other members of which have any vestige of a spinous dorsal fin. It seems certain that this family will have to receive reallocation.

American zoologists who may desire to examine this astounding little fish will be gladly supplied with specimens on request.

HUGH M. SMITH

DEPARTMENT OF FISHERIES,
BANGKOK, SIAM

CRITICAL POTENTIAL MEASUREMENTS

IN your issue of Dec. 11, 1926, there appeared an article by Dr. George Glockler on "Critical Potential Measurements: A Correction for High Emission Currents." The author notes that when the emission current becomes appreciable one must no longer consider the resistance of the tube to the infinite. He suggests that the p.d. between anode and cathode as calculated by a potentiometer scheme be corrected for this condition. I would like to suggest that there is nothing original in this suggestion. The tube simply acts as a shunt across a section of the potentiometer resistance and the calculations are carried out in precisely the same manner as for any shunted instrument.

I might add that I have used this correction factor for the last five years in measurements on vacuum tube characteristics. However, I have never regarded the matter as an original procedure.

JOHN G. FRAYNE

DEPARTMENT OF PHYSICS,
ANTIOCH COLLEGE

"DATA IS" OR "DATA ARE": WHICH?

IT is far from my desire to be unduly critical in regard to the use of scientific terms, but I have long hoped that some one would call attention to the incorrect use of the word "data" now too prevalent.

"Memorandum" and "memoranda," words seldom seen or heard now-a-days, seem to have been comprehended readily and honored by correct use almost invariably: why not "datum" and "data"? Yet in about one scientific article in six, often in those sponsored by institutions of the highest reputation, there will be found the careless, ignorant or indifferent use of these words. Sometimes the blame may be laid to inadequate editing, often where we least expect it; but primarily it is the fault of authors—even though their names are followed by a generous share of the alphabet, indicating that much time has been spent in scientific circles, and correctness should be expected. In the interest of scientific precision and to maintain proper standards it is time to call a halt on this unfortunate practice.

Probably the expressions "this men is" and "much children does" would grate even upon the sensibilities (at least, let us hope so!) of those who make use of "this data indicates," "much data has," etc.

A. P. MORSE

PEABODY MUSEUM,
SALEM, MASS.

THE INDICATION OF QUOTATIONS

MR. S. M. NEWHALL has recently[1] called attention to the need for a pair of equivalents, in oral speech, for the unwieldy phrases "quotation begun; . . . quotation closed."

May I suggest that we find in ordinary telegraphic language many instances of the reduction of such cumbersome expressions to others more concise, graphic, and effective?

In this case the usual rendering is "quote . . . unquote."

JOHN W. ARNOLD

WESTERN UNION TELEGRAPH COMPANY

SCIENTIFIC BOOKS

Coffee. By RALPH H. CHENEY, New York University. Pp. 244, 77 plates. The New York University Press, 1925.

THIS book is a very unusual combination of scientific research and practical information. It is a curious fact that coffee, one of the most familiar and important plants, has never before been adequately investigated. Cheney has certainly filled this gap in our knowledge in a most complete way, so that everything known about coffee is now on record.

Part I contains the scientific presentation of the botany of coffee. Its four chapters give in detail taxonomic descriptions of the nineteen known economic species. Associated with these scientific descriptions, much interesting information is given as to the native names, the history and the uses of coffee. The bibliographical references are remarkably complete, so that the whole literature of the subject is available.

Part II consists of an economic discussion of coffee. The story of the indigenous distribution of the economic species and the principal countries where they are now grown is most interesting. All these data are given with a wealth of detail that is surprising. A full description is also given of the preparation of the coffee-bean, the plantation treatment and the treatment by wholesale distributors. A very interesting chapter describes commercial sophistication and substitution, giving the botanical sources of coffee-substitutes and adulterants and also the methods of

[1] SCIENCE, LXIV, 427.

detection. An important chapter deals with the chemistry of coffee, which should be of great interest to investigators.

Having to deal with so many nations through such a stretch of time, Cheney has presented in two appendices an interesting ethnological discussion, showing the effect of the introduction of coffee on the political and social life of the metropolitan centers of Egypt, Arabia, Asia Minor, Europe and America. In the derivation of the term "coffee," Cheney presents a new theory, based on philological and botanical research backward through several oriental languages, and resulting, as is said, "in the correction of an error which has existed since the tenth century."

This book deserves wide attention, for it is a new kind of presentation of an important economic plant. A well-known coffee firm has made the following statement: "For exhaustive scientific research, for wealth of bibliographical reference to a species of plant life that has become a great economic factor, it is likely to be accepted as an authoritative and standard work."

JOHN M. COULTER
THE BOYCE THOMPSON INSTITUTE

SPECIAL ARTICLES

CONIFERS AND THE COAL QUESTION

FOR over a century and a half a controversy has raged in regard to the origin of that all-important mineral, coal. On the one hand it has been maintained that its raw materials are the result of transport by water and that consequently coal is essentially of the nature of an aqueous organic sediment. On the other hand, the opinion has been held that coal is in the main the result of vegetable accumulations similar to those in actual circum-polar peat-bogs, consisting of the subaerial deposits, representing successive generations of fallen peat plants. The first view of the origin of coal is usually called the allochthonous or transport theory. The second is known as the autochthonous or *in situ* hypothesis. European geologists have in the main in recent years held to the latter view and their American colleagues have for the most part followed them in this opinion. It is important to emphasize however that the earlier and even the current views in regard to the origin of coal are for the most part arrived at in complete ignorance of its organization. Except in very recent years figures revealing the organization of coal are conspicuously absent in geological works, even in those which particularly deal with coal. It is apparently not without significance that the French, who above all others gave early attention to the actual organization of coal, are supporters of the transport or aquatic hypothesis of the origin of coal. Although new methods and improved old methods now give us real insight into the organization of coal, there is as yet unfortunately in general little observable rational improvement in geological theories regarding the formation of coal deposits.

The Tertiary coals as being nearest to our times and consequently representing conditions most easily compared with those of to-day, suggest themselves as most likely to resolve finally existing controversies. In this connection the lignitic remains in a large number of Tertiary coals have been examined in the writer's laboratories with results which are apparently highly significant. It has long been the custom in central Europe to compare the Tertiary coals with such formations as occur to-day for example in the Dismal Swamp. The characteristic Conifer of such swamps is *Taxodium distichum* and the abundant remains of wood in German coal deposits were referred to this or a similar species under the generic name Taxodioxylon. A notable difficulty in this connection is the fact that the conspicuous "knees" or pneutamophores of Taxodium have never been found even in the often excellent preserved remains of supposed Taxodium stumps, in the central European brown coals.

Over two decades ago the present writer pointed out that a reliable diagnostic feature of our two living species of Sequoia is their reaction to wounds. In *S. washingtoniana* (the Big Tree) and *S. sempervirens* (the Redwood) resin canals are formed in the wood of the wound cap. This feature distinguishes Sequoia from all other genera possessing the Cupressinoxylon type of wood and holds also for the Laramie (upper) Cretaceous (the most remote epoch in which true Sequoias have been found). It now turns out that in many cases the supposed Taxodiums of the German Tertiary coals are in reality Sequoias. Both our living species of the genus are mountain trees and in no case are they ever found in swamps. As a result of this addition to our knowledge of the most important ligneous remains of the central European coal deposits, a change of view is necessary in regard to the conditions under which they have been accumulated. It is now admitted even by some of our German colleagues that there must have been inundations (Ueberschwemmungen) by means of which the remains of Sequoias, at that time abundant throughout the northern hemisphere, were washed into the coal bogs. Unfortunately this concession does not go far enough, for an examination of Tertiary coals, in the writer's laboratories, covering North America, Europe and Asia, shows not only the presence of Sequoias, but at the same time a general organization typical of the organic sediments found in the