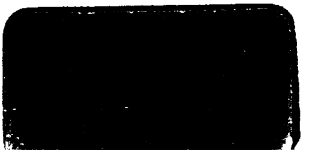

Gifford

S.R.G.

DR. GEORGE FRICK (1793-1870), THE FATHER OF AMERICAN OPHTHALMOLOGY.

The Development of Ophthalmology in America

1800 to 1870

A Contribution to Ophthalmologic History and Biography

AN ADDRESS DELIVERED IN ABSTRACT BEFORE THE SECTION OF OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION, JUNE 4, 1907. REVISED AND ENLARGED. ILLUSTRATED BY SELECTED PORTRAITS AND CUTS.

BY

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PREFACE.

Through the earnest solicitations of numerous esteemed confrères, I have been induced to republish in book form the address which I had the honor to present to the Section of Ophthalmology of the American Medical Association at Atlantic City, N. J., June 4, 1907. In doing this I have availed myself of the opportunity to revise the text throughout, to rewrite portions of it, to make several additions to it, and to incorporate a number of cuts and selected portraits. These portraits are of men who have distinguished themselves more or less in ophthalmology during the period which I have reviewed. Some of them have never before been given to the public, and it is only through the extreme courtesy of professional and other friends that I am enabled to publish them now. Those who have been especially helpful to me in this regard are Drs. B. Joy Jeffries, Hasket Derby, Edward Reynolds and Edwin H. Bingham, of Boston; Mr. Charles P. Fisher, librarian of the College of Physicians of Philadelphia; Mr. John S. Brownne, of the New York Academy of Medicine, and Dr. Herman Knapp, of New York; Dr. Walter S. Steiner, of Hartford, and Drs. Samuel Theobald and Harry Friedenwald, of Baltimore. This collection of portraits, only two of which are of living men, viz., Dr. Derby and Dr. Knapp, adds interest, it seems to

me, to the biographical sketches, and also serves to reveal in their physiogomy something of the character of the men who have been instrumental in establishing, advancing and dignifying ophthalmology as a specialty in America.

I can not let this little volume go forth without warning my readers that it is not intended to embody a complete survey of American ophthalmology from 1800 to 1870. It simply sketches the principal factors of its development—the men who have been most conspicuous in connection with it, and the institutions, in their beginnings, which have become perpetual fountains of ophthalmologic knowledge and experience, as well as harbingers of relief to the suffering and blind. I realize that almost any one subject herein touched upon merits in itself a more detailed consideration—a chapter if not a volume; but I trust that even the outlines and incomplete sketches which I have given will not be entirely devoid of historical interest, and that they may at least serve as landmarks to guide some future historian into a wider field of study.

The story of the progress of ophthalmology from 1870 to the present time is an interesting one, as I know from the material which I have collected and which I had hoped to use when I was first invited to deliver this address. Whether or not it is to be told in the future depends largely on the judgment which is passed upon this first installment. A. A. H.

212 Franklin Street, Buffalo, N. Y.

THE DEVELOPMENT OF OPHTHALMOLOGY IN AMERICA: 1800 TO 1870.*

I.

INTRODUCTION.

In undertaking to indicate the factors that have contributed to the development of ophthalmology in America, I have found it obligatory to limit my study to Canada and the United States. This has been necessary because of lack of time and readily available resources to go farther, and also because our interests in American ophthalmology center in these two great nations.

An important question has also arisen in this connection, viz., who are they, in this restricted sense, that are Americans? Are they those alone who were reared and educated in one of those two countries? Or should those be included who, although foreign born and foreign educated, have come to these lands to live, and who have identified themselves with these peoples, their thought, their work, their purposes and their institutions? America, in the sense above indicated, and in which I shall hereafter use the word, is essentially cosmopolitan, and every man is an American who subscribes to the laws of the country, makes himself an in-

* I have taken the liberty of changing the title which the officers of the Section of Ophthalmology of the A. M. A. assigned to me at the time I was honored by an invitation to deliver this address. The subject suggested was "What America Has Contributed to the Advancement of Ophthalmology."

tegral part of its national life, and labors hand in hand with others for the common weal, whatever may have been his birthplace or in whatever country he may have received his education and scientific training. Herman Knapp and Ferdinand C. Hotz, for example, are to-day as truly American in sentiment and spirit, and through ties of scientific interests and affiliations, as are Hasket Derby or G. C. Savage; and it is both my pleasure, pride and duty to recognize them as Americans, and their labors here, as American, and all who, like them, have adopted America as their own. I thus define what I mean by America and American that there may be no misconception of these terms for the purpose of this occasion.

OPHTHALMOLOGIC ADVANCEMENT.

In its evolution, ophthalmology has advanced at times very slowly and at other times almost by bounds. With the announcement of Maitre-Jan and Brisseau of the true nature of cataract in 1706 to 1709, with Cheselden's operation for artificial pupil in 1728, with Daviel's publication in 1752 of a new method of curing cataract by extracting it, with the discovery of sulphuric ether anesthesia in 1846, with von Helmholtz's invention of the ophthalmoscope in 1851, with von Graefe's newly-found surgical relief for glaucoma in 1857, with Donders' revelations in regard to the refraction of the eye and its anomalies in 1859 to 1864, with Lister's teachings of antisepsis and the protection of operative wounds from the invasion of germs in 1867, with Koller's announcement of ocular anesthesia by cocain in 1884, ophthalmology took tremendous leaps. Other advances, such as those pertaining to anatomy, physiology, path-

ology and therapeutics, have made slower pace, but nevertheless they have been effective, and by a gradual and cumulative accretion have united with the more rapid advances to bring to a higher degree of perfection the special department of medicine, whose interests it is our accredited privilege to promote.

Not only, therefore, is some new and marvelous discovery in ocular pathology and therapeutics a contribution to the advancement of ophthalmology, but so is every well-studied and well-reported case; so is every well-planned and well-executed experiment having for its purpose and result the corroboration of previous findings or the establishing of new facts, the importance, however, varying inversely as the substantiated verity of past conclusions or the need of new and additional facts decrease or increase. Dr. Osler has said[1] that "truth grows, and its general evolution may be traced from the tiny germ to the mature product." So it is with ophthalmology. Out of the germinating stages of the dim and distant past it has emerged as a vital part of the great body of medicine, and, like the majestic trunk to which it belongs, it has gradually grown and extended, sometimes opposed by the most blighting influences of ignorance and cupidity and sometimes sustained by the invigorating accessions supplied by intelligence and genius; but always has it grown by the accretion and assimilation of countless experiences, for the most part trifling and unnoticed, seldom striking and far-reaching, until to-day it has attained a degree of perfection, a proportion of completeness that are the pride, if not the wonder, of our whole profession. Not alone, then, has

1. Brit. Med. Jour., Oct. 27, 1906, p. 1077.

the genius of Daviel, of von Helmholtz, of Donders and others brought ophthalmology to its present proportions, but the thousands on thousands of lesser and often most trivial observations, devices, inventions, suggestions and experiments of the past have also been essential factors in its growth and permanency.

I agree with Dr. C. A. Oliver, who says, in a private letter, that "it seems to me that each man, in accordance with his opportunities, contributes his mite; that each institution gives its fruits in direct relationship with those in charge, and that he who now may be the least known and the most humble in American ophthalmology may be really the greatest."

If ophthalmology has not developed as rapidly in America as in Europe, it must be remembered that there have been sufficient reasons. With few exceptions the medical institutions of America, both clinical and teaching, have been the outgrowth of private enterprise and supported by private gain. The exceptions have been the few instances where, through the foundation of state university organizations, provisions have been made for medical teaching and hospital facilities. Physicians and surgeons have seldom been paid for teaching or for serving a hospital, except, perhaps, either directly through the proceeds of private patronage of the institutions which they may have been serving, or indirectly through the increased private practice which they may have obtained by the publicity given them through their medical school affiliations. The result has been, therefore, that, without such a living salary as is paid to those attached to the government schools and hospitals of Europe, our American medical teachers and

hospital attendants have had to earn their living outside in private practice, and in doing this it has consumed nearly or quite all of their time and energy.

Besides this, there has been the insufficient qualification of our medical men, incident to the free development of our medical institutions. The great liberty that has been allowed in their organization, the envious and often bitter strife that superfluous numbers of them has engendered and the lamentable lack of government restrictions and oversight in their operations, have produced from the beginning a gradual lowering of medical standards, both for entrance and graduation of students, and for license to practice, until in the '60s these were reduced to the most meager proportions, or to nothing. Our country, therefore, became flooded with ill-prepared, incompetent and often fraudulent practitioners, who had been sent out by these inferior, ill-equipped private medical schools. It was they who, in turn, obtained positions in our hospitals, or created hospitals of their own, and who became, in large part, our teachers. I do not wish to be understood as putting all institutions or all practitioners into these classes. Their proportionate numbers were simply in excess. Many young men began the study of medicine with better qualifications than were demanded. Some faculties, with a high sense of responsibility, rose above their environment and had ideals higher than private gain. These formed a residuum of professional men whose ability, whose skill, whose intellectual attainments, whose moral breadth and depth made them ornaments and an honor to our ranks and maintained the dignity and the sanctity of the high and noble principles of our profession.

Such men saved us from utter disgrace; and in their struggle they were greatly aided by such movements as the organization of the American Medical Association and of the American Medical College Association, by the special initiative of the State of Illinois in establishing a state board of health with powers to demand higher standards on the part of those who would practice in that state, and by the creation of state boards of medical examiners in New York, Pennsylvania and other states, which made it incumbent on those who would practice in those states to possess certain qualifications preliminary to entering a medical school, which required medical colleges to maintain certain standards and courses of study, and which finally required the applicants for license to pass specific examinations in the principal subjects of medicine. A great revolution in professional standards and qualifications has followed since the various states have thus taken the licensing to practice out of the hands of medical faculties; and this progress, too, has gone on in spite of the continued private character of most of our medical institutions.

The necessity, however, of relying on private gain or private aid to meet present and future demands of research and teaching has not ceased. It has been, and still is, the great obstruction that impedes our medical progress in America, notwithstanding that our medical men, on the average, have to-day just as well-endowed brains, just as astute and resourceful minds as medical men in Europe. In fact, they are of European stuff. They simply lack opportunity. And this condition must continue till some government scheme prevails by which the living of our medical teachers and investigators is

made secure without consuming all of their time and energy in practice for this purpose. But our ophthalmologists are alive to the importance of research work, and, in spite of the environment, they are making commendable progress, and their rewards are growing richer and richer.

II.

FACTORS OF DEVELOPMENT.

The factors that have contributed to the development of ophthalmology in America are found in our special ophthalmologic institutions; in the eye clinics of general hospitals and dispensaries; in the observations and clinical teachings of our pioneer laborers in the ophthalmologic field of practice, and, in a more limited way, of our great surgeons; in the writings of these men, and in the literature, both American and foreign, which they have disseminated throughout the profession; and in inventions and discoveries bearing on ophthalmologic science and practice. This review must, necessarily, be most incomplete, barely taking a glimpse here and there, and merely noting a few of the beginnings, some of the special claims, and a few of the most enlightening observations and suggestions.

THE FIRST EYE INSTITUTIONS.

In regard to institutional and clinical eye work, our special institutions take first rank, and their origin and development are of deepest interest.

THE NEW LONDON EYE INFIRMARY.

The first effort to establish an institution for the treatment of diseases of the eye in this country was that of the New London Eye Infirmary.

In a biographic sketch of Elisha North,[2] it is stated

2. Biography of Eminent Am. Phys. and Surg., by R. F. Stone, 1892, p. 356.

that he established in New London, Conn., the first eye infirmary in this country. He did this in 1817. His institution was in active operation in 1819, as is shown by an advertisement in *The Connecticut Gazette,* a New London newspaper, in which Dr. North says: "I had the pleasure to prevent total blindness and restore sight to twelve or thirteen persons during the last three years. These would now probably be moping about in total darkness and would be a burden to society and themselves had it not been for my individual exertions." How long his "infirmary" continued to exist is unknown, but it is possible that it was still alive as late as 1829, as Dr. North at that time added to his name, on the title page of the book later referred to, the words "Conductor of an Eye Infirmary." I include it in the historical sketches of those whose history we know, without regarding it as one of especial importance.

NEW YORK EYE INFIRMARY.

The next attempt to provide an institution for the relief of the poor, afflicted with diseases of the eye, was in New York City in 1820. The motive of this effort can best be described by quoting one of its founders and one of its first physicians, the late Dr. Edward Delafield,[3] of that city.

> Some time in the year 1816 two young men, recent graduates in medicine of the College of Physicians and Surgeons of this city, who had spent together the previous year in the New York Hospital, one as house physician and the other as house surgeon, sailed for Europe. Their object was to improve themselves in the knowledge of the profession of their choice. . . . They thought then that they understood the

3. Address delivered by Dr. Delafield at the dedication of the new building of the New York Eye Infirmary, April 25, 1856.

nature and treatment of diseases of the eye as well as any part of surgery; and when they sought abroad for additional knowledge, it was with no especial view of learning more on this subject than any other in medicine.

With these impressions they arrived in the city of London, where they had determined to pursue their studies, and among other public medical charities were induced to become pupils of the London Eye Infirmary, then recently founded by Mr. Saunders.

And here they soon made a discovery which is the best prelude to all study, that they were profoundly ignorant of the surgery of the eye, and that what they had been taught on that subject was almost of no value. Knowing at the same time that they learned from the same sources as the rest of their countrymen, they drew the inference, which the result proved true, that ophthalmic surgery was comparatively unknown in America. The thought flashed on them that here was an open field in which they might walk, and with the ardor of youth they devoted themselves to this new branch of knowledge.

On their return to their country in the year 1818, the subject of diseases of the eye engaged their earnest attention, and they soon came to the resolution that they would establish in our city for the first time in America, an infirmary for curing diseases of the eye.

. . . To demonstrate the good to be derived from such an institution, they agreed, unaided and alone, to make the experiment, and to call for no public assistance, until they could already show results of a character and number sufficient to prove how many poor suffered under diseases of the eye, and how much could be done for their relief.

Accordingly, two rooms were hired in the second story of a building in Chatham Street, then in a central situation, and the few articles provided the humble institution required. Some students of medicine volunteered to perform in rotation the duty of apothecary, and the landlord from whom the rooms were rented acted as superintendent. Small as was the scale on which our infirmary started, it had everything essential to a public charity; except, indeed, money, and little of

that was required, as nobody was paid for his services. It was made publicly known that all poor persons applying at No. 45 Chatham Street, on certain days and hours of each week, with diseases of the eye, would be gratuitously treated, and the necessary medicines and appliances furnished them.

A single week proved that our infirmary would succeed, for immediately many poor persons, thus suffering, applied for relief, and in a short time our small apartments were crowded with them, and the labor of caring for so many proved far greater than was anticipated.

NEW YORK EYE AND EAR INFIRMARY, ERECTED, 1856.

The undertaking was commenced in the month of August, 1820, and in a period somewhat less than seven months 436 patients had applied and received the care and treatment of the surgeons of the infirmary. . . .

. . . Having, then, in this manner, demonstrated that an infirmary for curing diseases of the eye would be a great boon to the suffering poor of our city and country, it was de-

termined to bring the subject before the public, and appeal to them for the means of founding and continuing a public charity for the cure of diseases of the eye in the city of New York.

Of the two young men who thus adventured on an experiment whose success is this day demonstrated, one was the late Dr. John Kearney Rodgers, and the other now addresses you—abundantly rewarded for all the labor he has bestowed in founding and continuing this charity, by the satisfaction of meeting you in this admirable building, erected and now to be dedicated for the New York Eye Infirmary.

The first officers and directors of the institution were elected April 21, 1821, and were William Few, president; Henry I. Wyckoff, first vice-president; John Hone, second vice-president; John Delafield, Jr., treasurer; James I. Jones, secretary; Nathaniel Richards, Benjamin L. Swan, William Howard, Henry Brevoort, Jr., Joshua Jones, William Howell, James Boggs, Isaac Pierson, Jeromus Johnson, Isaac Collins, Cornelius Heyer, Henry Rankin, Benjamin Strong, Samuel F. Lambert, Edward W. Laight, Gideon Lee; consulting surgeons, Drs. Wright, Post, Samuel Borrowe; surgeons, Drs. Edward Delafield, J. Kearney Rodgers.

Thus through the public spirit and sagacity of two young men began the now celebrated New York Eye and Ear Infirmary, in the month of August, 1820. Its beginnings were small, but its needs were manifest, and from time to time receiving the financial support of the public and the active cooperation of the medical profession it developed into one of the largest and most philanthropic institutions of the world.

During the year ending Sept. 30, 1906, 2,789 persons were treated in the wards of the infirmary and 40,311 cases were treated in the out-patient department. The

daily average number of all cases treated in both the out-patient and in-patient departments was 502.

The records of the infirmary show that since its opening in August, 1820, with the exception of three months during the prevalence of an epidemic fever in 1822, the doors of the infirmary have never been closed to patients. From the month of August, 1820, to Sept. 30, 1906, there have been treated at the infirmary a total of 1,051,892 patients. This number includes ear, nose and throat, as well as eye patients. Its further history must be told at another time.

INSTITUTION FOR THE DISEASES OF THE EYE AND EAR, PHILADELPHIA.

The next movement toward the establishment of an institution for the treatment of diseases of the eye was in Philadelphia in 1821. It seemed to be the outcome of the energy and public spirit of Dr. George McClellan of that city, a young and ambitious man, then 25 years old, who was just entering on his career as surgeon, and who afterward greatly distinguished himself as such.

Early in 1821 a notice was published in a Philadelphia medical journal[4] of an intention to start such an institution in the following words:

Dispensary for Diseases of the Eye.—For the increasing number of indigent blind people in the city of liberties, a number of gentlemen have been contemplating the institution of a society to afford gratuitous relief; and though circumstances at present prevent more than a limited foundation, they indulge reasonable expectations of being able, in the course of a few months, to establish a much more extensive charity.

4. Am. Med. Recorder, April 14, 1821, iv. 402.

The object of this communication is to notify those who, afflicted with any diseases of the eyes, can not compensate medical services, that arrangements have been made with Dr. McClellan for surgical attendance, and with Mr. Marshall, Chestnut Street, for medicines, which will be afforded gratuitously. Application to be made at Dr. McClellan's office, Swanwick Street, near Walnut, above Sixth.

In the spring of 1822 a further publication was made,[5] stating that:

The Institution for the Diseases of the Eye and Ear had, during the past year, been conducted in the form of a dispensary, and the poor have been supplied with medicines and attendance, at the expense of a few subscribers, from the office of Dr. McClellan in Swanwick Street. The operations which were performed for cataracts, etc., on a respectable number of blind people, proved so successful, that considerable interest has been excited, and we are happy to announce that the institution has in consequence recently been extended into a hospital. We understand that more than one hundred of the most influential citizens of Philadelphia have associated themselves together to support this interesting establishment, that a charter has been obtained from the Supreme Court and attorney-general, and that in a few days it will go into regular operation as an organized hospital, for the relief of diseases of the eye and ear.

The following prominent citizens composed the first board of managers: Hon. Chief Justice Tilghman, Right Rev. Bishop White, Hon. Judge Duncan, John B. Brinton, Edward S. Burd, John W. Condy, James C. Fisher, Paul Beck, Hon. Benjamin R. Morgan, Richard H. Bayard, Thomas Kittera, John M. Scott and Benjamin Tilghman.

The surgeon's first report was in part as follows, bearing date of March 26, 1822:

5. Am. Med. Recorder, 1822, v, 393.

Gentlemen:—In the month of March, 1821, an association of ten individuals was formed in this city for the purpose of establishing an institution for the relief of diseases of the eye. By the gentlemen who composed that association, S. Badger, Esq., was elected treasurer, with power to make all necessary purchases; Mr. Marshall, in Chestnut Street, apothecary, and I was honored with the appointment of surgeon. On the 14th of April, 1821, an advertisement was inserted, by a committee appointed for that purpose, in the *Medical Recorder* and in some of the daily prints of this city, announcing the formation of the institution, and inviting the poor to partake of its benefits. Since that period many physicians and other respectable citizens have recommended poor persons afflicted with diseases of the eye to my care, and in no instance has any patient so recommended, or in any other way introduced, been refused the charities of the institution.

The report was signed, "George McClellan."

Then follows an abstract of the cases treated during the year, together with a detailed report of some cases operated on. There had been ten cataract operations, two of which were by extraction and eight were by "division" or by "depression." Eight other cases of cataract had not yet been operated on. The total number of cases of all kinds was fifty-one, twenty-five of which had applied and been registered during the "present month."

The *American Medical Recorder* (vol. vi, p. 382) next takes notice of this institution in 1823 by announcing "by request" that the "distinguished and public spirited" managers of the new "Philadelphia Hospital for Diseases of the Eye and Ear have so far organized the institution under the provisions of the charter as to provide for the gratuitous treatment of patients from every part of the country." It adds that Dr. McClellan, surgeon of the institution, invites his professional brethren

to send poor patients. This will "confer a favor on the managers and will forward the interests of science."

This institution seemed to start auspiciously, but for unknown reasons, perhaps some higher personal aspirations on the part of its promoter, such as the founding of Jefferson Medical College, which was consummated in 1825, and in which he was the moving spirit, it was short-lived, as little or nothing is heard of it after 1824. It is possible, also, that rivalry had something to do with its decline, as another Philadelphia institution was organized at about the same time as this, and was backed by a strong professional support, and also appealed with equal and probably greater force to the public.

PENNSYLVANIA INFIRMARY FOR DISEASES OF THE EYE AND EAR.

This fourth organization in the United States, and the rival of Dr. McClellan's "Hospital," had its beginning in 1822. I am indebted to the interesting account published by Dr. Charles A. Oliver[6] for the principal facts which I here present in regard to it.

Several gentlemen in Philadelphia met on Feb. 8, 1822, for the purpose of organizing an infirmary for treating the poor afflicted with diseases of the eye and ear, when, as appears from the first address to the public in which the constitution was included, with the names of the officers, the following managers were chosen: James Gibson, William Meredith, Charles N. Baucher, Manuel Eyre, Robert M. Patterson, M.D., Clement C. Biddle, William McIlvaine and Richard C. Wood. Mr.

6. A Brief Account of the Pennsylvania Infirmary for Diseases of the Eye and Ear, established in the City of Philadelphia in the year 1822. Medical Library and Historical Journal, New York, April, 1903.

James Gibson was made chairman of the meeting, Dr. Isaac Hays, secretary, and Mr. Richard C. Wood, treasurer. Drs. George B. Wood, Isaac Hays, John Bell and Robert E. Griffith were appointed surgeons, and Drs. Phillip S. Physick and William Gibson, consulting surgeons. The surgeons were *ex officiis* members of the board of managers. Among other transactions of the meeting, a resolution was passed constituting the surgeons a committee "with authority to procure a room for an infirmary and to make arrangements for carrying into effect the objects of the institution." The committee was also instructed to prepare an address to the public, to have two hundred and fifty copies of it and a constitution printed in pamphlet form, and to frame a system of by-laws, all of which was to be reported on at the next meeting of the board.

A managers' meeting was held twelve days later at which Mr. William Meredith presided. The committee reported a second-story room at No. 4 South Seventh street at one hundred dollars a year, that it had made arrangements with Messrs. A. M. and E. L. Cohen to furnish medicines at a reasonable rate, and that it had prepared an address and a constitution and had them printed, as authorized, in pamphlet form. A body of by-laws was also adopted at this meeting, and certain forms and methods for carrying on the work of the institution were agreed on.

The original "address to the public" of 1822, with the constitution omitted as published by Dr. Oliver, is as follows:

The Pennsylvania Infirmary for Diseases of the Eye and Ear. Established at Philadelphia.

In calling the attention and soliciting the patronage of the

public to an institution which is to embrace the relief of a class of diseases having so important a bearing on individual happiness and social comfort, we need but advert to the success which has attended similar ones in Europe, more particularly those established at London and Vienna. In these cities thousands have been anually relieved and cured of diseases of the eye and ear, who otherwise would have lost the use of these all-important organs, and proved a burthen to themselves and to society. Like benefits have resulted from institutions of the same nature in some of our own cities, and we may now confidently hope that the citizens of Philadelphia, distinguished for their zeal and liberality in the support of whatever tends to usefulness and charity, will not suffer the present opportunity to escape without testifying their approbation of the institution already organized, and prepared to commence its beneficial operation, as will be seen from the subjoined constitution, adopted at a respectable meeting of the contributors on Friday last.

It is interesting to note in this connection that provision was made in the constitution "that clinical instruction may be given under such regulations as shall be provided by the by-laws."

It will be seen by this "address" that these managers entirely ignored Dr. McClellan's institution, although it had already been in operation for a year, and although they must have known of its existence.

The Pennsylvania Infirmary had somewhat of a struggle to live, but it was kept in more or less successful operation for at least seven or eight years. It was not incorporated, however, till early in 1826. Dr. Oliver says that the last meeting of the board that he can find recorded was held on May 1, 1829. But at that meeting a committee was authorized to collect subscriptions, and other actions were taken looking toward its continued support and work. In 1829 Dr. Isaac Hays, in an article

of much detail and interest on "Diseases of the Cornea,"[7] subscribed himself as one of the "Surgeons of the Pennsylvania Infirmary for Diseases of the Eye and Ear," showing that he was still active in the institution, and not ashamed of it. How long it lived after 1829 or 1830 I can not say. Perhaps it did so till James Wills' legacy became effective in 1834, when place and means were provided for the work of the staff of surgeons, and for lack of which this was made difficult, and without the desired efficiency.

MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY.

The fifth institution that was organized in this country and which, unlike the first and last two above referred to, has lived to the present time, and has been both a credit and pride to American opththalmology and to the medical profession. This was the Massachusetts Charitable Eye and Ear Infirmary of Boston, which was founded in 1824. Like the New York Eye Infirmary, it had its beginnings through the enterprise of two young Boston physicians, Dr. Edward Reynolds and Dr. John Jeffries. I can not do better in introducing this brief historical sketch than to quote from an address of one of its founders, Dr. Reynolds, delivered at the dedication of its new building, on July 3, 1850. Among other things, Dr. Reynolds said:

As the London Eye Infirmary owes its origin to the Institution at Vienna, so the Massachusetts Infirmary, where we are this day assembled, must claim its parentage from that. The valuable work of Saunders, published in 1816, and the occasional reports of the infirmary of which it was the first fruits, began to excite a spirit of inquiry among several emi-

7. American Medical Recorder, xiii, 324.

nent individuals in our country. But no general movement was made in its favor until 1821 (1820); when the first eye infirmary in America was established by Dr. John Kearney Rodgers and Dr. Edward Delafield, two of the most distinguished physicians and surgeons in New York, who may be called the fathers of American ophthalmology. Filled with the spirit first received at the London institution, and finding on their return from Europe a great number of poor people afflicted with diseases of the eyes, they were desirous of extending a similar blessing to their native city. Accordingly, at the request of several of the senior members of the profession, they founded the New York Eye Infirmary.

Two (four) years after, in the latter part of 1824, the example was followed in Boston, and the first effort made, whose noble result we are this day assembled to celebrate. Perhaps, on this occasion, I may be pardoned in saying that the Massachusetts Charitable Eye Infirmary partly originated in the fact that one of its founders had the happiness of restoring a beloved father (Edward Reynolds, Esq.) to sight by the operation of cataract. The tender relation in this case of surgeon and patient, becoming extensively known among the small population then composing our community, brought to his observation a large number of ophthalmic patients; and soon revealed the fact that the poor and laboring classes are peculiarly liable to these diseases—a fact now familiar to every one acquainted with the results of these institutions. . . .

. . . In the month of November, 1824, the speaker, in conjunction with Dr. John Jeffries, hired a room in Scollay's buildings; fitted it with such conveniences as their limited means enabled them to procure; and invited the poor, afflicted with diseases of the eye, to come there for gratuitous aid. After having continued their daily attendance for the period of sixteen months, it was found that during this time, although the population of the city did not exceed 50,000, no less than 886 persons had applied at the rooms. . . .

Having thus satisfactorily tested the experiment, the surgeons now thought the time had arrived which authorized them to present the claims of this large class of the poor to

the attention of the public. Accordingly, a meeting was called on March 13, 1826, at which the Hon. John Wells presided. The report was read. Its simple statement of facts impressed all the gentlemen present with a conviction of the usefulness and importance of the institution, and determined them to give it a more perfect trial as a public charity. In accordance with a vote there passed, a subscription was commenced. By the personal exertions of one gentleman, Mr. Lucius Manlius Sargent, more than two thousand dollars were

MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY, BOSTON, ERECTED 1850.

collected in one week, as a permanent fund; and nearly three hundred dollars in annual subscriptions.

The first meeting of the subscribers who had thus promptly replied to the call of the committee, was held at the Exchange Coffee House, on the evening of March 26, 1826. Mr. Richard D. Tucker presided. The result of Mr. Sargent's efforts being made known by Mr. Bryant P. Tilden, was regarded as a spontaneous expression favorable to the establishment of the institution. Accordingly, it was then regularly organized under the title of the Boston Eye Infirmary by the election of a board of officers, composed of the following gentlemen: Edward

Tuckerman, president; Lucius M. Sargent, vice president; William B. Reynolds, secretary; Bryant P. Tilden, treasurer; Richard A. Tucker, Edward H. Robins, Robert G. Shaw, Henry Sargent, Henry Rice, Nathaniel G. Snelling, James C. Dunn, Thomas C. Amrory, and Rev. John Codman, managers.

In February of the following year it was incorporated by the legislature of Massachusetts under the title of the Massachusetts Eye and Ear Infirmary.

From this time till the fall of 1836 the infirmary was "housed" in different places, and was used only as a dispensary, serious cases being cared for by the staff elsewhere. The requirements for hospital accommodations became so imperative that a building, the Gore House on Green street, was then purchased, and was remodeled and adapted to both dispensary and hospital purposes. This building was opened for admission and treatment of patients on July 19, 1836. The number of patients registered during this year is recorded as 689. It rapidly increased to such an extent that additional room and facilities were found necessary, and once more an effort was made to provide larger quarters, which resulted successfully in the purchase of a lot on Charles street in 1848, and the erection of a new building which was completed in 1850 and dedicated on July 3 of that year, the dedicatory address above quoted from being delivered by one of its founders. From that year the number of patients increased from 2,004 to nearly 20,000 in 1895. The building of 1850 had thus become inadequate for the needs of the institution and it was decided to purchase adjoining land and to erect a new building. This was done, and the new hospital was built, and was ready for occupancy in 1899. In connection with this a ward for contagious diseases of the eye was provided in an adjoin-

DR. GEORGE A. BETHUNE (1812-1896).

ing building, and is the first of its kind to be erected in this country. The infirmary building to-day is, like that of the New York Eye and Ear Infirmary, a model of its kind. According to the last annual report, 1906, the number of patients of all kinds treated at the infirmary during the preceding year was 35,319.

Ophthalmic clinics in the institution were begun as early as 1836, and both Dr. John Jeffries and Dr. E. Reynolds and later Dr. George A. Bethune gave regular courses on the diseases of the eyes. At the present time clinical instruction is given to the students of Harvard and Tufts medical colleges.

BALTIMORE DISPENSARY FOR THE CURE OF DISEASES OF THE EYE.

In 1823 Dr. George Frick, of Baltimore, published "A Treatise on Diseases of the Eye." In the preface Dr. Frick says that "opportunity has been considerably augmented since his (the author's) return to his native country, by his appointment to the Baltimore Dispensary for the Cure of Diseases of the Eye." Dr. Isaac Hays, of Philadelphia, in reviewing Dr. Frick's work in a Philadelphia medical journal,[8] says that "with respect to the institution at Baltimore he has but little information to communicate. It is attached to the Baltimore Dispensary and is committed to the author of this (Frick's) work." Dr. Cordell says, in his "History of the University of Maryland," that the foundation of the Baltimore Dispensary was laid in 1823 and patients were received the same year. There were four wards, of which "one was reserved for eye cases, instruction in

8. Phila. Jour. Med. and Phys. Sci., 1825, pp. 409 to 427.

ophthalmic surgery forming a prominent feature in the course." This being in the time of Frick's early activity, this prominence given to ophthalmology was probably due to him, and it was he who delivered the lectures referred to.

Dr. Harry Friedenwald[9] says that on Dr. Frick's return from Europe, about 1819, "to engage in the practice of ophthalmology, he was appointed surgeon to the Baltimore General Dispensary, where he established the first eye dispensary in Baltimore in 1824." This dispensary must, however, have been started before 1824, if Dr. Frick's own statement above quoted from his book be correct, for his work was published in 1823, and also according to Cordell's statement, which I have above quoted.

I can obtain no further record of the Baltimore institution, and it is even doubtful if it had an organization independent of the general dispensary. Being a first effort, however, at establishing a special eye clinic in Baltimore contemporaneously with the beginnings of eye infirmaries in New York, Philadelphia and Boston, it is worth mentioning.

WILLS EYE HOSPITAL.

In following up the historical references to the early institutions for the treatment of diseases of the eye which have contributed in various ways to the advancement of ophthalmology, the next in chronological order is the Wills Eye Hospital of Philadelphia. This institution was created by the benevolence of a wealthy Philadelphian,

9. The Early History of Ophthalmology and Otology in Baltimore (1800-1850), reprint from Johns Hopkins Hospital Bulletin, Baltimore, 1897.

James Wills, who was born in England in 1760 and died in Philadelphia in 1830. His fortune was in part by inheritance and in part from his own business in Philadelphia, where he was an honored member of the Society of Friends. At his death he left a will providing for the founding of a "hospital for the indigent blind and lame." A question arose as to the legality of his be-

OLD WILLS EYE HOSPITAL, PHILADELPHIA.

quest, and for some time it was in process of litigation. The decision of the court, however, upheld the provisions of the will, and, after satisfying other bequests, there was a sum of $108,396.35, with its accumulations, making a total of $122,548.57, available for the purchase of a lot and the erection of a building in compliance with the wishes of the benefactor. The place selected by the officers of the organization was on Race street, between

Eighteenth and Nineteenth streets, on which was erected a building, the foundations of which were laid on April 2, 1832. On March 3, 1834, the hospital was opened for the reception of patients. On the completion of the building, all expenses had been paid, and there was a residue of $65,344.88 for the future support of the institution. The first surgeons were appointed in 1834, and were Drs. Isaac Parrish, Squier Littell, Isaac Hays and George Fox. Those entitled to the privileges of the hospital were persons in indigent circumstances, and on application they were expected to give satisfactory evidences of respectable character. Since the erection of the first building many alterations and additions have been made, until now it is provided with offices, operating and clinic rooms and one hundred beds for interne patients.

From the earliest days of the hospital, eye diseases were most prominent among the patients who applied for assistance. As early as May, 1834, two operations were performed for cataract by couching and, to quote the report of the visiting committee, "these cases were watched with the utmost interest as to the outcome of the operations." At first the full capacity of the house was twenty patients, and the physicians and surgeons attended but once or twice a week. The institution was then known as "Wills Hospital for the Blind and Lame." The character of the cases became more and more limited to eye diseases, until in November, 1837, it was reported that there were no medical cases for treatment. A few years later the office of attending physician was abandoned. Almost without a single moment's hesitation has the institution received kindly rec-

ognition and a helping hand. It has been so well supported by state and private benefaction that the work has steadily grown from sixty cases the first year to over sixteen thousand annually at the present time.

The present building is most suitably arranged for the proper treatment of diseases of the eye, and has all the modern improvements and facilities.

THE MONTREAL EYE AND EAR INSTITUTION.

In this connection I may properly mention the Montreal Eye and Ear Institution of Montreal, Canada, the organization of which was undoubtedly inspired by Mr. Henry Howard, of that city, and which began its existence in or before 1846. Information is not at hand which will enable me to give any definite account of this institution and its duration.

I have thus taken the time to briefly outline the origin of these early institutions, because those that have survived have been the greatest of the sustaining and developing forces of American ophthalmology. But it must still be borne in mind that these have been reinforced by the organization from time to time of ophthalmic services in connection with general hospitals and general dispensaries by men more or less interested in diseases of the eye. The Baltimore Dispensary, in which Dr. Frick took an active part as early as 1823, and to which I have already referred, was one. Another, the Philadelphia Dispensary, a charity said to have been organized by Benjamin Rush, always had a certain proportion of patients with eye diseases, and they were attended to by the physicians on service. The Philadelphia Hospital and the Pennsylvania Hospital of Philadelphia, the New

York Hospital, the Massachusetts General Hospital of Boston, the Baltimore Hospital, and others throughout the United States had their surgeons who were more or less skilled in ophthalmic operations.

SOME OF THESE EARLY SURGEONS.

Some of the early surgeons of Philadelphia who were thus skilled were Thomas Bond (1712-1784), who, with Benjamin Franklin, founded the Pennsylvania Hospital in 1752 (the first of its kind in America); William Shippen, Jr. (1736-1808), Philip Syng Physick (1768-1837), William Gibson (1788-1868), John Syng Dorsey (1784-1818), nephew of Physick; George McClellan (1796-1847), Jacob Randolph (1796-1848), and George Fox (1806-1882). In New York there were such distinguished surgeons as John Jones (1729-1791), later of Philadelphia, Wright Post (1766-1822), Samuel Borrowe, J. Kearney Rodgers (1793-1857), Valentine Mott (1785-1840), Gurdon Buck (1807-1877), Willard Parker (1800-1884), and Alfred C. Post (1806-1886). In Boston there were John Warren (1753-1815), his son John Collins Warren (1778-1856), George Hayward (1791-1868), and John Jeffries (1796-1876); in Baltimore, John Beale Davidge (1769-1829), Horatio G. Jameson (1778-1855), John Harper (———-1831), Granville Pattison (1791-1851), and Nathan R. Smith (1797-1877); at Dartmouth and Yale, Nathan Smith (1762-1829), the father of the Baltimore surgeon, and himself a great physician as well as surgeon of his day; in Chicago, Daniel Brainard (1812-1866); in Transylvania, Ky., Benjamin Winslow Dudley (1785-1870), and so on in all large towns throughout the country,

of which the above is a very incomplete list and does not include those surgeons of a little later period who were more or less celebrated for their skilful operations on the eye.

Those who stood out more exclusively for ophthalmology were George Frick of Baltimore, Isaac Hays and Squier Littell of Philadelphia. Edward Delafield, of New York, served the New York Eye Infirmary many years, but was actively engaged in other departments of practice. Dr. J. K. Rodgers was also faithful to the same institution, but his service was incidental to his surgical work. John Jeffries, George A. Bethune, John H. Dix, Robert W. Hooper and Edward Reynolds, in Boston, who attended the Massachusets Charitable Eye and Ear Infirmary, were also general practitioners. Samuel D. Gross, Philadelphia, was a great surgeon, and he also did eye surgery. The same is true of D. Hays Agnew, also of Philadelphia.

The lives of some of these men deserve further record in this connection and I shall, therefore, give sketches of them very briefly.

III.

BIOGRAPHICAL SKETCHES.

GEORGE FRICK, Baltimore, was the first in America to undertake to restrict his professional work almost exclusively to ophthalmology. He was born in Baltimore in 1793. After completing his medical studies and graduating from the University of Pennsylvania in 1815, he was licensed to practice in his native city in 1817. He visited Europe, where he became a favorite pupil of the celebrated Vienna ophthalmologist, Beer. He came to feel deeply the dearth of knowledge of diseases of the eye in America and set himself to work to so qualify himself under the great master that he might return to his home and give some enlightenment and a scientific uplift to a neglected department of medicine. After a prolonged period of study, and enthused by the example of Beer as an exclusive specialist, he returned to Baltimore in 1818 and undertook in a measure to follow his teacher's example. He at once began his plans for ophthalmologic work. He organized a special eye clinic in connection with the Baltimore Dispensary and established a course of lectures on the eye in the University of Maryland. He was naturally retiring in disposition, and without demonstration he undertook this innovation. There is sufficient evidence extant to show that his work as an ophthalmologist was approved in Baltimore, and had it not been for a frail physique and the infirmity of deafness he would undoubtedly have left a more impressive and lasting record than he has.

DR. ISAAC HAYS (1796-1879.)

Nevertheless, his clinical work in ophthalmology became an inspiration to others, and his ophthalmologic contributions to the *American Medical Recorder* of Philadelphia and his "Treatise on the Eye" (1823) are enduring monuments to his learning. Unfortunately, as his infirmity increased, and having tastes for other pursuits, he was led to abandon his profession so well begun. He finally repaired to Dresden, where he died in 1870, at 77 years of age. (For these facts regarding Dr. Frick's life I am indebted to Dr. Harry Friedenwald's "Early History," etc., above cited.)

ISAAC HAYS.—The next who did much credit to early ophthalmology was the distinguished Isaac Hays, who was born in Philadelphia in 1796 and died there in 1879, spending the whole of his life in that city in most arduous and productive labor. He graduated in medicine from the University of Pennsylvania in 1820, and, unaided by friends or by the patronage of the great and influential of his city, he began the world's struggles, and at once won the confidence of the most distinguished physicians with whom he came in contact. Fitted by Nature and by training for literary work, he nevertheless took a deep interest in ophthalmology, both scientifically and practically, and so far as he practiced medicine at all it was chiefly in this field. He began the practice of ophthalmology early in life, and when the Pennsylvania Infirmary for Diseases of the Eye and Ear was founded in 1822, undoubtedly as a rival to Dr. McClellan's hospital, he was one of its first surgeons. His services there were faithful and efficient, and it was also to his influence and energy that it was kept alive till the time when James Wills died in 1830 and left a

bequest, whereby there would be means to support an institution in which charitable work of this kind could be done in accordance with higher ideals and with less worry over insufficient financial support. At the opening of the Wills Hospital for the Blind and Lame in 1834, Dr. Hays became one of its surgeons. Here his masterful influence greatly dominated its work, and here, too, he built up an enviable reputation as a skilled and progressive ophthalmologist. In the meantime he contributed numerous learned articles on ophthalmologic subjects to the journal with which he became identified when a young man, viz., the *Journal of the Medical and Physical Sciences,* afterward the *American Journal of the Medical Sciences,* a journal which has come down to our own time, and which has ever been the pride of our profession and an honor to its editors and its publishers. Dr. Hays' service at the Wills Hospital continued till 1854, a period of twenty years, when the pressure of literary work led him to resign. During all of those years of institutional work, from 1822 to 1854, the knowledge which he acquired of ophthalmology, both practical and theoretical, was most efficiently and advantageously reflected to the public in the lectures which he gave in Dr. Godman's private school and at the eye hospitals with which he was connected; in the editorial work of his journal; in his original articles, and in the notes which he discriminatingly added to his American edition of T. Wharton Jones' "Principles and Practice of Ophthalmic Surgery," and to his two editions of Lawrence's "Treatise on Diseases of the Eye."

Dr. Hays, besides contributing many articles of great value to his journal, made important devices in ophthal-

DR. SQUIER LITTELL (1803-1886).

mic instruments, occupied many positions of trust, and kept alive the newer and more progressive ideas touching the science and practice of ophthalmology. The extent and value of his labors in this field alone can not be measured.

On withdrawing from the Wills Hospital, he also withdrew from the practice of ophthalmology; but as long as he lived his interest in the subject was never lost. Although he did not endeavor to make it an exclusive department of practice, the world will always claim him as the great American editor-ophthalmologist of the first half of the nineteenth century, whose learning and skill were the admiration and inspiration of the practitioners of that period.

SQUIER LITTELL.—A third name that stands out in bold relief in the same historical period is that of Squier Littell. He was born in Burlington, Vt., in 1803 and died in Philadelphia in 1886. He was one of a family who was endowed with literary tastes. It was his brother who founded that old and still popular magazine, "Littell's Living Age." Dr. Littell also possessed a strong religious nature, and his literary predisposition was shown both in medicine and in religion. After studying medicine with Dr. Joseph Parrish of Philadelphia, he graduated from the University of Pennsylvania in 1824. He then entered into general practice, making his first attempt at this in South America, but returning to Philadelphia in 1826, where he remained the rest of his life. His retiring and modest disposition, his consequent lack of aggressiveness, contributed to a slow acquirement of practice. The death also of his young and charming wife, who left to him a little daugh-

ter and an infant son, so overwhelmed him with grief from which he did not recover in years, that it in a great measure stifled his ambition and diverted him into channels of thought and labor, which, to say the least, did not contribute to enviable success in general practice. Not to dwell, however, on these or on his literary labors in medical journalism and in religious publications, it should be mentioned that he early contributed several important papers on general medicine and was esteemed a physician and medical writer of merit. In 1834, on the organization of the Wills Hospital, and perhaps through the kind offices of Dr. Parrish, his preceptor and friend, he was appointed one of its surgeons. He was a faithful and conscientious attendant to this institution for thirty years, resigning in 1864. He disclaimed any title to being a specialist, and regarded himself simply as a general practitioner, and yet his attachment to an eye hospital had more or less effect in making his ophthalmic practice disproportionately the larger part. His experience in the Wills Hospital and in private practice bore good fruit, for, while Dr. Littell did not write extensively, his best contributions were in the interests of an advanced ophthalmology. His "Manual on Diseases of the Eye," 1837, was his most conspicuous and helpful production. In 1853 he edited the first American edition of H. H. Walton's "Treatise on Operative Ophthalmic Surgery," adding some useful notes.

The first article which the doctor published in a medical journal was in 1821 and the last was in 1873, numbering in all about twenty. Of these only three or four were on the eye. On the discovery of the ophthalmoscope Dr. Littell at once recognized its value and its

practical application to diagnosis and treatment. He, although conservative by nature and slow to adopt new methods, at once devoted himself to mastering the difficulties of the new instrument and used it habitually and intelligently in his practice.

Dr. Littell, having had a good constitution and having led a regular and temperate life, had kept comparatively young to advanced age. As he approached his eightieth year his sight began to fail him from a chorioidal affection and was one of the severe trials of his old age, but he made no complaint, and to the last, as his blindness increased, he adapted himself to his privation.

Like Dr. Hays, this pioneer ophthalmologist portrayed those qualities of mind and heart which should stand as an example to all young men in generations to come.

THE THREE PIONEERS.

These three men, Frick, Hays and Littell, unlike all others in the first half of the last century, almost completely divorced themselves in practice, though not in theory, from other departments of medicine. Each one was modest and conservative by nature, each was refined and cultured, and each was endowed with literary tastes. Each was full of the feeling of the great responsibility of his work, and each had an unselfish desire to better the ophthalmic practice of his time and to lead others to a higher plane of ophthalmologic knowledge. They practiced according to the best information and experience available, and they opened their clinics to those who would come. In ophthalmology they stood above all others in the extent of their practice, in their self-sacrificing devotion to their work and in the literary contri-

butions which were the outgrowth of their knowledge and experience, and which served so effectually to advance the science in America and to enlighten the profession on a neglected subject.

OTHER SKETCHES.

There were others, however, who were the contemporaries of Frick, Hays and Littell, or who came later, who did less writing, but who did most important service in ophthalmology. Their careers should also be briefly noted.

ELISHA NORTH (1771-1843), of New London, Conn., attempted to make ophthalmology more or less prominent in his practice, even earlier than did either of the three men whose lives I have sketched. He was the son and grandson of physicians, and studied medicine in Hartford, and subsequently in Philadelphia under Benjamin Rush. After being admitted to practice he settled in his native town, Goshen, Conn., and engaged in the pursuit of his profession until 1812, when he removed to New London, Conn. He was a man of progress and was among the earliest to practice vaccination in the United States, being the first to introduce vaccine matter in New York City, sending it to Dr. Edward Miller of that town. In New London he devoted special attention to diseases of the eye, and in 1817 established there the first eye infirmary in this country. According to information furnished me by Dr. Walter R. Steiner, of Hartford, Conn., Dr. North in 1829 published a book entitled "The Science of Life." In it he refers to his work and institution as follows: "We had attended to eye patients before that time (1817), but it occurred to us then that we might multiply the number of cases of that descrip-

ELISHA NORTH (1771-1843).

tion and hereby increase our knowledge, advertising the public in regard to an eye institution. This was done, and we succeeded, although not to our wishes in a pecuniary view of the case. Our success or exertions probably hastened in this country the establishment of larger and better eye infirmaries (i. e., for larger cities)." Little is really known of Dr. North's institution or his ophthalmic practice, but the fact that he was thus interested in ophthalmology is worthy of record here.

PHILIP SYNG PHYSICK.—In making special note of the early general surgeons who should be remembered in connection with the development of ophthalmology the name of Philip Syng Physick should, perhaps, come first. He was born in Philadelphia in 1768 and died there in 1837. He received a collegiate education from the University of Pennsylvania, where he graduated in arts in 1785. He studied medicine with a physician in his native town for three years, and went to London in 1789, where he became the private pupil of John Hunter, with whose family he lived. He was a great favorite of Hunter, and received many attentions and considerations from him. It was through Hunter's influence that he was appointed to the house staff of St. George's Hospital, London, in 1790. In 1791 he went to Edinburgh, and in 1792, after one course of study in the University of Edinburgh, he graduated in medicine. He then returned to Philadelphia and began practice under most favorable conditions. In 1794 he was appointed surgeon to the Pennsylvania Hospital, which he served for many years. In 1800 he was taken into the medical department of the University of Pennsylvania. first as lecturer, and in 1805 as professor of surgery. In

1818 he was transferred to the chair of anatomy, which he occupied till 1830.

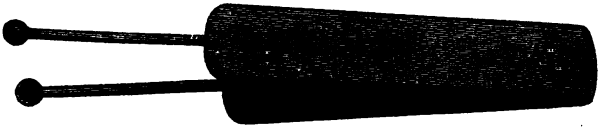
Dr. Physick is said to have been a man of medium height, with "pale classic features," reserved and rather forbidding in his manner, pessimistic in his temperament, and devoid of the sense of humor. In his teaching he was precise and emphatic and commanded the profoundest deference from his pupils. He was not a ready speaker, and for the most part read his lectures to his classes. As a surgeon he was skilful and accurate in operating, and always conservative. He was not a "man of books," neither writing much nor reading much. Dr. Gross has said of him that he had no books worth mentioning, either medical or non-professional. In his practice he was essentially an empiric, apparently being guided altogether by the light of experience. He had no theories of his own, and was intolerant in his teaching and practice of the theories of others. He possessed, however, one of the richest endowments of a professional man, namely, strong common sense, and this was his great bulwark in every situation. Although cold and unsocial, yet at heart he was full of sympathy for suffering humanity.

It was he who originated the idea of the use of animal ligatures as I shall elsewhere note, and he is said to have been the first to wash out the stomach, in cases of poisoning, with a gum-elastic catheter and syringe. He devised many new surgical appliances and instruments, and in many ways advanced surgical practice. He was an expert operator on the eye, especially for cataract and artificial pupil, as is made evident by Dorsey, his nephew, in the first volume of Dorsey's "Elements

DR. PHILIP SYNG PHYSICK (1768-1837).

of Surgery." Among the original devices of Dr. Physick for ophthalmic operations is a forceps-punch (see illustration) for removing a piece of iris for artificial pupil.

Dr. Physick wrote scarcely anything for publication, yet, fortunately, his work and memory have been perpetuated, at least partially, through the writings of others, particularly of his distinguished nephew, John Syng Dorsey, and of his son-in-law, Dr. Jacob Randolph. Dr. Physick's surgical originality and genius have won for him the distinction of being regarded as "the father of American surgery."



Physick's punch-forceps for making artificial pupil.

WILLIAM GIBSON, another eminent surgeon who thought and acted for himself and who contributed materially to ophthalmologic knowledge and practice, was the successor to Physick in the chair of surgery in the University of Pennsylvania, to which he was called in 1819. He was born in Baltimore in 1788 and died in Savannah, Ga., in 1868. He graduated in arts in 1806 from Princeton College with high rank as a classical scholar. He then repaired to Edinburgh, where he studied medicine under John Bell, graduating in medicine from the university of that city in 1809. From there he went to London, where he studied for some time under Sir Charles Bell. From London Dr. Gibson returned to Baltimore, and was soon in successful practice. He was appointed professor of surgery in the med-

ical department of the University of Maryland in 1812. He occupied this position till he removed to Philadelphia in 1819. His connection with the University of Pennsylvania continued until 1855, when he resigned. Dr. Gibson was the first to ligate the common iliac artery in 1812, but his greatest feat, a feat which made his name widely known, both in Europe and in this country, was the performance of the Cesarean section twice on one woman, saving mother and child in both instances. His reputation as an expert operator extended far and wide, and while at times his ill temper betrayed him into unkind expressions, yet he never failed to command the highest respect of most of his confrères. He was an able and impressive teacher, his characteristic qualities being clearness, accuracy and earnestness. He made no pretentions to eloquence. Dr. Gross in his sketch of him says: "He handled his knife with great skill and was one of the foremost operators of his day." Dr. Gibson made many contributions to the practice and literature of general surgery and some to the surgery of the eye. His most noted literary production was his "Institutes and Practice of Surgery," the first edition of which was published in 1824, the last, the eighth, in 1850. The first volume of this work contains an excellent résumé of the diseases of the eye and their treatment, in which is embodied the undoubted results of the experience and study of a man versed in the ophthalmology of his time. His discussion of cataract is especially authoritative. He was the first surgeon to perform the operation for convergent strabismus, which was afterward made so popular by Dieffenbach. Unfortunately, he did not record his operation in time to re-

DR. GEORGE McCLELLAN (1796-1847).

ceive due credit for priority. This subject is reviewed elsewhere in this paper. I have also detailed on other pages some of his procedures and instruments for operations of the eye, showing the originality and resourcefulness of his intellect. Gibson will long remain a prominent figure in the history of ophthalmology as well as surgery.

GEORGE MCCLELLAN,—As I have in the preceding pages briefly rehearsed Dr. George McClellan's effort to establish an eye hospital in Philadelphia in 1821, it seems appropriate to add a few words in regard to the man himself. He was born in Woodstock, Conn., in 1796 and died in Philadelphia in 1847, 51 years of age, from an ulcerative perforation of the small intestine. He graduated in arts from Yale College in 1815, and began the study of medicine with Dr. Thomas Hubbard, of Pomfret, Conn. He afterward became the pupil of the celebrated Philadelphia surgeon, Dr. John Syng Dorsey. He graduated in medicine from the University of Pennsylvania in 1819. After receiving his M.D. degree he began the practice of his profession in Philadelphia, where he labored during the remainder of his life. Immediately after locating in Philadelphia he began to teach anatomy and surgery, privately, and his lecture room soon became a rallying point for many pupils. It may be said that Dr. McClellan's private school, which grew into great popularity, was the germ from which the Jefferson Medical College sprang later. In 1825, with the assistance of other Philadelphia physicians, particularly John Eberle, he organized the Jefferson Medical College, in which he became the professor of surgery, a position which he occupied till 1838, when

he was compelled to withdraw. Immediately after this change he, with others, founded the medical department of the Pennsylvania College of Gettysburg in 1839. The department was closed, however, after four annual courses of lectures, and he then retired to private practice.

Dr. McClellan as a young man was aspiring and aggressive, and both in the "Institution for Diseases of the Eye" and in the Jefferson Medical College he was, as Dr. Gross says, the "master genius." His teaching in the medical college included both anatomy and surgery, and his vivacity and fluency of speech attracted large classes. His lectures were "extemporaneous" and they achieved a popularity and produced an effect seldom equaled. He was full of energy and enthusiasm, but utterly without system. Every student was strongly attracted to him, and "Mac" was the name by which he was generally designated. As an operator he was showy and at times brilliant, but it was claimed by his adherents that he lacked judgment and patience. McClellan wrote and published very little. A posthumous work on the "Principles and Practice of Surgery" was published by his son, the late Dr. John H. B. McClellan, which, however, attracted indifferent attention. I have already shown that Dr. McClellan was especially interested in ocular surgery, and no doubt this interest was lessened only by being overshadowed by that in general surgery It appears that he had similar "troubles and tribulations," however, in this branch of surgical art to those which frequently befall ophthalmologists and surgeons of the present day, for in 1828 a suit for malpractice was brought against him on account of alleged want of skill

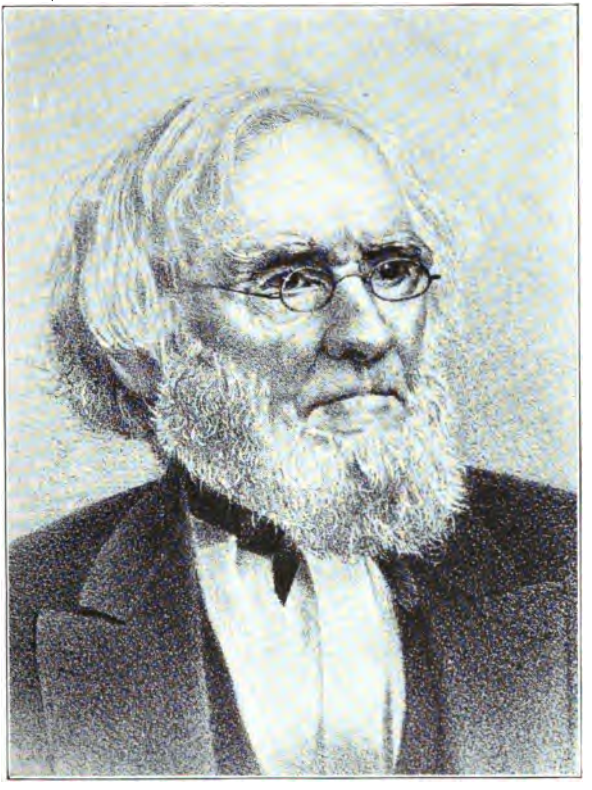
DR. JOHN KEARNEY RODGERS (1793-1851).

in a case of cataract, in which a verdict of $500 was rendered in favor of the plaintiff. Dr. Gross has reminded us that "the suit, as most frequently happens, had been instigated by professional enemies." Notwithstanding the criticisms and inuendos which his enemies in the profession saw fit to make, he was recognized as a practical surgeon of high rank. The school which he founded has contributed through its graduates many eminent surgeons and teachers. He is also to be remembered as the father of Gen. George B. McClellan, of Civil War fame, and grandfather of George B. McClellan, the present mayor of the city of New York.

JOHN KEARNEY RODGERS was born in New York City in 1793 and died there in 1851, his death being caused by "phlebitis of the liver followed by peritonitis." He obtained his classical education at Princeton College, and afterward studied medicine under Dr. Wright Post, who was a distinguished New York surgeon. He graduated from the College of Physicians and Surgeons in 1816. After his graduation he and Dr. Edward Delafield went to London, where they pursued their studies at the hospitals of that city under the famous masters of the metropolis, giving special attention to diseases of the eye. In 1818, soon after his return to New York, Dr. Rodgers was appointed demonstrator of anatomy in the college from which he graduated. Four years afterward he was made surgeon to the New York Hospital, an office which he much coveted and which he retained up to the time of his death—a period of thirty years. He was a practitioner of great eminence, and with Dr. Delafield, was the founder of the New York Eye Infirmary, in 1820, which institution he served for many

years. He was especially noted for his sterling integrity, his active and generous mind, and for his adroitness and ease as an operator. It has been said that as an operator he had no superior in this country, except, perhaps, Valentine Mott, who so long wielded the scepter on the American continent. The principal operation which gave him great honor throughout the surgical world, and for all time, was the ligation of the left subclavian artery within the scaleni muscles, in 1845, on account of a large aneurism of that vessel, a feat which up to that time was universally regarded as impracticable. In consultations he was the wise counselor, and under all circumstances he was the sympathizing and trusted friend and physician. His contributions to medical literature were not numerous, and it is to be regretted that the record of his vast experience has been so insufficient. Meager as his contributions were they, however, leave a mark which will not be easily erased.

EDWARD DELAFIELD was during his whole life a prominent figure in New York professional circles. He was energetic, skilful and courteous and occupied many positions of trust. He had a very large practice, and was for a long time professor of obstetrics and diseases of women and children in the College of Physicians and Surgeons. He was born in 1795 and died in 1875. He graduated in arts at Yale College in 1812 and in medicine at the College of Physicians and Surgeons of New York in 1815. After a period of service as interne in the New York Hospital, he and Dr. John Kearney Rodgers went to Europe for special study. Soon after returning Dr. Delafield, with Dr. Rodgers, organized the New York Eye Infirmary in 1820, as above detailed.



DR. EDWARD DELAFIELD (1795-1875).

He acted as surgeon and gave clinical lectures there on diseases of the eye for many years. He was one of the active promoters of the organization of the American Ophthalmological Society in 1864 and was unanimously elected its first president, a fitting acknowledgement of what he had done by his example and labors during many years to make ophthalmology an honorable department of medical practice in the estimation of the public and profession. Clinical teaching at the New York Eye Infirmary was early instituted by Dr. Delafield and was carried on by himself and associates for many years. He wrote and published very little. His ophthalmologic writings were chiefly reports of experiences from his practice in the infirmary, a few of which will be found in the early transactions of the Ophthalmological Society, and his notes to his American edition of "Travers on the Eye," to be referred to later.

Dr. Edward Reynolds was born in Boston, Mass., in February, 1793, and there closed his long life in 1881. He graduated in arts at Harvard College in 1811, and afterward for several years was a private pupil in medicine of Dr. John Collins Warren. He then availed himself of the very great advantage of three years of training abroad. In London he studied under Abernethy and Astley Cooper, and at Paris with Bichat and Dupuytren. He also followed, at London, the lectures of Sir William Lawrence on diseases of the eye, and with his fellow-students was carefully taught, among other things, to perform ophthalmic operations, using sheep's eyes set in a mask. It was perhaps owing to the influence of his European teachers that he acquired a preference for surgery, and especially for ophthalmic

surgery, although he always enjoyed an extensive general practice. During Dr. Reynold's lifetime modern specialization of the medical profession was not known, and he never lost his interest in the pursuit of general professional work.

After returning from abroad, he found his father, at 60 years of age, blind with cataracts in both eyes. He had the rare courage to perform the depression of the two lenses at one sitting. Happily the operation proved a complete success. It had never before been undertaken in Boston and, becoming widely known, formed the foundation for a reputation which made him the leading surgeon in diseases of the eye in Boston and throughout New England for many years.

In 1824 he and Dr. John Jeffries, son of the famous aeronaut and man of science of that name, established a dispensary which developed into the well-known Massachusetts Charitable Eye and Ear Infirmary above referred to. After the withdrawal of Dr. Jeffries, Dr. Reynolds long continued to be the senior surgeon of the infirmary, training for it a staff of able men, devoted to ophthalmic practice. His connection with the institution, first as surgeon and later as teacher, lasted until 1870, but his interests in it continued unabated to the end of his days.

He was one of the founders of the well remembered Tremont Medical School, and was for many years its professor of general surgery. During a prolonged absence of Dr. Warren in Europe he also taught anatomy and surgery at the Harvard Medical School. As an eye surgeon his fame was such that in 1864, on the organization of the American Ophthalmological Society, he was made an honorary member.

DR. EDWARD REYNOLDS (1793-1881).

DR. JOHN JEFFRIES (1796-1876).

Physically he was a giant among men. His fine and commanding presence, his always genial humor, and the ready generosity of his character made for him a host of friends and followers in his community. There was an entire absence of professional jealousy in him, and he was as kind as he was unselfish. He lived to be for many years the Nestor of the local profession and, except for an increasing deafness, retained all his faculties and capacity for the enjoyment of life to within a few months of his death, which occurred at the end of his eighty-ninth year.*

JOHN JEFFRIES, who with Dr. Edward Reynolds, founded the Massachusetts Charitable Eye and Ear Infirmary, was born in Boston in 1796 and died in 1876. He was the son of a distinguished surgeon of revolutionary times, Dr. John Jeffries. In 1815 he graduated in arts from Harvard College, and in 1819 received from the same institution the degree of doctor of medicine. He was one of Boston's most distinguished practitioners, and from the foundation of the Massachusetts Charitable Eye and Ear Infirmary in 1824 until 1841 he was one of its surgeons. While he was recognized only as a general practitioner, his ophthalmologic practice, nevertheless, was large. He was universally respected and beloved as a citizen and as a physician.

HORATIO GATES JAMESON was an early Baltimore surgeon whose work included the treatment of diseases of the eye. He was born in York, Pa., in 1788, and died in Baltimore in 1855. He graduated in medicine from the University of Maryland in 1813, and imme-

* From information kindly furnished me by his grandson, Dr. Edward Reynolds, of Boston, and to whom also I am indebted for the accompaning portrait.

diately located in Baltimore, where he soon attained high rank as a surgeon and physician. He was the founder in 1827 of the Medical Department of Washington College (afterward the Washington University School of Medicine), Washington, Pa., and was its professor of surgery from the time of its organization to 1835. Besides being a practical surgeon, he made numerous contributions to surgical literature. Perhaps one of the most important of these was the prize essay of 1827, on "Observations upon Traumatic Hemorrhage, Illustrated by Experiments upon Living Animals," in which he demonstrated anew the use and value of animal ligatures. His teaching, however, on this subject, although sustained by the authority of Dr. Physick, was not appreciated by contemporary surgeons, and it was forgotten until after the method became popular as one of the features of antiseptic surgery.

Jameson, besides being an excellent surgeon, was also a journalist of considerable note and was the author of several books and papers on medical subjects which received high commendation.

Although a distinguished general surgeon and practitioner, it is his contributions to early American ophthalmology that especially concern us here, as he appears to have been much interested in diseases of the eye. He undoubtedly included them in his surgical practice and teaching and wrote some instructive papers pertaining to them. Dr. Harry Friedenwald[10] cites some of them which were published in Jameson's own journal, *The Maryland Medical Recorder*. One was on

10. The Early History of Ophthalmology and Otology in Baltimore (1800-1850), Johns Hopkins Hospital Bulletin, August-September, 1897.

the "Pathological Sympathy between the Eye and the Larynx;"[11] another was on "A Case of Enlargement of the Eye Following the Entrance of Steel into the Eye,"[12] probably panophthalmia; another was one describing "Two Cases of Ossification of the Lens with Luxation Through the Pupil,"[13] and another was on "Amaurosis Associated with Inordinate Thirst."[14] He also published[15] another paper giving an account of the successful removal of "An Encysted Tumor of the Orbit."

JOHN MASON GIBSON was another Baltimore man who aspired to do ophthalmologic work and evidently to make it an exclusive practice. He was admitted into the "Faculty" of Maryland in 1825. Very little is recorded of his life, but his ambition was made apparent by the publication of a book entitled "Condensation of Matter upon the Anatomy, Surgical Operations and Treatment of Diseases of the Eye," in 1832. I shall refer to this book elsewhere.

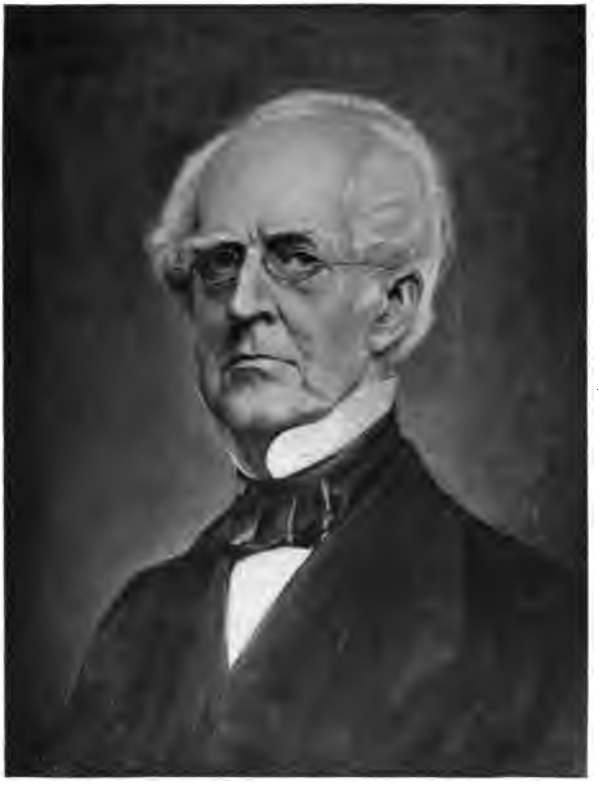
JOHN HARPER.—Still another surgeon of Baltimore was John Harper (——-1831). He is mentioned by Dr. Harry Friedenwald and also by Dr. R. M. Reese in his American edition of "Cooper's Dictionary of Practical Surgery" as one of the most successful surgeons in this country. He was a native of Ireland and graduated at Glasgow. He died in Baltimore in 1831. The *Maryland Medical Recorder* (vol. ii, p. 179) refers to him as "well-known as an oculist." He was one of the early surgeons who, according to Dr. Reese,[16] operated fre-

11. Maryland Med. Recorder, 1831, ii, 117.
12. Ibid., p. 601.
13. Ibid., p. 608.
14. Ibid., p. 664.
15. The American Medical Recorder of Philadelphia, xii, 340.
16. Cooper's Surg. Dictionary, 1842, i, 272.

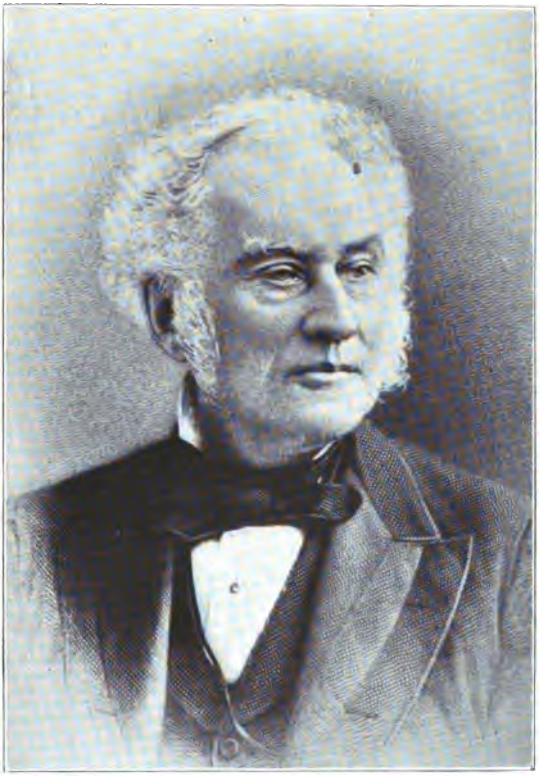
quently for cataract. He seldom adopted any other operation for it than the laceration of the capsule and lens substance, repeated "as often as necessary on the same eye."

NATHAN R. SMITH was another notable Baltimore surgeon and teacher who was also eminent as an ophthalmic surgeon. He was born in Concord, N. H., in 1797 and died in Baltimore in 1887. He was the son of the great physician and surgeon, Nathan Smith, of New Haven, and received both his classical and medical education at Yale, in which his father was one of the professors. He graduated in medicine from that institution in 1823. Dr. Smith was successively attached to medical schools in Philadelphia, Lexington, Ky., and Baltimore, the principal part of his professional career having been spent in the last mentioned city. He had an inventive mind and added considerably to the instrumental and operative improvements of both surgery and ophthalmology. Some of his ophthalmologic instruments will be referred to later. Dr. Smith was the grandfather of our distinguished colleague, Dr. Samuel Theobald of Baltimore.

SAMUEL D. GROSS.—It would be quite unjust to limit my references entirely to those whom I have already considered. Certain other surgeons of a little later period were so active in this department of practice that some mention should be made of them also. I wish first to take note of Samuel D. Gross, who was not only one of the greatest surgeons of his time, but practiced ophthalmology and contributed to ophthalmologic literature from the earliest periods of his professional life almost to the time of his death. In fact, at the time of



DR. NATHAN R. SMITH (1797-1887).



DR. SAMUEL D. GROSS (1805-1884).

his graduation his thesis had for its subject "The Nature and Treatment of Cataract," to the composition of which he devoted unusual care and labor. In his autobiography (vol. i, p. 39) he says: "I had seen many cases of this disorder during my Philadelphia pupilage.[17] It is a subject which during my prolonged professional life has deeply interested me." So prominent was he in ocular surgery at the close of the first half of the nineteenth century that he was elected one of the delegates from the United States to the first international ophthalmologic congress, held in Paris in 1857, and contributed to it an important paper in regard to the prevailing eye diseases of this country. He was also one of the first to operate for strasbismus, and he wrote a valuable paper on the subject, which was published in the *Western Journal of Medicine and Surgery* in 1842. One of his cotemporaries said that this article "abounded in discriminating criticisms on popular errors on the subject and furnished the best statistics on the subject anywhere to be found."[18]

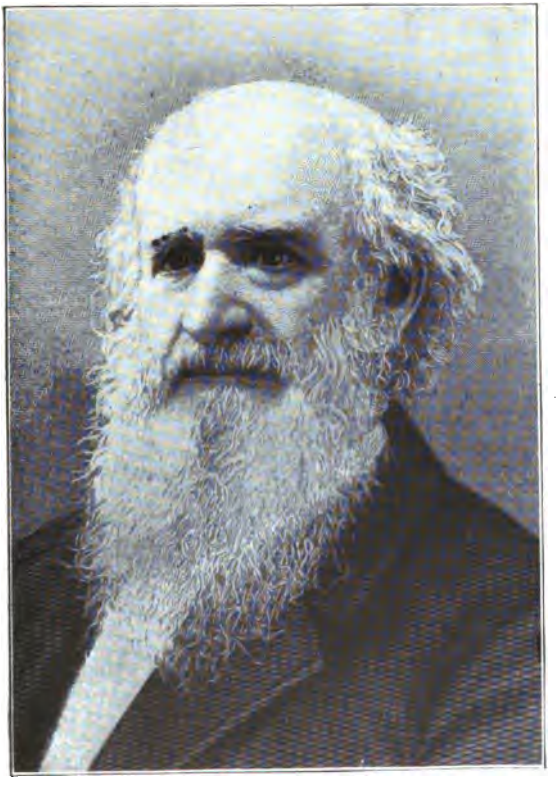
Dr. Gross was born in 1805 and died in 1884. He was a student of medicine of the celebrated Dr. George McClellan, to whom I have already made reference, and graduated from the Jefferson Medical College in 1828. The first period of his career was in the then West (Cincinnati and Louisville). He finally took up his residence in Philadelphia, and in 1856 was made professor of surgery in the college from which he received his medical degree. He was a voluminous writer, but one of the most charming, clear and systematic of medical authors. He will, of course, be especially remembered

17. Probably under Dr. McClellan.
18. Dr. Reese in Cooper's Surgical Dictionary, Am. Ed., 1842, p. 128 of supplement.

for his "System of Surgery," the first edition of which appeared in 1859. A man of his versatility, of his surgical judgment and skill and of his diversified practice will never be forgotten; and, inasmuch as he was so distinguished in ophthalmologic practice, our own "cult" should show him special homage.

ALFRED C. POST.—Still another practitioner who contributed to the advancement of ocular surgery was Alfred C. Post, who lived and practiced in New York City. He was born in 1806 and died in 1886. He graduated in arts from Columbia College in 1822 and from the College of Physicians and Surgeons in medicine in 1827. He afterward continued his medical studies in Paris, Berlin, Vienna and London, returning to New York in 1829, where he began the practice of surgery. As a teacher of surgery he served first the College of Physicians and Surgeons, and afterward the Medical Department of the University of the City of New York. As a surgeon he was attached, at different times, to the New York Hospital, the Presbyterian Hospital, St. Luke's Hospital and others. He achieved great fame in surgery, being noted for precision and dexterity in his operations. He also exercised much mechanical ingenuity in devising instruments and methods of operating, laboring particularly to improve plastic surgery, both generally and in the region of the eye. His first case of blepharoplasty was reported as early as 1842, in a paper entitled "Blepharoplastic Operations for the Cure of an Aggravated Case of Ectropion."[19] He also read an important paper on the same subject before the American

19. New York Medical Gazette, vol. ii, 1842, p. 23.



DR. ALFRED C. POST (1806-1886).

DR. JOHN H. DIX (1813-1884).

Medical Association in 1878.[20] His deep interest in ocular surgery was manifest on various occasions and should not be forgotten. His principal writings were published in medical periodicals, with the exception of a small volume on strasbismus, which was issued in 1841. Dr. Post was the son of Joel Post and was born in New York, where he lived during his whole life.

JOHN H. DIX.—Belonging to this period was John H. Dix. He was born in Boston in 1813 and died there in 1884. He graduated in arts from Harvard College in 1833, and in medicine from Jefferson Medical College, Philadelphia, in 1836. He at once began the practice of medicine in his native town, giving especial attention to diseases of the eye. In 1846 he visited Europe, where he continued his study of this subject. At home he was one of the most active workers in that field, and was a frequent contributor to the ophthalmologic literature of his time. He was always alert to the latest discoveries and was the first[21] in America to follow the example of Dieffenbach in the operation for strabismus, reporting his case in September, 1840. He again operated Oct. 16, 1840, in the presence of Drs. Reynolds, Jeffries, Hooper, Bethune and Charles Ware.[22] He is said to have been a skilful operator and a very close and discriminating observer.

D. HAYES AGNEW.—Only a brief sketch can be given here of this great surgeon, although, like others to whom I have similarly referred, he is worthy of a more detailed presentation and study. He came into surgical

20. Transactions of the American Medical Association, vol. xxxix, 1878, p. 353.
21. Boston Medical and Surgical Journal, Sept. 30, 1840.
22. Medical Examiner, Philadelphia, 1840, iii, 760.

prominence soon after Dr. S. D. Gross had risen to his zenith. He, too, practiced ophthalmology in connection with general surgery. He was born in Nobleville (now Christiana), Lancaster County, Pa., in 1818, and died in Philadelphia in 1892. His father was a physician of local renown and belonged to the family of Agnews, who have been more or less distinguished both in Europe and America since the Norman conquest of England. Young Agnew received a good classical education, although he never took a degree in arts. He studied medicine with his father, and in 1836 entered the Medical Department of the University of Pennsylvania, from which he graduated in 1838. He then returned home and for five years practiced with his father, after which he endeavored to establish himself elsewhere in different places, but without success. Between the years 1844 and 1847 he undertook a business enterprise, which resulted in failure. He then returned again to the practice of his profession, first in the country and afterward in Philadelphia. He removed to that city in 1848 and at once began a career of teaching and practice which culminated in his being one of the most famous surgeons in the United States. It would be untimely for me to take note of the various steps which led up to such renown. In a general way I may say that his professional relations to hospitals were numerous. His popularity as a teacher, both in his private schools and in the University of Pennsylvania, was unrivaled. As a writer he contributed many papers and monographs to the literature of surgery of much value. The great work, however, of his life and that which will stand as an enduring monument to his memory was the "Prin-

DR. D. HAYES AGNEW (1818-1892).

ciples and Practice of Surgery," in three volumes, the first being published in 1878 and the last in 1883. Immediately after its publication Dr. Gross was asked what he thought of it, and in his impressive style he said: "I sat up nearly the whole of the night before last reading this work, and I will venture to assert that 'Agnew's Surgery' will be read and consulted by the medical world long after the dust has settled forever on the covers of similar works." To an added inquiry, "How do you think it compares with your own work?" Dr. Gross modestly replied: "Why, sir, mine is in comparison a pigmy." In a letter to Dr. Agnew later Dr. Gross said: "You have produced a great and noble work, one creditable alike to yourself, your profession and your country." The subject of diseases of the eye was carefully and fully considered, and the section devoted to it gives ample evidence of the author's familiarity with it. It is a most creditable production.

Dr. Agnew's personality was impressive and attractive. He was tall, like his ancestors. It is said that his father, who was the shortest of seven brothers, had a height of six feet and two inches, the tallest of the seven being six feet and seven inches. As a man and physician (and he practiced "internal medicine" as well as surgery to the end of his life) he was greatly honored. He was never morose, never discouraged, always calm exteriorly. Although reticent and undemonstrative, he was always cheerful. He had no jealousies and was ever ready to assist the weak and struggling practitioner. He did not attain his preeminent position in surgery suddenly. The first fifteen years of his professional

life seemed to him fruitless and unsatisfactory, but by patient industry and tireless application, wise judgment, thorough knowledge, consummate skill, honest purpose of word and act, he rose to a distinction in the profession seldom attained.

Dr. Agnew took great interest in ophthalmic surgery and was one of the surgeons to Wills Eye Hospital from 1864 to 1868. He was an expert operator on the eye, and his thorough knowledge of the subject is made evident by the manner in which he has presented it in his "Surgery."

WILLIAM CLAY WALLACE.—A man who will long be remembered, not for his eminence in the profession, but for a work on the comparative anatomy of the eye, and especially of the ciliary muscle of that organ, including its physiology, is William Clay Wallace of New York City, who styled himself "oculist." It is because of Dr. Wallace's work on the ciliary muscle, which included original and careful dissections, and his theory of the accommodation of vision to different distances, that I hereby refer to his name. I am, however, unable to obtain a sketch of his life. I shall refer to his work in another connection.

That Dr. Wallace had a recognized standing is proved by the fact that Dr. Reese included him in his list of American surgeons who were his collaborators in producing the American edition of "Cooper's Surgical Dictionary" in 1842.

MR. HENRY HOWARD—In the history of the ophthalmology of Montreal I find one man who early undertook to limit his practice exclusively to the treatment of dis-

eases of the eye. This man was Mr. Henry Howard. He studied this subject undoubtedly with a great deal of care under the instruction of the distinguished Professor Arthur Jacob of Dublin Ireland, and he was found engaged in this special practice in Montreal for several years beginning in 1846.

IV.

THE AMERICAN LITERATURE ON OPHTHALMOLOGY DURING THE FIRST HALF OF THE NINETEENTH CENTURY.

The books that were published during this period by American authors were few and their merits varied. Some were excellent both in subject matter and style and others were inferior. Several English works were republished in this country with the revisions and additions of our best men. I will speak of this literature very briefly.

THE FIRST AMERICAN BOOK ON DISEASES OF THE EYE.

The first American book on ophthalmology was that of Dr. Frick entitled: "A Treatise on the Diseases of the Eye, Including the Doctrines and Practice of the Most Eminent Modern Surgeons, and Particularly those of Professor Beer. By George Frick, M.D., Ophthalmic Surgeon to the Baltimore General Dispensary. With an engraving. Baltimore: Fielding Lucas, Jun., 1823."

This is an octavo volume of xx-320 pages, with one plate illustrating instruments for operation for cataract.

The book is a precious souvenir of the early ophthalmology of America, first, because it was the first American treatise on diseases of the eye, and, second, because it was the production of a young man who had had unexcelled training and a diversified experience under the tutelage of Dr. George Beer of Vienna, the greatest ophthalmologist that the world had then ever known.

The author says in the introduction that the volume is little more than the abstract of a course of lectures which he had prepared on diseases of the eye and represents the teaching of Dr. Beer, to which "he has endeavored to add what he has conceived most important from the experience and practice of others, together with such remarks as his own observations have supplied."

The arrangement "is founded on the variety of textures which enter into the structures or composition of the eye, and is comprehended under four general divisions. The *first* includes the various forms of inflammation of the eye; the *second* the effects of sequelæ of this inflammation; the *third* comprehends the various diseases of the appendages, and the *fourth* such diseases as attack at the same time several or all of the tissues of the organ."

Dr. Frick laments "that the pathology of the eye has not kept progress with the advanced state of pathologic science in general, and this is attributable, no doubt, to the circumstances that this branch of the healing art has been confined for so long a time to exclusive oculists," and also that diseases of the eye have "obtained but a small share of the attention of the profession." The work is a model, from the literary standpoint, and is clear and concise in expression.

I can not dwell on the contents of this book, but I wish to call particular attention to his chapter on cataract. After describing, with the utmost clearness, the nature of cataract and the different methods of its treatment, including its extraction and absorption, he comes to the following conclusion:

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laid before the meeting a series of preparations of the eye made by Dr. Wallace which, he said, were calculated to establish some important points in the theory of vision.

JAMES W. POWELL ON THE EYE.

"The Eye: Its Imperfections and Their Prevention," published by the author, 1847.

This is a small octavo volume of 140 pages, published, probably, more for the purpose of advertising the author than of enlightening the profession. It deals in the most meager manner with the "anatomy and physiology of the organ of vision, rules for the prevention, improvement and restoration of sight, with remarks on near sight and aged sight, on optics, and the uses and abuses of spectacles, with directions for their selection." The author signs himself a member of the College of Surgeons of Ireland and "oculist and aurist," and says his hours of attendance at his residence and office, 261 Broadway, New York, are from 9 to 4. At the conclusion of the book he wishes, also, to inform persons residing at a distance that they may obtain his "opinion on various affections of the eye and ear by writing a description of their case and enclosing a fee of three dollars." Dr. Powell was a pupil of the celebrated Dr. Arthur Jacob, of Dublin, whose lectures, and those of others, he attended from 1828 to 1833. Undoubtedly Dr. Powell was a well-informed man, but his book shows that a commercial spirit dominated certain physicians half a century ago, as well as in our own time.

WORKS ON STRABISMUS.

As soon as Dr. Dieffenbach, of Berlin, had published his operation for strabismus, the profession of the world

was very much aroused over a procedure which apparently gave such marvelous results. As has always been the case, American surgeons caught the enthusiasm and many were the reports of operations made by them throughout the United States, and many were the improvements that were suggested. A number of "treatises" were also soon published. It is the latter that I desire to chronicle in this connection.

As I have already stated, Dr. John H. Dix, of Boston, is said to have been the first to perform Dieffenbach's operation in the United States. In 1841 he published a small book covering the causes, symptoms and operative treatment of strabismus. It is entitled "A Treatise on Strabismus, or Squinting, and the New Mode of Treatment."

In the same year, 1841, Alfred C. Post, of New York, published a small 16mo volume on the same subject, with excellent colored plates, illustrating the anatomy of the muscles involved, the instruments used, and the methods of operation. It was entitled "Observations on the Cure of Strabismus, with an Appendix on a New Operation for the Cure of Stammering."

Following the small works of Dix and Post was that of James Bolton, of New York, in 1843, which he entitled "A Treatise on Strabismus, With a Description of New Instruments Designed to Improve the Operation for Its Cure, in Simplicity, Ease and Safety." This was a small octavo volume treating the subject of strabismus very much as the others had done. Bolton was a young man and had undoubtedly been attending the clinics at the New York Eye Infirmary, and, through one of his teachers, Dr. John Kearney Rodgers,

to whom he dedicated the volume, he had become very much interested in the subject, had studied it carefully, and embodied in his "treatise" the best conclusions of the time.

Four years after the works of Dix and Post, Dr. Frank H. Hamilton, at that time professor of surgery in Geneva Medical College, Geneva, N. Y., published a very small 16mo volume, entitled "A Monograph on Strabismus, with Cases." Buffalo, N. Y., 1845. It was scarcely more than a bound pamphlet, which, he stated, was for the use of his medical students.

WEAKNESS OF SIGHT.

Another small book which attracted considerable attention was one by John H. Dix, of Boston, entitled "Treatise on the Nature and Treatment of Morbid Sensibility of the Retina, or Weakness of Sight." Boston, 1849. This little book was the republication of an essay which gained the Boylston prize for 1848, and, from the standpoint of ophthalmologic knowledge then, it was esteemed an important contribution.

Aside from the binding into book form of a few papers of minor importance, no other ophthalmologic books than those above mentioned were written by Americans having a professional standing during the first half of the nineteenth century.

AMERICAN EDITIONS OF ENGLISH WORKS ON DISEASES OF THE EYE.

I will now supplement the above notices of American works on the eye by a list of English works which were republished in this country under the editorial supervision of American practitioners. Several works were

also republished here, besides the ones that I shall mention, such as the works of Saunders, Vetch, and early editions of Lawrence and Mackenzie, but without American revision. The first in the list was Delafield's edition of Travers' work: "A Synopsis of the Diseases of the Eye and Their Treatment, to Which Are Prefixed a Short Anatomical Description and a Sketch of the Physiology of That Organ, by Benjamin Travers, F.R.S., surgeon to St. Thomas' Hospital, with notes and additions by Edward Delafield, M.D., surgeon to the New York Eye Infirmary and lecturer on diseases of the eye. First American from the third London edition. Published by E. Bliss and E. White, New York, and H. C. Carey and I. Lea, Philadelphia, 1825," 8vo, pp. xxi-474.

This book was brought out by Dr. Delafield in this country not long after he and Dr. Rodgers organized the New York Eye Infirmary. In its English form, the work was a very desirable manual, but its value was materially enhanced by the numerous additions and notes, as well as illustrations, which Dr. Delafield incorporated.

"A Treatise on Diseases of the Eye, by William Lawrence, F.R.S. A new edition, with many modifications and additions, and the introduction of nearly two hundred illustrations by Isaac Hays, M.D." 8vo, pp. 900. Philadelphia: Lea & Blanchard, 1847.

William Lawrence's work on the eye was encyclopedic in character, and in its revised and enlarged form it was cordially received by the American profession.

"Principles and Practice of Ophthalmic Medicine and Surgery, by T. Wharton Jones, F.R.S., etc., with 102

illustrations. Edited by Isaac Hays, M.D., surgeon to Wills Hospital." 12mo, pp. 510. Philadelphia Lea & Blanchard, 1849.

This work of Mr. Jones was issued by the same publishers and under the same editorial supervision as that of Lawrence. It was more concise and was intended to serve the profession in another way. In the words of the editor, "it was one of the series of manuals intended for students. By its conciseness and systematic arrangement the author was enabled to embody such material as would be suitable for the student within a small compass."

"Spectacles: Their Uses and Abuses in Long and Short Sightedness, and the Pathologic Conditions Resulting from Their Irrational Employment, by J. Sichel, M.D. Translated from the French by permission of the author by Henry W. Williams, M.D. Boston: Phillips, Sampson & Co., 1850."

This was not a republication of an English author, but was a translation of an excellent French work by the learned Dr. Sichel, which gave the latest views on the abnormal refractive conditions of the eyes, several of which, he believed, were caused by the abuse of spectacles. While these views have radically changed since that time by the teachings of Donders, yet the book has a recognized historical value.

PUBLICATIONS IN MEDICAL PERIODICALS.

From the very beginning of the last century our American medical periodicals have always been more or less alive to the importance of that department of medicine pertaining to diseases of the eye. The *American Medical Recorder,* the *Journal of the Medical and Phys-*

ical Sciences, and the successor to both of these, *The American Journal of the Medical Sciences,* of Philadelphia, and the contemporary *New England Journal of Medicine and Surgery,* of Boston, and several medical journals that were started at about the same time in New York and the West, all contain articles of more or less ophthalmologic interest.

Dr. Frick, of Baltimore, in 1821, 1822 and 1823, contributed, each year, to the *American Medical Recorder* (Philadelphia). His articles were on the subjects of conjunctivitis, cataract and the various modes of operating, and on modes of operating for artificial pupil. They were in reality an extended summary of what was known in regard to those subjects at that time, and to the medical historian are to-day of much interest. Since Frick published his book, little or nothing is found written by him.

The writings of Dr. Isaac Hays were almost without exception published in the journals in which he had an editorial interest. As early as 1826 and 1827 we find long and well written articles on inflammation of the conjunctiva and of the sclera, in 1828 on the diseases of the cornea and their treatment. From that time to 1850 he published many valuable and interesting papers, abstracts and discussions on various ophthalmologic subjects.

Dr. Littell was not a prolific writer. The few articles, however, that he did write were published in the same journals as those of Hays, and were meritorious. The most frequent contributors in Boston to medical journals were John Jeffries (a few reports), John H. Dix with great frequency, and later George A. Bethune.

The ophthalmologic contributors in New York, Baltimore, Louisville, Cincinnati and other cities were less numerous, but after the announcement, through the medical journals, of Dieffenbach's operation for strabismus, the periodical literature on that subject became quite voluminous and was widely scattered throughout America. In fact, there was so much of it that I shall not undertake to review it.

Many reports on rare cases of diseases of the eye, many experiences and different views on ophthalmologic subjects were published here and there in the numerous medical periodicals of the United States. These are so diversified in character and the authors so many that they, too, cannot be specifically referred to. One feature of medical journalism in this country, embodied especially in *The American Journal of the Medical Sciences,* was reports of the progress of the medical sciences, with a department given up exclusively to ophthalmology. I believe it is impossible to measure the good that Dr. Hays did to the American profession by publishing, from quarter to quarter, the essentials of the current ophthalmologic contributions of the world. The abstracts were of sufficient length to make the subjects under discussion intelligible, and, through this channel alone, he advanced very materially the knowledge of ophthalmology in this country. At the time when this was done it was impossible for any but an experienced ophthalmologist, like Dr. Isaac Hays, to realize the professional needs and to be able to supply them so well. For this, if nothing else, ophthalmology, to-day, owes this great man an undying gratitude.

THESES.

Besides the journalistic contributions, I find a number of theses, or dissertations on the eye or its diseases, of special interest, and among them I may mention one on cataract by Isaac Cleaver, University of Pennsylvania, 1805 (dedicated to Dr. Phillip Syng Physick); another on the nature and treatment of cataract, by Samuel D. Gross, Jefferson Medical College, Philadelphia, 1828 (dedicated to George McClellan), and still another on the same subject by Arthur B. Stout, College of Physicians and Surgeons, New York, 1837 (dedicated to Drs. Edward Delafield, John Kearney Rodgers and James Edward Cornell); one on the eye and on vision by Elisha DeButts, University of Pennsylvania, 1805 (dedicated to Dr. Casper Wistar); one on ophthalmia, by David Morre, University of Pennsylvania, 1807 (dedicated to Drs. John Claiborne and John B. Walker, both of Virginia), and one on Iritis, by Richard Kissam, College of Physicians and Surgeons, New York, 1839 (dedicated to Drs. Edward Delafield and John Kearney Rodgers). These essays have distinct merit as representing the knowledge of the times in which they were written. There undoubtedly were many other theses on ophthalmologic subjects, but these serve to indicate that ophthalmology was by no means entirely neglected in the teachings of our early medical schools.

V.

SOME SPECIAL AMERICAN CONTRIBUTIONS TO OPHTHALMOLOGY.

In times past, as well as to-day, there have been many evidences of great surgical originality and insight on the part of Americans. In some instances they have been shown by suggestions, in others by demonstrating important procedures and devices. When Dieffenbach's operation, for example, had been made public, it was found that the same operation had long before been suggested and even performed in this country. The great misfortune was that the genius of our American surgeons had not always been put more fully into light and recorded.

DR. INGALLS' SUGGESTION OF THE OPERATION FOR STRABISMUS

was made as early as 1812, as is proved by the following:

PROVIDENCE, Feb. 8, 1841.

To the Editors of the *Medical Examiner.*

Gentlemen:—I have this day received the following letter from Samuel Y. Atwell, Esq., of this city, in which he gives the credit of having first suggested the operation for strabismus to Dr. William Ingalls of Boston.

Mr. Atwell is an eminent member of the legal profession in this state, and his statements are worthy of the highest credit.

I think it due to Dr. Ingalls that the fact of his having first suggested the operation, should be made known to the profession.

I also send you notes of two cases of strabismus on which I have operated successfully. Your obedient servant,

HENRY WHEATON RIVERS, M.D.

PROVIDENCE, Feb. 8, 1841.

Dear Sir:—I observe from the newspapers that you have operated with great success in several cases of strabismus, or squinting. I have also noticed this operation spoken of as a new discovery in the art of surgery, and is said to have lately originated in Germany. Now, sir, I think we should give honor where honor is due. In the years 1812 and '13 I attended courses of surgical and anatomic lectures delivered before the Medical School of Brown University, by William Ingalls, M.D., of Boston, then the professor of anatomy and surgery in that institution; being subject myself to this infirmity (strabismus), Dr. Ingalls took frequent opportunities to explain to me the method of its surgical cure; he did this by dissecting the eye itself, explaining the power and disposition of several muscles appertaining to that organ, and showed me how by division of one or more of them, the eye might be brought to its proper place. In my own case I know he proposed to divide the *rectus internus*. So strongly was I impressed with the practicability and success of this operation, that I strongly urged my father to permit me to submit to the operation; but upon the nature of the operation being explained to him, he declined the permission, because he feared the effect might be to turn the eye the other way.

I make this statement in justice to my friend and quondam master, and to show that we have surgeons in this country as learned in their profession as some in Europe. Respectfully, your obedient servant. SAMUEL Y. ATWELL.

To Henry W. Rivers, M.D., Providence, R. I.

Then follows a report of two cases successfully operated on by Dr. Rivers on Dec. 23, 1840, and Jan. 13, 1841, respectively, by dividing the rectus muscle (ex-

ternus, first case, divergent; internus, second case, convergent).[23]

Soon after that William Gibson, who was then professor of surgery at the University of Maryland, actually operated for this condition. Dr. M. D. Reese, in 1842, in his supplement to the "Surgical Dictionary" of Samuel Cooper (p. 127), refers to the subject in these words:

It appears from the "Institutes of Surgery" that Professor Gibson attempted the cure of strabismus by dividing the recti muscles of the eye precisely as now practiced, some twenty years since in Baltimore. Soon after, he repeated it unsuccessfully, in Philadelphia, in several cases, and was induced to abandon it by the unfavorable opinions expressed on the operation by Dr. Physick. He, however, inculcated the propriety of the operation on his class many years since, and Dr. A. E. Hosack of New York, then one of his pupils, distinctly recollects Dr. Gibson's expressions of confidence that the operation would ultimately succeed.

Dr. Gibson himself in the sixth edition of his "Institutes of Surgery," published in 1841, describes in detail the operations which he performed in 1818, and also adds that on the advice of Dr. Physick he was led to abandon these experiments. His reference to the subject will be found on page 375 of his work.

Dr. Harry Friedenwald, of Baltimore, in his "Early History," etc., quotes Dr. Gibson's remarks in full.

GIBSON'S SCISSORS FOR OPERATION OF ABSORPTION OF CATARACT.

William Gibson,[24] then professor of surgery, University of Pennsylvania, in 1821, described an instrument

23. Philadelphia Medical Examiner, iv, 119.
24. Phila. Jour. Med. and Phys. Sci., 1821, iii, 192.

for "cutting to pieces the crystalline lens in all cases of cataract." It was a pair of scissors, thus described:

So delicate as hardly to exceed, in size, the iris knife of Sir William Adams, and at the same time, so strong and sharp as to cut, with ease, the most solid and compact lens and capsule, without injuring, in the slightest degree, any part of the eye. These scissors are formed on the principle of Mr. Willaston's scissors, used for common purposes—with the edge so constructed as to operate like a knife. On this account, the instrument perforates the coats of the eye with the utmost facility, and when introduced, the blades can be opened to a certain extent so as to cut the lens to pieces without bruising it or any other part—the necessary effect of scissors, as they are usually made. This instrument possesses another advantage—the lens is supported in its natural situation during the operation, by having one blade behind, and the other before it, so that it may be cut to pieces, in situ, and its remains afterwards forced, by the shut blades, into the anterior chamber, for dissolution.

At the time Dr. Gibson suggested this instrument, "dissolution" of cataract had become a popular method of operating through the influence of Saunders and Adams, of London, and the scissors were offered as a substitute for needles, the use of which was frequently attended by dislocation of the lens into the vitreous humor.

ANOTHER INGENIOUS METHOD OF ABSORBING CATARACT.

Dr. Gibson's originality was further illustrated by another method which he adopted for the absorption of cataract.[25] His operation was described by Dr. J. Revere, of Baltimore, in a letter dated March 2, 1819. It consisted in passing "a common sewing needle, slightly curved and armed with a single thread of silk"

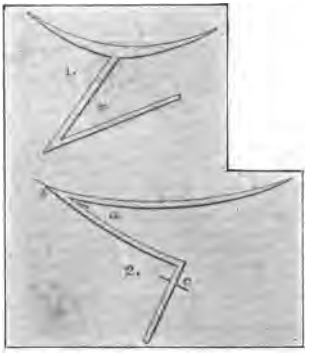
25. New England Journal of Medicine and Surgery, 1818, viii, 119.

through the sclera about two lines from the cornea, through the opaque lens and sclera of the opposite side at a point corresponding to the one at which it was introduced, the pupil having been previously dilated with belladonna. "The silk being drawn through and the ends cut off, a single thread was thus left passing through the ball of the eye and acting on the diseased lens in the manner of a seton." Dr. Gibson had operated in this manner on two cases. "No reaction or accident intervened, and at the end of ten days, in both cases, the diseased lens had disappeared." The silk was then withdrawn and in a few days the vision was restored. In a third case in which this operation was performed "it failed in consequence of the iris being wounded" and the thread was withdrawn at an early period because of inflammation. The wound of the iris was attributed to not using belladonna.

HORNER'S OPERATION FOR ECTROPION OF THE LOWER LID.

Dr. Horner, like many others, devised a very ingenious operation for ectropion of the lower lid which he described in the *American Journal of the Medical Sciences*, 1837, vol. xxi, p. 105. It deserves to be remembered as an original and effective method of correcting this deformity. Dr. Horner had performed it as follows: "An incision, two inches in length and down to the bone, was made parallel with and at the inferior margin of the orbicularis muscle. The whole thickness of the eyelid was then dissected up from the adjoining bones. From about the middle of that incision started another, of an inch in length, downward toward the angle of the jaw. From the termination of the latter another

incision of the same length was directed toward the root of the nose. The two last incisions consequently defined an angle of integuments, which, being dissected up as far as its base, was then turned into the beginning of the first incision. The following diagram will illustrate the operation.



Diagrams illustrating Horner's operation.

"The angle A, Figure 1, taken from the cheek was inserted into the lower eyelid, as seen in Figure 2, and a pin fixed at b and another at c, so as to keep the parts in place. An almost immediate correction of the deformity ensued."

The ordinary dressings were applied over the eye and recovery was rapid.

OPERATION FOR BLEPHAROSPASM.

Dr. George C. Blackman, a prominent surgeon of New York, again illustrated the resourcefulness of our American surgeons by devising a method of operating for blepharospasm, which, in a modified form, has since

been widely practiced. His case was recorded in the *New York Lancet,* 1842, vol. i, p. 410. The operation was used as a last resort after every remedy which seemed applicable had been unsuccessfully tried. Dr. Blackman's description is as follows:

After explaining to the patient the nature of the operation which I thought likely to raise (open) the eyelid, she readily consented to its performance. With the assistance of Prof. Willard Parker and Dr. Hall, I divided the *musculi orbicularis palpebrarum* in the following manner: The patient was seated on a low stool before the window; Professor P. then passed a smooth ivory handle beneath the lid, in order to protect the eyeball, whilst with a straight, narrow tenotome, a puncture was made near the outer margin of the lid, and midway between the outer and the inner angle. The knife was passed on towards the superciliary ridge, when, turning the edge towards the muscle, and by gently pressing during the act of withdrawing, its fibers were easily divided. The muscle both at the inner and outer edge of the eye I divided in the same manner, in every instance leaving the conjunctiva entire. Instantly our patient remarked that she could raise the lid so as clearly to distinguish objects across the street. Professor P. then suggested that the division of the lower portion of the muscle might relieve the entropion of the lower lid. This I divided in the manner before mentioned, and much to our satisfaction, the entropion immediately disappeared. . . .

From the happy effects which followed the division of the muscle in the lower lid, as Professor Parker recommended, I have but little doubt but that we now possess an easy and effectual remedy, perhaps in a majority of the cases of this troublesome affection. G. C. BLACKMAN, M.D.

NEW YORK, June 14, 1842.

BLEPHAROPLASTY.

Alfred C. Post was probably the first in America to successfully perform plastic operations to correct deformities of the lids resulting from cicatrices. His first

account was published in the *New York Medical Gazette,* Jan. 19, 1842. His example was soon imitated by Dr. J. Mason Warren of Boston, Dr. George McClellan and Dr. Mütter of Philadelphia and others. Dr. Horner's method, which was reported in the *American Journal of the Medical Sciences* for 1837, was entirely different in its principles.

INSTRUMENTS AND OPERATION FOR LACHRYMAL STRICTURE.

Dr. Nathan R. Smith, the eminent Baltimore surgeon, early devised a knife for dividing strictures of the nasal duct. His instrument is figured in vol. iii, p. 161, of Norris and Oliver's System of Diseases of the Eye. The operation which he performed antedated Stilling's by many years, having been done as early as 1846 at least. Dr. Smith also used gold lachrymal canulæ of his own device, which were an improvement on the old forms.[26]

ABSCISSION OF THE CORNEA.

Prof. L. A. Dugas, of Augusta, Ga., was an eminent surgeon of the South who also gave much attention to diseases of the eye. In 1840 he practiced an operation on the eye in certain conditions of corneal staphyloma, which has since met with much favor by experienced ophthalmologists. The operation was the abscission of the cornea, which he did "by passing a tenaculum through the cornea and excising it with the straight bistoury without touching the sclerotica." Dr. Dugas seems to have used proper discrimination in his cases and preferred this method to the excision of the whole

26. Norris and Oliver's System, iii, 157.

eyeball. The deformity resulting from his operation was greatly diminished, while the removal of the cornea was attended with no danger.[27]

CHLORID OF SODIUM IN PURULENT OPHTHALMIA.

Dr. L. A. Dugas, of Augusta, Ga., published a paper in the *Southern Medical and Surgical Journal* for 1837 on "Purulent Ophthalmia," in which he related several cases, all of which were successfully treated by a solution of chlorid of sodium as a wash, one-half ounce to a quart of water.

If there were no medicinal properties in chlorid of sodium, it served the purpose of cleanliness at least, and it is possible that effectual cleanliness in purulent conjunctivitis is better than the indiscriminate use of some of the strong drugs which have, during later years, been so popular.

POTASSIUM IODID IN DISEASES OF THE EYE.

As early as 1842 Dr. Isaac Parrish,[28] of Philadelphia, recommended this drug in certain ophthalmic diseases, in doses of from two to six grains, three times a day. He believed it had potency in relieving inflammatory affections "involving the deep tunics of the eye."

HORNER'S MUSCLE.

In 1824 Dr. William E. Horner (1790-1853), of Philadelphia, who was an excellent anatomist and very painstaking and minute in his dissections, described[29] a muscle which he believed to be separate from the or-

27. Reese: Cooper's Surgical Dictionary, Supplement, 1842, p. 75.
28. Medical Examiner, April 16, 1842.
29. Phila. Jour. of Med. and Phys. Sci., 1824, viii, 70.

DR. WILLIAM E. HORNER (1790-1853).

bicularis of the eyelids and which extended along the course of the lachrymal canals of the lids from the crest of the lachrymal bone to the lachrymal puncta. The article was entitled "Description of a Small Muscle of the Inner Commissure of the Eyelids." He said that a "compend of the foregoing description was published two years ago" (p. 72). The function of this muscle he believed to be to "apply the puncta lachrymalia to the ball of the eye." This muscle has from that time been called "Horner's muscle" in almost all of the anatomic descriptions of the eye, and has been regarded by physiologists as having the special function, noted by Dr. Horner himself, of facilitating the excretion of the tears. While it is a structure of small size, yet it deserves the attention that it has received, and has a useful function in the "economy" of the eye. Horner will be remembered for many generations as its discoverer.

FIRST CASE OF ASTIGMATISM IN THIS COUNTRY FOR WHICH CYLINDRICAL GLASSES WERE MADE.

Isaac Hays, in his American edition of Lawrence on "Diseases of the Eye," of 1854, p. 669, and Dr. Henry D. Noyes, of New York, in the *American Journal of the Medical Sciences,* 1872, vol. lxvii, p. 355, both described the case of Rev. Mr. Goodrich, who had deficiency of sight, which he called "near sighted," because he was obliged to approach nearer to objects to see them than most persons. This man had noticed that in looking at lines, or branches of trees, or the rigging of a ship, that those objects having a vertical direction were more distinct than those having a horizontal direction. In 1828 he consulted a skilled optician, Mr. John McAllister, of

Philadelphia. After studying the case and making tests, McAllister had a glass ground, "plane on one side and to a section of a cylinder on the other." This corrected the irregular refraction and the vision was much improved. Mr. Goodrich later became chaplain of the New York State Lunatic Asylum at Utica, and Dr. Noyes came into possession of the glasses. Dr. Noyes says: "They were given to me in a piece of writing paper on which, in the owner's handwriting, was inscribed the following memorandum: 'Number 7, French number, cylinder conc., got of McAllister, May, 1828.'"

Dr. Noyes stated that they were plano-concave cylinders of seven inches' focus, with axes horizontal, and were mounted in a spectacle frame with oval rims. It is believed that these were the first of the kind made in this country, and, according to Dr. Noyes, "they have become historical."

DISLOCATION OF THE LENS.

It is said that Dr. J. C. Warren was the first to describe a case of accidental dislocation of the crystalline lens.[30] He also called the attention of the profession to "rheumatic inflammation of the eye, now universally recognized, but then little was known of its diagnosis."[31]

"INVERTED" VISION.

It is very interesting in this connection to note that perhaps the first case on record of so-called "inverted" vision was reported by Dr. John D. Godman, of Philadelphia, in 1827.[32] His article is headed, "Note of an

30. New England Med. Jour., 1811.
31. Reese's Supplement to Cooper's Surgical Dictionary, p. 75.
32. American Journal of the Medical Sciences, 1827, i, 183.

Interesting Fact Connected with the Physiology of Vision," which he reports as follows:

The following instance communicated to me by Reuben Peale, Esq., the uncle of the young man, is the only one with which we are at present acquainted, where the inversion of objects on the retina was productive of inaccuracy of judgment as to position, notwithstanding all the other senses were in their ordinary condition, and the individual had arrived at the age of 7 years.

When his father, who was a distinguished artist, began to give him lessons in drawing, he was very much surprised to find that whatever object he attempted to delineate, he uniformly inverted. If ordered to make a drawing of a candle and candlestick set before him, he invariably drew it with the base represented in the air and the flame downwards. If it was a chair or table he was set to copy, the same result was the consequence; the feet were represented in the air, and the upper part of the object, whatever it might be, was turned to the ground. His father, perplexed at what he considered the perverseness of the boy, threatened, and even did punish him for his supposed folly. When questioned on the subject the youth stated that he drew the objects exactly as he saw them, and as his drawings were in other respects quite accurate, there was no reason to doubt his statement. Whenever an object was inverted previous to his drawing it, the drawing was made to represent it in its proper position, showing that the sensations he received from the eye were exactly correspondent with the inverted pictures formed on the retina. This condition of his vision was observed to continue for more than a year, when his case gradually ceased to attract attention, which was when he was about 8 years old. Since that time he has imperceptibly acquired the habit of seeing things in their actual position.

COLOR BLINDNESS.

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When his father, who was a distinguished artist, began to give him lessons in drawing, he was very much surprised to find that whatever object he attempted to delineate, he uniformly inverted. If ordered to make a drawing of a candle and candlestick set before him, he invariably drew it with the base represented in the air and the flame downwards. If it was a chair or table he was set to copy, the same result was the consequence; the feet were represented in the air, and the upper part of the object, whatever it might be, was turned to the ground. His father, perplexed at what he considered the perverseness of the boy, threatened, and even did punish him for his supposed folly. When questioned on the subject the youth stated that he drew the objects exactly as he saw them, and as his drawings were in other respects quite accurate, there was no reason to doubt his statement. Whenever an object was inverted previous to his drawing it, the drawing was made to represent it in its proper position, showing that the sensations he received from the eye were exactly correspondent with the inverted pictures formed on the retina. This condition of his vision was observed to continue for more than a year, when his case gradually ceased to attract attention, which was when he was about 8 years old. Since that time he has imperceptibly acquired the habit of seeing things in their actual position.

COLOR BLINDNESS.

This visual defect received attention in this country long before the publication of George Wilson's book in

Philadelphia. After studying the case and making tests, McAllister had a glass ground, "plane on one side and to a section of a cylinder on the other." This corrected the irregular refraction and the vision was much improved. Mr. Goodrich later became chaplain of the New York State Lunatic Asylum at Utica, and Dr. Noyes came into possession of the glasses. Dr. Noyes says: "They were given to me in a piece of writing paper on which, in the owner's handwriting, was inscribed the following memorandum: 'Number 7, French number, cylinder conc., got of McAllister, May, 1828.'"

Dr. Noyes stated that they were plano-concave cylinders of seven inches' focus, with axes horizontal, and were mounted in a spectacle frame with oval rims. It is believed that these were the first of the kind made in this country, and, according to Dr. Noyes, "they have become historical."

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30. New England Med. Jour., 1811.
31. Reese's Supplement to Cooper's Surgical Dictionary, p. 75.
32. American Journal of the Medical Sciences, 1827, i, 183.

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knowledge in general surgery, yet I will take the time to refer to but two American contributions which were made previous to 1850, and which have proved to be so advantageous in ophthalmic surgery and in its advancement. My first reference is to

ANIMAL LIGATURES.

I need not discuss the value of animal ligatures in certain operations on the eye and its appendages. All will agree that it is very great. The credit of suggesting and demonstrating the advantages of such ligatures in surgical practice belongs to an American surgeon, Dr. Phillip Syng Physick, of Philadelphia. The story of Dr. Physick's adoption of the use of animal ligatures is best told by Dr. Frederick P. Henry[38] as follows:

In the *Eclectic Repertory*, 1816, vol. vi, p. 389, there is a letter from Dr. Physick, in which he speaks of the delay in the healing of wounds because of the ligatures in use. He says: "Several years ago, recollecting how completely leather straps, spread with adhesive plaster and applied over wounds, for the purpose of keeping their sides in contact, were dissolved by the fluids discharged from the wound, it occurred to me that ligatures might be made of leather, or of some other animal substance, with which the sides of a blood vessel could be compressed for a sufficient time to prevent hemorrhage, and that such ligatures would be dissolved after a few days and would be evacuated with the discharge from the cavity of the wound." He requested Dr. Dorsey to try such a ligature on a horse, and the result justified his anticipations. The letter goes on to say that, acting on Dr. Physick's suggestion, Dr. Hartshorne had used ligatures made of parchment on some of the arteries, after an amputation of the thigh, and they were found dissolved at the first dressing. Dr. Dorsey,

38. Standard History of the Medical Profession of Philadelphia, 1897, p. 436.

with Dr. Physick's assistance, used French kid ligatures with success in several cases. He experimented with different substances to ascertain which would withstand the solvent power of the pus for the longest time, by applying the material over the surfaces of ulcers. Buckskin and kid dissolved first, then parchment, lastly the catgut. Fearing that the leather might dissolve too soon in tying large vessels, he intended to request Dr. Dorsey to use leather impregnated with the varnish used in making elastic catheters. In his letter he makes the suggestion that perhaps tendon would be found more durable than any of the materials above mentioned.

Further historical details are given in the *American Medical Recorder,* 1819, vol. ii, p. 488, and the *Philadelphia Journal of the Medical and Physical Sciences,* 1821, vol. ii, p. 4.

GENERAL ANESTHESIA.

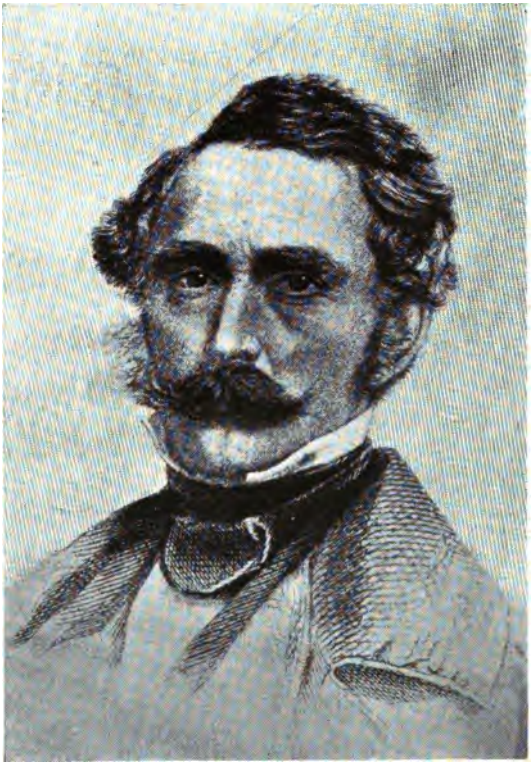
The other contribution, and undoubtedly the most important to surgery, is general anesthesia. This, too, is emphatically of American origin. The history has been so often told that I need only refer to a few facts in connection with it at this time. The first man to use sulphuric ether as an anesthetic was Dr. Crawford W. Long of Jefferson, Jackson County, Ga., in March, 1842. He had graduated from the University of Pennsylvania in 1839, and had spent one year after this in a New York Hospital. His use of ether was the outcome of the knowledge of effects derived from its inhalation as a matter of amusement. His experiments, which were prosecuted in a perfectly scientific manner, demonstrated that the operations which he performed under its influence were done without pain or disagreeable reaction to the patient. His first operation was performed on March 30, 1842, and consisted in the removal of a small cystic tumor of the jaw. His second

operation was on the same patient on June 6, 1842, for the removal of another small tumor. His third case was that of a negro boy who had a disease of a toe which rendered its amputation necessary, and the operation was done on July 3, 1842. Dr. Long continued to use sulphuric ether anesthesia in surgical operations, but, unfortunately, he does not seem to have realized what a vast benefit this discovery would prove, and, being a modest country practitioner, he did not publish his experience until 1849.[39] In 1852 he read a paper on the subject before the Georgia Medical Society, in which he again detailed his experience with ether as an anesthetic. His claims to priority of the discovery were publicly admitted by Dr. Charles T. Jackson in 1861 in the *Boston Medical and Surgical Journal* of April 11, that year.

Another claimant for the early administration of sulphuric ether as an anesthetic, according to Professor Lyman in his work on "Anesthesia," (p. 6) was the late Dr. W. E. Clark, of Chicago, Ill., who, while a student in Dr. E. M. Moore's office, Rochester, N. Y., in the winter of 1842, administered ether to a young woman for the extraction of a diseased tooth, which was done with the patient in an unconscious state. Dr. Moore believed, however, that the unconsciousness was hysterical, and advised his pupil to make no more experiments in that direction, and the advice was unfortunately followed.

It remained for Dr. W. T. G. Morton, later, to rediscover the anesthetic properties of sulphuric ether and to bring the agent to the attention of the public in the form of a proprietary preparation which he named

39. Southern Medical Surgical Journal, December, 1849.



DR. W. T. C. MORTON (1819-1868).

DR. JOHN COLLINS WARREN (1778-1856).

"letheon;" and, so far as the professional world is concerned, sulphuric ether anesthesia had its real birth in the Massachusetts General Hospital on Oct. 16, 1846, at the hands of its originator, Dr. W. T. G. Morton, and under the knife of that progressive and distinguished Boston surgeon, Dr. John Collins Warren. As is well known, the news of this demonstration of sulphuric ether anesthesia spread rapidly throughout the world. It led Sir James Y. Simpson to use chloroform anesthesia at Edinburgh the following year, and from that time till now general anesthesia has been a priceless boon and a most powerful factor in that surgical advancement in which ophthalmology has taken a proportionate share. The extent of the progress which it has furthered can not be measured or even imagined. I need not undertake to picture any of the benefits which operative and experimental ophthalmology has derived from it. It will suffice to say that America would have glorified herself in ophthalmology as well as in general surgery had this been her only contribution.

VI.

THE TRANSITION-PERIOD FROM THE OPHTHALMOLOGY OF THE PHYSICIAN AND SURGEON TO THE OPHTHALMOLOGY OF THE SPECIALIST.

The imperfect review which I have now given of the ophthalmology of America from 1800 to 1850, of its institutions, of the men who were most alive to its interests, of the surgeons who incidentally made it a part of their teachings and practice, and of its literature and contributions, shows what growth can be obtained, what developments can be made, what lasting foundations can be laid in the midst of an environment whose professional standards averaged low, whose professional life in a new country was a struggle for bread, whose professional sentiments were opposed to specialism, looking upon it as disgraceful, and in which a certain amount of apathy toward ophthalmology was always present.

Isaac Hays and his co-workers had, notwithstanding all these hindrances, supplied foreign and original literature which, at the opening of the second half of the nineteenth century, impressed the American profession with the value and respectability of this special science, and the special institutional activities had demonstrated its public as well as private needs and benefits. More and more had a few of our physicians and surgeons in our large cities been extending their practices into this special field. James Edward Cornell, Mark Stephenson,

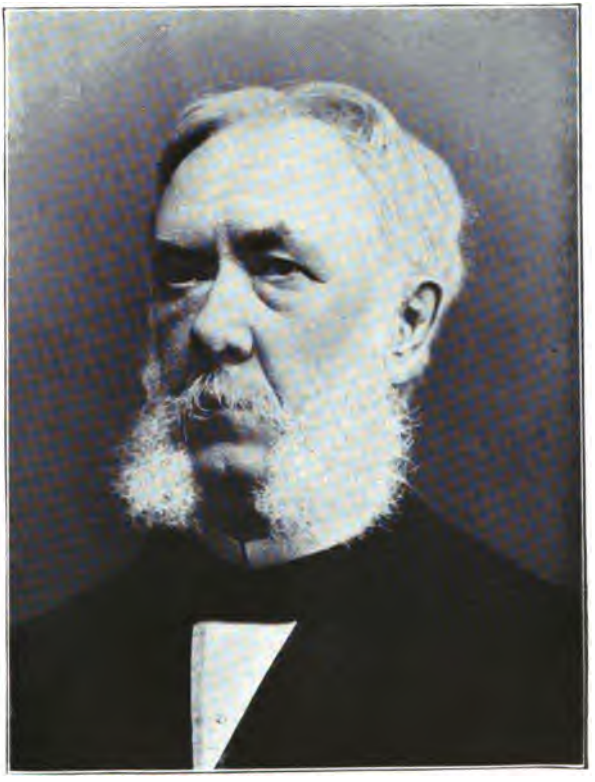
George Wilkes, Freeman J. Bumstead, Henry B. Sands and David L. Rogers, of New York; George Hayward, Robert W. Hooper, Francis P. Sprague, John H. Dix and George A. Bethune, of Boston; Adinell Hewson, Samuel D. Gross, William Hunt, Edward Hartshorne, A. D. Hall, Thomas G. Morton, Henry H. Smith, John Neill, D. Hays Agnew and R. J. Levis, of Philadelphia; Aaron Friedenwald and Nathan R. Smith, of Baltimore; J. S. Hildreth and Moses Gunn, of Chicago; Simon Pollak, William Dickinson, John T. Hodgen, Paul F. Eve and Charles A. Pope, of St. Louis; Robert A. Kinloch, of Charleston; Julius F. Miner, of Buffalo, and Alden March, of Albany, and probably many others whom I do not recall, had been greatly skilled in it, if not foremost in its practice, and their prestige had so dignified it that it needed only the slightest reaction from abroad to establish it as an exclusive department of medicine here. This reaction was imminent, and this specialism was soon to be an accomplished fact

VII.

THE PIONEER SPECIALISTS.

HENRY W. WILLIAMS.

The first American, I believe, to set himself to exclusively special study in Europe was Dr. Henry W. Williams (1821-1895), of Boston. He had begun his medical studies at Harvard in 1844, but it appears that before graduating he went to Europe, where he spent three years, returning in 1849. In the same year he received his M.D. degree from Harvard. While in Europe he took a systematic course in ophthalmology at the then famous clinics of Sichel and Desmarres, of Paris, also following the services at Vienna of Frederich Jaeger and Rosas, and at London of Dalrymple, Lawrence, Dixon, Critchett and Bowman. It was too early to study with von Graefe, von Helmholtz and Donders, for they were just entering on their life work. On his return to Boston, he was appointed one of the district physicians of the Boston Dispensary, and in 1850 was made its first ophthalmic surgeon. In the same year he organized a class of Harvard medical students for instruction in diseases of the eye, in which he was greatly aided by his lifelong friend, Dr. Charles E. Buckingham, who for several years placed at his disposal a very abundant and excellent clinical material at the "Old City Institution" in South Boston. In 1864 Dr. Williams was made ophthalmic surgeon to the City Hospital, a position which he held for many years. In



DR. HENRY W. WILLIAMS (1821-1895).

1869 he was made lecturer on ophthalmology, and in 1871 professor of ophthalmology in Harvard Medical College. It is said that his teaching was lucid and practical, and was always admirably suited to the just requirements of the particular class of hearers, whether physicians or students, to whom it was addressed.

Through the long succession of ophthalmic internes and externes under him at the City Hospital, and the many classes of students taught by him at the medical college, also through the numerous editions of his books, which were bought and studied by physicians, he exerted a continuing and far-reaching influence.

As an ophthalmologist, Dr. Williams won favorable recognition from the first years of his practice as a physician in 1850. He was identified with this specialty from the beginning of a professional career which extended through forty-six years, and, although a specialist of high rank, he never gave up his interest in general medicine or in subjects of public interest.

Throughout the whole of his professional life Dr. Williams showed himself at once conservative and independent. A careful observer of the work of others, he possessed in a high degree the faculty of discrimination in respect to the relative merits of teachers and the value of their particular methods. Learning from all, he owed no partisan allegiance to any single master or school.

The method of Daviel, as perfected by Beer, was, with unimportant variations, practiced by all the great masters of the art with a deftness and finish which have never been rivaled. Influenced by such examples, it was only natural that he should adopt extraction in

preference to the brilliant but uncertain operation of reclination then in vogue in this country. In the performance of extraction he was unexcelled, and it is characteristic of the man that he never departed very widely from the method which he had learned to practice so well and which he believed to be, on the whole, the most satisfactory in its results. He adhered to the classical flap incision long after the peripheral linear section of von Graefe had been generally adopted, and steadfastly withstood the tidal wave of opinion in favor of iridectomy as an integral part of the operation. He was one of the first, if not the first, among ophthalmic surgeons to advocate and employ etherization as a general practice in cataract extraction.

He was a man of large stature and strong character, and was a conspicuous figure on all medical occasions. He was a frequent and forcible, but persuasive, speaker and an excellent presiding officer. He was sturdy and honest in suppressing quackery, and in a thousand ways left his mark on his times and on his community.[40]

ELKANAH WILLIAMS.

Elkanah Williams (1822-1888) began his professional life a little later. He graduated from the University of Louisville in 1850. After engaging in general practice for a short time, he went abroad in 1852, with the avowed purpose of studying ophthalmology. He followed the same teachers as had Henry W. Williams at Vienna, Berlin, Paris and London. He was a young man of intelligence and ambition, and he fitted himself for ophthalmologic practice as completely as possible.

40. From biographical sketch by Dr. John Green, Trans. Am. Oph. Soc., 1896, vii, 479.

DR. ELKANAH WILLIAMS (1822-1888).

While in Europe the newly invented ophthalmoscope was the source of much experiment and discussion. He acquired a knowledge of its use in its modified form and was probably the first to bring an instrument to this country and to teach his American colleagues its wonderful revelations. It is said that he was also the first to demonstrate its use to London ophthalmologists at Moorfields in 1854.[41] They had previously hesitated to employ it, fearing that the strong light which was reflected by it into the eye would injure the retina. To illustrate the sentiment then existing in London I will quote from Mr. James Dixon, who was then one of the most prominent ophthalmologists in England, and who was one of the surgeons to the Moorfields Eye Hospital. In 1853 he said:[42] "If the praise bestowed on this instrument (the ophthalmoscope of Coccius) be allowed to go forth to the professional public without strong cautions and limitations, such dangerous results appear to me likely to ensue that I feel it a duty to offer a few remarks on the subject for the consideration of your readers." The practitioner in using the ophthalmoscope "may bring about the very condition (amaurosis) that he is hoping to avert." Later he also said[43] that he retained "a very strong opinion as to the mischief likely to result from the abuse of the reflecting ophthalmoscope if it is indiscriminately resorted to by inexperienced persons for investigating cases hastily classed as incipient amaurosis."

Dr. Williams,[44] in an article on the ophthalmoscope,

41. London Medical Times and Gazette, vol. ix, p. 30, 1854.
42. The London Medical Times and Gazette, vol. vii, 1853, p. 379.
43. Ibid., vol. ix, 1854, p. 7.
44. The London Medical Times and Gazette, vol. ix, 1854, p. 30.

contributed in 1854, modestly referred to his use of the instrument in the Moorfields (Royal London Ophthalmic) Hospital, where he probably demonstrated its harmlessness, as well as benefits, with convincing effect. He said: "As examples are always more interesting and instructive than general descriptions, I will give a short account of some cases which I have had occasion, within the last few weeks, to observe at the London Ophthalmic Hospital in the presence of Mr. Dixon and Mr. Bowman, who had themselves seen some of the alterations which it is my object now to describe. It is with great pleasure that I take this opportunity of thanking the eminent surgeons of the institution for the kind permission they have granted me of attending their extensive and interesting practice, and especially of continuing those observations with the ophthalmoscope which I had commenced at Paris with Dr. Anagnostakis, the ingenious inventor of the ophthalmoscope which I use." Then follows a description of the cases in which he had used this instrument and of the appearances which they presented.

On his return to Cincinnati, in 1855, Dr. Williams at once established an eye clinic in connection with one of the hospitals, which met with success. In 1860 Miami Medical College, which was organized in 1852, created a chair of ophthalmology, and Dr. Williams was elected professor to it. This was the first time in America that a medical college had thus recognized this specialty.

Dr. Williams was a lucid and impressive teacher, and was greatly beloved by both physicians and students. For a number of years he had editorial charge of the *Cincinnati Lancet and Observer,* and contributed nu-

merous articles and reports on ophthalmologic subjects to its columns. In 1885 he wrote the section on diseases and injuries of the eye for Ashurst's International Enclycopedia of Surgery, 1884, vol. v, pp. 169-288. It was concise and comprehensive; in fact, it was a complete manual on the subject and embodied the results of his own observations and experience of many years' duration. As a teacher, practitioner and operator he had few equals.

THE INFLUENCE OF THE TWO WILLIAMSES.

These two men, Henry W. Williams, of the East, and Elkanah Williams, of the West, inspired by the examples of their famous European teachers and believing in the dignity and value of specialism, dared to assert themselves in opposition to an organized and inbred sentiment against it. By their professional loyalty and uprightness, by their devotion to the interests of general medicine, by their enthusiasm and consistent aggressiveness, by their learning and their skill, and by their kindly and commanding personality, they won the battle for the exclusive practice of ophthalmology.

With the examples and labors of these two men, and with the growing interest in ophthalmology that had already developed, the impulse became irresistible and the time seemed to have arrived for men to build anew on the foundations which a half century had made secure. Other young men began to repair to the large eye clinics of Europe, and they continued to bring back to this country the enthusiasm of the great masters and a greatly enlarged view of ophthalmology.

VIII.

AN ERA OF RAPID CHANGE, AFTER 1850.

While this interest was deepening and widening in this country, great changes were also taking place abroad. In 1851 von Helmholtz published his invention of the ophthalmoscope; in 1854 von Graefe established his *Archives;* in 1857 Streatfield began the publication of the *Royal London Ophthalmic Hospital Reports;* in 1857 von Graefe startled the world by the announcement of a surgical remedy for glaucoma; in 1857 to 1859 Donders recorded in von Graefe's *Archives* his marvelous researches in the refraction and accommodation of the eye and their anomalies.

During the '50s the important accessions to the special literature were Dr. H. W. Williams' translation, in 1850, of Dr. Sichel's work on "Spectacles," and new editions of English treatises on the eye and its diseases. In 1853 Lindsay and Blakiston, of Philadelphia, issued "A Treatise on Operative Ophthalmic Surgery," by H. Hayes Walton, F.R.C.S.E., of London, England, edited by S. Littell, M.D., of Philadelphia. It was the first American, from the first London edition, in an octavo volume of 599 pages, illustrated by 169 engravings. As indicated by the title, the range of the work was limited to operative ophthalmic surgery, and within that range it was a valuable contribution to our science. It was the first work on the eye to contain a chapter on general anesthesia in this department of surgical practice. The

DR. ADINELL HEWSON (1828-1889).

author preferred chloroform to sulphuric ether or any other agent in producing the anesthesia. He believed that it might be administered to "persons of all ages, from a few weeks or months old to extreme age." He further stated that "it is scarcely possible to overrate the value of a discovery which tranquilizes the mind of the patient by banishing the anticipation of pain, deadens the sensibility, and prevents the reality of suffering; while to the operator it brings the inestimable advantage of quieting the struggles of children, or of irresolute adults, which are so apt to frustrate all the care, foresight and dexterity that the most assiduous application to practical surgery can command."

In 1854 another edition of the great work of Lawrence was republished here, much enlarged and improved by Dr. Hays. His notes were numerous and valuable.

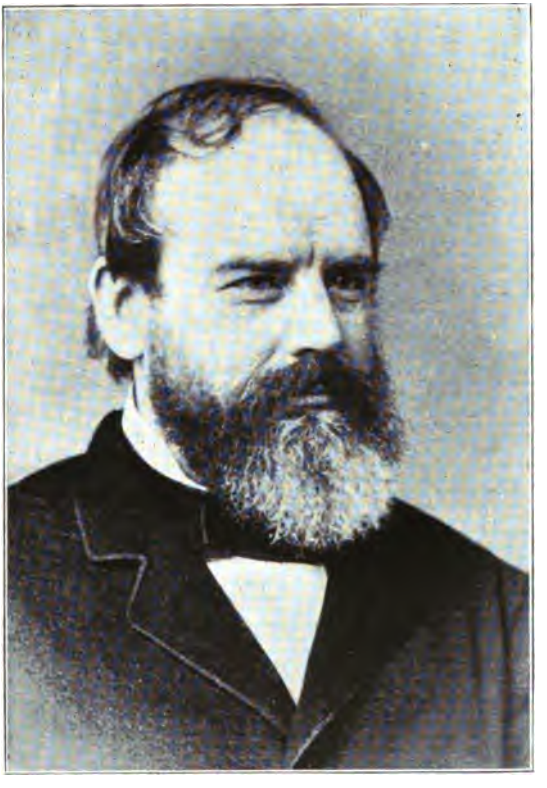
The next year, 1855, Dr. Adinell Hewson brought out a new American edition of William Mackenzie's encyclopedic "Practical Treatise on Diseases of the Eye." His additions, too, were numerous and valuable. They included new suggestions, as well as recent observations, and for the first time, in an American book, he described the ophthalmoscope by adding a special chapter devoted to it. This instrument had been entirely ignored in the English edition.

In 1856 there was another, the second American, edition of T. Wharton Jones' "Principles and Practice of Ophthalmic Medicine and Surgery" (Philadelphia Lea and Blanchard, 1856). This time it was edited by Dr. Edward Hartshorne instead of by Dr. Hays. Dr. Hartshorne was a distinguished practitioner of Philadel-

phia and was prominent there in ophthalmic circles. His notes added materially to the value of the book.

The '60s became more prolific than ever before, at least of foreign literature on the eye, and its influence on America was deeper and more lasting. In 1864 the classic work of Donders on "Refraction and Accommodation" was put into English, and in 1866 and 1867 that of von Helmholtz on "Physiological Optics" was issued both in German and in French. Immediately after these publications J. Soelberg Wells, of London, wrote his extended "Treatise on Diseases of the Eye," accepting and incorporating the conclusions of Donders and von Helmholtz, together with the operative proccdures of von Graefe in glaucoma and cataract. Wells' work epitomized, also, the new experiences and conclusions of his English confrères, Critchett, Bowman and others. In fact, it was the reflection of all that was new in ophthalmology, and at the same time embodied the verities of the old. It was published in London in 1868 and in this country in 1869. E. Jaeger, in 1869, also published that inimitable "Atlas," representing the normal and pathologic fundus of the eye, the descriptive text being in German. It was followed the next year by a French edition, by de Wecker, of Paris.

Another work of great erudition and merit was that of Stellwag von Carrion. It was issued in German in 1867 and was at once translated into English by Drs. Roosa, Bull and Hackley of New York and published in 1868 by William Wood & Co., New York. In the meantime translations of foreign ophthalmologic articles were published in the Boston, New York and other journals, either in full or in abstract, by Hasket Derby, Henry D. Noyes and others.



DR. EDWARD HARTSHORNE (1818-1885).

Dr. H. W. Williams in 1862 published his "Practical Guide to the Study of Diseases of the Eye," a 12mo of 351 pages. This was the fourth original work on diseases of the eye written by an American, and in its clearness and conciseness, and yet completeness, has never been excelled. Representing, as it did, the ophthalmology of that time, the publication of Donders' work in 1864 made it necessary to give it an early revision. It passed through several editions, the last of which was issued in 1886, and to-day, even, is a model of medical authorship. In 1865 Dr. Williams was the successful competitor for the Boylston prize, the subject being "Recent Advances in Ophthalmic Science." This was published in uniform style with his "Practical Guide," making a 12mo of 178 pages. The substance of this essay was afterwards incorporated into his "Practical Guide," but in itself alone it was an important addition to the ophthalmic literature of that time.

THE OPHTHALMOSCOPE.

Soon after the discovery of the ophthalmoscope much interest was shown in this instrument in this country, and numerous articles were written describing it and its uses. Among the earliest of those who wrote on the subject were George A. Bethune, of Boston;[45] John H. Dix, of Boston:[46] Adinell Hewson, of Philadelphia;[47] Montrose A. Pallen, then of New York,[48] and L. Turnbull, of Philadelphia.[49]

45. Boston Med. and Surg. Jour., 1854, vol. ii.
46. Boston Med. and Surg. Jour. for 1855, 1856 and 1858.
47. Am. Ed. of Mackenzie, 1855.
48. Trans. Am. Med. Assn., 1858.
49. Phila. Med. and Surg. Reporter, 1859.

TWO NOTABLE ARTICLES.

Two original articles which were especially notable, both by the Williamses, were published during the early part of this formative period. One was by Henry W. Williams "On the Treatment of Iritis Without Mercury," in 1856. It was a memorable essay, and is said to have inaugurated a radical reform in the therapeutics of that disease. Dr. Williams demonstrated by the study of sixty-four cases that this class of cases would recover by the systematic use of a strong solution of atropia, the only internal remedies administered being iodid of potassium, colchicum and iron.

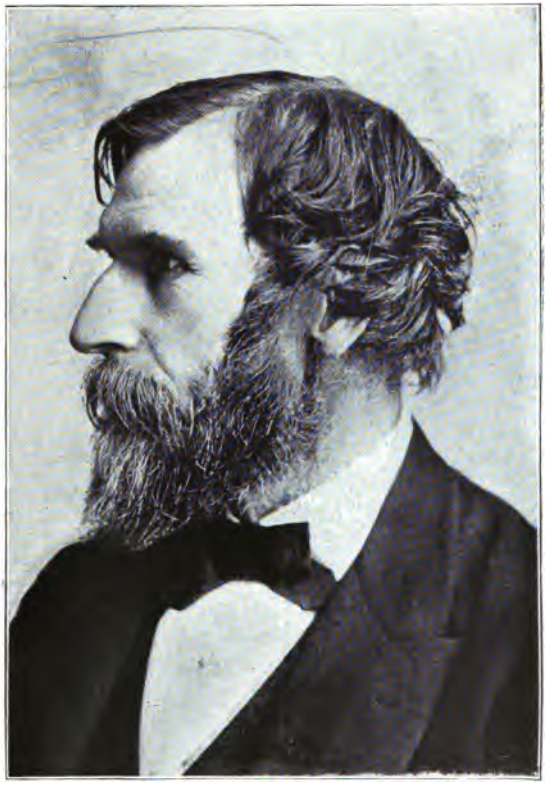
The other paper was by Elkanah Williams "On the Obliteration of the Lachrymal Sac by the Actual Cautery." It was first presented in Cincinnati in 1856 (*Cincinnati Lancet and Observer,* 1856), and again before the International Congress of Ophthalmology in 1862.[50]

TWO NEW EYE HOSPITALS.

During the same period two new institutions devoted to the charitable relief of the poor afflicted with diseases of the eye were added to those previously founded.

The first was the New York Ophthalmic Hospital, which was incorporated April 21, 1852, and was opened on May 25 of the same year. The board of directors was made up of prominent citizens of New York City, and Hon. C. S. Woodhull was its first president. The first surgeons were Dr. David L. Rogers and Dr. Mark Stephenson, both of New York. It had a humble beginning like other institutions of the kind, and the

50 Congrès Périodique Internationale d'Ophthalmologie, 2e session, 1862. Compte-rendu, Paris, 1863, p. 137.



DR. EDWARD L. HOLMES (1828-1900).

purpose of its organization was said to be to accommodate the poor in districts then farther up town in that city. Its first location was at No. 6 Stuyvesant Street, between Second and Third Avenues. According to its first report, four hundred and forty-four patients were treated from May 25, 1852, to Jan. 1, 1853. From that time it had a steady and healthful growth. In 1865 the surgical staff was constituted of Drs. John P. Garrish, Marcus P. Stephenson, William F. Holcomb, Ebenezer McFarland, Giovinni Ceccarini and John M. Carnochan, with Drs. David L. Rogers, Alfred C. Post and Frank H. Hamilton, consultants. Almost from the outset clinical instruction on diseases of the eye was given to students, and in 1865, the report states that "over six hundred students have availed themselves of these advantages."

In 1867 the homeopaths in some way secured possession of the management, and since then it has been served by homeopathic practitioners. To-day it is estimated that about 15,000 patients, including eye, ear, nose and throat cases, are treated there annually.

The other institution was that most active and beneficent one of Chicago, known to-day as the Illinois Charitable Eye and Ear Infirmary.

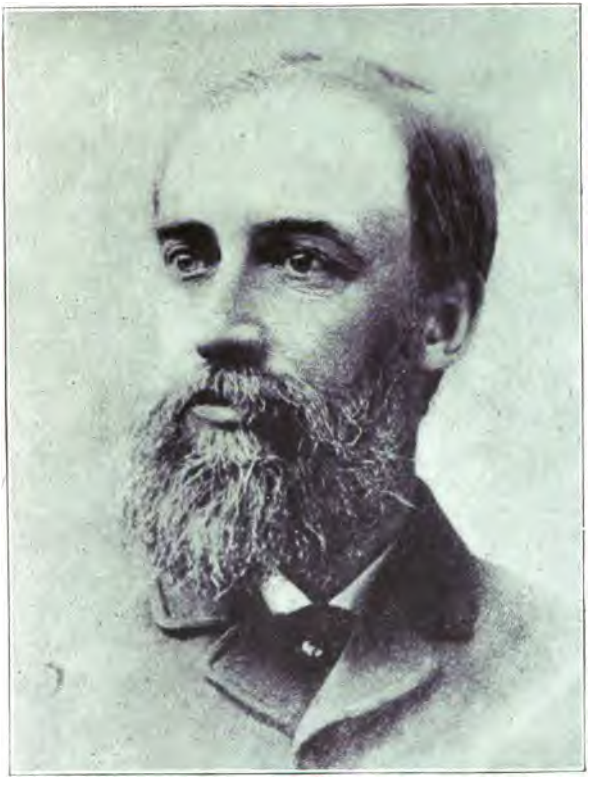
In the month of May, 1858, a number of physicians, under the leadership of Dr. Edward L. Holmes, met some benevolently disposed citizens of Chicago and founded the Chicago Charitable Eye and Ear Infirmary, electing a board of trustees and making Dr. Edward L. Holmes surgeon. Its first location was in a single room at the northeast corner of Michigan and North Clark Streets. It remained there until 1862, when it was re-

moved to No. 28 North Clark Street. In 1864 Walter L. Newberry, president of the institution, donated for a term of ten years the lease of a lot of land, on which was erected a large two-story frame building. In 1865 this building was raised and a brick basement constructed under it. In 1871 the State of Illinois, after some preliminary legal proceedings, received it into the circle of state institutions by a special act, when the name of the institution was changed by the substitution of the word "Illinois" for "Chicago." On Oct. 9, 1871, fire swept away the old infirmary. The state at once made provisions for carrying on the work of the institution, and as soon as possible erected the present building, which was completed in 1874. The number of patients of all kinds admitted to the infirmary for treatment for the biennial period ending June 30, 1902 (the last report at hand), was 21,395, making a total at that time of 182,904 admitted since the opening of the institution by the state in 1874.

Among the active surgeons have been Edward L. Holmes, Edwin Powell, F. C. Hotz, S. J. Jones and others.

OPHTHALMOLOGIC JOURNALISM.

Early in the '60s a movement was made to establish an ophthalmologic journal. This deserved to be a lasting success, but it was not. There had never been an ophthalmologic journal in this country, ophthalmologic papers having been heretofore published in the general medical journals and in the transactions of the state societies and of the American Medical Association. Dr. Julius Homberger, who had been a pupil of von Graefe and Sichel, had just settled in New York to practice



DR. HENRY D. NOYES (1832-1900).

ophthalmology. The time seemed to him auspicious for establishing a special journal. In 1862, therefore, he undertook to do so, under the name, *The American Journal of Ophthalmology.* The first prospectus announced that it would be a quarterly with forty-eight pages to each number. The first number was issued in July, 1862. Six numbers were published between that date and May, 1863 and constituted the first volume. The second volume was begun in January, 1864, but the enterprise was apparently discontinued with the second number of this volume, in April of that year. It contained but few original articles and these were mostly written by the editor. The bulk of the contents was made up of translations of articles by von Graefe and other German writers. The pages were closely printed and the articles represented some of the best German thought.

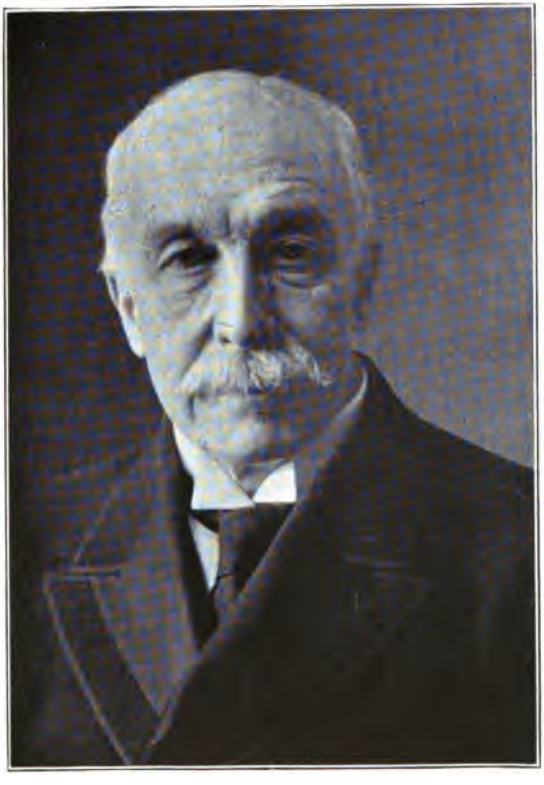
THE AMERICAN OPHTHALMOLOGICAL SOCIETY.

In point of time the next movement to create a means of interchange of thought and experience on the part of the few Americans who were engaging themselves wholly or in part in ophthalmic study and practice was instigated by two enterprising young men, Dr. Henry D. Noyes, of New York, and Dr. Hasket Derby, of Boston, who had then just entered on careers of specialism. They were materially aided and encouraged by Dr. Freeman J. Bumstead, a prominent and influential general as well as ophthalmic surgeon of New York. In response to several verbal invitations, a conference was held at the office of Dr. Noyes, 278 Fourth Avenue, New York, on Jan. 9, 1864. The purposes of the conference were stated to be "to consult on the best mode of promoting

the interests of ophthalmology in this country." Drs. H. B. Sands, H. Althof, J. H. Hinton, F. J. Bumstead, D. B. St. John Roosa, W. F. Holcomb, H. D. Noyes, all of New York, and Hasket Derby, of Boston, were present. The project of founding a journal of ophthalmology was discussed, but it was voted down.[51] A resolution, however, presented by Dr. Bumstead, was passed, authorizing the appointment of a committee "to invite ophthalmic surgeons from the whole country to assemble in New York at the time of the meeting of the American Medical Association." Drs. Bumstead, Noyes and Derby were appointed such committee. Pursuant to a call of this committee, a meeting was held at the New York Eye Infirmary, Second Avenue and Thirteenth Streets, on June 7, 1864. Eighteen gentlemen were present. Dr. Bumstead called the meeting to order, and Dr. Edward Delafield was elected chairman and Dr. H. D. Noyes secretary. A constitution and by-laws were adopted.

At the meeting held the next day papers were read

51. Since the above was put in type I have received the following note from Dr. Hasket Derby, of Boston, which is self explanatory. It will serve to indicate the opposition that was felt toward Dr. Homberger and his journal, and the actuating desire of the pioneer ophthalmologists to neutralize his influence and to advance ophthalmology on scientific and unselfish lines. Dr. Derby says: "The actual founder of the society was Dr. Julius Homberger, as I used laughingly to assert, to Dr. Noyes' great indignation. About 1862, a peripatetic German adventurer of this name came to New York to engage in ophthalmic practice, and started a magazine of ophthalmology. After a few numbers this probably fell stillborn, but while it lasted it disgusted reputable ophthalmologists, and the meeting called by Dr. Noyes, after consultation with me, was really to concert measures for the establishment of a magazine that should be respectable. Eight of us came together at Dr. Noyes' office in Fourth Avenue, and after well weighing the matter, decided that a society would be a better thing to found than a magazine. So we issued a call for a meeting and held it (the first) June 7, 1864. Thus we originated. Whatever became of Homberger I have no means of knowing. The Germans have a word, 'verschollen,' which probably applies to him."



DR. HASKET DERBY.

and discussed and certain other business was transacted. The organization was completed and named The American Ophthalmological Society. Dr. Edward Delafield was elected president, Dr. Henry D. Noyes recording secretary, and Dr. Herman Althof corresponding secretary. As an indication as to who the principal ophthalmic surgeons were in 1864 I will here record those who were present and who were made charter members, and also those who were not present but who were elected to membership: Present, Drs. Edward Delafield, F. J. Bumstead, John Hinton, Francis Simrock, Herman Althof, W. F. Holcomb, D. B. St. John Roosa, William F. Carmalt, William Stimpson, Henry B. Sands, Henry D. Noyes, of New York; John H. Dix, B. Joy Jeffries, Hasket Derby, Francis P. Sprague, of Boston; Ezra Dyer, of Philadelphia, and C. A. Robertson, of Poughkeepsie. Others elected to active membership were Drs. Abram Du Bois, of New York; Henry W. Williams, Gustavus Hay, of Boston; J. F. Noyes, of Detroit, J. S. Hildreth, of Chicago; Adinell Hewson, William Hunt and Thomas G. Morton, of Philadelphia. The following were elected honorary members: Drs. Edward Reynolds, Robert W. Hooper, George A. Bethune, John Jeffries, of Boston; George Wilkes, of New York, and Isaac Hayes, of Philadelphia.

Dr. John H. Dix was the first to read a paper before the newly organized society. It had a double subject; one part was the report of a case of "Peculiar Transparent Neoplastic Formation in the Anterior Chamber of the Eye," and the other was "On the Effects of Calabar Bean on Paralysis of Accommodation Following Diphtheria."

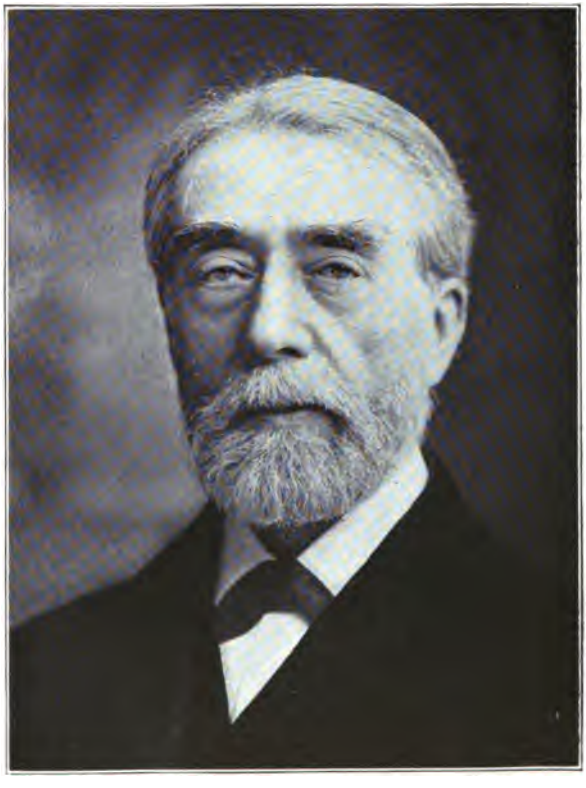
Thus was founded the first ophthalmological society in America, if not in the world. Thus began the united scientific labors of American ophthalmic surgeons, and such was the personnel of its first membership. The transactions of the society from 1864 to 1906 record the essential results of the study and practice of these and subsequent members, and in a great measure represent the progress of ophthalmology in this country during the last forty years.

LOCAL SOCIETIES.

In 1864 the New York (City) Ophthalmological Society was organized, with Dr. Cornelius R. Agnew its first president. It has continued in successful operation to the present time.

On Feb. 1, 1870, a similar organization was started in Philadelphia, the Philadelphia Ophthalmological Society, with Dr. Isaac Hays president and Dr. Edward Hartshorne vice-president. Dr. S. D. Risley, of Philadelphia, in a private letter to me, says:

> The names of many eminent men, some of whom are still living, appear again and again in the records of the scientific proceedings and in their discussions of the private business of the society. Monthly meetings with full attendance were held for the first year, and most of the second. Then the attendance rapidly fell off, the leading ophthalmologists' names being absent from the list of those present, only general surgeons, like Levis, Morton and others, all of whom did eye surgery in conjunction with their general surgery, being habitually present. The society finally died a natural death after many vicissitudes, the last meeting having been held at Dr. Strawbridge's house, April 6, 1875.



DR. HERMAN KNAPP.

DR. KNAPP AND HIS ARCHIVES.

It was apparent from the discussion at the first meeting, held for the purpose of organizing the American Ophthalmological Society, that an ophthalmologic journal was regarded a desideratum, and yet it was not deemed best to undertake the publishing of one at that time. Perhaps the experience of Dr. Homberger was a warning against it. Soon, however, a distinguished and energetic Heidelberg professor, Dr. Herman Knapp, came to this country and took up his residence in New York. This was in 1868. In the following year he established his *Archives.* This journal had a vigorous beginning and gave assurance of perpetuity. With the realization of such perpetuity, with the maintenance of its high and scientific ideals and standards, it has proved to be a most powerful engine of ophthalmologic progress in this country.

IX

OTHER FACTORS OF ADVANCEMENT.

At this period also medical college after medical college was establishing special lectureships and professorships of ophthalmology.

Institutions for diseases of the eye were still being organized. The Ophthalmic and Aural Institute was

THE FIRST MANHATTAN EYE AND EAR HOSPITAL, 34TH STREET.

founded by Herman Knapp in 1868; the Brooklyn Eye and Ear Hospital by Arthur Matthewson, late of the United States Army, and Homer C. Newton, late of the United States Navy, assisted by Cornelius R. Agnew, in 1868; the Manhattan Eye and Ear Hospital by Cornelius R. Agnew in 1869.

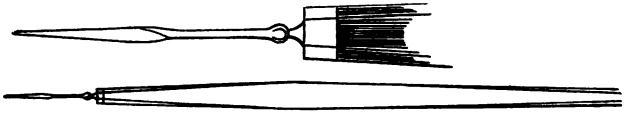
SOME NOTEWORTHY CONTRIBUTIONS DURING THE TWO DECADES AFTER 1850.

The first of these to which I wish to call attention is the "needle-knife" of Dr. Hays for the operation for

cataract "by solution or absorption."[52] Not only did this instrument admirably serve the purpose for which it was designed by Dr. Hays, but it is still an excellent knife for discission of "after-cataract." Dr. Hays described it, in 1855, as having a total length of six-tenths

THE SECOND MANHATTAN EYE AND EAR HOSPITAL.
103 PARK AVENUE, NEW YORK.

of an inch "from point to bead," with a perfectly straight cutting edge four-tenths of an inch long. The back was also straight to near the point "where it was truncated so as to make the point stronger, but at the same time



HAYS "NEEDLE-KNIFE."

leaving it very acute." This truncated portion of the back was made to cut. The rest was rounded and the shank was so constructed as to fill the incision and pre-

52. Lawrence's Treatise on Diseases of the Eye, Am. Ed., 1854, p. 726. and Am. Jour. Med. Sci., 1855, xxx, 81.

vent the escape of aqueous humor. It is doubtful if any discission "needle-knife" or "knife-needle" has since been devised that was better than this.

Previous to and for some time after this period "extraction of cataract was an infrequent procedure, confined to the hands of a few skilful men. Comminution and depression were the common operations."[53]

LEVIS' WIRE LOOP.

At about the same time Dr. R. J. Levis, a Philadelphia surgeon skilled in ophthalmic surgery, devised a wire loop with which to facilitate the exit of the lens in cataract extraction. This has proved to be of great service in certain cases.

EXPERIMENTAL CATARACT.

In 1860 Dr. S. Weir Mitchell made some interesting experiments which showed that the administration of saccharine substances to frogs produced cataract in them.[54] The experiments consisted in injecting "syrup" subcutaneously, the effect being, among other things, to produce a peculiar variety of cataract "due to mechanical disturbances of the form and relative position and contents of the component tubes of the lens."

DYER'S CILIARY GYMNASTICS.

Dr. Ezra Dyer, a careful student of Donders and an astute observer, read a memorable paper before the American Ophthalmological Society in 1865 entitled "Asthenopia in Connection with Hypermetropia."[55] He believed that the cause of asthenopia in these cases was

53. S. D. Gross: "Century of Surgery," Am. Jour. Med. Sci., 1876, lxxi, 478.

54. Am. Jour. Med. Sci., 1860, xxxix, 106.

55. Trans. Am. Oph. Soc., 1865, p. 28.

a loss of tone of the ciliary muscle. The treatment, therefore, consisted in increasing the tone or strengthening the ciliary muscle by systematic reading exercises, or what he termed, "gymnastic exercises" of the accommodating muscle. In addition to the lack of "tone" he believed that there was some disturbance of the relative accommodation, together with a "want of mental energy, the patient having lost confidence in his power to use the eye." He first changed the relation of the accommodation to the angle of convergence of the axes of the eyes by glasses. To the emmetrope he gave + 1.25 or + 1.00. In a myope of 4.00 D. he simply corrected the myopia. In the higher grades of myopia he carried the far point to ten or fifteen inches with the proper concave glass. Glasses having thus been ordered in accordance with the given refractive condition of the eyes, the patient was directed to read clear type of medium size for three to fifteen minutes in the morning. If no pain followed, the reading was continued a minute longer at noon and increased another minute at evening. This was done entirely by daylight. If pain followed the first reading until the time of the second, the patient should not mind it, but read a minute less than he had done in the morning and a minute less at night, if it still continued. In this way a point was to be found when he could read a certain number of minutes without pain and then the time increased a minute each day, or faster if prudent, until the patient could read thirty or forty minutes three times a day. Then other uses of the eyes than for reading were carefully substituted. When sixty to seventy minutes were reached the glasses, except in the myopic class, were gradually dispensed

with, the surgeon being guided by the nature and course of the case. Dr. Dyer added: One minute increase a day seems a small matter, but if a person begins with an increase of time of reading one minute, three times a day, at the end of a month he will be reading an hour and a half a day. Dr. Dyer's gymnastic treatment of asthenopia at that time was based on an experience with forty cases, in thirty-eight of which the results were "highly satisfactory."

UNIFORM ILLUMINATION OF TEST-TYPES.

Dr. Hasket Derby, of Boston, was probably the first to urge the importance of using steady and uniform artificial light on test letters in examinations for ametropia. He directed the attention of the profession to this in a paper read in 1866.[56] His statement was as follows:

> Let the letters used as a test be placed in a room from which daylight is excluded, and let them be illuminated by a steady flame, uniform in intensity of illuminating power, and placed always at the same distance from the letters.

MYDRIATICS A CAUSE OF GLAUCOMA.

Dr. Hasket Derby, in 1868, was also the first to protest against the use of mydriatics in glaucoma.[57] He cited two cases in which acute glaucoma had supervened on the use of atropia. He concluded that "so important in glaucoma are the early ophthalmoscopic symptoms . . . and so frequently does it become desirable to dilate the pupil in order to satisfactorily determine their existence, that any facts tending to show

56. Trans. Am. Oph. Soc., 1866, p. 116.
57. Trans. Am. Oph. Soc., 1868, p. 35.

DR. FREEMAN J. BUMSTEAD (1826-1879).

the impropriety of the use of mydriatics would have a most important practical bearing."

PRESCRIBING CYLINDRICAL GLASSES.

Dr. F. J. Bumstead and Dr. Hasket Derby were the first in this country to follow Donders in the determination and correction of astigmatism. Dr. Bumstead reported one case with suggestions in 1863.[58] In the same year Dr. Derby reported four cases, the first of which was examined by him in Boston in May, 1862. He had glasses ground in Berlin for them.[59]

Dr. Derby had been studying ophthalmology in Europe under the great masters, Arlt, Jaeger, Von Graefe and Donders from 1859 to 1862. During the latter part of this period he was in Utrecht with Donders, who was then working out the great problem of astigmatism and its correction with cylindrical glasses. He, with his companion at that time, Dyer, thus had the rare privilege of acquiring at first hand the essential principles of astigmatism and its correction from the one who scientifically established them. Being, therefore, one of the first disciples of the immortal founder of a new science, and being conscious of the verity and practicability of his teachings, he returned to this country to promulgate and apply them. In this most difficult and important field of refraction work he was an American pioneer.

OPERATION FOR DIVERGENT STRABISMUS.

Another original contribution which is worthy of notice was made by Dr. C. R. Agnew on the operative correction of divergent strasbismus. His paper will be found in the

58. Am. Med. Times, 1863, vii, 203.
59. Ibid., p. 277.

Transactions of the American Ophthalmological Society for 1866, p. 31, entitled "A Method for Operating for Divergent Squint."

Dr. Agnew described his method in substance as follows:

The patient being put under the influence of a general anesthetic, the eye is exposed by an eye speculum and the cornea is drawn as much as possible toward the outer canthus by an assistant grasping the tissues over the tendon of the external rectus muscle with a pair of fixation forceps. The operator then makes a horizontal opening of the conjunctiva over the external rectus muscle with scissors, midway between its borders and extending from a point one line distant from the cornea inward as far as the semilunar fold, thus exposing the muscle without difficulty and without the occurrence of much bleeding. After having found the insertion of a muscle, a strabismus hook with an eye in its free extremity and armed with a waxed silk thread is passed beneath it, from below upward keeping the hook in close contact with the sclera, and carried sufficiently far back to include every straggling band or theca which is to be advanced. The uplifted mass is then tied close to its scleral implantation. The next step is to divide the attachment of the external muscle freely through a horizontal wound in the conjunctiva. The operator now holds the ligature, which is tied to the external rectus muscle, firmly in one hand, and with scissors severs the insertion of the muscle and gently breaks up any bands of connective tissue which may attach it to the sclera. Having satisfied himself that there are no adhesions which may obstruct the advancement of the muscle, he now catches the scleral edge of the cut tendon of the external rectus muscle, draws the cornea toward the inner canthus, and while he holds up the muscle on the stretch, the retentive sutures are placed. For this purpose two delicate, short and sharp-curved needles are armed with fine, well-waxed silk and adapted to a needle-holder.

The author's method of placing this suture is, in his own words, as follows: "Having measured the extent to which the eyeball must be adducted in order to correct the divergence,

the sutures should be passed through the muscle and its theca as far from its cut end as may be necessary. The muscle should be drawn well out and kept on the stretch, so that the sutures may be passed through it as deeply as possible behind the caruncle, to secure a firm hold, and to leave a somewhat longer mass between the perforations made by the sutures and the ligature on its cut end than the original divergence measured. The course of the sutures should be perpendicular to the plane of the muscle, one passing through near its upper margin and the other near its lower. After the sutures have been placed in the muscle the end included in the ligature should be cut off, care being taken to leave enough to prevent their tearing out. The amount cut should nearly equal the degree of divergence to be corrected, allowance being made for shrinkage which has followed the detachment of the muscle from the sclera. The next step is to carry the sutures beneath the conjunctiva above and below the cornea. It is better to place the upper suture first. This also requires the curved needle. The point aimed at in carrying the needle along the sclera, beneath the conjunctiva, should be about a line above the cornea and over the center of the line of implantation of the superior rectus muscle, and there the suture should emerge. Before tying the upper, the lower suture should be brought out at a corresponding point over the inferior rectus insertion. While the operator is cautiously tying the sutures his assistant should, catching hold of the insertion of the external rectus, carry the cornea toward the internal canthus as much as possible and thus effect what may be considered the real intention of the operator, namely, to adduct the eye strongly, and thus place the end of the shortened internal rectus in coaptation with the sclera at the natural line of sclerotic implantation. The exercise of a little care will cause the muscle to spread out and be hidden beneath the horizontal pillars of the wound through which the retentive sutures have been carried, thus insuring a consolidation of the wounded parts intervening between the cornea and the caruncle in the ultimate result.

This operation has been followed by ophthalmic surgeons and has proved most satisfactory.

AGNEW'S OPERATION FOR THICKENED CAPSULE.

In 1867[60] Dr. Agnew also devised an ingenious and safe method for removing a thickened capsule or other pupillary obstruction, which was as follows:

The pupil having been dilated by atropin, the operator passes a stop needle through the cornea about one line from the nasal border and transfixes the membraniform obstruction. Then while holding this steady, he makes an opening in the cornea about one-half line from the temporal border with a knife or a broad needle. Through this opening a sharp hook is introduced, and its point entered in the opening made in the membrane by the stop needle. If possible, the hook is now to be rotated and the membrane rolled up around it, and brought out of the anterior chamber. If it can not be drawn out, it should be torn.

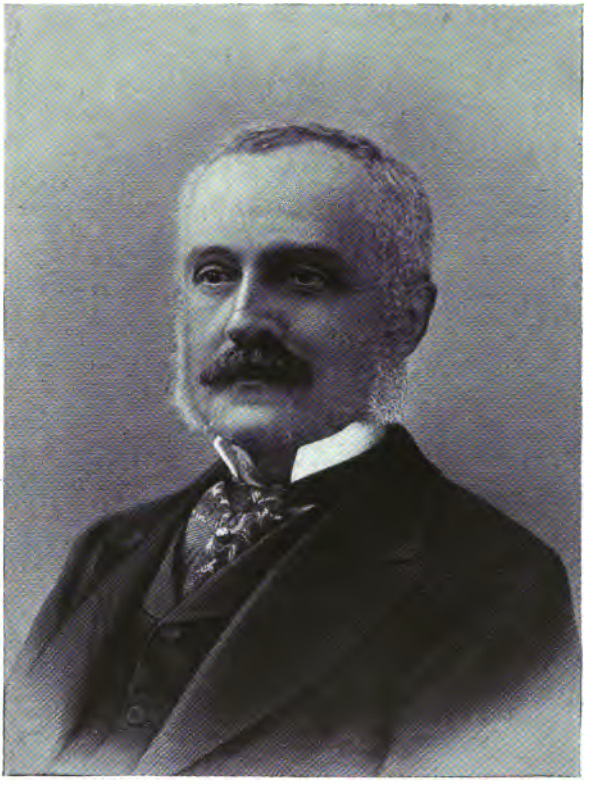
The patient is then kept in bed two or three days with the eye bandaged. The great advantage of the stop needle is that it prevents traction on the ciliary body.

CORNEAL SUTURE IN CATARACT EXTRACTION.

Dr. H. W. Williams, of Boston, was undoubtedly the first to suggest suturing the corneal wound after cataract extraction. His first reference to the subject was made in 1866.[61] He again described his method in the last edition of his work on "Diseases of the Eye" (Edition of 1886, p. 292), where he says:

The use of a suture to bring together the edges of the corneal wound was proposed by me about twenty years since. Extensive further trial has proved the value of this expedient in many cases, whatever method of operation is employed; as also the perfect tolerance by the cornea of the exceedingly minute suture.

60. See Stellwag. Am. Editions, 1868, p. 544, and 1873, p. 645.
61. Trans. Am. Oph. Soc., 1866, p. 45.



DR. CORNELIUS R. AGNEW (1830-1888).

By holding the edges of the wound in contact the suture promotes immediate union, and tends to lessen the danger of hernia of the iris, loss of vitreous and suppuration of the wound; while, by securing early restoration of the anterior and posterior chambers, it removes the iris from contact with the cornea, or with portions of lens substance or capsule, thus preventing synechia, or inflammation of the ciliary body. In my judgment, the suture deserves attention as a means of gaining quicker and better results in any mode of extraction.

The needle I use is one-fourth of an inch long, and has a flattened point with cutting edges. The needle-holder should not be fastened with a spring catch, but must be held with the fingers, so that the needle may be instantly released, without jar, at the proper moment. Only a single strand of the finest silk, scarcely larger than a filament from a cocoon, is used for the suture. One edge of the flap is taken hold of with a fine-toothed forceps, and held, while the needle is passed through it close to its border; the needle may be pulled through at this side before the opposite edge is seized and penetrated at a corresponding point. The slight contusion of a small point of the cornea by the forceps, or the continued presence of the suture, does no apparent harm. The silk may be left in situ till it comes away, or may be removed in a few days after the healing is consolidated, too much haste in this respect being avoided.

NEW FORM OF LACHRYMAL PROBES.

Dr. Williams in 1867[62] also proposed a modification of probes for the lachrymal passages. The modification consisted in having bulbous extremities of the sizes of Bowman's series, and which are slender for one-third of the distance from the bulb to the flat disc at their middle. He directed that they should be made of alloyed silver so that they might have an elastic flexibility

62. Trans. Am. Oph. Soc., 1867, p. 30.

without being liable to bend on themselves in encountering obstructions, as would be the case were the silver too pure.

LACHRYMAL STYLES MADE OF LEAD WIRE.

At about the same period[63] Dr. John Green, of St. Louis, suggested substituting for the rigid styles of silver in the treatment of lachrymal obstructions those made of leaden wire:

> The wire should be of the purest and softest lead, and drawn to sizes ranging from one to two millimeters in diameter. The styles are easily cut with a penknife, and the ends are carefully rounded and smoothed by scraping. They are made perfectly straight, as they are more easily introduced in this form, and the upper end is bent over into a hooked form by means of forceps after it has been placed in position.

Since Dr. Green suggested these styles many surgeons have used them with satisfaction.

TEST-TYPES FOR DETERMINING ACUTENESS OF VISION.

The publication of the test letters of Dr. Snellen, of Utrecht, Holland, in 1862, marks the beginning of the systematic testing of the acuteness of vision in clinical work. The principle of Snellen consisted in using "block" letters whose height subtends a visual angle of five minutes at given distances, and in recording the vision in accordance with the formula, $V = \frac{d}{D}$, V representing the acuteness of vision, d the distance at which the letters are viewed, and D the distance at which the smallest size of letter correctly named is recognized by an average normal eye. The first American to

63. Trans. Am. Oph. Soc., 1868, p. 31.

appreciate the value of Snellen's principle and to introduce into this country test letters based upon it was the late Dr. Ezra Dyer, in 1862, even several months before the publication of Snellen's standard test-types. After a prolonged period of study in Europe, the last few months of which were passed in Utrecht, Dyer, in 1862, entered on the practice of ophthalmology in Philadelphia. His letters, which were of different patterns placed in juxtaposition, were printed on a sheet for private use and distribution among his American colleagues. The credit due to him is for his prompt recognition of the importance of Snellen's invention and for making it known in this country in advance of its general promulgation in Europe.[64]

Soon after the publication of Donders' studies on refraction and accommodation Dr. Green, of St. Louis, became one of his pupils. He at once gave especial attention to the detection and measurement of astigmatism, his first paper being published in Holland in 1866 and again in the United States in 1867.[65] His paper in the English language was entitled "On the Detection and Measurement of Astigmatism," in which, after giving the definition of the term and a historical sketch of the subject, he proceeded to explain the methods of determining its presence, suggesting the use of new forms of charts made up of radiating lines or radiating rows of dots, designed in different forms and varying in numbers. He suggested also certain improvements in the test types of Snellen which had both a mathematical and practical interest. In a later article the same

64. From report of Dr. John Green, of St. Louis, Trans. Am. Ophthalmological Society, 1903, vol. x, p. 190.

65. Am. Jour. Med. Sci., 1867, liii, 117.

year[66] he wrote another paper on "Astigmatism Considered in Its Relation to Defective Vision, Asthenopia and Progressive Myopia." After the contribution of Donders this, so far as it went, was one of the most important on the subject of astigmatism, and especially in its causal relations to myopia. The article can not be easily summarized, but should be read in full.

Dr. Green's invaluable teachings in regard to the detection and correction of ametropia, beginning in 1867, have had great weight and they have permeated the whole ophthalmologic profession, and its members, many of them unconscious of their authorship, are determining and treating astigmatism in accordance with them, to-day.

PRAY'S ASTIGMATIC LETTERS.

Soon after the ingenious charts of Dr. Green were presented to the public Dr. O. M. Pray, of Brooklyn, suggested a form of test-type for astigmatism, in which the letters were made of lines running in different directions.[67] These astigmatic letters met with great favor on the part of ophthalmologists for a long time. I fear they are not used as much to-day as they should be.

PHOTOGRAPHY OF THE OCULAR FUNDUS.

Early in the '60s attempts were made by Dr. H. D. Noyes, of New York, and Dr. Liebreich, of Berlin, to photograph the fundus of the eye, but they were unsuccessful. In 1864 Dr. A. M. Rosebrugh, of Toronto, Canada, made another attempt with partial success. He devised a special form of ophthalmoscope with a camera

66. Am. Jour. Med. Sci., 1867, liv, 82.
67. Knapp's Arch. Oph. and Otol., 1869, i, 17.

attached, and after a long series of experiments, assisted by our Toronto colleague, Dr. Reeve, he succeeded in obtaining a "photograph of the eye of a cat, showing very clearly the nerve entrance and the larger branches of the vessels of the retina."[68] At the time of describing his instrument and method he had not attempted to photograph the fundus of the human eye. This pioneer effort, although not perfectly successful, demonstrated the scientific enterprise of this distinguished ophthalmologist, and it was the forerunner of the successful results which have been obtained in the last few years.

The above are a few of the more important American contributions that have been made to ophthalmology during its transition stage in this country from 1850 to 1870. They forcibly indicate the energy, intelligence, resourcefulness and progressiveness of our ophthalmologists of that period. While there were no momentous discoveries or startling revelations, there was a growing literature of genuinely scientific and practical value. There were many new experiences and new investigations which tended either to confirm or to disprove the conclusions and views which other students and practitioners had advanced. Such instrumental devices as were made were of value, and both the surgical and medical therapeutics were more or less improved. Clinical facilities were increased by the readjustment of the old institutions and the creation of new ones, and the provisions of lectureships and professorships in our medical schools promoted the ophthalmologic movement. The organizing zeal and enterprise of our medical men in founding the American Ophthalmological Society

68. Oph. Rev., London, 1864-5, i, 119.

and the ophthalmological societies of New York City and Philadelphia, together with the American Medical Association, established a "forum" for the freer interchange of personal experiences, observations and conclusions and for the fostering of those fraternal and ethical sentiments so conducive to united effort and scientific uplift. And, finally, Dr. Knapp came to this country, adopted it as his own, enriched it by his learning, gave encouragement by his enthusiasm, and in the face of adverse prospects, supplied it with a journal of ophthalmology, which became for years the principal channel for transmitting to the profession the fruits of the best labors and the most intricate studies of those cultivating this branch of medical science.

X.

THE NEW AMERICAN OPHTHALMOLOGY.

Developed to such definite proportions, erected on the firm foundations of three-fourths of a century's labor, built up of such forces as were at first nascent, and later active, in the men whom I have mentioned, and sustained by such activities as were going on in schools, in clinics, in organizations and in journalism, ophthalmology in America in 1870 had become an established specialty. It had reached a development which no influence could then retard, and an assurance of permanency and progress which could not be doubted. It had not only kept pace with the progress of general surgery and the development of other specialties, and, for the most part, had also shared in their improvements, but through the discovery of general and local anesthesia, the invention of the ophthalmoscope, and the increased knowledge of refraction and physiologic optics, it had excelled them all in precision of diagnosis and in definiteness and certainty of therapeutics. Moreover, it had opened up a field of study and practice of greatly expanded boundaries, as compared to former times, and with an intensely fascinating attraction.

The ophthalmologic ranks have since been gradually enlarged until now there are twenty-five hundred to three thousand members in America, basing the estimate on the membership of the Section on Ophthalmology of the American Medical Association. No Ameri-

can medical school is without its didactic and clinical teachers in ophthalmology. Besides the general hospitals with ophthalmologic departments, there are at least thirty-five special hospitals in this country. The older eye institutions have grown to immense proportions and, aside from their clinical advantages, are providing special facilities and opportunities for pathologic study and investigation. They are also engaging in experimental therapeutics which promise results of great value. Their equipment, in short, of ophthalmologic experts, of instrumental and laboratory appliances put them on a high plane of modern excellence.

American ophthalmology, with its small army of practitioners, workers and contributors, has already developed a literature too voluminous to be analyzed or even specified on this occasion. The transactions of the American Ophthalmoligacl Society (1864); the ophthalmological section of the American Medical Association (made a distinct organization in 1878, in my own city, Buffalo, through the efforts of Eugene Smith, of Detroit, and X. C. Scott, of Cleveland); the American Academy of Ophthalmology and Oto-Laryngology (1895) and the local ophthalmological organizations or sections of organizations in New York City, Philadelphia, Boston, Chicago, Buffalo, Detroit, Denver and other cities; Knapp's *Archives* (1869); Alt's *American Journal of Ophthalmology* (1884); the *Ophthalmic Record,* founded by Savage (1891), now under the management of Wood and Woodruff; the *Annals of Ophthalmology* (1892), issued under the editorial supervision, at first of James P. Parker, then of Wood and Würdemann, and now of W. T. Shoemaker and C. W. Parker; and

Würdemann's *Ophthalmology* (1904), are great storehouses of American as well as foreign contributions of varying but, in the aggregate, of immense scientific and practical value. The history of ophthalmologic progress since 1870 is, in fact, written in these volumes.

Auxiliary to these records have been those excellent summaries of current ophthalmologic progress, first so ably made by Hays and continued by Jackson in the *American Journal of Medical Sciences,* and afterward similarly presented by Noyes and Bull in the *New York Medical Journal,* by Thomson, Gould, Oliver, Posey and others in *Sajous' Annual* by Hansell, Clark, Reber, Pyle and others in *Saunders' Year-Book,* by Wood in the *Practical Medicine Series* volumes, and by Jackson and de Schweinitz in their *Year-Book.*

Besides this form of literature there have been the treatises, systems, text-books and manuals on diseases of the eye, together with monographs and essays on special subjects, beginning with the great work of Noyes, in 1890, which was an outgrowth of a former treatise published by him in 1881, and ending with those of the last year or two, the authors of which are so well known as to need no mention. Some of these works, according to the purpose for which they have been written, are not excelled in correctness of style, evidence of learning, or comprehensiveness of matter, by similar works in any language.

Supplementary to all of this there has been the invaluable indexes of all ophthalmologic, as well as other medical literature, found in the *Index Catalog* of the Surgeon-General's library and in the *Index Medicus.*

XI.

CONCLUSION.

In my endeavor to describe the origin of our early eye institutions; to call specific attention to those who have been foremost in keeping alive and advancing ophthalmology in this country and in developing it into an organized entity of enduring vitality, of scientific value and of honored recognition; and to trace its literature and most important contributions, from 1800 to 1870, I find that the material has been sufficiently abundant, important and interesting to warrant me in changing the scope of this paper as originally planned, and to bring it to a close at this point. I also justify myself in this change by the fact that it has already attained such proportions that the limitations of time and space forbid me to proceed further, although the records deepen in interest, at least to me, the nearer they approach the professional lives and environments of to-day.

Taking into consideration the educational and professional conditions incident to a new and democratic country, it seems to me that American ophthalmology has had a development fully commensurate with its opportunities and resources. It has been fostered by men of character, intelligence and skill, and has suffered comparatively little from the blighting influences of charlatanism. If viewed properly, it has a past of which all of us may feel proud. This is especially true of its institutional, scientific and literary contributions during the period beginning with 1870.

As to its future, there is every reason to believe that, with the new intellectual and scientific life that has been infused into it; with the inexhaustible clinical and pathologic resources at command; with the stimulation to research work which such an organization as the Section of Ophthalmology of the American Medical Association gives; and with a literature of such high excellence dominating professional thought and action, the outlook is resplendent with bright prospects and alluring promises. There can be no turning backward. The movement must be onward and upward. And when sufficient endowment of schools, teachers and laboratories is provided to meet the needs of research teachers and students, and of experimental pathology, etiology and therapeutics, American ophthalmology will lead and not follow. May not such provision soon come as the crowning recognition by this rich and prosperous country, of a pressing physical, intellectual and scientific need that can not otherwise be satisfied.