while the system and tone of the discussion are characteristic of the expert in this department.

In consequence of the fact that the free-hand classes are usually formed before the student has studied descriptive geometry, the writer of this work had found it necessary to give him some introductory work in that branch, and it thus furnishes a valuable series of exercises introductory to the more formal treatment of that subject later. The book is, in fact, a discussion of the principles of linear perspective as employed in free-hand sketching. The illustrations throughout the book are especially interesting as being *fac simile* reproductions of such actual sketches, made with a free hand, in the course of regular class work. The departure from the absolute perfection of line obtainable with instruments is clearly observable; but the accuracy of these lines, rectilinear and curvelinear, made by the unaided hand, is a beautiful illustration of the nicety with which the senses may be developed in this field. A comparison of Fig. 126 with the immediately succeeding sketches, all of which are of peculiar interest, illustrates this point. Nearly all the illustrations are curiously perfect, in line and in tone, as illustrative of free-hand work.

The last chapter, 'Sketches from Working Drawings,' involves the most original of the author's inventions and the most helpful, to the student of mechanism. The methods of sketching from simple drawings are indicated and examples given, the principles of location of line and angle and plane are shown very clearly and a system is developed for the production of a perspective drawing of the object when the only data available are to be obtained from the ordinary plan and elevation of the working drawing of the shop. The perfection and the extensive applicability of this new system are well exhibited in the progression from Fig. 111 to Fig. 114, in which a steam-engine crosshead is thus treated; in Fig. 118 and Fig. 119, in illustration of a complicated casting for an engine-bed, and even more remarkably in Figs. 133–136, where a very difficult form of beam and bell-crank for a pumping engine is brought out. The teaching of this new art, to the young engineer, particularly, is likely to give him great facility in the reverse process of reading the working drawing, and it must prove very helpful; especially, where he is compelled to explain to the workman drawings of peculiar or complicated forms, and shapes difficult to picture in the mind's eye, as the pattern-maker and the finisher must picture every piece on which he is to work and with no other aid to his imagination than the plans and elevation of the working drawings.

Mr. Wilson has made a distinct advance in his art, an invention of striking interest, one probably of no small value.

R. H. Thurston.

Our New Prosperity. By Ray Stannard Baker. New York, Doubleday & McClure Co. 1900. 12mo., pp. 267; many illustrations. Price, $1.50.

There is a class of books, illustrated by Carnegie's 'Triumphant Democracy,' Wright's 'Industrial Evolution of the United States,' Gannett's 'Building of a Nation,' and Dr. Strong's 'Our Country,' which should interest, absorbingly interest, every thinking man, especially every American citizen, and still more especially every young man. To this class belongs Mr. Baker's new book. It is a condensed and very impressive statement, based upon official statistics, of the conditions which have brought about the present extraordinary flood of prosperity in all industrial departments in this country, the good results that followed the trying period of 'hard times' of earlier years in the clearing off of old scores and reduction of the business of the country to a solid basis, the effects of the 'prosperity wave' at home and abroad, the development of the industries of the New South, the 'invasion of the world' by the exporters and manufacturers of the United States, and glances at the prognostications of a future, not likely to be free from trouble and an occasional retrogression, but on the whole one of enormous promise, and apparently of certain rise to as yet unimagined greatness. The statistical matter, which constitutes the main and fundamental portion of the work, comes from the Treasury Department bureaux, those of the Mint, the Labor Commissioner, the Geological Survey and the various other departments at Washington, with acces

sions from the technical journals and from many experts among business men.

R. H. THURSTON.

GENERAL.

MESSRS. GAUDRY AND BARROIS and their confrères in France have brought out in the form of a guide-book to the geological excursions undertaken this summer under the auspices of the International Congress of Geologists, a veritable hand-book of the geology of France, entitled 'Livret-guide des Excursions en France du VIII^{e} Congrès Géologique Internalional.' The work is beautifully illustrated with reproductions from photographs, with cuts of sections and colored maps, making the collection of papers on the different geological provinces of the Republic by far the most complete publication of the kind for any country. The matter is presented in such a form that it will serve the reader as well as the geological traveler. Paper and press-work are of the best quality.

J. B. W.

IN the first part of his work 'Ueber Museen des Ostens der Vereinigten Staaten von Nord Amerika,' Dr. A. B. Meyer, the director of the Dresden Museum, describes the museums of New York City, Albany and Buffalo.

BOOKS RECEIVED.

Status of the Mesozoic Floras of the United States. LESTER F. WARD, with the corroboration of WM. M. FONTAINE, ATREUS WANNER and F. H. KNOWLTON. Washington, Government Printing Office. 1900. Pp. 213–430. Plates XXI–CXLIV.

A Practical Course in Mechanical Drawing. WILLIAM FOX and CHARLES W. THOMAS. New York, D. Van Nostrand Co. 1899. Pp. vi + 98.

Chemical Technology. Edited by C. E. GROVES and WILLIAM THORP, Vol. III. *Gaslighting.* CHARLES HUNT. Philadelphia, P. Blakiston's Son & Co. 1900. Pp. xviii + 312.

SCIENTIFIC JOURNALS AND ARTICLES.

The Botanical Gazette, October, contains an important paper by Dr. R. A. Harper, of the University of Wisconsin, on 'Cell and Nuclear Division in *Fuligo varians*,' a common slime mold. The results have led Dr. Harper to discuss in a general way the processes of cell division, and he discovers no such definite rules of cleavage as have been urged by authors. Mr. W. J. G. Land, of the Hull Botanical Laboratory, describes cases of double fertilization in *Erigeron* and *Silphium*, in both of which cases he discovered the second male cell conjugating with the endosperm nucleus or with one of the polar nuclei. The male cells of *Silphium* are remarkable in that they are much elongated and spirally coiled. Miss Mary Hefferan, of the Bacteriological Laboratory of the University of Chicago, describes 'A New Chromogenic Micrococcus,' discovered in the course of an examination of river water for the Sanitary District of Chicago. Mr. E. R. Hodson, of the Iowa Agricultural College, describes 'A New Species of *Neovossia*,' a smut affecting the ovaries of *Phragmites communis*. Mr. Henry Kraemer, of the Philadelphia College of Pharmacy, writes concerning the origin of tannins in galls, coming to the conclusion that the crystalline compound found in the galls which he examined is gallic acid, which becomes transformed into tannin.

The Auk, for October, has for its first article an account of 'A Nuptial Performance of the Sage Cock,' with a plate showing how the bird slides along on its breast with distended air sacs. J. A. Allen discusses 'Aptosochromatism,' reviewing the most recent articles on alleged change of color in feathers without moult, changes which Dr. Allen does not consider as taking place. James J. Carroll presents 'Notes on the Birds of Refugio County, Texas,' giving a list of 185 species, and William H. Kobbé in 'The Birds of Cape Disappointment, Washington,' gives an annotated list of 63 species. W. E. Saunders describes the 'Nesting Habits of the Cerulean Warbler.' J. A. Allen under 'North American Birds Collected at Santa Marta, Colombia,' presents a list of 43 species. Finally Jonathan Dwight, Jr., makes another of his important contributions to ornithology in 'The Moult of the North American Shore Birds (*Limicolæ*),' which has a very direct bearing on the question of change of color without moult. Dr. Dwight emphatically states that changes of color in plumage are the results of moulting and wear. There are the customary General Notes and Reviews of Recent Litera-