of it a constitutive or explanatory principle. It affords no means of analysis; it determines no specific change; it contributes no formula of relation. At whatever level it appears this conception stands only for the unresolved residuum by which reflection is faced.

Thus in the study of organic life it may be that the biologist is unable to state the facts of development in terms of the known chemistry of the cells, or of the local relation of parts in the segmented ovum and their polarities and bilateralities, or of the influence of external agents upon the organisms; but it is nevertheless inadmissible to formulate the problem in terms of a conception which falls without this whole system of principles and to say that, since the chemical and mechanical conceptions which we are now able to apply to organic development have proved inadequate to the statement of that process in its entirety, we must conceive it as autonomous and treat it in terms of entelechies. Autonomousness is a conception which falls without the domain of science altogether, because it applies to the thing only in its self-dependent totality—with which philosophy deals—and not to the thing in its relations to other things, as science must conceive it. Only in terms of their interaction can the empirical reason explain things at all; and in the case of organic development, as of all other processes, explanation must be through the determination of specific causal relations.

This mechanistic conception of science is of course a purely methodological assumption into which no ontological meaning is to be read. Its nature is misunderstood when, for example, it is called materialistic. The mechanistic conception applies to all facts which fall within the domain of science, whatever the metaphysical interpretation which may be given to them.

Robert MacDougall
New York University,
October 14, 1912

A PROTEST

To the Editor of Science: Permit me to offer an emphatic protest against the closing paragraph of Dr. Dorsey's letter in this week's Science (December 6). It is Dr. Dorsey's right, if conscience and judgment impel him, to express disapproval of missionaries in respect to either their purpose or methods or both, but to accuse them of "distortions," made from mercenary motives, is an utterly unjustifiable bit of spite. It not only reveals lamentable ignorance of facts, but betrays that intolerant and biased attitude of mind against which scientific men are supposed to particularly guard, and which in my judgment vitiates Dr. Dorsey's whole argument.

Hubert Lyman Clark

QUOTATIONS

THE EFFICIENCY NOSTRUM AT HARVARD

There has been a great deal of groping in the dark over the problem of raising the quality of our universities and colleges. But light has appeared at last. There will no longer be any futile casting about for improvements here and changes there, no more mere scratching of the surface. Somebody at Harvard has gone straight to the heart of the matter. Indeed, he has solved the whole problem in point of principle, though of course the details of the beneficent revolution he has started remain to be worked out. What has been needed all along has been some simple and yet profound guiding principle, and this is what the new move at Harvard supplies. See that you get your money's worth out of each professor —this is the philosopher's stone, which, firmly and steadily applied, is going to transmute into gold all the baser metal of our university faculties.

Seldom has a great reform been ushered in so noiselessly. "Harvard professors and instuctors," so goes a newspaper account, "are thoughtfully rubbing troubled brows to-day while they ponder over an intricate network of blanks and spaces whereon Assistant Controller Taylor has requested them to record the exact disposition which they make of all time spent in the interests of the university." The assistant controller states that he desires these data for the purpose of using them "as

a basis for pro-rating salaries to the various classified functions"; but, after supplying a formidable array of blanks to be filled with this end in view, he winds up with a request for information concerning "Contributory Activities," the giving of which is optional. These include the number of hours spent on "research work carried on personally by the instructor," and certain other things which, like this, "are of a quasi-private nature." The assistant controller recognizes that the variations in such data due to the personal equation "would make impracticable the direct use of these figures for the purpose of distributing salaries," but nevertheless he is apparently of the opinion that they would be a comfortable thing to have, and so he asks for them. And quite right, too; for the optional of to-day may be the compulsory of to-morrow, and it is well to "get a line" on these professor people, even if you can't pin them down to exact facts and figures.

In sober truth, this news from Harvard is a very serious matter. It touches the very vitals of the professor's calling. It ought to bring out from the Harvard faculty, and especially from the men of light and leading in that faculty, an impressive protest; and the most impressive form the protest could take would be that of a dignified but firm refusal to comply with the demand made upon them. For what is at stake at Harvard is nothing less than the whole character and status of the American professorate. To be a university professor has hitherto meant, in this country, as in all the world, to give to the university yourself—your personality, your talent, your capacity to interest, to instruct, to inspire. Many professors have, to be sure. fallen woefully short of fulfilling this ideal; many have been deficient in ability, many in character. But the one great thing that has made the calling attractive to the best who are in it has been that this was the plane on which it was understood to rest. It offers none of the glittering material rewards of other vocations; it seldom holds forth the allurement of fame. In this country, its dignity has been far below that which belongs to it in Europe, thanks to an exaltation of the idea of management and administration elsewhere unknown; but the recognition of the personal nature of the professor's work, of a distinctively personal measurement of his value, has never been abandoned. It is Agassiz, or Child, or Martin, or Gibbs, or Norton, or Gildersleeve—not so many hours of their labor—that Harvard, or Yale, or Johns Hopkins has had the good fortune to possess; and every faithful and competent professor has a right to feel that the same is true of him in his degree. But how long would that feeling survive under a system which required each professor to make report of every hour that he spent upon his work, and have his pay doled out to him accordingly?

It is easy to accuse those who object to the introduction of this efficiency nostrum of being reactionaries—upholders of the doctrine that whatever is is right. But it is still easier to reply to the accusation. Not because our universities and colleges are all that they ought to be, but because the proposed remedy is a crude and barbarous one, do we reject that remedy. We ought to have more competent teachers, we ought to have more inspiring leaders of research; but we shall not get them by means of time checks or card catalogues. The American professor is already far more subject to managerial control than his fellow in Germany or France; but it is in America, and not in Germany or France, that the cry of incompetent professors and inefficient instruction is continually heard. What is needed, above all things else, is to make the professorship attractive to superior men—men of originality, men of power, men of enthusiasm. When you have got all your time-card and efficiency-measure mechanism going, you may be able to compel every professor to come up to a certain standard; but you can not compel the men whom you ought to have as professors to enter the calling. You may get the same amount of "results" out of the faculties for less money, or a greater amount for the same money, so far as "results" can be measured by your mechanical methods; but what you have lost you will never be able to measure. And what shall it profit the uni-

versity to have gained countless student-hours and experiment-units and to have lost what is highest and best in it?

* * * * * *

President Lowell has sent to the members of the Harvard faculty a statement which amounts to something like a repudiation of the preposterous circular of inquiry issued several days ago in the name of the assistant controller of the university. A more complete repudiation would have been more welcome, but it should be safe to assume that Dr. Lowell's statement that "answers were intended to be wholly voluntary" and that "the recent circular was issued under a misunderstanding" means the end of this folly. The episode is one that Harvard should be glad to forget, except in so far as it drew out—as it did, though we are not informed as to what extent—threats of resignation on the part of men who had a proper conception of the professor's calling. It is humiliating to think that such a protest should have been made necessary at our country's most distinguished seat of learning; but as it has happened, we trust that the feeling of self-respecting professors has been made so manifest as to preclude the possibility of any resurrection of the foolish scheme.—New York *Evening Post.*

SCIENTIFIC BOOKS

Methods in Chemical Analysis Originated or Developed in the Kent Chemical Laboratory of Yale University. Compiled by Frank Austin Gooch, Professor of Chemistry and Director of the Kent Chemical Laboratory in Yale University. 1912. New York, John Wiley & Sons; London, Chapman & Hall, Ltd. Pp. xii + 536. Price $4 net.

In his prefatory note the author states that "the object of this volume is to present the principal results reached by workers in the Kent Chemical Laboratory of Yale University in the investigation and development of methods in chemical analysis." As a rule, only those procedures are included which have been definitely proven to be useful, and the experimental data given are those immediately related to the facts stated. Copious references to original papers render further information regarding details, discussions and variations of procedure easily accessible if library facilities are available.

The subject matter is divided into twelve chapters, the first of which deals with "Appliances and General Procedure," the second with "The Alkali Metals," the third with the copper group, and so on, following the groups in the order of increasing valence across the periodic table.

The book is in no sense a text-book, nor is it of the character of a work for general reference with respect to methods of chemical analysis. It is, rather, a bringing together of abstracts of papers, all emanating from this laboratory so well and widely known for its contributions to chemical literature in this important field, but published in many journals throughout a long series of years. As such, it is a most remarkable compilation and can not fail to be of service to those in search of reliable analytical procedures, although its usefulness will be more like that of a "Beilstein" than that of a "Fresenius."

If it is recalled that the material is presented in concise, abstract form and yet occupies more than five hundred pages, it will be evident that the volume constitutes a striking tribute to the versatility and activity of Professor Gooch and his associates and a record which it would be exceedingly difficult for any other laboratory to parallel. The compilation is that of one who is a master in the art of clear, accurate and concise statement, but the compiler has characteristically repressed the evidences of his own share in the many investigations which made this volume possible. It is a book which should do much to uphold the "dignity of analytical chemistry," so warmly defended by the late Dr. C. B. Dudley, and one which may well incite others to renewed endeavor in this fundamental field of chemical science—a field which some have, of late, tended to regard as of inferior importance, but which happily shows signs of again asserting its claims to a fair share of recognition.

H. P. Talbot