SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

THE TRAINING OF CHEMISTS[1]

THE address of Dr. Whitney on research, which follows mine, deals with that aim of the chemist which always receives the most enthusiastic recognition, namely, the elaboration of the content of the science, the farther coordination of that content, and the expansion of the boundaries of chemistry. But thorough *training* is indispensable before original work can begin. A genius, without adequate training, seems to know by instinct what information he needs and where to find it. He devises new methods when those which he has learned fail. He reaches the goal, in spite of all handicaps. Better training would have saved him some needless loss of time, but often would not have improved the final result. Geniuses, however, are few and far between. The advancement of the science would be fitful if it depended upon them alone. The greater part of the additions to chemical knowledge are made by men with an aptitude for the science, it is true, but with nothing approaching genius of the higher order. With them, the thoroughness of the previous training is, therefore, a very potent factor. At the other extreme, in the case of the chemist who does mainly routine analyses, who corresponds to the draftsman as distinct from the architect, the training he received must determine largely the value of his results. In all the intermediate cases, where intelligent study of an individual situation is demanded, and new adaptations to special purposes are required, training in the prin-

[1] Address delivered in Urbana at the opening of the Chemical Laboratory of the University of Illinois, April 19, 1916.