tions of Euclid, Archimedes, Ptolemy, and perhaps of other Greek writers, together with the works of the Arabian algebraists, were read and commented on at the three great Moorish universities or schools of Granada, Cordova, and Seville. It seems probable that these works represent the extent of Moorish learning; but, as all knowledge was jealously guarded from any Christians, it is impossible to speak with certainty either on this point or on that of the time when the Arab books were first introduced into Spain" (p. 157).

A good summary of the condition of mathematical knowledge at the close of the renaissance is given at p. 228: "By the beginning of the seventeenth century we may say that the fundamental principles of arithmetic, algebra, theory of equations, and trigonometry had been laid down, and the outlines of the subjects as we know them had been traced. It must, however, be remembered that there were no good elementary text-books on these subjects; and a knowledge of them was thus confined to those who could extract it from the ponderous treatises in which it lay buried. Though much of the modern algebraical and trigonometrical notation had been introduced, it was not familiar to mathematicians, nor was it even universally accepted; and it was not until the end of the seventeenth century that the language of the subject was definitely fixed. . . . If we turn to applied mathematics, we find, on the other hand, that the science of statics had made but little advance in the eighteen centuries that had elapsed since the time of Archimedes, while the foundations of dynamics were only laid by Galileo at the close of the sixteenth century. In fact, it was not until the time of Newton that the science of mechanics was placed on a satisfactory basis. The fundamental conceptions of mechanics are difficult, but the ignorance of the principles of the subject shown by the mathematicians of this time is greater than would have been anticipated from their knowledge of pure mathematics. With this exception, we may say that the principles of analytical geometry and of the infinitesimal calculus were needed before there was likely to be much further progress. The former was employed by Descartes in 1637; the latter was invented by Newton (and possibly independently by Leibnitz) some thirty or forty years later: and their introduction may be taken as marking the commencement of the period of the modern mathematics."

That which follows is more familiar, and the feature of Mr. Ball's chapters on the modern period is his full and clear analysis of Newton's contributions to mathematical science. Descartes, Pascal, Barrow, Huygens, Newton, Leibnitz, the Bernoullis, Euler, Lagrange, Laplace, Legendre, Poisson, and others less important, are treated in turn and with excellent judgment. Their successors are very briefly mentioned, and no attempt is made to follow out in detail the researches of Abel, Gauss, Sir William Rowan Hamilton, Henry J. S. Smith, Weierstrass, Cayley, Sylvester, and Klein. But from this history, or historical sketch, the intelligent reader can gain a very complete view of the progress of mathematical science from its beginnings until its contemporary differentiation into numerous specialties, — each of them important and difficult enough to detain for a lifetime a brilliant mind, — all of which are fruitful in their applications to the various phases of modern science and modern industry.

A Brief History of Greek Philosophy. By B. C. BURT. Boston, Ginn. 12°. $1.25.

THIS work had its origin, the author tells us, in a series of articles in a religious newspaper, but has been expanded so as to cover the whole history of Greek speculation from Thales to Proclus. The result is a volume of three hundred pages, in which the leading doctrines of the various schools are concisely yet for the most part clearly presented. Mr. Burt's style is plainer than that of most writers of the school to which he belongs; and his readers will seldom have any difficulty in understanding what he says, except where the theories he is trying to explain are themselves obscure. The main fault in the book, according to our view, is the author's Hegelianism. This leads him not only to look in the ancient thinkers for anticipations of his own views, but also to give too much attention to some theories of the earlier philosophers and of the Neo-Platonists which can only be regarded as products of imagination. What we want to learn about the ancient philosophers is their contributions to the real philosophies of the world; while their visionary theories, which they themselves in many cases put forth as only conjectural, ought to be passed over in silence, or with a bare mention. In the main, however, Mr. Burt has confined himself to the best portions of Greek thought, the great names of Socrates, Plato, and Aristotle necessarily occupying the foremost place, yet without excluding what is most important in the works of others. The exposition of Aristotle is excellent, though the treatise on 'Politics' is accorded rather too much attention; but the account of Plato is hardly so satisfactory. The author's view of the periods of Greek thought is essentially that now commonly held. The first period was that of naturalism, or the attempt to explain the physical world; the second, that of rationalism, or the endeavor to understand human nature and discover the basis of morals; while in the third or Neo-Platonic period theological speculation held the leading place. Of these different phases of thought, the second is so much the most important that the exposition of it rightly occupies the greater part of the volume; yet the others receive all the notice that is necessary in so compendious a treatise. Mr. Burt is careful also to trace the connection of each period with the preceding one, and also of one individual thinker with another, thus exhibiting the course of philosophical development. On the whole, the book is well adapted to its purpose, and will undoubtedly be useful to young students, in college and elsewhere, for whom it is more especially intended.

Paradoxes of a Philistine. By WILLIAM S. WALSH. Philadelphia, Lippincott. 16°. $1.

THIS volume consists of a number of short essays, most of which had previously appeared in certain periodicals. The author remarks that the word 'paradox' "is usually held to be a synonyme for flippant smartness," but that it really means a proposition that seems absurd but is nevertheless true in fact. His own paradoxes, however, hardly answer to either of these definitions; for only a perverted intelligence could regard the mass of them as true, and, though they are flippant enough, we fail to see any 'smartness' in them. The book is a continuous sneer at men of genius and at intellectual and moral superiority of every kind. Mr. Walsh maintains that "men are more nearly equal than we suppose," and that "there is no such great difference between a genius and a dunce." "The great historian, the great poet, the great statesman, the great philosopher, . . . are as fallible and as foolish . . . as you and I are. The intellectual feats that they perform only happen to be more difficult to the average man, that is all." He endeavors to sustain this view by citing examples of follies and sins committed by men of genius; but most of the men he refers to were not geniuses at all, but commonplace men who followed the profession of literature. The author adopts a cynical tone throughout, which adds to the disagreeableness of what he says. Moreover, there is hardly any thing of a different character in the book, except some fantastic remarks on 'The Sense of Pre-existence,' and a few pages about 'Mother Goose.' Mr. Walsh says that he has collected these papers into a volume, "because the author likes them," and the world will probably be willing to grant him the exclusive enjoyment of them.

The Critical Period of American History. By JOHN FISKE. New York, Houghton, Mifflin, & Co. 12°. $2.

THIS book consists of lectures delivered first in the Old South Meeting-House at Boston, and afterwards in other cities. It relates to the time between the close of the revolutionary war and the adoption of the Federal Constitution, which Mr. Fiske justly regards as the most important period in our national history. Our popular historians are apt to give altogether too much attention to wars and other stirring events, and too little to the quieter but more influential movements of political and constitutional reform. Mr. Fiske, however, has a much better idea of the historian's duty, and has accordingly given us a much better book than most of his predecessors have done. His philosophical studies have given him the comprehensiveness that good historical writing requires, and have fitted him to trace with clearness the chain of causes and effects which is the fundamental fact in historical development. His style, too, with its clear and easy flow, is well fitted for the

conveyance of historical truth, and never leaves the reader in doubt as to the author's meaning. The result of these qualities is that the book presents a large amount of information in a plain and easily understood form; and, though it contains a great many details, they appear in the main as essential parts of the narrative, and not as isolated and insignificant facts.

Mr. Fiske opens his work with an account of the negotiations for peace between Great Britain and the United States, and then goes on to describe the condition of the several States at the time, and the political changes that took place in them after the attainment of their independence. The most important parts of the book, however, are the third and fourth chapters, dealing with the general state of affairs in the years succeeding the peace, the alarming tendency towards anarchy, and the utter inadequacy of the Confederation to furnish a stable government. Mr. Fiske makes it perfectly clear, that, if things had been left to take their own course, the Confederation would in a short time have broken up, and that it was the gradual but sure perception of this fact that paved the way for a stronger central government. The prejudice at first existing against such a government was dissolved by the logic of events, and then the good sense and patriotism of the people came to the rescue. Such a Constitution as ours, however, could not have been framed except by men of the highest political genius, and even the soberest thinkers will not regard Mr. Fiske's encomiums upon them as exaggerated. In his account of the Federal Convention, however, the author seems to us to have given too little attention to what is really the essential feature of our system of government. The most vital and most original part of the Constitution is the division of powers between the State and the Federal governments, and it is also the most perfect part; yet Mr. Fiske has less to say about this part of the scheme than about any other. But there is little to criticise in the book, and we cannot but hope that its author will give us other works of a similar character, and that other historical writers will come more and more to follow the same method of treatment. The American people need all the political instruction they can obtain, and books dealing with history, as this book does, in a philosophical manner, are among the best of political teachers.

Astronomy with an Opera-Glass. By G. P. SERVISS. New York, Appleton. 8°. $1.50.

THE greater part of the matter composing this volume appeared originally in a series of articles published in *The Popular Science Monthly*. The author points out the interesting phenomena of the heavenly bodies that are visible, with little assistance from optical instruments, and thus gives an interesting and valuable introduction to the study of astronomy. Although nothing has been described as visible that cannot readily be seen by means of an opera-glass or a small field-glass, enough of the discoveries made by means of powerful telescopes has been stated to lend due interest to the subject, and to instigate the observer to further studies. The book has been written for the purpose of being a guidance to the observer. For this reason the matter has been arranged according to objects visible in each season, the stars of spring, summer, autumn, and winter each being treated in one chapter. Observations of the moon, the planets, and the sun are described in the last chapter of the book. In an introduction the requirements of a good opera-glass are set forth. The work is well adapted to exciting interest in astronomy, and imparting such knowledge of the heavenly bodies as must form the foundation of intelligent study of the results obtained by means of powerful telescopes.

American Weather. By A. W. GREELY. New York, Dodd, Mead, & Co. 12°.

THE object of the present work is to give clearly and simply, without the use of mathematics, an idea of meteorology. The introductory chapters treat briefly the methods of measuring atmospheric pressure, temperature, and other meteorological phenomena, while the rest of the book is a detailed climatology of the United States. The various phenomena are fully discussed, and illustrated by numerous maps, which convey a peculiar interest to the book. The vast amount of material collected by means of the Signal Service and the State meteorological services has been made use of, and makes the book a very complete and comprehensive review of the climatology of the United States. The work is not merely a compilation of the work of other authors, but General Greely frequently takes occasion to put forward his own views, particularly in the chapters on storm-tracks. The principal merit of the book is the concise and clear treatment of the matter, which will enable every one interested in meteorological phenomena to understand the peculiarities and diverse character of American climate in various parts of the country. We hope it will contribute towards creating a greater appreciation of meteorology, and of its importance to the interests of American agriculture and industries. Some of the maps are particularly well adapted to show these applications of meteorology: among them we mention the maps of first and last killing frosts and the maps showing continuance of mean daily temperatures above 32° and 50°. The book forms a handy volume. It is well printed and illustrated, and is an excellent treatise on American weather. In the clearness of its method, it may be compared to Mohn's well-known 'Elements.'

The Writer's Handbook. Philadelphia, Lippincott. 12°. $2.50.

THIS book consists of three distinct parts, written apparently by three different writers. All the writers are evidently British; but who they are, nothing on the titlepage, or elsewhere in the book, enables us to say. The first part of the volume is an elementary treatise on composition and rhetoric, with a series of extracts illustrating the history of English style. The matter of this part is in the main good; though the author, like most rhetoricians, dwells too much on the merely mechanical qualities of style, and too little on the moral and intellectual ones. The subject of figurative language, too, is insufficiently treated, the important figures metonymy and synecdoche being wholly neglected. But the author's remarks on style, though covering but a portion of the ground, are pretty good as far as they go. They will not help the young writer much in acquiring the good qualities of style; but they will, if heeded, enable him to guard against many defects. The author's own style is not in all respects a model; for, though it is correct and clear, it has a certain mechanical character, and some paragraphs read like a succession of aphorisms. The samples of English prose are not always such as we should have chosen; for, though they illustrate fairly well the history of style, some of them are by no means models of good style, and for learners this latter consideration is the more important. The second part of the book is another treatise on composition, only one-third as long as the first, but superior in quality. It covers but a portion of the ground usually occupied by such works; the subject of figures, for instance, being omitted altogether. But it sketches in plain though brief terms the leading qualities of style, and gives some useful hints as to the best mode of acquiring them. The third and concluding part of the book is confined to the subject of letter-writing; and it seems rather out of place in this collection, for, though it may be useful to those who write nothing else than letters, it can hardly be of much service to those who have read the other parts of this book.

The Death-Blow to Spiritualism: being the True Story of the Fox Sisters as revealed by the Authority of Margaret Fox Kane and Catherine Fox Jencken. By REUBEN BRIGGS DAVENPORT. New York, G. W. Dillingham. 16°. 50 cents.

THE last phase in the sad but ridiculous story which this volume tells is perhaps the pleasantest, or, better, the least displeasing. Forty years after two mischievous girls in a lonely country house undertook to frighten their mother by a series of midnight tricks, the same girls, now as mature women, confess to the world that the unparalleled psychic epidemic to which their pranks gave rise is all a fraud. The raps interpreted by credulous folk as the answers of inquiries to departed spirits are nothing less homely than the dislocations of the great toe. Beginning these raps as children innocent of the uses to which they were put, spurred on to deeper and deeper mischief by the marked attention given to them by weak-willed believers and the money-making proclivities of an elder sister, they soon found themselves the centre of an ever-increasing throng of enthusiasts, and in a position where it was dif-