

of the cycle from time to time at any one point on the earth's surface. Number (3) appears to be true for every cycle except the annual and diurnal cycles, and is the most difficult and confusing condition that confronts the believer in weather cycles. The formula

$$\sum \frac{\cos nx}{n^2 - 8^2}$$

is a mathematical expression of the sudden inversion of phase which may take place in harmonic curves, as is beautifully shown by Professor Michelson's harmonic analyzer. Whether this, however, has any relation to weather curves is uncertain.

I feel strongly that the difficulties will in time be solved, and that forecasting by means of weather cycles will supplant largely, if not entirely, all other forms of weather forecasting.

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BLUE HILL METEOROLOGICAL OBSERVATORY,
HYDE PARK, MASS., February 8, 1898.

SCIENTIFIC LITERATURE.

The Ruins and Excavations of Ancient Rome. A Companion Book for Students and Travelers. By RODOLFO LANCIANI. Boston and New York, Houghton, Mifflin & Co. 1897. Small 8vo. Pp. xxiv+619.

This book will be a godsend to the more intelligent class of English-speaking travelers, who are not obliged to limit themselves to a very short stay in Rome. Few, indeed, are the persons who have not felt somewhat bewildered when they have been called upon to map out their time for a winter in the Eternal City so as to use it to the best purpose.

The ordinary guidebook, no matter how good it may be, is not enough; Middleton's 'Ancient Rome,' which is in many ways almost indispensable, is written largely from an architect's point of view; the various German works are for the most part intended more for professional students of antiquity, and Professor Lanciani's other two books, 'Ancient Rome in the Light of Recent Discoveries' and 'Pagan and Christian Rome,' are of too popular a character to be very useful, if a person wishes to undertake a serious, albeit a not strictly professional, study of the ruins of the city. There was,

therefore, need for just such a book, which should cover substantially the whole field and which should include the most recent results of Roman topographical investigation, as the one before us. Its usefulness will, however, by no means be confined to intelligent travelers, for, to quote from the preface, 'students wishing to attain to a higher degree of efficiency in this branch of Roman archæology (viz., topography) will find copious references to the standard publications on each subject or part of a subject.' Indeed, the skill with which Professor Lanciani has constantly kept in mind the needs of these two classes of readers, without thereby spoiling the unity of his book or making it unfit for either class, is worthy of high praise. The enormous mass of material which must be handled in any treatment of Roman topography has been arranged and presented with simplicity and skill; questions in dispute have been indicated without lengthy discussion, and thus the dryness so characteristic of works in which the statement of a very large number of facts is necessary has been in a great measure avoided.

In Book I. of his work, which contains 'general information,' Professor Lanciani has gathered together a large amount of material that is not easily accessible. The geological formations about the city, the climatic conditions, the quarries, the bricks and the Tiber are discussed. The walls in different periods, the bridges, the aqueducts, the *cloacæ*, the regions of Augustus and the maps of the time of Severus—what might, in fact, be termed the anatomy of the city—are also treated here. Some interesting statistics, too, in regard to population and the amount of the water supply have been included. Books II. and III. are concerned with the very heart of the city—the Palatine Hill and the Sacra Via from Coliseum to Capitol—and here is included also the discussion of the Forum Romanum and of the adjoining *fora* of imperial times. In book IV. the rest of the city is described according to the Augustan Regions and there is a brief concluding chapter on the 'general aspect of the city.' This is followed by an appendix containing lists of the Emperors, Popes and artists and useful information touching chronology, weights and

measures, etc. There are also two classified indexes, but no general one.

No attempt can be made here to review with any real thoroughness this important and interesting contribution to the ever fascinating study of Rome. One or two special points of excellence, however, may be noted and a few rather trivial defects pointed out which might easily be remedied in another edition.

The student will be glad to have in a work so readily accessible as this book is the discussion of the earliest settlement on the Palatine in the light of the excavations at Antemnæ and at Castellazzo di Fontanellato. No doubt deeper excavations are necessary before any clear idea of the pre-historic settlement in Rome can be gained; yet, with a knowledge of the lay of the land and of the settlements which must have had many points in common with that on the banks of the Tiber, the beginnings of the city are removed from the domain of pure speculation. It is pleasant, too, to note that a rational explanation of the dark rooms in Caligula's palace may now be read by the visitor to the Palatine, and that he will no longer be asked to believe that the beautiful decorations were never seen except by artificial light. It is, however, to the account of the Pantheon, the most impressive structure in our heritage from ancient Rome, that the average reader will turn with keenest interest. Doubtless many knotty questions about the building have not been and perhaps never will be solved, but the most recent and very important studies of it have developed the cardinal fact that the present structure dates from Hadrian and is not Agrippa's at all. Agrippa's structure was probably of a different shape and faced south instead of north. It appears to have looked out on a circular open space which was paved and which was enclosed by a wall that is concentric with the foundations of Hadrian's Pantheon. Unfortunately, it is still a mystery what the relation of the building to the thermæ was. Lanciani's account of this complicated architectural problem is a model of clear, simple statement, quite free from the vice of claiming results which it is not possible to prove.

It would be easy, if it were worth while, to extend in detail an enumeration of the many

excellent features of this handbook, but it is not so easy to discover its defects, which at best are insignificant. In the first place there should be a good map of modern Rome in the book. The lack of this is occasionally an annoying omission, as an attempt to follow out carefully the account of the bridges, pp. 16 ff., will show. A new general map of the Palatine would be an improvement. Many students of Greek sculpture will quarrel with the positive attribution of the 'Venus Genetrix,' p. 301, to Arcesilaus, and they will miss, p. 415, a reference to the publication in the *Antike Denkmäler* of the remarkable relief on the marble throne of the 'Venus Sallustiana.' Very welcome, however, is the publication of the beautiful Greek head on p. 177.

The English of the book is simple and clear, with almost no traces of foreign influence. On pp. 62 and 104 'designs' and 'designed' are not used in accordance with our idiom. 'Hedra,' p. 176, can hardly be justified, and the spelling 'Polykletos,' p. 215, is rather a flagrant example of the confusion we have fallen into in the transliteration of classic names. The German 'Poebene,' p. 115, even in quotation marks, is scarcely better than Valley of the Po or Po Valley, and it is questionable whether 'unities' (*once*) of water, p. 184, will be readily understood.

The publisher's work has been well done, though the volume is heavier than one could wish. There is a trifling misprint in 'tribute (sic) of the plebs,' on p. 117.

J. R. WHEELER.

Les Cécidomyies des céréales et leurs parasites.

By DR. PAUL MARCHAL. Annales de la Société Entomologique de France, Volume LXVI. 1897. Pp. 1-105; Plates I.-VIII.

This paper, which has just come to hand, is, taking it all in all, the most important contribution to a knowledge of the Hessian fly in Europe which has ever been published. It contains also studies of a very great biologic interest, especially with regard to the larval development of certain of the parasites of the larva of the Hessian fly, and it is especially in relation to these observations that this review is submitted. Dr. Marchal has studied carefully the life history of *Cecidomyia destructor* in