SHORTER NOTICES.

Sur le Développement de l'Analyse et ses Rapports avec diverses Sciences: Conférences faites en Amérique. Par EMILE PICARD. Paris, Gauthier-Villars, 1905. 167 pp.

La Science moderne et son Etat actuel. Par EMILE PICARD. Paris, E. Flammarion, 1908. 301 pp.

PICARD'S lectures delivered here in America, three at the decennial of Clark University in 1899 and one at Saint Louis in 1904, were published soon after their delivery. Those in celebration of the decennial of Clark appeared in the volume devoted to that celebration and again in the *Revue générale des sciences* early in 1900. The lecture at Saint Louis had its place in the Proceedings of the congress of arts and sciences. It was not, however, until 1905 that the author collected the four lectures in a separate monograph readily accessible to all.

In the general introduction to the first lecture the author states: "Je lis toujours pour ma part . . . le *Bulletin* de la Société mathématique américaine . . . qui tient ses lecteurs au courant des travaux les plus récents." It is much to be feared that the present review is too tardy to come under this generous compliment. There is, however, in all that Picard writes, and particularly in these lectures, that finish and that wisdom which makes his work immediately a classic and compels, not at the time merely but for many years thereafter, the attention and interest of the student who would really be "au courant des travaux les plus récents."

The chief thoughts in the first lecture are grouped about the genesis and growth of the general conception of function. The subject takes one far and wide in the history of the development of mathematics and there is scarcely a reputable mathematician since Euler whose name does not deserve mention in the sketch; for although the functions of real and of ordinary complex variables naturally take most of the attention, the possibility of functions of other hypercomplex numbers and the various geometric fields therewith connected are not overlooked. That the author is not so exclusively concerned with the scientific side of his subject as to forget the fundamental pedagogic ideas, is brought into evidence by the two remarks: "Si Newton et Leibniz avaient pensé que les fonctions continues n'ont pas nécessairement une dérivée, ce qui est le cas général, le calcul