

THE LITERARY WORLD.

immense work and labour in the great ocean; but these are almost confined to the tropical zone.

Mr. Darwin's book, like all able and thorough books relating to any branch of natural history, will serve to give interest to many a country walk, which, apart from such means of quickening and cultivating inquiry and observation, might prove dull and dreary. The volume reminds us that those who penetrate ever so short a distance into the great realm of Nature, in the true spirit of seekers of the truth, will surely be rewarded and will often meet with surprises; and readers of these chapters will find themselves led to the conclusion that worms are not, after all, the despicable creatures which they have been commonly supposed to be.

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1881

[DECEMBER 17.]

"The Formation of Vegetable Mould Through the Action of Worms, with Observations on their Habits." By CHARLES DARWIN. (Lond. Ed.) D. Appleton & Co. Pp. 301.

MR. DARWIN ON WORMS.*

THIS American edition, bearing the date of the coming year, but issued in November, 1881, is page for page identical with the original London edition, published early in the autumn.

In every object which Mr. Darwin treats he creates an abiding interest. And the present volume is noteworthy, if for nothing else, as an additional and very marked exemplification of the veteran author's genius in drawing significant lessons from seemingly insignificant things. He who now needlessly treats upon a worm (that is to say, upon an earthworm) may

know—what before he probably never suspected—that he is illustrating a benefactor to the human race. For to earth-worms is mainly due the formation of that dark-coloured rich humus—the so-called vegetable mould—which in every moderately humid country almost everywhere covers the surface of the land with a layer or mantle, the importance of which to agriculture is quite incalculable. Not only was this layer of finely comminuted materials mainly produced by worms, but it is undergoing constant change and renewal by their action, underlying materials being constantly brought to the surface and the whole mould periodically exposed to the air, stones and all particles larger than the worms can swallow completely sifted out and buried beneath, and the whole intimately mingled together in a way which a gardener preparing fine soil for his choicest plants and seeds can only imitate.

In this case it is well fitted to retain moisture and to absorb all soluble substances, as well as for the process of nitrification, says the author, upon which the productivity of the soil largely depends. His conclusions:

The plough is not of the most ancient and most valuable of man's inventions; but long before it existed the land was in fact regularly ploughed, and still continues to be thus ploughed, by earth-worms. It may be doubted whether there are many other animals which have played so important a part in the history of the world as these lowly-organized creatures.

Near to the agriculturist the archaeologist should be thankful to these creatures which otherwise were thought to be servicable only to the angler. For,

they protect and preserve for an indefinitely long period every object, not liable to decay, which is dropped on the surface of the land, by burying it beneath their castings. Thus, also many objects and curious translated monuments and other ancient remains have been preserved, though, no doubt the worms in these cases have been largely aided by such winds and blows from the adjoining land, especially when cultivated.

But they may work harm, as when they undermine such monuments and cause unequal subsidence.

Even old masonry walls may be undermined and subside; and an instance is in this respect noted, where the foundation is 6 or 7 feet beneath the surface, at a depth at which worms cannot work. It is probable that many mounds and some old walls have fallen down from having been undermined by worms.

As to how these effects are produced, and how it is proved that such feeble creatures are capable of bringing to pass such great results, we must refer to the book itself, which is easy and interesting reading, and—thanks to large type—of no formidable extent. In short, earth-worms largely swallow earth in making their burrows, and also for the sake of extracting any nutritious matter it may contain; and this is voided mainly on the surface of the ground in the form of the well-known worm-castings. It was in the year 1837 that Mr. Darwin communicated to the Geological Society of London, and published in its Transactions, a

paper On the Formation of Mould;—in which it was shown that small fragments of burnt mud, shiners, &c., which had been thickly strewn over the surface of several meadows, were found after a few years lying at the depth of some inches beneath the turf, but still forming a layer.

The suggestion that this apparent sinking of superficial bodies is due to the large quantity of fine earth brought up to the surface by worms in the form of castings was made by Mr. Darwin's cousin, Mr. Wedgwood; and this he at that time proposed to verify, by ascending the east of which objects left on the surface of the soil were in this way buried beneath it. He was thus led to conclude that all the vegetable mould over the whole country has passed many times through, and will again pass many times through the intestinal canal of worms.

and therefore that it should rather be called "animal" than "vegetable" mould. Returning to the subject now in later days, Mr. Darwin confirms his conclusions by another and more direct line of evidence, namely, by weighing all the worm castings thrown up on a measured space within a given time, as also by scrupulous and prolonged observation of the habits and actions of these animals. There is also an interesting chapter on the part which worms have played in the burial of ancient buildings, as at the old Roman remains at Silchester and Wywerter, and at Bradbury Abbey, destroyed by Henry VIII; and two others on their action in the denudation of the land.

A large part of the chapter on the habits of worms is devoted to the question of their intelligence, and to an account of the researches made by Mr. Darwin and his son Francis in this regard, founded mainly upon observations of their management in closing and opening their burrows, and in dragging into them various kinds of leaves and other articles of food. Adopting the idea that in-

telligence in the lower animals can safely be inferred only when an individual is found to profit by his own experience, and seeing that almost if not quite the only sense which these worms possess is that of touch, the author remarks :

It may be well to remember how perfect the sense of touch becomes in a man when born blind and deaf, an ear worm. If worms have the power of acquiring some notion, however rude, of the shape of an object and of their bearings, as seems to be the case, they deserve to be called intelligent; for they then act in nearly the same manner as would a man under similar circumstances. [p. 37.]

In the introduction reference is made to a critic who

rejected my conclusions with respect to the part which worms have played in the formation of vegetable mould, merely on account of their assumed incapacity to do so much work. He remarks that, "considering their weakness and their class, the work they are supposed to have accomplished is stupendous." Here we have an instance of that inability to sum up the effects of a continuously recurrent cause which has often retarded the progress of science, as formerly in the case of geology, and more recently in that of the principles of evolution. [p. 5.]

These two sentences are the only ones we have detected in this volume which have any bearing whatever upon Darwinism.

Mr. Pyle has repeated the story in a series of about thirty page-cartoons, drawn in the manner of the story's period, and illuminated with great ingenuity of design and wealth of color, writing the text stanza by stanza across the face of each cartoon, and also duplicating it in old type upon each opposite page. It makes a novel book, not only of poetic sweetness and artistic beauty, but of historical suggestion. One may guess from it what missal-painting was half-a-dozen centuries ago; and one may measure from it, too, the advance which color-printing is making just now in the great art establishments of the great cities. The cover, in blue and black and red and gold is a little dazzling. [Dodd, Mead & Co. \$6.00.]

Owen Meredith's Lucile.

This choice volume is late in reaching us, having been published some weeks since, but is worth waiting for, and stands the closest examination. The poem, which is by no means new, may be described as a novel in dramatic verse, and is full of a foreign scenery which invites the best artistic skill. Stedman has called *Lucile* not only the best work of its author, but "the most popular; a really interesting, though sentimental, parlor-novel, written in fluent verse,—a kind of production exactly suited to his gift and limitations. It is quite original," continues Mr. Stedman's estimate, "for Lytton adds to an inherited talent for melodramatic tale-writing a poetical ear, good knowledge of effect, and a taste for social excitements." The author, "Owen Meredith," will be remembered as the Hon. Edward Robert Bulwer Lytton, now Lord Lytton. In its present form the intrinsic traits of *Lucile*, whatever they may be, are left quite in the background by the chaste elegance of the typography and the rare beauty of the engravings,—engravings than which we recall none finer in all the range of illustrated work of the present year. Their one common characteristic is *finish*. Their unflinching refinement and delicacy, whether of the full-page cuts, or of the vignettes that are scattered through the text, we have not seen excelled. The impressions are uniformly clear and brilliant, and equal to the best work in the American magazines. The cloth cover also is in the best of taste. [James R. Osgood & Co. \$6.00.]

Poe's Bells.

Poe's poem of *The Bells* strikes one at first as a good subject for the pencil, but the book before us shows that the treatment has its limitations. Darley, Fredericks, and Perkins are among the artists who have furnished it with its twenty or so illustrations, and most of them are of a fair quality, taking what advantage of the text is possible. But there are incongruities. In the picture of "the sledges with the bells," for example, the sleigh is drawn without any reference to fact; and in "the mellow wedding bells," a bridegroom in Puritan dress and a bride in a Fifth Avenue trousseau are seen coming out of a carved gothic church porch. Other of the work, particularly the fanciful panels of birds and flowers which enclose some of the lines, are more successful. The paper and presswork are good. The silver on the cover we do not like; the purple book-marker we do. [Porter & Coates. \$1.50.]

— The Russian government has been pleased to authorize the formation of a new Pushkin Club, "which is intended," says the *Athenæum*,

"as a medium of intercommunication among men of letters in Russia. The club also proposes to assist necessitous members; to ensure the publication of works of merit by young writers; and to organize at its own expense excursions to the interior of Russia for the purpose of discovering and preserving specimens of the ancient popular literature."

CHILDREN'S BOOKS.

Sketches and Scraps.

Laura E. Richards and Henry Richards have coöperated in the production of this pretty picture-book of the modern school, in which nursery rhymes of a very respectable merit are fitted to color-illustrations that are often very clever. The rhymes have not much meaning, but jingle is what is wanted in a book like this; and the pictures are sufficiently grotesque to match. There is one little poem, however, which is so purely a gem in its way that we must quote it entire:

Phil's Secret.

I know a little girl,
But I won't tell who!
Her hair is of the gold,
And her eyes are of the blue.
Her smile is of the sweet,
And her heart is of the true.
Such a pretty little girl! —
But I won't tell who.

I see her every day,
But I won't tell where!
It may be in the lane,
By the thorn-tree there.
It may be in the garden,
By the rose-buds fair.
Such a pretty little girl! —
But I won't tell where.

I'll marry her some day,
But I won't tell when!
The very smallest boys
Make the very biggest men.
When I'm as tall as father,
You may ask about it then.
Such a pretty little girl! —
But I won't tell when.

This is well-nigh perfect. There is nothing better in the book; but the tale of "The Seven Little Tigers and the Aged Cook" is not bad; and "The Little Cossack" may go with it. [Estes & Lauriat. \$2.00.]

Yankee Doodle is a silly ballad, the best that can be made of it; the music to which it goes being the redemption of the words. Mr. Howard Pyle's illustrations of it do not lift it above its natural level, showing neither pleasant sentiment, true humor, nor particularly skillful execution. The book belongs to the lower order of picture-books of 1881. [Dodd, Mead & Co. \$1.25.]

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But they may work harm, as when they undermine such pavements and cause unequal subsidence.

Even old massive walls may be undermined and subside; and no building is in this respect safe, unless the foundations lie 6 or 7 feet beneath the surface, at a depth at which worms cannot work. It is probable that many monoliths and some old walls have fallen down from having been undermined by worms.

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HARPERS' CYCLOPEDIA OF UNITED STATES HISTORY.*

THIS work is made out of Mr. Lossing's reputation, and considering what that reputation is, it falls very far short of what it ought to be. It is large, imposing, attractive looking, externally methodical, and obviously compendious; but in reality it is an immense mass of materials, ill-digested, ill-arranged, and provokingly disfigured and injured by omissions, mutilations, fragmentary treatments, and inadequacies which a beginner in cyclopædic work ought to have avoided. How such a veteran as Dr. Lossing ever allowed himself, and how such publishers as the Harpers ever consented to his allowing himself, to execute this work on such a plan, we cannot conceive. The contents are those of an extremely useful work of reference; the form is bungling and impractical.

To begin, Dr. Lossing has no proper conception of the art of indexing. The following entries instance his most vicious habit in this respect: "Minor Events of the Civil War," "Monument on Bull's Run Battle Ground," "Mortality at New Plymouth," "Proposed Amendments to the Constitution." Who would ever think of looking for the subject of constitutional amendments under the word "Proposed," or for New Plymouth mortality under "Mortality," or for a chronology of the Civil War under "Minor"? These are specimens of his way throughout; and it is unaccountable. Next to this gross fault may be mentioned the compiler's fashion of splitting up a topic under half a dozen wholly insignificant subtitles, the alphabetical order of which puts the cart before the horse in the most absurd fashion, over and over again. Take, for example, the life of Washington, which is presented, not in one consecutive logical sketch, as it ought to be, but in a series of disjointed and disorderly paragraphs alphabetically arranged as follows: "Washington Abused;" "Washington a Dictator the Second Time;" "Washington, Adopted Children of;" "Washington a lieutenant-general of France;" "Washington and Mary Phillipse;" "Washington and Rochambeau;" then come accounts of Washington Benevolent Societies, of Bushrod Washington, and of the capture of Washington City; after which again "Washington Commander-in-Chief;" "Washington, Death of;" "Washington, Diplomatic Mission of;" and not till then "Washington, George;" with "Washington in Supreme Command of the Army," and "Washington in the Virginia Assembly." After another interruption we reach "Washington, Parting of, with his Officers," and so on through a dozen or more arbitrary heads. This is the way subjects are chopped up all through the work, and how anybody but the

compiler can find what he wants to find it would be hard to say.

The strength of the work lies in its descriptions of battles and battlefields of American history, which are elaborate and good. Military history is well provided for. Biography is pretty well represented. On other points the treatment is often deplorably inadequate. American Antiquities and American Literature have little attention. The two-inch paragraph on "Farms" should certainly have been extended so as to contain some account of the mammoth farms of the Northwest and of California. We look in vain for any account of American grape culture and wine manufacture, though that important subject may be treated under some obscure head. What is a "Cyclopædia of United States History" without some account of Newport, Saratoga, Long Branch, and Coney Island as centers of summer social life? Nothing is said of either. We find no account of the Swedes' development of the Aroostook, in Maine; none of New York City, Philadelphia, or Boston as seen at the present time; no connected narrative of the late Civil War, or of the Revolution, or of the War of 1812; nothing of the Poncas; nothing of "Black Friday"; nothing of the public school system; nothing of Amherst, Wellesley, or Smith Colleges; nothing of Bishop Whipple, who has done more to solve the Indian problem than any other one man, living or dead; nothing of the woman suffrage movement; and so forth and so on. The establishment of Harper & Brothers, the publishers, is noticed to the extent of about a page, which is certainly proper enough; but if American publishers are a part of American history, one wonders why such names as Appleton, Ticknor, Fields, and the Riverside and University Presses are not so much as mentioned.

The pictures are numerous, but there are no maps, and almost no statistical tables. Some of the portraits, like those of General Scott, Mr. Bancroft, Prof. Draper, and Peter Cooper, are excellent; others, like that of Albert Gallatin, are about as poor as they can be. There are many cross references, but often these are not fulfilled. Queen Anne may have a place in such a work, but there is nothing in the sketch of her to justify her claim to it. We notice some inaccuracies of statement.

This work is, in a word, an assemblage of articles, long and short, on topics related to United States history; fragmentary, heterogeneous, often thrown together under an arbitrary alphabet, with little or no sense of proportion, perspective, or partnership; containing a great amount of instructive reading in a form very poorly adapted for quick and sure reference. It is a pity that so costly an enterprise could not have been advanced one or two steps further, as it might easily have been, to the degree of perfection. A competent editor, in a year's

* Harpers' Popular Cyclopædia of United States History. From the Aboriginal Period to 1876. By Benson J. Lossing. Illustrated. Two volumes. \$12.00.