

to mathematicians in placing at their disposal English editions of Lobachevsky's and Bolyai's masterpieces.

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FRENCH SCIENCE.

Science and Learning in France with a Survey of Opportunities for American Students in French Universities. An Appreciation by American Scholars. The Society for American Fellowships in French Universities, 1917. 8vo. 40 + 454 pages. (For sale by A. C. McClurg and Co., Chicago: cloth, \$1.50; stiff paper, \$1.00.)

Exposition Universelle et Internationale de San Francisco. La Science Française. 2 tomes. Paris, Ministère de l'Instruction Publique et des Beaux Arts, 1915. 397 + 405 pages.

L'Histoire des Sciences et les Prétentions de la Science Allemande. By E. PICARD. Paris, Perrin et Cie., 1916. 12mo. 49 pages. Boards. Price 60 centimes.

THE Society for American Fellowships in French Universities has announced that it is prepared to award ten or more fellowships, each of one thousand dollars annually, to American graduate students who undertake to study in French Universities. The fellowships will be given for studies in any of the following fields of knowledge: anthropology, archæology, astronomy, botany (and agriculture), chemistry, criminology, education, engineering, geography, geology, history, law, mathematics, medicine, classical philology, oriental philology, romance philology, semitic philology, English philology, philosophy, physics, political science (including economics and international law), psychology, religion, sociology, and zoology (including biology).

The awards will be based on nation-wide competition. It is planned to make the first annual award in the spring of 1918, so that the Fellow may depart for France in July, 1918, if the war has ended by that time. It has been announced that a circular of information, giving details as to the persons eligible, the form of application, and the mode of making the award, will be ready for distribution to all American institu-

tions by October, 1917. Each fellowship is to be held for two years, and new fellowships will be awarded each year for ten years at least.

Preparatory to putting this scheme into effect the Society has published a sumptuous handbook for American graduate students in French universities. This is the work under review. It was edited by Professor John H. Wigmore, of Northwestern University.

In the Introduction Charles W. Eliot writes on "The Mind of France," and George E. Hale, a correspondent of the Institute of France, tells of "The Intellectual Inspiration of Paris." Then follow 33 chapters, each prepared by a drafting committee of specialists and each illustrated by a portrait of at least one Frenchman distinguished in the subject treated. "Each chapter," to quote from the preface, "sets forth briefly

"1. The progress of French science and learning in the particular field during the last half century or so; the notable achievements; the eminent leaders; the special lines of development; in general, the share in the world's accomplishments;

"2. The courses of instruction given, now or recently, at the universities of France, particularly at the University of Paris; the names of the most important scholars, with a mention of their principal works and of the special fields of research over which they preside;

"3. The facilities available for study and research, including libraries, laboratories, archives and museums, the auxiliary institutes, special schools, and learned societies and committees.

"There is also an Appendix describing the methods of instruction and study, the standards of preparation expected of the student, the system of degrees, the customs as to residence, attendance, etc.; the regulations as to fees, etc.; and other facts useful to the visiting student." The appendix is illustrated by pictures of buildings in the University of Paris, etc.

The drafting committee for the chapter on Astronomy consisted of: P. Fox, G. E. Hale, F. R. Moulton, W. D. Mac-Millan, and H. N. Russell; for the one on Engineering: I. N. Hollis, H. M. Howe, A. C. Humphreys and A. Sauveur; for the one on Mathematics: D. R. Curtiss, T. F. Holgate, E. H. Moore, and E. B. Wilson; and for the chapter on Physics: H. Crew, A. A. Michelson, and W. C. Sabine.

The committee on mathematics finds that this science "has always made a special appeal to French genius distinguished by its fondness for logic and its striving for perfection in form," and it pays tribute to the genius of Henri Poincaré, of whom "at his death in 1912 it was the universal verdict that he must be considered the greatest mathematician of his age." The portrait of Poincaré reproduced in the chapter was taken about thirty years ago. It is the same one that was reproduced in the *American Journal of Mathematics* for 1890.

A sentence on page 357 seems to indicate that the writer does not know that the Sorbonne is only that part of the University of Paris in which instruction is given in the faculties of sciences and letters.

The volume is of extraordinary interest.

On account of the war, France's exhibit at the San Francisco exposition of her scientific achievements was of an unusual nature. It consisted of a library in which were collected periodicals and books, ancient and modern, illustrating her scientific progress and activity. "Pour chaque science," President Poincaré writes in the introduction, "Pour chaque science, on a essayé de remonter au moment où, en France, un ordre d'études, importantes par le profit intellectuel ou moral qu'elles procurèrent aux hommes, fut abordé pour la première fois et devint l'objet de recherches systématiquement conduites. On a voulu marquer l'origine, le point d'où sont partis tant de hardis explorateurs pour l'éternel voyage à la recherche de la vérité; on a indiqué, sur les chemins tracés par leurs glorieux efforts, les sommets d'où ont été aperçus de nouveaux horizons; on a signalé enfin, avec quelque insistance, l'étape actuellement atteinte qui sera dépassée par le travail de demain poursuivi dans des directions que l'on a cherché à préciser.

"On verra donc dans la bibliothèque des livres vénérables et illustres par où une grande idée fut semée dans le monde; puis les publications principales, grâce auxquelles les rameaux puissants d'une doctrine se développèrent; enfin, pour l'heure présente, un choix assez large d'ouvrages individuels ou de recueils collectifs où l'on trouvera la preuve tangible de l'activité scientifique de la France, et où l'on pourra apprécier la luxuriante floraison produite par une habile culture."

In order that the visitor might better appreciate the choice of works, two volumes of admirable articles were written by

distinguished specialists to summarize France's contributions to each science. These articles were each concluded by a bibliography, which is quite extensive in some cases.* Each is illustrated by an excellent portrait of some deceased master in the field considered.

The 14 articles in the first volume are on: philosophy (by Bergson, 23 pages), sociology, science of education, mathematics (by Appell, 15 pages), astronomy (by Baillaud, 37 pages), physics (by Bouty, 21 pages), chemistry, mineralogy, geology, paleobotany, zoological paleontology, biology, the medical sciences, the science of geography. The 19 articles of the second volume deal particularly with the sciences of archaeology, history, art, language, and philology.

In the article on mathematics there are six main headings: arithmetic, algebra, mathematical analysis, geometry, kinematics and mechanics. Under astronomy there are three parts, one on the seventeenth century, a second on the eighteenth and the first part of the nineteenth century, the third on contemporary astronomy.

The volumes should be in every college library.

The motto for Picard's little book is by Etienne Lamy, secrétaire perpétuel de l'Académie française. It is as follows: "Les Allemands ont pris pour devise: L'Allemagne au-dessus de tout.

"Nous ne répondons pas: La France au-dessus de tout.

"Une seule devise est digne de la France: Au-dessus de tout, la vérité."

Picard confines his attention to the mathematical, physical and natural sciences. He shows that few indeed are the contributions of Germans toward their development, in comparison with those by scholars of other countries. While an attempt is made to explain the psychology of the German's "au-dessus de tout" illusion, the great discoveries of such men as Gauss are not slighted by any means. As far as it goes, the survey is very satisfying.

But the intellectual triumphs of France along these lines are much more fully set forth in the volumes whose plans have been described above. One of them, happily, it has been America's privilege to prepare. R. C. ARCHIBALD.

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* In the article on mineralogy, for example, about fifteen pages. Books whose titles are marked with an asterisk in these bibliographies were to be seen in the library exhibit.