, in 1919, they came to Washington and spent some time in the National Museum studying the mosquito collections and familiarizing themselves with the methods used in the preparation of the four-volume Monograph of the Mosquitoes of North and Central America and the West Indies, the final parts of which had recently been published by the Carnegie Institution. Although very appreciative of the opportunities given them in Washington and greatly pleased with the result of their work here, their thoroughgoing ideas led them subsequently to visit the British Museum and to make a careful study of the types of neotropical species which had been before Theobald's eyes when he wrote his elaborate Monograph of the Culicidae of the World. They then went to Holland and began the arrangements for the publication of their extensive work. A little later they returned to Surinam and continued observations, but have now gone back to Holland, where Dr. Bonne has been made director of the Laboratory of the Cancer Research Institute in Amsterdam.