they will be seriously lessened. The ladder of camps essential for the final assault can only be established rung by rung, a process that must take time, and can only be continued while the favorable conditions last. But whether the result be victory or defeat, the third attempt to conquer Everest will mean, like the two before it, an inspiring display of the resolution and endurance and indifference to discomfort and danger that, all through the ages and to the uttermost ends of the earth, have made the people of these islands, above all things, a race of pioneers. When General Bruce says that the great adventure of Everest has now almost become a pilgrimage, he touches upon a profound truth. Just because the way is long and difficult and beset with dangers, the mere attempt to progress along and up it is worth while—worth while not only for the pilgrims who first try to set foot on these untrodden peaks, but for the help of all those after them who will try to do hard things, because hard things are an end in themselves, even with the possibility of failure and no material gain in view.—*The London Times.*

SCIENTIFIC BOOKS

The Coming of Man. By JOHN M. TYLER. Marshall Jones Company, Boston, 1923, pp. 142.

THERE is a real need and ought to be and probably is a large field for such a book as the one before us. This is a day of greatly quickened interest in questions involving the nature, the origin and the destiny of man. And certainly these questions are now asked on the basis of more general enlightenment and with more vital interest than ever before.

One evidence and one consequence of this is an increasing number of inquiries for reading matter on the subject by persons of general education. No one whose professional status is presumed to be a guarantee of his competency escapes requests for advice concerning such matters. It would be a great satisfaction to those solicited could they recommend without misgivings the reading of some one or a few books.

The Coming of Man is designed, the author tells us in his preface, to meet the needs of the class of persons here indicated. And on the whole the design seems to the reviewer pretty well realized. Indeed in most respects it seems to him so superior to the usual run of what is now being written in this general domain that for the present it will stand first in the list of books he can recommend to such inquirers. For one thing in particular the author deserves commendation: He has largely avoided the dogmatic speculation that puts much of later writings of this nature outside the possibility of commendation by a conscientious adviser.

As might be expected from a life-long teacher of biology, the biological groundwork for the origin of man is quantitatively ample. Indeed one may justifiably question whether it is not more than ample, for nearly a third of the volume is devoted to it. In the reviewer's opinion some of the space given to such subjects as the skeletal parts of arthropods and molluscs could more profitably have been devoted to subjects that come closer home to human beings but which are given scant attention. Examples of such subjects are myth and superstition. A chapter on the "Nature of Man" in a book on human development which contains no reference to these cardinal matters strikes one even moderately informed about the lives of primitive people, as the play of Hamlet with the character of Hamlet left out, sure enough.

The reviewer is truly desirous that his full judgment of the book shall be accepted as favorable. But he believes his expression of that judgment can be most effective if it follows upon the heels of a reference to what seems to him a serious defect in it. And the criticism just made points toward that defect.

So great has been the progress in recent years of man's knowledge of his own mental life, and so inextricably is that life now known to be interwoven with his whole life, that the day is forever gone when any book, however small, on human evolution, can be counted as modern and adequate which does not give as much space to mental as to physical development.

Yet the author of *The Coming of Man* gives his readers distinctly to understand that if they wish information about the coming of this part of their nature they must go elsewhere to get it. "The whole subject" we read (p. 26) "of instinct and intelligence, their resemblances and differences, compensating advantages and disadvantages, especially their origin, forms a field of most fascinating study, *into which we will not attempt to enter*" (italics by the reviewer).

This I submit is almost tantalizing. It seems to say to the reader, "Although I know a good deal about these matters in which you are undoubtedly much interested, I refuse to tell it to you."

Beyond a question the most distinctive thing, and the most important thing about man is his mind. And, as already intimated, so aware of this is general enlightenment, and so eager is it for more enlightenment concerning many aspects of mind, that it seems inevitable that in the near future authors who contemplate writing general books on human evolution but are unwilling or unable to include the evolution of mind in their undertaking, will on second thought see that it would be better to leave the whole job to somebody else.

But the book before us has in this a saving grace. The truth is, its author does not do as badly as he promises to. For in reality there are many enterings

(even though for only a little way) into matters psychological scattered through several of the chapters. And in this, as in several other respects, the book is a distinct improvement on many another production of recent date in the same general field. For example, the chapters entitled "The Dawn of Civilization" and "The Rise of Personality" are exhilarating promises of how vast and how vital the drama of human life upon the earth will be seen to be, even by persons of ordinary education, when once a few biologists competent to tell well the material side of the story shall have become sufficiently educated to tell its spiritual side also.

WM. E. RITTER

LABORATORY APPARATUS AND METHODS

AN EFFECTIVE ABSORPTION APPARATUS[1]

DURING an investigation which aimed to determine qualitatively and quantitatively the gaseous evolutions from flowers of sulphur and from ground sulphur when freely exposed to the atmosphere and to bright sunlight different types of absorption apparatus were tried out in an endeavor to find one suitable for the purpose to which it was to be applied. Owing to the fact that the gases to be absorbed were very small in quantity and distributed through relatively large volumes of air it was quite essential that the absorbing apparatus should be efficient and capable of continuous operation for a considerable period of time. In examining the various types of apparatus such points as efficiency, compactness, rigidity, ease of sampling, ease of refilling, and cleaning were considered. To meet the particular experimental requirements it was necessary to devise and construct a special type of apparatus.

The essential features of the apparatus which was finally adopted and constructed are shown in longitudinal section in figure 1. The apparatus consists of a heavy walled bacteriological culture tube A about 25 mm. outside diameter and 150 mm. long to which is sealed near its lower end a side arm tube B 4 mm, in diameter. The lower end of the side arm tube is drawn out to a narrow tip which is directed downward toward the bottom of the tube A. The opening through this tip is quite small to permit the formation of only very small bubbles coming at regular intervals when the apparatus is in operation, the bubbles being released near the side wall at the bottom of the tube A.

The central tube E is about 12 mm. outside diameter and 125 mm. long around which 60 cm. or more of 4 mm. glass tubing is wound to form the spiral which is sealed off at both ends to prevent the entrance of liquids. The central tube E is open at both ends the opening at the upper end having the full diameter of the tube while that at the lower end is somewhat smaller; the tube, being rounded at this end, serves as a guide to direct the escaping bubbles against the spiral. The spiral with the central tube E slides freely into the tube A but fits snugly enough to prevent the bubbles from escaping between the spiral and the walls of the tube A. The spiral with the tube upon which it is wound, being movable, can be adjusted in the tube A in any position with respect to the tip of the side arm upon which it rests. It can be removed readily from the tube A for the purpose of cleaning which is an important matter to be considered.

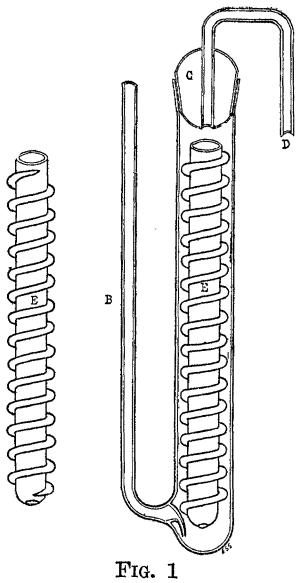

FIG. 1

The tube A is closed with an air tight seal by means of the ground glass stopper C which holds the outlet tube D. A rubber stopper holding the outlet tube may be substituted, of course, for the ground glass stopper if experimental conditions permit.

In operating the apparatus the tube A containing the spiral and central tube E is partially filled with the absorbing liquid after which the stopper holding the outlet tube D is put in place. The apparatus is then adjusted to receive the air containing the gases to be absorbed, these entering through the tube B when suction is applied at D. Suction may be applied continuously by the use of an ordinary small aspirating pump attached to a constant level reservoir to insure steady action.

Air and the gases to be absorbed, entering the apparatus, are delivered into the absorbing solution at the lower tip of the side arm tube B in the form of small bubbles which are caught by the spiral, passed

[1] Paper No. 140 of the Journal Series, New Jersey Agricultural Experiment Station, Department of Plant Physiology.