

Welch (W^{with the} = H.) *author's Compliments.*

7
06
RUDOLF VIRCHOW,

Pathologist.

BY

WILLIAM H. WELCH, M. D.,
BALTIMORE,

PROFESSOR OF PATHOLOGY, JOHNS HOPKINS UNIVERSITY.

*Reprinted from the Boston Medical and Surgical Journal of
October 29, 1891.*



BOSTON:
DAMRELL & UPHAM PUBLISHERS,
No. 283 WASHINGTON STREET.
1891.

S. J. PARKHILL & CO., PRINTERS
BOSTON

RUDOLF VIRCHOW, PATHOLOGIST.¹

BY WILLIAM H. WELCH, M.D., BALTIMORE,
Professor of Pathology, Johns Hopkins University.

It is fitting that of Virchow's manifold activities that side which represents nearly fifty years of academic work should be a special theme upon this occasion. My contribution, therefore, will relate only to Virchow, the pathologist, the broad view of his career and work in other departments having already been presented to you.

It is as an investigator and teacher of pathology that Virchow ranks as one of the great reformers in medicine.

To appreciate the character and extent of an advance made by scientific discovery, it is necessary to know something about the ideas which have been displaced or overthrown by the discovery. The younger generation of students are in danger of forgetting that facts which are taught to them and which seem to them the simplest and most natural, may have cost years of patient investigation and hard controversy, and possibly have taken the place of doctrines, very different or even contradictory, which long held sway, and which seemed to other generations equally simple and natural. If then, we wish to understand the nature and extent of the reforms in pathology, which we owe to Virchow, we must consider the condition in which he found medicine, and more particularly pathology, in the fourth decade of this century, when he began his scientific work.

¹ Address delivered at a meeting of the Johns Hopkins University, Baltimore, to celebrate the Seventieth Birthday of Professor Virchow, on October 13, 1891.



At that period medicine in one country was much less influenced by its condition in other countries than is the case at the present time. Medical journals and other means of interchange of ideas were fewer then than now. Medicine was more distinctly national, less cosmopolitan, than it is to-day.

France unquestionably held the leading position in medicine during the early part of this century. The first three decades mark the most splendid period of French medicine. At the very beginning of the century Bichat laid the foundations of general anatomy by his studies of the tissues. He opened the way for the study and classification of morbid changes according to the tissues affected. This is in some respects the most important contribution to pathological anatomy from the time of Morgagni to that of Virchow. Morgagni showed that the purpose of pathological anatomy is not simply the collection of curious and interesting cases, but is to teach us the seats of disease as is indicated by the title of his great work, "De Sedibus et Causis Morborum per Anatomen Indagatis." He, however, was not able to trace the seats of disease further than to the organs affected. Bichat took a long step forward when he substituted the tissues composing the organs, as the seats of morbid changes, and in this particular direction no distinct advance in pathological anatomy was made for fifty years, when Virchow taught us to go still further back than the tissues, to seek in the cells the seat of disease.

But so far as the gross appearances of diseased organs and tissues are concerned, pathological anatomy was most enthusiastically cultivated in France, and this, together with the development of the methods of physical diagnosis by percussion and auscultation, was made the basis of a new clinical medicine by such

men as Corvisart, Lænnec, Bayle, Piorry, Louis, Andral. The sound and healthy traditions of this French clinical medicine of the first third of the century, have been continued to the present day, and were early brought to our own country by distinguished pupils of Louis and Trousseau. But the studies in pathological anatomy were fruitful only in certain directions, mainly in diseases of the heart and lungs, and in the elucidation of typhoid fever. They were pursued by clinicians chiefly as a basis of clinical diagnosis. False and exaggerated ideas as to the kind of knowledge to be derived from pathological anatomy, led to the establishment of unfounded systems of medical doctrine, such as that of Broussais, regarding irritation and gastro-enteritis, so fatal in its practical consequences. The use of the microscope was even decried by some of the leading pathological anatomists, and when employed led to little of any value. Pathological histology did not exist. Experimental physiology was developed, one can almost say, was originated, by Magendie, but the importance of experiment and clinical observation for the development of pathological physiology, was not generally recognized.

In Great Britain there existed the fructifying influence of the name and teachings of that great investigator in pathology, John Hunter. In some respects Virchow is to be regarded as the immediate successor of John Hunter in the history of pathology, although his work began fifty years after Hunter's death. Both men discarded philosophical speculation and went back to nature, to observation, to experiment for facts on which to build their doctrines. Both made use of all allied sciences at their disposal, of anatomy in the broadest sense, of physiology, in their investigations, but of course much more was available for the later investigator. Both kept constantly in view the

problems of practical medicine, together with the broadest interests and direct participation in science. Both recognized pathological physiology as the foundation of scientific medicine and that this is to be constructed not from anatomical investigations alone, but with the aid of physiology, of experiment and of clinical observation. Hunter was the first to give a broad scientific basis to surgery. Virchow took up many problems just where Hunter had left them. The time had come when he could build deeper and stronger and broader on the foundations of scientific medicine.

In the year of John Hunter's death, his nephew, Matthew Baillie, published his work on "Morbid Anatomy," which is the first one based upon independent systematic observations. The plain, purely objective descriptions, free from the prevailing tendency towards unwarranted generalizations, have given a permanent value to this work. Sound observations continued to be made by such men as Abernethy, the Bells, Abercrombie, Cooper, Howship, Monro, Addison, Gulliver, Bright, Hope, Carswell, but much as they enriched the storehouse of pathological anatomy, the fundamental principles of pathology remained the same, although commendably free from many of the speculative tendencies of the Continent.

It was in the third and fourth decades that the great Vienna school of pathology came to the front under Rokitansky and Skoda. As a purely descriptive pathological anatomist, Rokitansky is the greatest who ever lived. The General Hospital of Vienna afforded him an enormous material for observation. When he retired from his professorship at the age of seventy years, he is said to have possessed over 100,000 protocols of autopsies made by himself or his assistants. The industry, acuteness of observation and purposeful character of his work are marvellous. His descrip-

tions of the gross appearances of diseased conditions serve now and will probably continue to serve for a long time as models of clearness, accuracy, conciseness and vividness. As Virchow has said, he is for pathology what Linnæus is for botany. But in the interpretation of the morbid changes which he described so objectively and in the deduction of general pathological principles, Rokitansky was singularly unfortunate. His attempt to construct out of pathological anatomy a general pathology or pathological physiology, is a lamentable failure in the first edition of his great work on Pathological Anatomy. Bound in the trammels of humoral pathology, he elaborated his doctrine of crases which was at first received so enthusiastically by his followers. It is fair to say that no one was more open to conviction by facts than Rokitansky, and that he threw overboard his whole complicated system of crases after the destructive criticism which it received from Virchow. It was mainly by the teachings of Rokitansky and of his pupil, the great clinician, Skoda, that the nihilistic school of therapeutics developed and dominated for so many years the Vienna school of medicine. With their attention fixed continually upon the post-mortem table and the gross anatomical changes produced by disease, these observers could not comprehend how such changes are amenable to treatment, and they fell into the error of those who make pathological anatomy the exclusive basis of clinical medicine. Those who do this forget that the changes found in the dead organ give only partial, although valuable, information as to the process of disease in the living organ, as to remote effects upon other parts of the body, as to causes of disease, as to disturbances of function.

In Germany proper medicine presented in the early part of this century a less edifying spectacle than in

the other countries mentioned. Although in this period work of fundamental importance was done in allied sciences, such as comparative anatomy and embryology, medicine presented a succession of systems and schools of doctrine founded largely on speculation. The minds of physicians were possessed by such doctrines as those of vitalism, of Brownianism, of the philosophy of nature. Here and there a good observer in pathological anatomy such as J. F. Meckel and Lobstein or an enlightened physician stands out in contrast to the dominant speculations, hypotheses and mysticism. The controversy, centuries old, as to whether disease affects primarily the solids or the fluids was still kept up with fruitless dialectics. A healthier direction was given to clinical medicine by the teachings of Schöulein, but he did not break with the prevailing ontological conception of disease as an entity, as something apart which enters the body and lives there like a parasite. Medical works published in Germany as late as the fourth decade of this century are still full of such terms as "natur-philosophische, natur-historische, rationelle, physiologische" systems of medicine, to say nothing of the ultramontane, theological system of the professor of medicine in Munich.

In the third decade discoveries in microscopical anatomy were made, surpassing in number and importance all which had come before, and forming the basis of modern histology. In Johannes Müller's work "On the Intimate Structure and the Forms of Morbid Tumors" published in 1838, we meet the first fruitful application of the microscope to the study of pathological anatomy, and this work may be regarded as the beginning of pathological histology in the modern sense. In the same year Schwann promulgated the cell theory as applied to animals. The fundamental error of Schwann as to the origin of cells by spoutan-

eous generation out of a primitive blastema exerted, for many years, an unfortunate influence upon pathology and led many a good investigator to spend his force in a will-o'-the-wisp search for the development of cells out of unformed material. The blastema theory for a time dominated pathology. The plastic substances of John Hunter, various pathological exudates were resolved to a large extent into blastemata and the problems which seemed most urgent were to determine the characters of these blastemata, their metamorphoses and the exact mode of formation of cells out of them; and to these delusive problems microscopists set themselves to work.

Surrounded by such ideas in the year 1844, one year after his promotion to the doctor's degree, Virchow began his work first as assistant and then as prosector in the Charité Hospital in Berlin. He must have received more inspiration from Johannes Müller, the greatest physiologist of the first half of this century in Germany, than from any other of his teachers, but he has acknowledged his indebtedness also to Schönlein, that remarkable man, who, without having ever published half-a-dozen pages after his graduating dissertation, became the most popular, influential and inspiring clinical teacher in Germany. Doubtless many an impulse must have come from association with that company of ardent young investigators in medicine assembled in Berlin in the early forties, from such men as Franz Simon, Reinhardt, Leubuscher, Joseph Meyer, Remak, Traube, DuBois-Reymond, Brücke, Helmholtz. The spirit of reform was no less in the medical than in the social and political atmosphere of the time. All of these influences of his teachers, of his co-workers, of the "Zeitgeist" must have had their effect upon the young man, but, from the beginning, Virchow's published work marked him as an original and independent genius.

In 1846, at the age of twenty-five, Virchow read before the Society for Scientific Medicine in Berlin the paper entitled "Concerning Points of View in Scientific Medicine," which was soon after published as the leading article in the first volume of the *Archive for Pathological Anatomy and Physiology and for Clinical Medicine*, founded by himself and Reinhardt. This short article is in a sense the programme of the author and of the journal in which it appeared. Here is emphasized the idea that disease is not an independent being, but is life under changed conditions. Scientific medicine is the investigation of these changed conditions and of the means of removing them. Halt is called to dogmatism and speculative systems of medicine. The limits of pathological anatomy are determined. The methods of investigation and the assistance of other natural sciences must be employed in medicine. Progress can come only by experiment and observation. The immediate task is to discard philosophical systems and to set to work in collecting facts. Permit me to quote the last paragraph of this remarkable article:

"Let us not deceive ourselves about the condition of medicine. Minds are unmistakably exhausted by the many hypothetical systems again and again cast aside only to be replaced by new ones. A few more invasions perhaps and this time of unrest will have passed by and it will be recognized that only quiet, industrious and persevering work, the true work of observation or experiment, possesses enduring value. Pathological physiology will then gradually be developed, not as the production of a few heated brains, but as the work of many patient investigators; that pathological physiology, which is the citadel of scientific medicine, of which pathological anatomy and the clinic are only out-works."

Brave words and true are these uttered by a young physician only three years after receiving his doctor's degree, words significant now, but many times more significant when they were spoken. But they were not the words of a dreamer or an idle talker. He who wrote them had already begun that "quiet, industrious and persevering work, the true work of observation and experiment," which was destined to introduce a new epoch in the history of medicine.

By a fortunate chance Robert Froriep assigned to his young assistant as a theme for independent investigation, the study of phlebitis. It would lead too far into historical detail for me to attempt to explain the position which phlebitis then occupied in pathology. Some idea may be gathered from Cruveilhier's sentence, *La phlébite domine toute la pathologie*. So firmly established at that time was Cruveilhier's doctrine that the essence of inflammation is coagulation of the blood in the veins and capillaries, that it seemed necessary to work out only certain details, such as, whether or not in suppurative phlebitis the pus is secreted by the wall of the vein. But it at once became clear to Virchow that the general doctrine rested upon no sure foundations and it was upon the foundations of the doctrine that he began to work. His preliminary studies were upon the morphology and chemistry of fibrin and the conditions for its coagulation both within and outside of the body. At the same time his attention was turned to the morphological elements of the blood, more particularly the white blood corpuscles, and here his observations on leukæmia opened new points of view on the nature and origin of the white corpuscles, so that in 1846, he could say, "Herewith I vindicate for the colorless corpuscles of the blood a place in pathology." His powers of critical analysis and correct interpretation of pathological

facts were at this time brilliantly exhibited in the view which he took as to the nature of leukæmia, the same view essentially which is still held, in contrast to Bennett's conception of the disease as an hæmitis, a suppuration of the blood. But it was in the epoch-making articles on "Plugging of the Pulmonary Artery and its Results" (1846 and 1847) and on "Acute Inflammation of the Arteries" (1847), that the best fruits of Virchow's studies of subjects suggested by phlebitis appeared. Here, for the first time, was there a clear insight into an important group of pathological facts which had been the favorite study of John Hunter and which had exercised the minds of the succeeding generation of pathologists. The doctrine of thrombosis and embolism as it was here and subsequently elaborated by Virchow formed virtually a new chapter in pathology, well rounded as it left the hands of its founder, a monument of brilliant scientific investigation in pathological anatomy and experimental pathology. The important articles on "Pathological Pigments," and "The Pathological Physiology of the Blood" belong also to the same period and the same line of investigation. The fundamental part of these researches, together with investigations in many other directions in pathology, belong to the first Berlin period of Virchow's activity (1844-1849).

The Würzburg period, extending to 1856, was one of great and fruitful scientific work. Already in Berlin, by his investigation of degenerative cellular changes in Bright's disease and of inflammation of muscle, Virchow had reached new views as to the nutritive alterations of cells in inflammation; but it was in Würzburg especially that his doctrine of inflammation, which has exerted such a reformatory influence upon pathology, was worked out by himself and his pupils. In the article on "Parenchymatous Inflammation"

(1852), and in that of the same year on "Units of Nutrition and Localizations of Disease," he has already conquered a large tract of cellular pathology. He has a firm grasp upon the nutritive and functional disturbances of cells. Further researches were necessary to reveal clearly their formative activities. In the light of the most recent views concerning inflammation, it is significant to note that in the first of these articles Virchow clearly recognizes suppuration as secondary to necrosis of tissue, and in this connection says, "Here there is certainly an inner, parenchymatous process, and if the subsequent suppuration be regarded as the outcome of inflammation, one need not hesitate to regard the degeneration of the parenchyma as an integral, neither consecutive nor accidental, part of the inflammatory process." And again at the close of the article, "not hyperæmia and not exudation, nor redness, nor swelling, nor pain, do I put first, although I recognize their importance, but degeneration—I vindicate, therefore, before all for inflammation the character of degeneration."

But the brightest lustre of this period of Virchow's scientific work comes from those investigations which laid the foundations of cellular pathology. Like all of his contemporaries, Virchow at the beginning was under the dominion of Schwann's theory as to the spontaneous origin of cells from blastema. His researches upon the origin and structure of the connective-tissue group of substances, published in 1850, were reformatory for both pathological and normal histology. There followed a series of investigations which laid broad and firm the foundations of cellular pathology. Already in 1854 Virchow cast aside definitely the blastema theory of cell formation.

To describe further in detail these and the other investigations of Virchow in pathology up to the present

time is impossible within the limits of an address. To do this would require a book covering nearly the whole ground of pathology. Into what corner of special pathological anatomy and of general pathology should we not be led if we attempted to follow the many hundred articles which he has written on these subjects? We cannot include here the consideration even of such a monumental work as that which he has written upon tumors.

I must content myself in the limited time remaining by directing your attention to a few salient points intended especially to show the reformatory character of Virchow's work in pathology.

In his beautiful oration on Johannes Müller, Virchow says, "There is no school of Müller in the sense of dogmas, for he taught none, but only in the sense of methods." The same may be said of Virchow's school. His school means not the propaganda of certain dogmas as meant the schools of the great leaders in medicine of olden times. It is the method and not dogma which characterizes it, and the method is that of the natural and physical sciences. In 1849, in the article on "The Scientific Method and Points of View in Therapeutics," Virchow wrote: "In fact, that is true which Asclepiades of Bithynia, the father of that old school of methodistic physicians, emphasized; the method of investigation is that which is essential and determining. It is the method which distinguishes the Harveys, the Hallers, the Bells, the Magendies, and the Müllers from their smaller contemporaries. This is the soul of the natural sciences."

Observe; experiment; seek the aid of allied sciences, chemistry, physics, general biology; collect by systematic and purposeful investigation, in which the "Frage-Stellung" is correct and clear, a body of facts, and from them deduce general pathological principles and

laws. It is along these lines that Virchow has worked and taught. The proper uses of hypotheses in scientific investigation he has always recognized; but important as are these uses, hypotheses are not to serve as the foundation of pathological doctrines. His early opponents, the adherents of the philosophy of nature and the so-called rationalists, accused him of leading medical science into the barren collection of facts, of letting the broad river of science waste itself in countless little streams. But both by precept and example no one has demonstrated more clearly than Virchow that the scientific mind, in the investigation of details, should not lose sight of the higher aims, the orderly classification of the facts, the search after new and loftier points of view, the establishment of general principles and laws.

This method of investigation is none other than the Baconian. Virchow did not originate it. Many before him had recognized its importance, and had applied it to medicine. Before Virchow it had already become the powerful lever of comparative anatomy, embryology and physiology. But one purpose of the historical remarks with which I began this address was to show that in pathology this method had not gained full sway when Virchow's work began, and that speculation and the construction of philosophical systems of medicine based upon speculation, were still in vogue. The application of the scientific method to pathology could not have been long delayed, but to Virchow more than to any other man belongs the credit of introducing into pathology the scientific method of investigation by the employment of which this department of knowledge has gained its rank as one of the natural sciences.

It is another great merit of Virchow to have made clear the kind of knowledge to be gained by the study

of pathological anatomy. In the enthusiasm of the rapid development of pathological anatomy in the early part of this century, false and exaggerated ideas were entertained as to the relations between this subject and practical medicine and as to the kind of information to be derived from the examination of diseased organs after death. The attempt was made to construct out of pathological anatomy alone, systems of pathological physiology. This led in France to such exclusive systems as Broussaisism and in Vienna to the craseological system of Rokitansky and to the nihilistic school of therapeutics, less dangerous than Broussaisism but equally unfounded. Rokitansky expressed and enforced upon his followers "the conviction," to quote his own words, "that pathological anatomy must be the foundation not only of medical knowledge but also of medical treatment, yes, that it contains everything that there is in medicine of positive knowledge and of foundations for such knowledge." Against this view Virchow pointed out that each department of medicine has its own field and must be investigated by itself and cannot be constructed entirely out of another. As he said, "Pathology cannot be constructed by physiologists, therapeutics not by pathological anatomists, medicine not by rationalists."

Pathological anatomy shows us simply the morbid changes in the organs, tissues and cells as they exist in one phase or in a series of phases. It does not show us the morbid process as it goes on in time. It does not reveal the alterations in function. Pathological anatomy is essential to pathological physiology, but the relations which these branches of knowledge bear to each other are similar to those between normal anatomy and physiology. General pathology or pathological physiology, as Virchow likes to call it, rests also upon experiment and clinical observations. It

never has been and never can be successfully built up from pathological anatomy alone. Its methods are those of normal physiology. In one of his earliest publications in 1846, Virchow said: "It would be sad indeed if anatomical investigation were compelled to confine itself to the dead material, to the recognition of the completed conditions of isolated and determined products, if the entire outcome were only the description and classification of certain objects in nature. Pathological experiment remains ever the sure control for the pathological anatomical conclusion, and it will seldom be employed without disclosing to us new and valuable sources of knowledge." These words appropriately introduced the description of Virchow's admirable anatomical and experimental work on "Plugging of the Pulmonary Artery and its Results." All this needed to be said when Virchow said it, and it has not lost its force to-day.

John Hunter and Magendie were the pioneers in experimental pathology, and Virchow and Traube established pathological experiment in its impregnable position as the most powerful aid in the development of pathological physiology.

The establishment of cellular pathology is one of the greatest events in the history of medicine. That Virchow's share in this was decisive and controlling cannot be successfully contested. The historical points pertaining to the development of the principles of cellular pathology have been often and much discussed. Virchow's investigations leading to the development of this great thought in his mind are briefly referred to in chronological sequence in the article at the beginning of the one hundredth volume of his *Archiv*. On this occasion I cannot enter into the history of the question, save to emphasize one point which is lost sight of by some of those who have written on the

matter. The discoverer of a scientific fact is not he who has divined it, but he who has proved it. The opportunities for the study of the development of animal cells are furnished chiefly by embryology and by pathology. The demonstration that all cells are derived from pre-existing cells was easier to bring by the embryologist, starting with the ovum, a single cell, than by the pathologist. Hence it is not strange that embryologists, such as Reichert, Kölliker and later Remak, had discarded the blastema theory, so far as the development of the embryo is concerned, at a period when the same theory prevailed in pathology. But so long as it was not proven that in pathological formations the new cells also come from pre-existing cells, this general principle of cell development could not be considered proven. It was not until Virchow had brought this part of the evidence, more difficult to obtain than the embryological and equally important, that the truth, which he was the first to frame in the words, *omnis cellula e cellula*, was fully established. The nutritive, the functional and the formative disturbances of cells became in his hands the ground-work of cellular pathology; and although this ground-work was laid before the publication of his "Lectures on Cellular Pathology," in 1858, nevertheless these came as a revelation to most physicians throughout the world.

The principles of cellular pathology have become to such an extent an integral part of medical thought that we can hardly estimate to-day all that this discovery meant a generation ago. To do this we must put ourselves back in thought to a time when all organized pathological products, pus, tubercle, cancer and all tumors were supposed to be formed out of a primitive blastema, an exudation of some kind. Think of trying to come, under the influence of such ideas,

to any coherent or intelligent opinions as to the nature and development of morbid processes.

The never-ending strife between humoralism and solidism would probably be going on to-day had it not received its death-blow from cellular pathology. The termination of this strife does not mean that we are not the heirs of great truths which came out of it, or that there is any contradiction between cellular pathology and humoral or nerve pathology in the proper sense of the terms. In 1855 Virchow said, with a cast of thought perhaps derived from his political opinions: "While we contend for the *Tiers état* of the many little elements, it may seem as if the aristocracy and the hierarchy of blood and nerve were to be destroyed to their very roots. But it is here only usurpation which we attack, monopoly which we wish to overthrow; and once again we emphasize it that we fully recognize blood and nerve as equally authorized factors together with the other parts; yes, that we do not in the least question their predominant importance, but that we concede their influence upon other parts to be only a stimulating and moderating, not an absolute, one."

With the recognition of cellular pathology, it became clearer than ever before that the laws working in disease are not different from those in operation in health, but that they are subject to different conditions. The ontological conception of disease passed out of the horizon of scientific medicine.

Cellular pathology is not a system, a doctrine; it is a biological principle, as has been said by its founder. Its foundations have been attacked, but never have been shaken. The discoveries of karyokinesis, of wandering cells, of the migration of leucocytes from the vessels, and of the specific cellular germs of disease have only widened our views of cell pathology.

Cellular pathology is one of those great principles in science which, when established, disclose new points of view, open up limitless fields for investigation, and receive the new results without a tremor in the foundations. How different this from the era of speculative systems and schools of medical doctrine, when every new discovery threatened the overthrow of the dominant system!

With Virchow's return to Berlin, in 1856, he had secured from the government the concession of a new pathological institute, to be constructed according to his own ideas and plans. In any estimate of the reformatory influence of Virchow upon pathology, his share in bringing about the general recognition of the importance of establishing pathological institutes should not be overlooked. In 1858 he wrote: "As in the seventeenth century anatomical theatres, in the eighteenth clinics, in the first half of the nineteenth physiological institutes, so now the time has come to call into existence pathological institutes, and to make them as accessible as possible for all." His ideas as to the general organization of such institutes have been the controlling ones for most of those since constructed in Germany, and for many in other countries. The importance of such institutes for the instruction of students and physicians and for the progress of pathology cannot easily be overestimated. A pathological institute, constructed and conducted like the one in Berlin, requires a very considerable outlay of money, which Virchow said must come in general from the government. In this country, however, we must look in general to private beneficence to endow hospitals and medical schools with such pathological institutes as have made Germany for many years the Mecca of those from other countries who wish to study pathological anatomy.

Virchow, like his teacher, Müller, and like one of his great predecessors in Würzburg, Döllinger, has been one of those teachers who have attracted pupils in large numbers, and have exercised a powerful influence upon their thought and development. The professorships of pathological anatomy in Germany are occupied to a very large extent by those who have been under the inspiration of his personal teachings, and many in other lands are proud to call him master.

Nearly forty years ago, Virchow wrote: "There are also those who, if they do not create the current, still give to it its direction and force. These men are not always the happiest. Many go down in the movement, or by it. Many grow weary after they have given to it their best forces. Much power and great tenacity are necessary if the individual shall not only live to see his triumph, but also to enjoy it."

He who wrote these words has lived to see and today enjoys his triumph. May health and happiness be his for many years to come!

— THE BOSTON —
MEDICAL AND SURGICAL JOURNAL.

A FIRST-CLASS WEEKLY MEDICAL NEWSPAPER. PUBLISHED EVERY THURSDAY.

Two Volumes yearly, beginning with the first Nos. in January and July. But Subscriptions may begin at any time.

This JOURNAL has been published for more than sixty years as a weekly journal under its present title. Still it is incumbent upon this JOURNAL, no less than upon others to assure its patrons from time to time, as the occasion arises, of its desire, ability, and determination to meet all the requirements of the most active medical journalism of the day, without sacrificing any of that enviable reputation which is an inheritance from the past.

It is under the editorial Management of Dr. George B. Shattuck, assisted by a large staff of competent coadjutors.

Communications from all quarters of the country are acceptable. Liberal arrangements are made for reprints of original articles, and for such illustrations as serve to increase their value or interest.

All editorial communications, and books for review, should be addressed to the Editor. Subscriptions and advertisements received by the undersigned, to whom remittances should be sent by money-order, draft, or registered letter.

Terms of Subscription : In the United States, and to Canada and Mexico, \$5.00 a year in advance. To Foreign Countries embraced in the Universal Postal Union, \$1.56 a year additional. Single numbers, 15c. Ten consecutive numbers free by mail on receipt of \$1.00.

Sample copies sent free on application.

PUBLISHED BY DAMRELL & UPHAM,

283 Washington St., Boston.

