had turned out as fine a piece of work as has appeared in fifty years, so long will English physics remain preeminent.

The first chapter reviews briefly the older theories of X-rays and presents Laue's discovery and photographs. The second presents the Bragg theory of the diffraction of X-rays, the third describes in detail the Bragg X-ray spectrometer, the fourth is a brief account of the properties of X-rays. The fifth merely describes crystal structure, little known to most physicists, and the sixth presents our present knowledge of X-ray spectra, and includes an admirable report on Moseley's work. The remaining six chapters present the Bragg analysis of crystal structure made by means of their spectrometer.

Few books have ever appeared which represent in so high a degree the creative work of the authors themselves.

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*An Elementary Manual of Radio-Telegraphy and Radio-Telephony for Students and Operators.* By J. A. Fleming, M.A., D.Sc., F.R.S. Third edition. Longmans, Green & Co., 1916. Cloth, 360 pages, 194 illustrations.

This is an excellent elementary text-book on the principles of radio-communication, with enough history inserted parenthetically to add descriptive interest, without sensibly distracting attention from the main line of exposition.

Like all of Dr. Fleming's writings, it is particularly strong on the quantitative side. Nevertheless, the mathematics employed are not difficult.

The book is divided into nine chapters, relating to the following topics: Electric Oscillations, Damped Electric Oscillations, Undamped Electric Oscillations, Electromagnetic Waves, Radiating and Receiving Circuits, Oscillation Detectors, Radio-telegraphic Stations, Radio-telegraphic Measurements, Radio-telephony.

The chapter dealing with radio-telegraphic measurements is particularly good.

A blemish in the didactic method is the use of English units of measure in a few of the examples. The complexity involved in the arithmetic, by reference to such archaic and unscientific units, repels the student more than a transition from English to metric units before attacking the problem, and a final transfer from metric to English units in stating the results.

The book will be of great value to students of radio-telegraphy, and to operators seeking to improve their knowledge of their work on the scientific side.

A. E. Kennelly

*The Institutional Care of the Insane in the United States and Canada.* By Henry M. Hurd, W. F. Drewry, R. Dewey, C. W. Pilgrim, G. A. Blumer and T. J. W. Burgess. Baltimore, The Johns Hopkins Press, 1916. Pp. 497, 30 pl. Edited by Henry M. Hurd, M.D. $2.50.

This is one of the few works in the English language in which the history of a separate branch of medicine has been exhaustively treated. The editor, Dr. Hurd, prior to his election as superintendent of the Johns Hopkins Hospital in 1889 and after, has had a long practical experience in institutional psychiatry, and there is probably no other authority in this country so well fitted for the difficult task delegated to him and his associates. The four volumes of this work, when completed, will comprise no less than a full set of separate histories of all the insane hospitals in the United States and Canada. The present volume, although it professes to deal only with the general history of institutional care of the insane on this continent, is, in reality, an exhaustive history of American psychiatry in all its phases, and is therefore likely to remain the authoritative work on the subject for an indefinite period. In this history, there are no great outstanding names, like those of Pinel or Tuke or Griesinger, unless it be that of a woman, who was the prime mover of our improved institutional care of the insane. The record is one of collectivism, of the patient labors of societies, journals and individual propagandists for the good of a much-neglected class of human suffering. Matthew

Arnold, under the influence of Renan, ridiculed the "bold, bad men" who frequent social-science congresses; but it was largely through foregatherings of this order, their patient endeavors with legislative bodies, that we get this record

> Of labor, that in lasting fruit outgrows
> Far noisier schemes, accomplished in repose.

The history, from the crude pioneer conditions to the advent of the psychopathic hospital, where insane patients are no longer pauperized or imprisoned but treated as so many cases of acute disease, traces the slow evolution of a definite series of ideas. It begins with the foundation of the Association of Medical Superintendents of American Institutions for the Insane (October 16, 1844), and the subsequent history of this body, which became the American Medico-Psychological Association on June 6, 1893. A careful synoptic account of all the transactions is given. Among the items of note are Luther Bell's original description of phrenitis or "Bell's mania" (1849), the introduction of the famous "propositions" by T. S. Kirkbride (1851), Field's discussion of hæmatoma auris in the insane (1894), a condition which he showed to be identical with the aural deformity found in antique statues of athletes and in modern boxers and wrestlers (*Pancratiastenohr*), and Weir Mitchell's drastic arraignment of the status of American asylums (1894), which, at the time, was adjudged somewhat premature and captious by our alienists. A chapter on the history of the *American Journal of Insanity* (founded 1844) is followed by chapters on the early and colonial care of the insane, the evolution of institutional care, of the administration of hospitals and their construction, of training schools for nurses and attendants, of state and private care, of the psychopathic hospital and of legislation, the latter part of the volume being taken up with the psychiatric aspects of immigration, insanity in the negro, the Indian, the Chinese and Japanese, the census of the institutional population and the history of Canadian psychiatry. In the Colonies, the psychiatric burden was thrown mainly upon the town councils, which usually meant the pauperization of the insane in county jails, work-houses and almshouses. Under the healthy *plein air* conditions of colonial life, this burden was probably light. It is of record that a large donation for an asylum was declined by colonial Boston on the ground that there were no insane to put in it. In Maryland and Virginia, the custody of the pauper insane and the poor was delegated to the Established Church. The first state hospital (incorporated 1768) was opened at Williamsburg, Va., in 1773. The "era of awakening" (an important chapter) came slowly. It comprised the erection of such hospitals as the Bloomingdale Asylum (1821), the McLean Hospital (1818), the asylum at Lexington, Ky. (1824), the Hartford (1828), and Brattleboro Retreats (1836), and above all the wonderful propagandist labors of Miss Dorothea L. Dix, of whose life a full account is in preparation by Dr. C. W. Page, of Hartford. This remarkable woman practically created institutional psychiatry in Massachusetts, Rhode Island, New Jersey, through the south and west, and even accomplished much in Scotland and England. Her efforts were based upon most careful investigation beforehand and her success was due to the fact that she was an eminently reasonable person, with the unique power of producing convincing facts and of making unanswerable statements at the right moment. This was something different from the usual course of "making a noise like a reformer." After a brief conference with her, a rough New Jersey legislator said: "I do not want to hear anything more. You've conquered me out and out. I am convinced." In Scotland, where the frowardness of women is eyed askance, she incurred the enmity of the Lord Provost of Edinburgh, beat the hostile official in a midnight race to London, and so impressed the statesmen there, that she secured Queen Victoria's order for two commissions of investigation (1885). In Parliament, the member from Glengarry, Mr. Edward Ellice (Prosper Mérimée's old friend), said that "the commission was entirely due to Miss Dix's exertions."

She was a "moral Columbiad," rather than the "Moral Bully" of Dr. Holmes's aversion.

The principal defect of early American care of the insane was that it was mainly a local enterprise, delegated to counties and county officials, men who had "an eye single to the taxpayer," whose chief aim was to establish a reputation for economy as a means of securing reelection to office, with the result that the county asylums were practically poorhouses. This has been notably the case with the so-called Wisconsin system of county care of the chronic insane (1881), which is the subject of an able critique. State care, by which is meant the proper care of all the insane in the state in a suitable state-supported hospital, as distinguished from state support of a limited number, with the rest in county almhouses, is a plant of recent growth. The earliest state hospitals were those at Williamsburg (1773), Columbia, S. C. (1828), Worcester, Mass. (1833), and Utica, N. Y. (1843). The New Hampshire State Care Act did not become operative until 1913. In this field, New York state leads, with the institutions at Willard, Binghamton, Middletown, Poughkeepsie, Buffalo, Ogdensburg, Auburn, Matteawan and Dannemora. Next to Binghamton in size comes the admirable Government Hospital at Washington, D. C., which, under the able administration of Dr. William A. White, is now a community of over 4,000 persons. The psychopathic hospital, a development of Griesinger's idea of a (university) psychiatric clinic, combines the features of voluntary admission, temporary detention, non-restraint and continuous medical observation and treatment. Such institutions or wards now exist at Albany, N. Y., Ann Arbor, Boston, Waverly (Mass.), Providence, White Plains and Washington, D. C. The best example is the recent Henry Phipps Psychiatric Clinic at Baltimore, under the direction of Dr. Adolph Meyer. England and France have left their mark upon the architecture of our earlier insane hospitals. Later institutions have followed the plan evolved by Kirkbride for the Pennsylvania Hospital which consisted essentially of a large central administration building, with extended wings on each side for the separation of the sexes. Details were governed by the "cast iron rules" of the "propositions," a set of hard and fast regulations evolved by the association (1844–1875) for the construction and organization of asylums (Kirkbride) and the legal management of the insane within them (Isaac Ray). The cottage plan and the farm colony are later developments. Of the Buffalo State Hospital, the most extreme example of the old Kirkbride plan, Dr. Hurd says that "the medical officers must walk a distance of half a mile from the administration building to reach the farthest ward on either side," which suggests the flatboatmen on the Potomac River, who, in poling their craft, walk just twice the distance they travel.

Dr. Hurd modestly regards this work as a source-book for the historians of the future, but it is undoubtedly a permanent history, which may be extended but will hardly be duplicated. The chapters are complete in themselves, the book is well-illustrated and the style is charming in its simplicity, sobriety and its traces of delicate humor. A complete index to the whole work, which may be expected at the end of the fourth volume, will make it invaluable for ready reference.

F. H. GARRISON

ARMY MEDICAL MUSEUM

## PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE fifth number of Volume 2 of the *Proceedings of the National Academy of Sciences* contains the following articles:

1. *Differential Equations and Implicit Functions in Infinitely many Variables:* WILLIAM L. HART, Department of Mathematics, University of Chicago.

Three problems are handled: First, Certain fundamental theorems concerning a type of real-valued functions of infinitely many real variables. Second, The problem of infinite systems of ordinary differential equations. Third, The fundamental problem of implicit function theory in this field.