Les Differents Systèmes d'Irrigation. 7me Série, Tome 1. 623 pp., and Index. Institut Colonial International, Brussels, 1906.

The volume begins the seventh series of the publications of the International Colonial Institute. The series will be devoted to the legislation now in force in

various countries relating to irrigation. Volume I treats of the irrigation laws of British India and the East (Tonkin, Annam, and the deltas of the Mekong and Menam). The succeeding volumes will deal with irrigation laws of the Dutch East Indies, Egypt, North Africa, Spain, Italy, the United States, Canada, Chile, Peru, etc.

Volume I opens with a concise and illuminative article by Sir Alfred Lyall on the general subject of irrigation in India in which he describes the great benefits conferred upon the inhabitants of vast districts where, in some years, rainfall is sparse or fails completely. He shows the necessity for scientific regulation of the development and maintenance of irrigation works; describes the *régime* of the two principal irrigation systems in India, (1) the diversion of the water of rivers into canals and (2) the accumulation in reservoirs or cisterns of water flowing off the lands after important rainfall; compares the two irrigation systems and treats of the topographic influences that affect the extent and the distribution of irrigation.

Four sections give the irrigation laws in force in various parts of India. On each page under the French text is printed the English original. India has 510 pages and the concluding 93 pages are given to the *régime* of irrigation in other countries above noted and the laws relating to them.

This book relating to a part of the world where scientific irrigation is already far advanced cannot fail to be useful in other countries which have only recently began to develop irrigation on a large scale.

The Cherokee Indians. With Special Reference to their Relations with the United States Government. By Thomas Valentine Parker. viii and 116 pp., Sketch Map, Illustrations and Bibliography. The Grafton Press, New York, 1907. (Price, $1.25.)

The author's aim is to exhibit the policies of the Federal Government in its treatment, during more than a century, of the Cherokees. He sets forth the story of blunder, injustice, and dishonesty that marked the Government's relations with these Indians. He tells of their final removal by compulsion from the small part of their original territory still left to them and how 4,000 of them perished during the terrible march to the Indian Territory.

Even in the earliest days of the Republic, the Cherokees were probably the most intelligent Indian nation and farther advanced in civilization than any other. The promise of their future, however, did not save them from the bitterest injustice. But the years of strife are finally over and the Cherokees will start anew, each as the owner of a bit of land; and when these Indians are enrolled among the citizens of the State of Oklahoma the end of their stormy history may be reached. To all who wish to judge for themselves of the relations between the Cherokees and our Government, this narrative, written both with sympathy and impartiality, is to be highly commended.

Klimakunde. 1 Allgemeine Klimalehre. Von Prof. Dr. W. Köppen. Second, improved Edition. 132 pp., 7 Tables, 2 Figures, and Index. G. J. Göschen'sche Verlagshandlung, Leipzig, 1906. (Price, 80 pf.)

This little work appears in the excellent "Sammlung Göschen." The seven chapters treat of the content of climatology, meteorological observations, climatic research, factors, types, zones, water vapour, etc. A list of the best works of reference is given. At once a scientific work and adapted for the general reader.

What Rome Was Built With. A Description of the Stones Employed in Ancient Times for Its Building and Decoration. By Mary Winearls Porter. viii and 108 pp., Indices and Works of Reference. Henry Frowde, London and Oxford, 1907.

The Romans were long content to use volcanic tuff, travertine, basaltic lavas and other Italian rocks in their edifices. Later the passion for beautiful marbles became almost a craze. Wealthy men were ever in search of new and beautiful stones with which to embellish their city.

The author has ransacked literature for all it will yield relating to the rock materials used in the building of Rome in ancient times and later. The visitor to Rome observes the beauty and variety of decorative and building stones. This little book tells what these stones are, gives something of their history, and traces them to their places of origin. Many of the finest rocks were brought from inner Egypt, from Algeria and Tunis, from France, Greece, and Turkey. Many of Pliny's bitter words, in his scorn of contemporary luxury, relate to Rome's enormous expenditures for beautiful stones. One of the most interesting sections relates to the development of the Carrara marble industry. The author chose a unique and edifying topic and has treated it in an interesting and adequate manner.

Études Géologiques dans le Nord de Madagascar. Contributions à l'Histoire Géologique de l'Océan Indien. Par Paul Lemoine. 520 pp., Maps, Illustrations, and Index. A. Hermann, Paris, 1906. (Price, 25 frs.)

The French Ministry of Colonies sent Dr. Lemoine in 1902 to study the geology of the north of Madagascar. The island being as large as France, Belgium, and the Netherlands together, it is not to be expected that adequate knowledge of its geology will be the work of one man. Field studies will result in a series of monographs by different authors.

Dr. Lemoine's studies extended from Port Loky on the west coast to Analalava on the east coast. His work was considerably embarrassed by lack of good maps on which to base his observations. Upon his return to France, therefore, he made entirely new maps based upon the later government map on a scale of 1:1,000,000 which was more exact than the official map he had used in the field. His maps, admirably produced, are among the fine results of the work.

After giving concisely the history of geological investigation in Madagascar and a bibliography of the resulting writings, Dr. Lemoine presents a geographical description of the region in which he laboured. He then discusses the distribution in his field of the geological formations from the primary to the most recent, including the latest eruptive rocks. Each section ends with a statement of what is known of the occurrence in other parts of Madagascar of the formation described in the section. This discussion, filling 278 pages, gives a complete view of the geology of the northern part of the island.

It is followed by a chapter on applied geology. Coal is lacking, but abundant water power will supply electrical energy. A chemical analysis of the clays and limestones shows a large amount of material for the brick, cement, and lime industries.

The second part of the work deals with the geological history of the Indian Ocean. The author endeavours to establish by zoo-geographical considerations the ancient continental relations of Madagascar with other lands. Dr. Lemoine is to be congratulated upon the result of his arduous labours in a virgin field.

Bulgaria of To-day. xv and 299 pp., 38 half-tone Illustrations, Map, and Commercial Diagrams. Ministry of Commerce and Agriculture, Bulgaria, London, 1907.

The book was prepared by the Bulgarian Government for the Balkan States Exhibition at Earl's Court, London, in 1907. It is an excellent *résumé* of the geography, resources, and activities of Bulgaria, which has made wonderful progress in her independent existence during a quarter of a century. The geographical account of the country is to be criticised in one respect. Adequate geographical descriptions are based upon geology, and this volume contains no reference to the geology of Bulgaria.

Part 1 deals with the country and its population, sketches the history of the nation, describes the political organization, public instruction, the Bulgarian Church and other religions. Part 2 is devoted to economic conditions and development. The book is to be commended as a full and authoritative account of the Bulgaria of the present time.

The Value of Pure Water. By George C. Whipple. viii and 84 pp. John Wiley & Sons, New York, 1907. (Price, $1.)

The book deals with problems of practical importance and great public interest. It is based upon the proposition that pure, as compared with impure, water has real financial value which may be measured by computing what impure water costs the community. The leading characteristics which affect the value of water to the consumer are its sanitary quality, its attractiveness, and its hardness.

The author suggests a formula for the computation of the effect of the sanitary quality of water on its financial value, based on the financial value of the lives lost by typhoid fever; a formula for computing the effect of the general attractiveness of water on its value, based on the physical characteristics of turbidity, colour and odour; and a formula for computing the effect of the hardness of water on its value to consumers based on the use of soap in the household.

He does not claim that his formulas have scientific accuracy, for some of his assumptions have not been established beyond doubt; but the general conclusions are not far out of the way and he certainly presents ample proof that an impure water supply not only affects the health and comforts of a community but also the pocketbooks of the people.

Thus he shows that, aside from all humanitarian considerations, no city can financially afford to distribute an impure water supply; that a water supply which is attractive in appearance, taste and odour, is of material advantage on the financial side; and that the economic advantages gained by correcting the hardness of water are very great. In brief, he demonstrates the possibility of computing the value of pure water in dollars and cents and shows that the financial value of filtration justifies its cost. He illustrates, in conclusion, the disadvantage of the use of hard water in the household, the industries, and in steam making.

Human life cannot be estimated in dollars and cents, but the financial basis is involved in all questions relating to public utilities; and, apart from this striking method of treating the water question on the financial side, the book is educational in its clear setting forth of the qualities that make water impure, the evil effects that follow the use of such water, and the benefits and cost of filtration.

Wanderings in Arabia. By Charles M. Doughty. Arranged with Introduction by Edward Garnett. Two vols. xx and 309 pp., and x and 292 pp., Glossary of Arabic Terms, Map and Portrait. Imported by Charles Scribner's Sons, New York, 1908. (Price, $4.50.)

An abridgment of Doughty's "Travels in Arabia Deserta," published nearly twenty years ago and the classic of English literature relating to Central Arabia. The book is a mine of information concerning many phases of the scientific study of Arabia, but the general public has scarcely come into contact with it.

This republication deserves a hearty welcome, for the larger book is out of print and the shorter one should attract a wide circle of readers to Doughty's unique and fascinating narrative. Mr. Garnett truly says that Doughty's work stands among the great travel books in our literature. Doughty wandered among the Beduins, tenting in the steppes and deserts, studying the life of the oasis towns, seeing everything and describing it in a style which has been referred to as "stately Elizabethan." The reader may not be drawn to his quaint and old-fashioned diction, but it was a part of the man and gave vividness to every picture he drew. Here are a few lines from his description of the returning desert day:

> The desert day returning from the east, warns the Beduin awake, who rises to his prayers; or it may be, unwitting of the form, he will but murmur toward heaven the supplication of his fearful human nature and say, "Ah Lord my God!" and, "Oh that this day may be fortunate; give Thou that we see not the evil!" Of daily food they have not half enough, and if any head of the cattle be taken!—how may his household yet live? Bye and bye the herdsman is ready and his beasts are driven far from his sight.
>
> No sweet chittering of birds greets the coming of the desert life, besides man there is no voice in this waste drought. The Beduins, that lay down in their cloaks upon thé sandy mother-earth in the open tents, hardly before the middle night, are already up and bestirring themselves. In every coffee-sheykh's tent there is new fire blown in the hearth, and he sets on his coffee pots, then snatching a coal in his fingers he will lay it in his tobacco pipe. (Vol. I, p. 93.)

The stamp of genius and insight is impressed on every page of Doughty's work and his book belongs as well to literature as to geography. This reproduction, less unwieldly than the original, is an event of no small interest.

Les Projections Cartographiques. Par Ch. Duchesne. vii and 202 pp., Bibliography, and Tables. Académie Royale de Belgique, Brussels, 1907.

A technical treatment of map projections showing their mathematical development, the cartographic purposes which each is best adapted to serve and also the mathematical problems suggested by the study of projections.

Die bayerischen Kartenwerke in ihren mathematischen Grundlagen. Von Karl Then. viii and 192 pp., 48 Figures, 5 Maps, and Index. R. Oldenbourg, Munich and Berlin, 1905. (Price, M. 4.80.)

The writer is an official in the Topographic Bureau of the Bavarian Government. His book is in use in the mathematical section of the cartographic service as a practical and theoretical guide. An introductory chapter treats briefly of the significance, scope and problems of cartography. Most of the work is divided into two parts, the first containing a detailed discussion of map projections (121 pp.) and the second a description of the methods and the instruments used in cartographic surveying (58 pp.). Many diagrams and mathematical demonstrations are employed.

Der Vulkanismus. Von Dr. Walther von Knebel. 128 pp., 3 coloured Plates, Illustrations in the Text, Diagrams, Bibliography, and Index. A. W. Zickfeldt, Osterwieck und Leipzig, 1907. (?) (Price, M. 1.75.)

The book deals first with the results of field study of volcanic activity and secondly with theories as to the origin, various modes of action, and meaning of vulcanism. The author conducts his readers from one volcanic field to another for the purpose of observing and collecting facts. He discusses the question "What is a volcano?" treats of their distribution, the phenomena that accompany volcanic outbursts, volcanic explosions, lava and lava and gas eruptions, and calderas. All this and other information is given in the course of descriptions of these phenomena as they have been observed. The theoretical part of his subject is treated in the concluding chapters and many hints are given as to what and how to observe. The volume is highly to be commended to the general reader and the teacher. It is strikingly illustrated with pictures and a map showing the distribution of younger volcanoes, some of which are now extinct.

River Discharge. By John Clayton Hoyt and Nathan Clifford Grover. viii and 137 pp., Map, Illustrations, Tables, Diagrams, and Index. John Wiley & Sons, New York, and Chapman & Hall, London, 1907. (Price, $2.)

Prepared for the use of engineers and students. The book gives the fullest information as to the methods of measuring stream flow and the interpretation of the data collected. This information has been so widely scattered in engineering periodicals and government reports that it was not easily accessible. The work therefore is especially timely when so much attention is being given to the flow of streams. The student as well as the engineer may fully profit by its contents.