

have been false to his just philosophical purpose had he conceived it otherwise."

The Spencerian will derive great comfort from the different attitudes of the idealist and the logical scientist toward his master. The fault which each finds with Spencer is a virtue in the eyes of the other. The latter objects that cosmology, because of its immense variety, cannot possibly be deduced as a consequence of a fixed law, such as that of the "persistence of force," which will not of itself suffice even to explain a steam-engine. To do this the second law of thermodynamics has to be invoked; and this law, as Maxwell first showed and as is now universally acknowledged, merely provides that nothing shall interfere with certain chance distributions; for an intelligent demon opening a door for molecules that happened to be moving with particularly high velocities in one way as well as for those moving with particularly low velocities in the other way, would produce the effect which this "law" denies. It thus has a character opposed to that of ordinary definite laws, since these provide that mere chance is not to have its way. The physicists further object that, so far as Spencer explains any phenomena of nature, he virtually bases his explanation on a principle quite independent of that of the "persistence of force," and, moreover, that many of his deductions are too vague to have any value as explanations, although they may be valuable as general descriptions of the course of nature. On the other hand, they admit that he did well in putting the emphasis he did upon the distinction between simple and compound evolution; the former describing histories such as that of a planet, and the latter, histories such as that of a plant or of a race of plants. These objections are familiar to all who have any acquaintance with the world of physical research. They are worth recalling, however, because their contrast with the objections of Professor Royce brings out the distinctive character of the idealistic views; and we may presume that Professor Royce intended to mark this contrast. He is very explicit in bracketing the two laws of thermodynamics as of precisely equal rank, the one determining the *quantity*, the other the *direction*, of change, and is equally explicit in praising Spencer for reducing all the transformations of the physical universe to this single invariant type. Nor has he one word of fault to find with his deductions as being too vague. A reader who should know no other writing of Royce than this would think him substantially a Spencerian like Youmans; for the only objection he makes is that simple and compound evolution ought not to be described as a *single* process. But the question whether Spencer does as a matter of fact describe them as a single process or as two processes would appear, to the Spencerian and to the physicist alike, to be little more than a question of words.

The third quarter of the volume is given to a criticism by Professor Royce of Spencer's educational theories, which, by the way, have no apparent connection with the doctrine of evolution. They are treated with much greater severity than is that doctrine, and the last paragraph of this part reads as follows: "Let us honor him for

what he was. But let us be glad that he is not the trainer of our children."

The volume is brought to a close by some personal reminiscences of Spencer by Mr. James Collier, who was for nine years his secretary, and for ten his amanuensis. It is as good a personal portrait as any we call to mind; not speaking, of course, of large books. It begins by saying that Spencer was no recluse, and telling where he might often be seen in London. The places mentioned do not include any at which he would be drawn into serious discussions; and though, besides the places mentioned, he could be found, for many years, almost every evening at the Athenaeum, upon the committee of which he served, yet he did not join the conversation circle there, but played a certain number of games of billiards and went home to bed. It was only his sworn adherents who could see much of him. It was that vast work which so absorbed him that sometimes, having of his own motion brought about an interview, when the occasion came he found he must not talk. Yet, let an attack be made upon any position he had taken, and instantly upon hearing it read out he would be ready to dictate his reply, for two or three hours, without wishing to make any corrections. On such occasions, his grasp seemed Napoleonic. In short, he had converted himself into an apparatus for performing that one task, and he had no passions or intuitions which in any way deranged his adjustment to that.

That he certainly was a wonderful thinker in his peculiar way appears much more clearly now that his work is done. Mr. Collier says he never read any book of philosophy except Mansell's "Prolegomena Logica," and it is a great pity that he ever read that, because it was just that which introduced an element into his "First Principles" which philosophical students then and always regarded as utterly refuted and out of date, and which did not harmonize with his original work. When one thinks that his "Psychology" appeared in 1855, five years before Fechner's "Psychophysik," and simultaneously with Bain's first book, "The Senses and the Intellect"—so inferior in originality and value, although it taught us more, because we were better prepared for it—one cannot but rank Spencer very high. He wrote when the ideas of energy were in the air, especially among engineers, with whom he had mingled much. But those conceptions were by no means *répandues*, as they now are. That he had grasped them in his own way, we need not say. His valuation of Darwinism was from the first extraordinarily near to that of biologists of to-day. So it was with his estimate of the nebular hypothesis at a time when the objections to it appeared most redoubtable.

He did his work in his day, but the system of Synthetic Philosophy will never become a classic. It will not be read forever, like Locke's "Essay concerning Human Understanding," Berkeley's "Principles of Human Knowledge," and Hume's "Treatise of Human Nature." In a few years it will have passed into history, along with Cudworth and Occam—books that one wishes to know about, but to be excused from reading.

RECENT DRAMATIC VERSE.

In "The Sin of David" (Macmillan) Mr. Stephen Phillips has produced a play better calculated to "place" him critically than any of its predecessors. There is certainly nothing in it to furnish any occasion for those critical rhapsodies which, at the publication of "Paolo and Francesca," caused some momentary anxiety to admirers of Sophocles and Shakspeare. On the other hand, while the general tone is still of an elegiac wistfulness, rather than of true dramatic unction, "The Sin of David" is, essentially, less of a melodramatic spectacle, more of a tragedy, than either "Herod" or "Ulysses." The chief impression made by it is that it is the product of a moderate poetic faculty guided by an industrious and self-poised intelligence. Nothing could be cleverer than the scheme of setting the old Hebrew story of David, Uriah, and Bathsheba over into the very Israelitish times of the Puritan Commonwealth. David is represented by Sir Hubert Lisle, a commander in the Parliamentary army; Uriah by Col. Mardyke of the same army; Bathsheba by Miriam, his wife, who, for the sake of the poetry, is given a touch of Southern blood and a pretty vein of romantic fantasy. There is no addition to the scriptural story save in one respect; but structurally that one is important. It is in the first scene of the play, where we have Sir Hubert Lisle condemning to death Lieut. Joyce, one of his officers, for a wrong to a maid. The accused offers no defence save to say:

"Her face was close to me and dimmed the world." With fine tragic irony, Sir Hubert afterwards urges again and again the same extenuation for his own act.

It is needless here to follow the course of so familiar a fable, or to present any specimens of Mr. Phillips's habitual Tennysonian imagery and cadence. There is, however, one point in the play as its ethical knot is untied that calls for comment on the score of its general significance. In the view of any Puritan moralist, Sir Hubert Lisle has, like David, been guilty of the two tragic sins of murder and adultery. Yet at the end, when, five years after their marriage, Sir Hubert and Miriam are punished by the death of their child, the dramatist is content with this vicarious explanation, and leads us to hope that his married lovers, chastened by grief, will continue to live happily together. Read in the closet, this conclusion is moving and purging to the passions, leaving us in that situation, "durch Mitleid wissend," that is so agreeable to our modern mood. Yet on the stage, coming as it does after the execution of Lieut. Joyce for a less subtle but no more mortal sin, we fear that the effect of this conclusion will be that of a rather cynical morality. It is, of course, open to Mr. Phillips or to anyone to contend that this morality is less cynical than that of the source in Samuel, where we are told that David, after the absolving death of his love-child, "comforted Bathsheba, his wife, . . . and she bare a son, and he called his name Solomon, and the Lord loved him." Yet neither Sophocles nor Shakspeare, we think, to whom Mr. Phillips has been so often and so foolishly likened, would have let either the Psalmist or Sir Hubert Lisle off without the old tragic penalty—his death or the woman's. Even Haw-

P (1084)

Palace and gathering of its collections. Extensive works at Tivoli and Ostia find detailed treatment in this volume. The accounts of the establishment of the Church of S. Maria degli Angeli within the Baths of Diocletian, and many other fruitful excavations within its limits; the removal of the equestrian statue of M. Aurelius to the square of the Capitol, where it still stands upon a pedestal carved by Michelangelo out of an immense block of marble from Trajan's Forum; the building of the great bastions of Sangallo—these and a dozen other chapters furnish most agreeable and stimulating reading.

The author occasionally displays his personal bias, as when, for example, he protests (p. 96) against the position of those who would deny the present commune of Rome the moral right to keep its own collections of antiquities apart from those of the state, and under its own exclusive control; or when (p. 219) he refers to Boni's yet uncompleted work about the Sacra Via as "the recent devastations." In this day of the investigation of Roman origins one may wonder whether the hydriae mentioned by Marliani in connection with "ossa cadaverum" as discovered within the Porta Salaria, not far from Sallust's gardens, could have marked the primitive necropolis of the Quirinal settlement.

The Becquerel Rays and the Properties of Radium. By Hon. R. J. Strutt. London: Edward Arnold, 1904. New York: Longmans.

From the son of Lord Rayleigh one anticipates intellectual superiority—not necessarily individual force, but that superiority which comes from sitting often at table during many years with the leading physicists of Europe; and one is not disappointed in the event. The promise of his preface is only "to give as clear and simple an account of the phenomena of radioactivity as the subject admits of, without sacrificing accuracy," binding him to no more than compilation; but in generous fulfillment he gives us a most interesting discussion of all the questions that have been opened by the discernment and skill of Mme. Curie. Indeed, his only fault worth mention is that he has not realized that the majority of those who will attach a value to the volume would have been glad if, somewhere between its covers, somewhat fuller details could have been found. They are mostly quite able to read mathematics, be the motive for doing so sufficient; they would have liked references to the original papers; and they would have been glad to know that they had only to take down this book from their shelves to find, for example, the value of Mme. Curie's determination of the atomic weight of radium, and other minutiae of that nature. It is a most interesting book, brimful of information and of thought; but it falls just a little short of the kind of perfection that an experienced bookwright would have imparted to it. The lacking matter we have spoken of might have been relegated to the appendices, of which there are three as it is, besides a direction to "see" an unembodied fourth. It will not be long before a new edition of this work is called for—or if there is not such a call it will be only because of this irrepletion. Let us hope there soon will be a second edition, and that the little conveniences we speak of will have been put in

before the work is offered again to the public. Probably Mr. Strutt did not wish his volume to dispute the ground with Rutherford's 'Radioactivity.'

Beginning with an account of Crookes's exquisite experiments (for let us not forget that it was Crookes's surpassing genius that started the whole development), Mr. Strutt first treats of the cathode rays, and shows how it was a happy idea of Henri Becquerel's—albeit, most curiously, a totally mistaken one—that brought about the discovery of radioactivity. Mr. Strutt says this was a circumstance unparalleled in the history of science, and the remark (which, we doubt not, expresses not only his own impression, but that of a whole circle of the first physicists of the world) merits our attention as illustrating, in despite of Dr. Karl Pearson, what very great significance those men attach to successful prediction. The case was this: The cathode rays of Crookes's tubes produced a peculiar green phosphorescence in the glass where they struck upon it; and this led Becquerel, after Röntgen had discovered that from the outside of the glass at that point his wonderful X-rays were given off, to surmise that salts of uranium, which likewise phosphoresce with green light, might perhaps emit similar rays. To test his guess, he wrapped a photographic plate in black paper, and, having placed some uranium nitrate upon the paper, awaited results. Sure enough, after a few days, on developing the plate, he found a perfectly distinct impression of the crystals pictured there. Now the thing that Mr. Strutt, in common with physicists generally, finds so extraordinary and downright unparalleled is that, notwithstanding this successful issue of a quasi-prediction, it nevertheless turned out, as he says, (1) that the green fluorescence of the glass of Crookes's tubes has nothing to do with the production of Röntgen rays; (2) that the green fluorescence of uranium salts has no connection with their effect on photographic plates, and (3) that those uranium rays which affected the plates are of a radically different nature from the Röntgen rays which duplicate the effect. It was, indeed, a remarkable case, conveying the important lesson, not that prediction or quasi-prediction is not a vitally important factor of physical research, far less that it is unscientific or even anti-scientific, as Professor Pearson contends, but that one or two fulfillments of predictions do not suffice to prove that the hypothesis upon which they are based is so much as a recognizable likeness of the real truth. The experience of Becquerel was, it is true, not so unprecedented as Mr. Strutt represents it to have been. He goes too far in saying that the Röntgen rays, the uranium invisible rays, and the green phosphorescence "have nothing to do with" one another. It can hardly be doubted that there is some connection between them, although we cannot say what it is, and although the phenomena are certainly not directly allied. Mr. Strutt can surely have no difficulty in calling to mind many and many a chemical induction, virtually predictive, which went on swimmingly for a long time and then broke down so one-horse-shay-ly that the favorable instances seem to us little more than accidental coincidences. Probably, however, time will show that they were not so utterly for-

tuitous as they at present seem to have been.

Several of Mr. Strutt's positions in the logic of science are questionable; but whenever he has set forth his reasons they appear very strong and very interesting, even if not fully convincing. Against his mode of attacking the substantiality of matter and his argument in favor of electricity as the only subject of spatial motion, it is impossible to hold out. (We speak of his argument, which, however, neither is nor professes to be absolutely demonstrative.) His doctrine of the transmutation of the elements is peculiar in making the course of development to proceed from elements of high atomic weight to elements of lower atomic weight. Moreover, he makes the transmutations run along the horizontal lines of Mendeleeff's table. The brilliant ingenuity exhibited by Curie, Ramsay, Rutherford, etc., in all these researches, and their astounding marvels of manipulative skill, are now an old story, perhaps; but, as narrated in Mr. Strutt's book, they appear more real and more fabulous than ever.

The Tomboy at Work. By Jeannette L. Gilder. Doubleday, Page & Co.

In this sequel to her 'Autobiography of a Tomboy,' Miss Gilder makes her heroine tell the tale of her first year's work. Her strenuous career began when, at the age of fifteen, she was engaged by a historian of the civil war to search the records in the Adjutant-General's Office at Trenton. To do this work, she had to take the six o'clock train every morning from Birdlington, but this only lent zest to the employment. At sixteen, "Miss Gilbert" obtained work in the Mint in Philadelphia. There she had to weigh gold, and, when gold was scarce, to make cotton flannel bags to hold it when it should begin to come in again. From the Mint she went with her family to Newark, and at first colored photographs for a living. Then came an appointment in an auditor's office, where, as she was quite unable to add figures correctly, the head clerk obligingly did her work as well as his own, declaring himself more than repaid by her whistling of tunes from the Italian opera. Next came a post as proofreader, then another as copyist in the office of the Registrar of Deeds. Finally, at about eighteen, as far as we can calculate, this enterprising young woman, having already discarded five or six different pursuits, settled down as a newspaper writer in Newark.

But hers was not the temperament that enjoys being settled, and she is soon in New York interviewing "the proprietor of the most famous newspaper. . . . The interview was short. 'Well,' said he, regarding me with piercing eyes, 'what do you want to do?' 'I should like book-reviewing, or anything that comes to hand.' 'You can do the books, if you like,' said he, 'but be original; don't give us the same old cut-and-dried stuff. Your salary will be \$30 a week—good morning!'" No wonder that "Miss Gilbert" had to restrain an impulse to drop on her knees and kiss his "strong, shapely hand." In order not to be cut-and-dried, on the advice of Miss Kate Field she wrote her reviews in dialogue form: "I had a family take up the books of the day and discuss them, giving

P 1085