

The methods of qualitative and quantitative analysis employed by the chemist are not included, since there is nothing specially applicable to this particular industry in them. The historical account of the apparatus devised for the purpose of aerating natural water by carbon dioxide is an instructive example of the slow and gradual stages required to effect a comparatively simple process. From the first experiment of Bergmann in 1770 the invention and elaboration of apparatus for aerating and bottling has extended, and the latter half of the book is devoted to descriptions of the machines employed to-day. The commercial production of liquid carbon dioxide has simplified the process, and most ingenuity is centred upon the charging and bottling machinery and the gas-tight fastenings. The description of the machinery is somewhat superficial, and is the least effective part of a commendable work. The examination of mineral waters for bacteria and metallic contamination is of special interest in view of the various containers for such waters on the market.

Vorlesungen über allgemeine Histologie. By Prof. Alexander Gurwitsch. Pp. v+345. (Jena: Gustav Fischer, 1913.) Price 11 marks.

PROF. GURWITSCH'S work is not a text-book of histology in the ordinary sense. It is arranged in the form of a series of lectures, in which the subject is dealt with not as an end, but as a means to the solution of the wider problems of biology; a good deal of space, for instance, is taken up with a discussion of the meaning of heredity. The lectures, written as they are from a critical and philosophical point of view, are full of interest, and examples are taken from every branch of the kingdom of life to illustrate the subject. The drawings of microscopic appearances which beautify the text are numerous, well selected, and well executed. W. D. H.

LETTERS TO THE EDITOR.

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Submerged Valleys and Barrier Reefs.

IN a letter on "Dana's Proof of Darwin's Theory of Coral Reefs," published in NATURE for April 3, Mr. Cyril Crossland points out that "land valleys which extend beneath the sea are not always proof of subsidence. Such valleys, like coral reefs, may owe their existence to different factors in different cases." He adds that certain harbours on the east coast of Africa "are the high parts of submarine fault valleys," which, although they simulate embayments produced by the general depression and partial submergence of a dissected coastal region, really result from the local depression of fault blocks, and hence cannot be taken as evidence that any coral reefs which may occur near them have been built up during a period of submergence.

There can be no two opinions on this point; but the discussion of fault-block depressions is aside from the problem involved in Dana's proof of Darwin's theory, which is concerned with valleys of erosion. To imply

that an argument which involves only such valleys is vitiated because some "land valleys" are due to down-faulting or other causes is unwarranted. If "land valleys" due to faulting were called "troughs" instead of "valleys," their irrelevance would be more apparent.

Some of the harbours on the Red Sea coast, mentioned by Mr. Crossland as due to down-faulting, are regarded by Mr. John Ball as partly submerged valleys of normal erosional origin above sea-level; so he states in a letter which appeared in NATURE for May 22. Which of these two opinions is the correct one may be best left to observers on the ground, as neither of the writers here cited adduces detailed evidence to support his conclusion. Mr. Crossland's remarks on the relation of certain coral reefs to abrasion I will not discuss here, because, probably on account of the brevity of his note and the lack of explanatory diagrams, his meaning is not clear to me. But his statement that "land valleys which extend beneath the sea are not always proof of subsidence" calls for comment, because it indicates a misunderstanding of the question at issue.

The embayments considered in my article on "Dana's Proof of Darwin's Theory of Coral Reefs," published in NATURE for February 6, were not such as occupy down-faulted troughs, or over-deepened fiords of glacial origin, neither of which indicate subsidence of their region, but only such as occupy valleys of normal erosion; that is, valleys which have been excavated by the ordinary processes of subaerial weathering and washing, and can therefore have originated only on land above sea-level. The peculiar and essential consequence of Darwin's theory, which remained unnoticed by its author, is the invasion of the previously eroded normal valleys of a dissected and subsiding coast by the sea; and the whole point of the long-neglected confirmation of Darwin's theory lies in the evidence that Dana gave to the effect that the drowned valleys of the Pacific islands had been formed by the action of land waters above sea-level before they were drowned, and not by any other process, such as down-faulting or glacial erosion, or by marine erosion, as Darwin apparently thought. Hence, interesting as are the complications which Mr. Crossland mentions, they do not touch the question in discussion, which has to do, not with shore-line embayments of whatever origin, but with embayments of a highly specialised kind, occupying valleys of normal erosion. So far as the evidence of the Admiralty maps and of various recent observers goes, the embayments of the central islands enclosed by barrier reefs in the Pacific are practically all of this highly specialised kind; the occurrence of other kinds of embayments elsewhere is no more relevant to the case than the occurrence of upraised platforms of marine erosion.

The real point raised by Mr. Crossland's letter is the possibility of distinguishing between embayments of different origins. I cannot accept his opinion that embayments which occupy troughs produced by locally down-faulted blocks simulate embayments formed by the submergence of normally eroded valleys, unless in a very rough manner, from which no confusion should arise. Even if the two kinds of embayments do in some superficial manner simulate each other, they can be distinguished readily enough. A normally eroded main valley is joined by branch ravines and side valleys, all systematically related as parts of a valley system; they may have young, mature, or old forms, according to their stage of development. Submergence of a main valley must therefore produce an indented or branching embayment, like the "rias" of north-western Spain or the drowned rivers of Devonshire-Cornwall. A down-faulted trough must at first