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Culture and Chemistry.

**C**RITICISM is an art to which Prof. H. E. Armstrong, as is well known, has given some attention. The opportunity occurring on the occasion of his lecture before the Royal Society of Arts on “Marcelin Berthelot and Synthetic Chemistry”—a full report appears in the *Journal of the Society of Dec. 30*—for the exercise of that faculty, was employed, in the main, in a manner such as cannot fail to arouse appreciation. As Sir William Pope, who opened the subsequent discussion, remarked, it would have been an easy enough task merely to give an account of Berthelot's life and of his manifold scientific activities, but to present a picture which should indicate how that work fitted in with the great scheme of progress and led to the present situation was an entirely different matter. That such a picture should be presented by one who has lived through that great epoch and has himself taken part in many of the big movements to which he necessarily referred, invested the discourse with a special degree of importance.

So much has been said and written in recent months in praise of the undoubtedly tremendous influence of that master-mind on the progress of scientific thought and achievement, that one may be forgiven for welcoming the condiment of informed, if sometimes mordant, criticism and analysis. It is evident that Prof. Armstrong still has no use for our modern system of chemical education—a system which we all freely admit to be far from perfect, but scarcely to be jettisoned on that account. We do not read original literature. We do not strive to shape our style on that of our forefathers. Indeed, we are losing the conception of culture in that domain, he says. There is, we submit, no lack to-day of either genius or philosophy. True, there may be more ‘pottering’ than yesterday, but may not that be ascribed to a greater abundance of potential potters, perhaps even more than to the “present low level of academic impotence”?

We should do well, moreover, not to ignore the fact that the outward and visible signs of scientific culture, no less than of social culture, change with the times; they cannot be unaffected by the evolution of socialism (with a small ‘s’) from individualism. More and more, too, such is the luxuriant growth in the garden of knowledge, one is consciously or unconsciously influenced by a mass-effect rather than by an individual plant, however venerable. In assessing the real importance

of Prof. Armstrong's justifiable complaint, one may perhaps be permitted to take passing note of the other extreme of the matter, and to be reminded that there must be a modicum of truth in Mr. Stephen Leacock's amusing confession: "I'd like to take a large stone and write on it in very plain writing—'The classics are only primitive literature. They belong to the same class as primitive machinery and primitive music and primitive medicine,' and then throw it through the windows of a University and hide behind a fence to see the professors buzz!"

However, to return to the main theme of Prof. Armstrong's discourse, namely, Berthelot's pioneering labours at the foundations of our amazing modern edifice of synthetic chemistry. His multitude of thermochemical investigations was considered less worthy: "... he ceased to be a constructive artist; grasping the thermometer, he became a thermalist... the slave of physical measurement." His work on biological problems and on chemical changes of importance to agriculture received less praise, although not quite so little as agricultural research of to-day. Berthelot's work in this subject "... shows him once more, in the main, as a chemist with undeveloped biological feeling." But in another field "it is clear that he set out upon his upward journey advisedly, bearing a banner inscribed with the device then entirely strange—'Organic Synthesis''; alcohol, mustard oil, methane, acetylene, benzene, naphthalene, and anthracene were among the numerous compounds which were synthesised for the first time, and the idea of 'vital force' behind organic chemistry was disposed of for ever.

The very success of Berthelot's syntheses, suggesting that man may make all things, has done much, we are told, to hasten a debacle. To-day there is an "insensate desire" abroad to synthesise and manufacture everything. Prof. Armstrong becomes quite indignant at the idea of eating "margarine... 'improved' with the aid of advitants from the livers of animals all and sundry." Berthelot, he declares, has given manufacturing chemists enough to do for some time to come without interfering with our food. In the discussion at the close of the lecture, however, Mr. Robert Mond put forward a point of view which might well be emphasised from the educational side: that in chemistry one can check one's own errors, and that chemistry *qua* chemistry may therefore be made the best tool for moral training that we possess.

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### Keeping Abreast—Some Aids for Physicists.

- (1) *Radioaktivität*. Von Prof. Dr. Stefan Meyer und Prof. Dr. Egon Schweidler. Zweite, vermehrte und teilweise umgearbeitete Auflage. Pp. x + 722. (Leipzig und Berlin: B. G. Teubner, 1927.) 36 gold marks.
- (2) *Thermionic Phenomena*. By Eugène Bloch. Translated by J. R. Clarke. Pp. viii + 145. (London: Methuen and Co., Ltd., 1927.) 7s. 6d. net.
- (3) *Dielectric Phenomena: Electrical Discharges in Gases*. By S. Whitehead. Edited with a Preface by E. B. Wedmore. Published for the British Electrical and Allied Industries Research Association, being Reference L/T 22. Pp. 176. (London: Ernest Benn, Ltd., 1927.) 16s. net.
- (4) *Institut International de Physique Solvay. Conductibilité électrique des métaux et problèmes connexes*. Rapports et discussions du quatrième Conseil de Physique tenu à Bruxelles du 24 au 29 avril 1924 sous les auspices de l'Institut International de Physique Solvay. Pp. viii + 368. (Paris: Gauthier-Villars et Cie, 1927.) 50 francs.

EVERY physicist must at some time or other have felt some sympathy with the suggestion, coming in the first place from an ecclesiastical source, that research laboratories should take a compulsory vacation of some ten years or so, in order that a breathing space might be given in which it would be possible to assimilate the vast accumulation of knowledge of the past few years, and to consider its bearings and implications not only in science but also in philosophy. In fact, with the slight and obvious reservation that nothing in the bill should be regarded as applying to one's own laboratory, a measure on such lines would undoubtedly meet with considerable support. It is pretty certain that no one in the future will be able to know the whole of physics, as it was possible to know it twenty or thirty years ago, or to keep in touch with all its developments even to the extent of reading, at first hand, the original memoirs in which the new work is described. At the same time, the actions and reactions of different branches of the subject upon each other are as close as, or closer than ever.

The problem is a serious one for the university teacher. It is absurd that a student of physics should go out from the university without some knowledge of the developments of his subject during the last ten or twenty years, and yet one searches in vain through the standard curriculum for some-