

pages to heterogeneous reactions. Whilst the difference between chemisorption and physical or van der Waals' adsorption is mentioned, it is debated whether there is a true distinction between the two kinds. Many now would take the view that catalytic reactions function because both kinds of adsorption are involved and that the act of catalysis involves a switch-over of the 'adsorbed' constituents from one type to another.

In the last chapter several general aspects of chemical change are discussed, of especial interest being the section on a comparison of reactions in the gaseous state with those in solution.

The author is to be congratulated on a magnificent achievement. In the preface he states that it is written for anyone who cares to read it; the reviewer might add, anyone who cares to read it will read it again and again. ERIC K. RIDEAL.

HISTORY OF LABORATORY APPARATUS

The Tools of the Chemist

Their Ancestry and American Evolution. By Ernest Child. Pp. 220. (New York: Reinhold Publishing Corporation; London: Chapman and Hall, Ltd., 1940.) 21s. net.

IF it be true, as has often been emphasized, that scientific progress is associated with the development of new laboratory methods and technique, then the story of laboratory apparatus becomes a part of the history of chemical education. This is a special branch of historical chemistry so it requires close contact with the instrument business for its investigation; the author, long associated with Eimer and Amend of New York, has proved fully capable of discharging his self-assumed task. Though limited to American chemistry, Mr. Child has necessarily gone back to European origins so as to place his picture in its proper setting. The resulting story, briefly told in an attractively produced book, makes the most pleasant reading: we would recommend its perusal to our colleagues.

Sellers of scientific apparatus are not to be regarded as mercenary and tainted with commercialism. The great Gay-Lussac founded with Collardeau a firm for the manufacture of the burette, vapour density and other apparatus he had originated. Accum, a gentleman of whom there are two opinions to-day, declared "that he who establishes a place of fabrication of an article of use to the sciences is a benefactor to the public".

American chemists, like the British, were too dependent, prior to 1914, upon Continental manufacturers and dealers for much of their scientific equipment. Hundreds of chemists who became future leaders studied in Continental laboratories and on their return home naturally ordered the apparatus with which they were familiar. The implications of this sentence might well be pondered over for the future: Britain must see to it that after the War she attracts students from both the Americas, the Dominions, the East, and even from the Continent, that besides teaching them

science they are also inculcated with British ideals and the habit of buying British. This form of propaganda is both necessary and justifiable, and might properly form an activity of the British Council.

America, of course, owes much to its emigrants, skilled mechanics from England, Holland and France, while as a result of the political disturbances of 1848 many glassblowers and instrument makers came from Germany.

The text is divided into three sections, the first headed "People and Events", the second entitled "Ancestry and Development", whilst the third gives the history of the distributors of apparatus in America. The first recorded importation of apparatus and chemicals into North America was made by John Winthrop in 1633; the cradle of American laboratory apparatus was in Philadelphia, where thermometers and hydrometers and "glasses for Philosophical Experiments" were made so far back as 1785.

Mr. Child has a happy knack of mixing past and present, and is clever in selecting his illustrations and quotations.

In days when there is serious discussion in the columns of NATURE of curtailing the practical course in school training in science, it is worth while quoting a philosophy expressed in the eighth century by Jābir ibn Hayyān, the great chemist of Islam. "The first essential in chemistry is that thou shouldst perform practical work and conduct experiments." This is as true to-day as when it was written; it applies above all to schools. We fail to-day because we are not a practical nation; nine tenths of us in the towns are unable to use our hands. We are trained to fill in forms and not to work lathes, so that most of us are helpless when emergency arises. The same philosopher also says, "But thou, oh my son, do thou experiment so that thou mayest acquire knowledge". It is in the laboratory that progress is made; the chemist must look to it that his tools are ready.

We thank Mr. Child for a delightful book.

E. F. ARMSTRONG.