



Kindness of the Baltimore Sun and of Henry L. Mencken

MAX BRÖDEL

Max Brödel, 1870–1941

Director of the First Department of Art
as Applied to Medicine in the World

By THOMAS S. CULLEN, M.B.

AS THE YEARS roll by and this war-torn world finds itself again at peace we will gradually catch up with the things we have not attended to or have missed completely.

There was in Baltimore a kindly, curly-headed man of quiet demeanor, beloved of his friends and possessed of a passion for music. He was a born artist and during his forty-eight years in Baltimore revolutionized medical illustrating in the United States and Canada; his work has reached even the uttermost parts of the earth. No other man who has ever lived has done as much to improve the beauty and accuracy of medical illustration.

In the following pages I shall endeavor to give in some detail the picture of this man and of what he has accomplished. Less than two months before he died he gave a full account of his many years of stewardship. This was in a paper entitled "Medical Illustration," published in the *Journal of the American Medical Association*, August 30, 1941, Vol. 117, pp. 668-672. To Morris Fishbein go my warmest thanks, for I have used portions of the article wherever they could add to the proper portrayal of that Master Medical Illustrator. In after years, as he is now in many places, Max Brödel will be recognized as the greatest medical illustrator who has ever lived.

Max Brödel, Illustrator for Dr. Howard A. Kelly

Several years ago I asked Max Brödel to tell me about his early life and he jotted down the following which I have in his own handwriting:

Born in Leipzig, June 8, 1870. He was the son of Louis Brödel and Henrietta Frenzel Brödel. He went to the public schools until 1884. His father loved music and forced his son to study piano, beginning at the age of six. For several years he played nothing but scales, Czerny, and trivial sonatas. Finally he had sufficient technique to plunge into Beethoven. His teacher purposely kept him away from Beethoven until he was equal to playing his Sonata

Appassionata. Beethoven has had a powerful influence upon Brödel's entire life.

Brödel went to the Technical High School, 1884-85; then to the Leipzig Academy of Fine Arts, 1885-90. During the vacation he worked in the Anatomical Institute for His, Braune, Spalteholz, and later in the Physiological Institute for Carl Ludwig and his pupils. It was there that he met Dr. Franklin P. Mall in 1888.

Brödel was drafted into the army, November 8, 1890, to serve two years. Through the good offices of Geheimrat Carl Ludwig, Prince George of Saxony ordered that Brödel serve only one year with arms and that he devote the second year to artistic activity for the regiment.

In 1892 Brödel returned to Leipzig to free lance in fine art and anatomical and physiological illustrations.

Negotiations to come to America began in 1891 but because of misunderstandings, resulting from lost correspondence, Brödel did not arrive in Baltimore until January 18, 1894.

I can see Max as he arrived in Baltimore harbor in January, 1894. He was wearing a stiff black hat and the curly locks were welling out beneath the brim of his hat. He went to board with the Gills at 1640 E. Fayette Street where I had boarded during the Fall of 1891.

Max immediately started work with Dr. Howard A. Kelly in the Gynecological Department of the Johns Hopkins Hospital. One of the first drawings he made was of a case of prolapsus. Each operating day he would visit the operating-room and confer with the Chief; sometimes it was a specimen that Dr. Kelly wanted drawn, sometimes a new operation that was to be sketched. If the condition was not perfectly clear, Dr. Kelly, by a few judicious strokes, would clearly outline just what he wanted and Max would, at a glance, see just what Dr. Kelly desired drawn.

Max Brödel in his address at Dr. Kelly's 75th birthday dinner, on February 20, 1933, made this point very clear. I quote him verbatim:

In the early years, Dr. Kelly's friend, Mr. Anthony Murray, made many excellent photographs, fine records of the dramatic aspect of surgery and of external lesions. But photography has its limitations and it is not hard to see where and why it fell short. I knew that it would be useless for me to compete with the camera in the realistic or imitative field. It was necessary to originate a different type of picture, one that would show far more than any photograph could ever do. To make such a picture is much more difficult. The artist must first fully comprehend the subject-matter from every standpoint: anatomical, topographical, histological, pathological, medical, and surgical. From this accumulated knowledge grows a mental picture, from which again crystallizes the plan of the future drawing. A clear and vivid mental picture always must precede the actual picture on paper. The planning of the picture, therefore, is the all important thing, not the execution.

There is where we learned from Dr. Kelly. He had a way of making little

modest outline sketches when he explained his operative procedure to his illustrators. There were three of us now. Hermann Becker came in 1895, August Horn in 1898. Dr. Kelly had endless patience with us. He invented diagrams to show variations of form and relationship, motion, pressure, tension, rupture, the development of a pathological process, the sequence of operative steps, the placing of ligatures, sutures, etc.; in short, every clinical phenomenon, every operative procedure flowed in simple, eloquent lines from the end of his pencil. Few medical men can do that. What if the form was not quite correct; it did not matter, the spirit was there. We understood his diagrams; they were eloquent. In this way Dr. Kelly taught his artists the secret of the correct conception of an illustration, which is the very basis of all creative drawing. It usually was comparatively simple to build on, to give to the primitive contour correctness of form, to elaborate the plastic rendition and add surface texture. This is one great debt we owe to Dr. Kelly, and now for another: while making a drawing the conscientious artist has a way of discovering gaps in contemporary knowledge, so when knowledge was lacking and the literature silent on the subject, Dr. Kelly always permitted the artists to make original investigation to clear up the obscure point. That meant temporary cessation of illustrative output until the question could be answered. He never failed to give his consent to such digression. Few authors of medical books will do that. Without his sympathetic attitude we could not have learned our trade as we did.

It was not long before Dr. Kelly was publishing articles containing Brödel's illustrations, and these illustrations at once drew forth very favorable comments. When Dr. Kelly's two volumes on Operative Gynecology appeared in 1898 Dr. Kelly was at once recognized as the leader in American gynecology, and Brödel's illustrations in these two volumes immediately revolutionized medical illustrating.

Brödel made the majority of the gross pictures and Becker many of the histological pictures. Horn also made excellent gross and histological illustrations.

During all the years Dr. Kelly was most generous in agreeing to have Brödel make pictures for members of his staff, and every now and then, when a colleague in another department needed an illustration badly, Dr. Kelly gladly had Brödel do it for him.

Max Brödel was not only a wonderful draftsman: he had also a wide knowledge of anatomy and was a born investigator. For example, on one occasion Dr. Kelly wanted some anatomical data about the blood supply of the kidney. Brödel would go to the autopsies in the Pathological Laboratories, get a normal looking kidney, attach it by a tube to the tap, and wash out the kidney. He would then fill the arteries of the kidney with red, the veins with blue and the ureter with yellow. Next he would digest the kidney, using the digesting method he had seen Mall use in Ludwig's laboratory in Leipzig. The results he obtained were fascinating.

Various portions of the kidney reminded one of branches of an apple tree, and all over these branches were minute apples—they were the glomeruli or filters of the kidney. He pointed out the avascular area in the kidney and suggested opening the kidney along this line when exploring the kidney for stone, and before finishing this kidney investigation, he developed a suture which could be used to stitch up the kidney that had fallen down—one that was prolapsed. This suture is to this day referred to as Brödel's suture; it is triangular and so placed that a piece of kidney will tear out before the suture will give way.

In 1916 I published a 680 page book, *Embryology, Anatomy, and Diseases of the Umbilicus*. The best part of that volume is the embryology. Brödel had the opportunity of studying the most extensive and best collection of human embryos in the world, a collection started and continued for years by the late Franklin P. Mall. Without it such embryological studies and such drawings would have been impossible. This collection of embryos, after Dr. Mall's death, was greatly increased by Dr. George L. Streeter, who became Director of the Carnegie Laboratory, and when Dr. Streeter retired, by his successor, Dr. George W. Corner.

Let me give you one other striking example of Brödel's investigative spirit. I had collected an interesting group of cases, in which, for some reason, there had been a sudden rupture of a rectus muscle with hemorrhage. I asked Max to make me a drawing or two of the rectus muscle. That he had long been interested in this important muscle was unknown to me. In the course of a few months he had studied the rectus muscle most carefully and had also gone into the histology of it. The drawings he made were masterpieces. I told him we would have to publish the article jointly, as I could not for a moment lay claim to these wonderful drawings. Finally, he reluctantly consented and it was published under our joint names. He was modesty itself and most self-effacing.

In 1919 I published a short sketch of Dr. Howard A. Kelly in the *Johns Hopkins Hospital Bulletin*. Accompanying this article was a relatively complete list of Dr. Kelly's publications, prepared by Miss Minnie Blogg. The vast majority of these publications were illustrated by Max Brödel or by his associates, Hermann Becker and August Horn. To speak of these many publications would carry us too far afield.

Color reproductions in the text probably reached their high-water mark in *Cancer of the Uterus*, published in 1900, and in the *Umbilicus and its Diseases*, published in 1916.

MAX BRÖDEL'S ARTIST MODEL

Most artists have models. The majority of Max's drawings had to do with tumors or with operations; consequently he needed no regular

model. On a few occasions, when he was a relatively young man, and when he was illustrating Dr. Kelly's new method of examining the bladder and ureters, he required a model from which to sketch the knee-chest posture. Every time I see the drawings he made on those occasions I cannot help smiling broadly. I was Max's model, and you may rest assured that it was easier for me to assume the knee-chest posture at that time than it is now.

Max Brödel as My German Teacher and as My Companion

Almost immediately after Brödel came to Baltimore he and I became fast friends. At that time I had charge of the laboratory of Gynecological Pathology and would watch him making sketches of the tumors that had been removed. Later on I would go to his small studio and read. Just as soon as Brödel reached Baltimore he began to talk English and I began to attempt to answer him in German. Although I had had quite a number of lessons in German, my knowledge of the language was very fragmentary. As he spoke English and I German we very frequently had temporary misunderstandings, but as our knowledge of the two languages became greater we got along perfectly. In my spare time, while he was at work on a drawing, I would read a German book aloud. In the course of a few years I had read several novels by Gustav Freitag and two large volumes on the Franco-Prussian War. Of course Max would correct my mistakes in pronunciation as we went along.

Having Max as my teacher was of inestimable value to me. I soon could read medical German with relative ease, and on one occasion the reading knowledge of German relieved me of much embarrassment. At an international congress in Rome in 1902 I gave a lantern talk on adenomyoma of the uterus. The medical amphitheatre of the university was crowded. The speaker who preceded me came from the United States and few understood what he was saying. Prof. Paul Zweifel of Leipzig, whom I knew well and who was sitting in front of me, turned round and said, "Cullen, you must talk in German; there are not four persons in the audience who can understand English." I told him that I could not, but he said, "You must."

In a moment or two I was called upon and after explaining the matter to the presiding officer, who was an Italian, I started to talk in German and kept it up for forty minutes. I made many mistakes, of course, but my pictures on the screen helped mightily. My attempt to speak in German evidently pleased the Italians, as they made me an honorary member of the Italian society the next year.

Max and I stood by our original intentions. He was always to speak

English and I German. During the nearly forty-eight years of our friendship, I spoke in all less than two hours in English to him.

In the early days Max and I would in the afternoons take long walks out into the country and after traveling a couple of miles we would sit on a fence and read German. At other times we would take the car out to Walbrook and have a long walk along the millrace. Sometimes we would journey down to Cambridge on the steamer to visit Dr. Brice W. Goldsborough and his brother, Phillips Lee Goldsborough, later Governor. On other occasions we would run up to Waynesboro, Pennsylvania, to visit our friend, Dr. A. Barr Snively. On at least one of these occasions we returned to Baltimore on our bicycles.

In the fall of 1897, just after I had completed my term as Resident Gynecologist at the Johns Hopkins Hospital, Max and I went to Groveton, New Hampshire, and started on a hunting trip with a one-armed guide who was a delightful fellow. He lost his way and we slept out in the open. It froze during the night, and next morning there were fresh bear tracks within one hundred feet of where we had slept. We started off early that morning and had to cross a small river on a fallen tree that still retained its branches. To make it more difficult, we had to carry our satchels with us. Late in the day we reached the cabin of a deserted lumber camp. That night, while we were sitting by the fire, a lynx pressed its face against a window pane to see what was going on inside. Next morning we stepped out to the stream which was not over ten feet away. As there was a little ice on each bank of the stream we had to step in very carefully in order that we would not cut our feet. The brook trout darting up and down stream gave us a real thrill. Later in the morning Max and I were sitting quietly on a log in the forest hoping a deer would come along. We really were so quiet that a squirrel came up and sat down beside us on the log. We saw no deer.

Early in 1923 I had my second gall-bladder operation and took several months off. Max and I and our old friend, Alf Raaflaub, of Pembroke, Ontario, visited the homes of my childhood. I say "homes" because my father was a Wesleyan Methodist minister and according to the church rule we moved every three years. Max made sketches of some of the old homes, of one old swimming-hole where I had spent many happy days, of several of father's old churches and of many other interesting things. We had a glorious time and often referred to the fun on that trip. All this material was gathered together at the time, over twenty years ago. It is growing mellow and may possibly some day appear under the title, "From One to Twenty-One."

Max was an expert fisherman and if anyone could catch fish, he could. Well do I remember the day when he said, "Tom, I have some fine minnows; let us go fishing." After luncheon he and I started off for Burnt Island, which belongs to Miss Olga Kelly and lies about

a mile and a half north of the Kelly camp. After dropping anchor, Max put a wonderful minnow on my hook. Within five minutes my line started out. After it had gone about thirty feet I checked it, and after playing the fish for about five minutes, cautiously reeled it in. Max gaffed it and drew it into the boat. It was a wall-eyed pickerel weighing nine pounds—my best catch. Max had made his own gaff; it was an ordinary butcher's hook on which meat is hung. The handle of this hook had been embedded in a wooden handle about eighteen inches long. It was an ideal gaff. Max also repaired his own fishing tackle.

Frequently I went over to see my youngest sister and her family on an island about eight minutes away. On the way back I would invariably drop in to say hello to Max if he were fishing on his wharf. As soon as he saw me coming he would leave his rod and slip behind his boat-house to the shore; by the time I got there he invariably had a red and green bouquet to hand me, a fine bunch of young radishes. He had a new crop of these every week or two, and this was a regular ritual with him.

On one occasion, with Chancellor James H. Kirkland of Vanderbilt University and Abraham Flexner, the distinguished Director of the Institute for Advanced Study at Princeton, Max and I went to Horn Lake after lake trout. Kirkland and Flexner were trolling along slowly when suddenly my reel slipped off and dropped into ninety feet of water. Both Flexner and Kirkland were just like two small boys and teased me unmercifully. As I started to draw in, the wire gradually unrolled from the reel until all was unwound. The reel then came to the surface. To unreel and then reel up hundreds of feet of wire without kinking any of it was certainly a feat. It was in large measure due to Max's skillful handling of the canoe that he and I were successful.

We then had luncheon on a small island which had a very steep slope into the water, which at that point was over fifty feet deep. All of us were sure-footed. I built the fire, the Chancellor boiled the potatoes, Max made the coffee and Abe Flexner fried the bacon. We had a delicious luncheon.

I have given you this glimpse of Max Brödel to show you that he was no dreamer, that he was very capable in solving small difficulties as well as large ones, and that he was an ideal and most lovable companion. He was absolutely fearless and most unconventional. I can still see him out in his small motor boat fishing at the point at dusk. The exhaust of a motor boat ever brings back to memory that genial, curly-headed friend of mine who, when getting up to speak at the dinner given me by nearly five hundred friends of mine on my seventieth birthday, stepped up and kissed me on my bald head before beginning his speech. Nobody ever had a better or truer friend.

Max Brödel's Illustrating Apart from Medicine

Most of Max Brödel's friends thought that he made only medical drawings, but such was not the case. During his summer vacation he would every now and then find time to make a drawing from nature.

I have in my library three of these pictures. The first is a beautiful painting of our log cabin, with the solid rock in front and the blue sky and white fleecy clouds, so characteristic of this vicinity, above and in the background. I can see Max anchored out on the lake making this picture. Next to that painting is one showing the interior of our log cabin with its fireplace and with the contents of the cabin depicted in careful detail, and in front of these pictures, illuminated by a study lamp, is a view of Ahmic Lake as seen from our sleeping cabin. It shows at the end of Rhodes Island the land of my youngest sister and her husband, Mr. and Mrs. R. A. Daly of Toronto. Across the lake from Rhodes Island rises a very tall tree on the mainland, on the property of my friend, Abraham Flexner, and down our side of the lake, about half a mile from our camp, is a boathouse, belonging to Max Brödel's family; their camp is hidden by the trees.

When I come in from a busy day's work and am a little fagged, these pictures act as a strong stimulant and carry me back to the glorious times we have had on and around the lake.

When we took long trips through our woods, Max would be on the lookout for fungi. These were often a foot or a foot and a half long and were attached to the sides of the trees. They were usually brown on top, pure white on their under sides. Brödel would take these fungi home, carefully protecting the white under sides of the fungi. On reaching home he would, with a pen, a pin or some other sharp instrument, etch a charming scene on each fungus. These pictures he usually presented to his friends. They were greatly admired and treasured; I have never seen their equal.

Max Brödel modernized the seal of the Medical and Chirurgical Faculty of Maryland, providing the seal now in use. He also made bookplates for the John M. T. Finney, the John Ruhräh and the William Osler collections of books of the Medical and Chirurgical Faculty. Among the limited number of bookplates made by him was one for Dr. Lewellys F. Barker. I am the happy possessor of another, the theme for which was arranged by Mrs. Cullen and Max.

Max Brödel made the famous cartoon, "The Welch Rabbits." "Popsy" Welch is standing up with a cigar in one hand and in the other are grasped the reins leading to the younger men who are pictured as rabbits. They were men whom Dr. Welch had trained or who had been associated with him. The cartoon was made at the time a very large

dinner was given to Dr. Welch. Many copies are in existence; the original was given to Dr. Welch's niece.

Back of me as I write in my library is the original of the now famous cartoon, "The St. John's Hopkins Hospital." Dr. Osler is adorned with halo and wings; his toes are sticking out of his small shoes. In the background is the Johns Hopkins Hospital, and in the whirlwind starting at the hospital and rising heavenward is Osler. Below him are many germs; some of them are scurrying away, others just don't care a damn and are sitting down resting on their haunches. Dr. Osler sometimes addressed letters to me and to others to "The St. John's Hopkins Hospital," and it was for this reason that Max drew the cartoon.

Before entering the operating room the surgeon and his assistants take off their street clothes and put on cotton shirts and trousers with drawstrings and without buttons. If the operator is thin there is usually no trouble, but occasionally, where the surgeon is stout and where the drawstrings are at the equator or slightly below, the trousers may slip. The nurses and students were well aware that on several occasions my trousers had slipped, but that really made no difference because the operator wears a sterile gown which extends to his knees.

In January, 1923, at an operative clinic, a student handed my head nurse a long, slim package addressed to me. I at once opened it. On the cover of the box was the picture of a very pretty girl. The box contained a fine pair of suspenders with a note to me expressing the best wishes of the class and presenting these suspenders for emergencies. I thanked the students for the beautiful and valuable suspenders but reminded them that I had no buttons.

A few weeks later, on February 28, 1923, an operation revealed that I had commencing gangrene of the gall-bladder and that the gall-bladder contained many stones. Max Brödel was present at the operation and took the gall-stones to his studio, where he made a facsimile of my name with the date. He used the individual gall-stones in reproducing my name and date in color and then made a frame around the picture using the large and irregular stones for this purpose. So graphic was the picture that one of my special nurses, when she saw it, immediately put out her hand to pick off one of the gall-stones from the frame of the picture. She really thought that the large gall-stones had been glued on to the picture.

On a bitterly cold and damp morning, about six days after my operation, Max had my student group congregate on the hospital bridge near Ward D for an exhibit. First of all there was the pair of suspenders with the kind note from the students; then came the painting of my gall-stones with the following note beneath: "The reason why the

drawstrings were not drawn tight." All were greatly pleased with Max Brödel's unique and telling demonstration.

The Brödel Family

Ruth Huntington, a charming young lady from Sandusky, Ohio, had had an excellent training in anatomy and art at Smith College, where she majored in scientific subjects, especially in zoology and botany. She always loved drawing, and her laboratory books attracted the attention of her professors to such an extent that they requested her to make charts to be used in the classrooms and to illustrate some of their articles. She was recommended to Professor Bailey of Cornell to make drawings of rare plants in the very fine, endowed botanical gardens in Northampton; she also furnished fifty illustrations for his *Encyclopaedia of American Horticulture*.

In 1900 Professor Franklin P. Mall asked Miss Huntington to come to Baltimore. Here she illustrated some embryological reconstructions for Dr. Charles Bardeen. As soon as she arrived at Dr. Mall's laboratory, Max Brödel went over to pay his respects to the new artist. He showed her the drawing technic he had developed for his students and in a short time learned to his pleasure that Miss Huntington was also a musician. Max suggested that they play on the piano together occasionally.

A little later she began work on the appendix book which Dr. Howard A. Kelly and Dr. Elizabeth Hurdon were about to publish. Brödel supervised the drawings made by Miss Huntington and August Horn for this beautifully illustrated volume. Incidentally, Brödel and Miss Huntington jointly wrote the anatomical chapter for the appendix book, and in the preparation of this made frequent trips to the Surgeon General's Library to look up the literature on this subject.

Naturally, it was not long before Max thoroughly appreciated Miss Huntington's unusual ability both as an artist and as a musician. They often played on the piano together. One summer Dr. Kelly invited Ruth Huntington and Max to his summer camp on Ahmic Lake. On a memorable day Max and Ruth paddled over to Birch Island, about half a mile from the Kelly camp. They returned late that day looking very happy, and that night Dr. Kelly, around the camp fire, announced their engagement. They were married in 1902.

A few years later, the Brödels built their camp on Ahmic Lake, and in 1910 I built mine along the same shore about half a mile distant from theirs. During the years four children were born to the Brödels. Little Ruth died while still a small child. Elizabeth, Carl and Elsa survive.

Elizabeth followed in her father's and mother's footsteps and is a

most talented medical artist in New York. She illustrates chiefly for Professor H. J. Stander at the New York Hospital. Carl is a Ph.D. of the Johns Hopkins University and specializes in mining geology. Elsa also has a great deal of artistic ability, and her advice is frequently sought about the proper selection of attire. She is now Mrs. Burk Allerton.

In the early days Max and Ruth lived at 707 Carrollton Avenue, next door to the Matt Tinker family, of whom we were all very fond. Mr. and Mrs. Charles Dohme and their family also lived on Carrollton Avenue; they and Mr. Louis Dohme could not have been kinder to the Brödel family or to me. Mrs. Louise Pomplitz was invariably included in the happy group.

For many years the Brödels lived at 320 Suffolk Road, Guilford. It was there that Mrs. Cullen and I spent a very happy evening once almost every week for years, playing bridge. Max was invariably my partner. Who usually won is a secret, but one thing is certain, Max and I often lost. With Max's going, and with the major portion of the Brödel family in New York, I rarely have the heart to pass 320 Suffolk Road, the scene of so many happy occasions.

Max Brödel a Remarkable Pianist

Max Brödel, as already mentioned, began his musical career when only six years old, and for two years his teacher allowed him to play nothing but scales, Czerny, and trivial sonatinas. After Max had practiced on these for two years he was given Beethoven's "Sonata Appassionata." He has often told me that in the playing of this he was almost overcome by its beauty and by its stirring qualities. When he came to Hopkins he always had a piano; sometimes it was in a room across from the hospital, sometimes in the center front room on the third floor of the hospital.

On March 24, 1899, Max entered the Johns Hopkins Hospital on account of a serious hand and arm infection resulting from some anatomical dissections he had been making. His hand and arm were opened on numerous occasions. Finally the wound healed, but some nerves had been caught in scar tissue and this complication necessitated further operation.

Brödel made many illustrations of his left arm and hand, showing the areas of numbness that existed following the operations for the infection. Dr. Halsted urged him to publish his case, together with the most instructive drawings, but Max was too busy and never did so. I saw the illustrations a few weeks ago.

In December, 1904, shortly after Brödel's attack of typhoid, a street-

car on which he was riding gave a lurch and he was thrown to the street. The middle finger of his right hand was bent right back on the back of his hand. It looked as if he might lose this finger. Fortunately, Dr. Finney was able to save it.

Had it not been for the excellent treatment given him by Dr. Halsted in 1899 and by Dr. Finney in 1904, Max's friends would have missed the many delightful and happy musical evenings he gave us in after years.

Brödel and Henry L. Mencken were the principals in the celebrated Saturday Night Club. Max derived a great deal of pleasure from the Club and attended it religiously. Every now and then I would invite him to spend the week-end down in the country. Time and again he would reply, "I wish I could, but Henry Mencken will be away on Saturday night and I must be there."

Up on Ahmic Lake was a jolly company consisting of some of the Kellys, the R. A. Dalys, the Abraham Flexners, the Chancellor Kirklands, the Benjamin Meritts, and the Cullens. Some or all of us would on frequent Sunday evenings congregate at the Brödels. Some sat in the numerous chairs, others, by preference, sat on the floor, all in camp attire, and listened to delightful music by Max and Ruth Brödel. These were evenings that we shall never forget; our debt of gratitude to the Brödels can never be repaid.

It is not generally known, but as a boy Max made such progress with his music that the musical authorities in Leipzig urged him to give up medical illustrating and to devote his life to music. Max Brödel was a remarkable pianist.

My knowledge of music is very limited, but on one occasion I accompanied Max to the piano. He and I were visiting our friend, Dr. David Houston of Troy. The night was very warm; Mrs. Houston was away, and Dr. Houston was out all night on an obstetrical case. When he returned in the morning he found our beds empty, but our clothes still in our room. After hunting the house over he finally looked in the parlor, which had been closed for weeks; the room was cool, and Max and I were sound asleep under the piano.

A Unique Tribute to Brödel

Max Brödel was made an honorary member of the Medical and Chirurgical Faculty of Maryland in 1909. He was the only layman ever accorded this distinction.

The Establishment of the Department of Art as Applied to Medicine in the Johns Hopkins Medical School

In 1910 Max Brödel, who had illustrated so many of Dr. Howard A. Kelly's papers and books, and who had made so many pictures for my publications, received an urgent invitation to join the staff of one of the finest private clinics in America. Dr. Kelly was loath to let him go but at the time had no large publications under way. Brödel said, "I was tempted to go elsewhere, but my roots were deep in the ground and I was loath to leave Johns Hopkins."

I was worried sick at the thought of my friend's departure. One day at camp I walked down to my tent, pulled out an old corncob pipe, filled it and struck a light and dreamed. I dreamed of a department of art as applied to medicine in the Johns Hopkins Medical School. Here artists who wanted to make medical art their life work could get a training of two or three years. Medical students could be taught how to make charts and blackboard illustrations, and the spare time of the head of the department would be taken up in illustrating articles published by members of the Faculty. In ten years the leading medical schools would have competent medical artists, and in twenty years American medical illustrations would be the best in the world, adding much to the prestige of American medicine.

After many heartaches, just four days before Brödel had to give his answer I was successful in enlisting the sympathy of a hard-headed business man who had a deep interest in art. This man, Mr. Henry Walters, promised \$5000 a year for three years, and on receipt of his letter, I invited President Remsen and the Trustees of the University to luncheon at the Maryland Club at forty minutes' notice, as prompt action was necessary. The letter was read and the Trustees at once accepted the generous offer. Thus the Department of Art as Applied to Medicine came into being.

Attempts were made to secure an endowment, and the correspondence shows that the W. B. Saunders Company, medical publishers of Philadelphia, agreed to give \$1000 toward the endowment. Mr. J. P. Morgan, through Dr. James Markoe, promised \$5000 should the full \$125,000 be raised. Dr. Markoe, an outstanding New York physician, was most helpful. A short time later, when he was taking up the Sunday morning collection in one of the leading New York churches, a crazy man, who had never known him, pulled out a pistol and killed him.

Mr. Walters offered to give \$15,000 should the proposed \$125,000 endowment be raised. The attempts to secure the necessary endowment

were, however, unsuccessful. Mr. Walters paid the \$5,000 a year for three years, and finally told his Baltimore office to pay the Johns Hopkins University \$2,500 every six months until he told them to stop. After continuing his benefaction for ten years Mr. Walters agreed to endow the department to the extent of \$110,000. Thus Mr. Walters contributed in all \$160,000 to the only Department of Art as Applied to Medicine in the world.

I wish the Brödels' friends could have seen the happiness on Max's and Ruth's faces when it was my rare privilege and pleasure to tell them that the Department of Art as Applied to Medicine in the Johns Hopkins Medical School had been endowed. Their faces shone with happiness, but a slight moisture was visible in the eyes of both of them. Up to that time the permanence of Max's Department had ever been in doubt.

Thus was started the first Department of Art as Applied to Medicine in this or in any other country. Max Brödel and his pupils have had a profound influence on medical illustrating throughout the entire world.

On March 1 of each year, Mr. Walters had on his desk in New York a complete report of what had been accomplished in the Art Department during the preceding year: the number of students, the parts of the country from which they came, the character of the illustrations, and frequently reproductions or photographs of the most important illustrations. He received a full report each year up to the time of his death. His interest in the Department grew greater and greater, and shortly before his death he wrote me as follows:

The Breakers, Palm Beach, Fla.

March 3, 1930

Dear Dr. Cullen:

I thank you for your kind letter of February 27 regarding the increasing influence of the work done under Max Brödel's supervision, and advising me that you have sent the report of the Johns Hopkins Medical School for the year ending February 28, 1930, which has been received at my office in New York.

It is a great pleasure to me to know that you led me into aiding you in establishing the Department of Art as Applied to Medicine, which has developed into so much real service to medicine and surgery.

(Signed) H. Walters.

At the time of Max Brödel's dinner, in 1938, Mrs. Walters wrote me the following letter:

Five East Sixty-First Street, New York, N.Y.

February 8, 1938

Dear Dr. Cullen:

Thank you for your kind letter of February 2. I appreciate greatly your thinking of me.

I do not think there was anything that Mr. Walters ever did, which gave him more satisfaction than the work, "Art as Applied to Medicine."

Very sincerely,

(Signed) Sarah W. Walters

The correspondence between Henry Walters and me relative to the Department of Art as Applied to Medicine in the Johns Hopkins Medical School extended over a good many years. It is intact and at the request of Mr. Morgan Marshall, Director of the Walters Art Gallery, has been deposited with the incunabula in a specially fire-proofed room in the Walters Gallery. Some one will, in due time, write a biography of Mr. Walters. His correspondence with me reveals a delightful side of him, a side that few knew anything about.

Presentation of a Portrait of Max Brödel by W. B. Saunders and Company, Medical Publishers of Philadelphia, to the Johns Hopkins University

In the Spring of 1937 Mr. R. W. Greene, vice-president of the W. B. Saunders Company, medical publishers of Philadelphia who had published many of the books brought out by Dr. Howard A. Kelly's department, dropped in to see me; he said that their company would celebrate its fiftieth anniversary on March 4, 1938 and that they wanted on that occasion to honor Max Brödel who had done so much for medical illustrating. He asked my advice as to the best plan to pursue.

In June I went down to Atlantic City to attend a meeting of the Board of Trustees of the American Medical Association a couple of days before the annual session. Mr. Greene took dinner with me on the night of my arrival. We finally came to the conclusion that probably the most appropriate thing would be for the Saunders Company to have Brödel's portrait painted, give a dinner to Max in Philadelphia, and present the portrait to the Johns Hopkins University where Max Brödel had done such wonderful work. The company at once decided on this plan of procedure.

The only difficulty was in persuading Max to fall in with these plans. I well knew his retiring nature and fully appreciated that the task ahead of me was not easy. On June 28, 1937, I wrote Henry Mencken telling him that just as soon as I reached camp I would take Max out in a boat where he could not possibly get away and then tell him what was in store for him.

On September 10, 1937, I again wrote Henry Mencken saying, "I wish you had seen Max the evening of the day he arrived at camp. He and Ruth took dinner with Mrs. Cullen and me, and after dinner I unfolded what is to take place on the 4th of March. His eyes bulged, he shook his head, he could not do it. As the evening progressed and as he

smoked a very delicious imported cigar he became more docile and in due time expressed appreciation for the honor in store for him. We shall have no trouble."

Mr. Thomas Corner, one of the country's outstanding artists, although very busy at the time, agreed to paint the portrait. He gave us a striking picture of Max.

The late afternoon of March 4, 1938 arrived and a full carload of Brödel's friends, lay and medical, left Mt. Royal Station, Baltimore, for the Barclay Hotel in Philadelphia. There they were joined by the leaders in medicine and surgery from all over the United States. It was a joyous company, as the great majority of those present were old friends of the distinguished guest of the evening. The members of the W. B. Saunders Company asked that they be allowed to stay in the background. Mr. R. W. Greene introduced me as the presiding officer and toastmaster. Max's and my old and beloved Chief, Dr. Kelly, slipped up to me and said, "Tom, may I say grace?" Of course he could; he did, and the dinner got under way.

After the dinner Dr. Howard A. Kelly spoke of the remarkable work Max had done at the Johns Hopkins Hospital and later in the Medical School. Morris Fishbein, the distinguished Editor of the *Journal of the American Medical Association*, told us of the profound influence Max Brödel had had on medical illustrating in periodicals and books. Henry L. Mencken described the celebrated Saturday Night Club which he and Max had started in 1910, just twenty-eight years before; this address, under the title "Max Brödel as a Pianist," appeared in "Tonics and Sedatives" of the *Journal of the American Medical Association* for March 26, 1938. Mr. Lawrence Saunders then presented the Corner picture of Max Brödel to the Johns Hopkins University. Because of the illness of President Isaiah Bowman, Dean Berry, an old friend of Max, accepted the portrait on behalf of the University, and we had finally a most appreciative and touching speech from our honored guest and beloved friend, Max Brödel.

We had had a delicious repast. The speeches were short and snappy. We returned to Baltimore the same evening. Everybody, including Max Brödel and Mr. Thomas Corner, the artist, had had a lovely time, and on the way home to Baltimore all were in a very happy frame of mind. On March 9, 1938, I had a short note from Morris Fishbein from Chicago. He said: "The dinner was marvelous and I shall always remember it as one of the big events of my life." The W. B. Saunders Company could not have done a finer thing for Max Brödel; as outstanding medical publishers they knew full well what this celebrated medical artist had done for the improvement of medical illustrating. A full report of the dinner is given in the *Journal of the American Medical Association* for

March 12, 1938, page 823. A reproduction of Thomas Corner's portrait of Max Brödel appears on the same page of the Journal.

"Medical Illustration," by Max Brödel

A number of years ago Morris Fishbein told me that he would like to have an article by Max Brödel giving a description of the Department of Art as Applied to Medicine. The paper, entitled "Medical Illustration," appeared in the *Journal of the American Medical Association* on August 30, 1941. We were fortunate, as Max left us on October 26, less than two months later.

In the paper Brödel gives us a panoramic view of how his department was run. It is of such interest and importance that I am going to give the highlights in his own words. In a few places there is a little duplication of what I have already written, but the repetition only serves to emphasize the various points. He says:

I believe that the illustrator will learn to regard the photographer not as a rival to be feared but as a helpful friend.

A medical picture may even be entirely synthetic and yet be drawn with convincing realism. To make such a picture the artist must know his subject so thoroughly that he can shut his eyes and coax into existence a mental picture of great clarity, complete in every respect. He also must be fully equipped to put this imaginary picture on paper, swiftly, accurately and, if necessary, with convincing realism. This is medical illustrating at its best.

The technic is a matter of choice—half-tone, water-color, oil, lead pencil, simple or elaborate pen and ink, or a combination of these. It should be remembered, however, that technic, artistic feeling, accurate draftsmanship, neatness and speed are all relatively unimportant. The planning of the picture and the registration of the scientific facts are what give it its value, not the execution.

As a rule a simple outline drawing is harder to make than an elaborate plastic picture. It is perhaps the most eloquent and useful type of medical illustration.

Much information, explanation and analysis can be crowded into a diagram. It may be stripped entirely of all form and structure, relying for its message solely on well chosen key words, figures and numbers, connected by lines and rendered more expressive by the addition of symbols, such as loops, rings, arrows and the like. Even the time element can be graphically shown, also cause and effect, sequence of stages in a disease or an operation. Most instructive pictures can be made that way.

For more than fifty years it has been my privilege to make medical illustrations in all the branches of the field.

Since March 1911 I have also taught medical illustrating at Johns Hopkins University School of Medicine. Horn had died, Becker's health failed and I was left alone. So it became my privilege to organize and develop this school from 1911 until 1940, a period of thirty years, very happy years to me.

The experience gained during this long period may be of interest to those wishing to become medical illustrators. I shall try to show that the making of a medical picture is an intricate process, requiring much specialized knowledge and skill. It takes years of preparation to become an artist good enough to serve the medical profession.

How I Became a Medical Illustrator

The Art Department of the Johns Hopkins Medical School was the first of its kind in existence. I did not plan it. It came into being through a series of fortunate circumstances which I shall briefly describe.

1. Fifty years ago most medical pictures in textbooks and journals were done by untrained, self-taught artists who knew very little about medicine and less about art. There were no others available, and as a consequence the pictures in the medical literature were of poor quality, far beneath the illustrations in non-medical publications such as magazines and storybooks. The draftsmanship of medical pictures was amateurish, the object ineffectually posed and illuminated, sometimes inaccurate in regard to its anatomy and topography. The object evidently was not properly understood by the artist, and the author was unable to help. He probably knew that something was wrong with the picture, but his attempt to suggest corrections usually made it worse. It must be admitted that the atlases were notable exceptions. They were costly tomes, mostly from an earlier period, magnificently illustrated with elaborate copper and steel engravings, later on by lithography, often in gorgeous colors. Much of their beauty was due to the exquisite technic of the engraver or lithographer, not to the artist who made the originals. The same was true of the really fine wood engravings of the early textbooks.

The photomechanical method of reproduction ended this period and the cheap reproductions and poorly made drawings began.

This was the state of medical illustrating when I entered the service of Dr. Howard A. Kelly on January 18, 1894.

2. I had been fortunate in having received my art training in an academy where meticulous draftsmanship was insisted on and where the graphic arts were included in the curriculum. Both were of great help to me in medical art.

It was also lucky for me to be poor, for I had to seek work during the summer vacations and other free hours throughout the year. I came under the eye of Prof. Carl Ludwig, the great physiologist, and was permitted to illustrate his research and that of his famous pupils. In the course of this work I met Dr. F. P. Mall and Dr. William H. Welch.

3. Luck pursued me. Through Dr. Mall I came to know and work for Dr. H. A. Kelly, whose brilliant work in gynecology marked the beginning of a new era in that field. He chose me to make the pictures for his first large publication, "Operative Gynecology." That was in 1894. I worked hard but with little success. Photography was called in to aid in holding the elusive steps in an operation, to produce a clinical picture or show a pathologic specimen. I was urged to accept the help of the camera and obediently did so for a while but soon abandoned its aid, realizing that mere copying of a medical

object is really not medical illustrating at all, which, as every medical man knows, goes much deeper than that. Moreover, an artist feels degraded when he copies or uses a photograph as a basis for his drawing.

4. It was fortunate for me that Dr. Kelly was not only a kind and patient chief but also an excellent teacher. He could see that my ignorance in medical matters was a handicap to me. I felt sure that I could draw what I understood but found it exceedingly hard to plan a picture so that any one, even a layman, could understand it. It was difficult for me to select the most suitable view, to determine what to show and how to show it, what to emphasize and what to subdue or leave out. This is where I hesitated and wasted time, as every novice does. It was lucky for me that Dr. Kelly had the remarkable gift of explaining with sketches. In a few simple but graphic lines he could show all the new ideas in connection with his operative work. There is no question that Dr. Kelly's genius for visualization and for sketching paved the way for his illustrators. He made it clear that the conception of a picture is the all important thing, not the plastic elaboration, the realism or the technical finish.

5. Another lucky factor was that Dr. Kelly let me study while working for him. Few employers would permit that. They want pictures for their money. I dissected and injected the pelvic and abdominal organs many times. No drawing was made by me without original study by injection, dissection, frozen section or reconstruction. When variations in adult forms puzzled the eye, the study of embryology gave the key. Many embryos and fetuses were injected, dissected, sectioned and studied. Had these studies been made for me by some one else, in order to save time, I would have benefited little; the finished dissection, injection or reconstruction would still in part have been an enigma to me. The eye and hand must work together to obtain the priceless information that automatically crystallizes into a mental image, which is the forerunner of the subsequent picture on paper. There is no other way, at least for the beginner.

If the artist has made sure of his ground, his drawing shows it. It is a truer, bolder, better picture and is done with greater speed.

6. Dr. Kelly also permitted me to help other illustrators while in his employ. He even encouraged this digression. This paved the way for subsequent teaching of professional illustrators, of art students, medical students and members of the faculty doing research work. There is no better way to learn a subject thoroughly than by teaching it to others. My first pupils, of course, were my friends Becker (1895) and Horn (1898), who came to assist me in the work for Dr. Kelly and his staff. I tried to teach them the fundamental principles of gynecologic illustrating but had little to give in those days. The job was not of my making; it was wished on me. The truth is, we learned together. I was rarely more than a jump or two ahead of them. Confession is good for the soul.

7. Thousands of pictures were made by the three of us to illustrate the various books and articles written by Dr. Kelly and his associates. Each book marked an advance in our method of approach and technic.

It should be stated here that Dr. Kelly also permitted us to make illustrations for other departments—those of anatomy, embryology, physiology,

pathology, surgery with its many sub-divisions, and obstetrics. This outside work retarded our regular illustrating, but Dr. Kelly invariably presented the pictures to his colleagues. This unselfishness broadened my field and ultimately led to the creation of the Art Department in March 1911. When Dr. Kelly's work ceased, I was tempted to go elsewhere. But my roots were deep in the ground and I was loath to leave Johns Hopkins.

8. This is where my friend Dr. Thomas S. Cullen came in. He had other plans. He had faith in our work, ideals and technic and wanted to keep them at Johns Hopkins. His dream was to create an art department in which the methods and technic which we had evolved during the wonderful Kelly period could be handed down to new generations of medical illustrators and spare them the years of trial and disappointment of their self-taught predecessors. . . .

I have described elsewhere in this paper how the Department of Art as Applied to Medicine came into being. Let me quote Max Brödel further:

The Art Department, 1911-1940

During the thirty years of its existence the art department has trained nearly two hundred medical illustrators, carefully chosen from thousands of applicants. There are no two alike. Each has his or her own individual style. I can nearly always tell who made the picture without seeing the signature.

Those who have taken the course are employed in the important medical schools and clinics of the United States and Canada. A few of them are abroad. Their work can be found in the medical literature, exhibits, hospital records, lantern slides and the like.

The size of the class varied from four to twenty-three regular students a year; the average was ten. Every year a few professional illustrators were admitted as post-graduate students for intensive study in a special branch, mostly technic. Members of the faculty and a limited number of medical students received instructions in drawing—the former as an aid in their research, the latter because of their interest in and talent for drawing and its obvious benefit in the study of medicine.

The instructions of the regular art students, the beginners, were as follows:

Since no illustration can be made without anatomic and histologic knowledge, the student begins in the dissecting room, doing the work with his (or her) own hands, slowly and thoroughly. Because each student can have only a few bodies to study from, while the range of variations is legion, daily lectures and demonstrations accompany and augment the dissection. A large transparent ground-glass plate covers life sized drawings of a skeleton, front, back and side views; also sections, properly co-ordinated. With charcoal and colored chalk these pictures can be altered before the student's eye to show variations in size, form and proportion due to sex, age or race; also physiologic, pathologic and postural changes, diseases and their course and operations; in brief, everything that concerns the illustrator. Each alteration requires

only a few strokes, which are erased when the alteration is demonstrated and another type drawn—and so on.

While the student dissects and studies the skin, the ground-glass plate explains its phenomena in a multitude of variations. Then are taken up the bony landmarks, fat deposits, vessels, nerves, lymphatics and their variations and significance; muscles, tendons, ligaments and fasciae. Then come the internal organs first in toto, then each organ separately with its variations and pathologic alterations.

Every structure and every organ is studied at the same time microscopically under low, medium and high power to give a complete picture.

The most important part of the student's work in the dissecting room, however, is sketching and drawing. Everything revealed by the student's eye and hand is put on paper immediately, while the impression is fresh. The sketches are made boldly and rapidly in black and colored crayons. Thousands of such sketches are made. They are the test that the student has grasped the subject.

They are valuable to him as forerunners of medical and surgical pictures. He has learned to study the subject in the form of pictures, not in words.

At the end of the year a recapitulation of the topography of the viscera is made by the study of frozen sections, sagittal and transverse.

Fresh material is employed, whenever necessary, to augment the studies on the cadaver and to correct post-mortem phenomena, alterations of form, consistency and color.

Many accessory methods are used to teach the student the correct approach to a problem in illustrating. It is always done in the form of pictures, either on paper, or on the ground-glass plate or on the blackboard; occasionally by graphic description, made alive by expressive gestures by the hands. Nearly every discussion terminates with a diagram; a question asked by an alert pupil may lead to the creation of a helpful topographic sketch sometimes startling in its originality. It is a stimulating habit to show the beginning, course and end result of a disease in an eloquent diagram. The medical literature can use more such pictures.

The student must also learn to make accurate, realistic pictures of objects placed before him. He must know how to pose and illuminate them so that their plastic rendition is simplified.

Much time in the class is given to this part of the training. No artist can create a picture unless he has first learned to imitate nature. Many pictures are made of fresh or hardened specimens from an operation or an autopsy, and most important of all, realistic pictures of operative steps.

Paralleling these studies are complete instructions in accurate draftsmanship and perfect technic. All important technics must be mastered in order to make the original drawing or painting acceptable to the author, to the engraver and to the publisher. Several new technics were worked out in this department and are taught to the students. The pen and ink technic is by far the most useful, because a line drawing costs less to reproduce and is not easily ruined by inferior press work.

Being thus equipped, the student is ready independently to plan and make

finished pictures for publication. After many failures a moderate degree of success may be attained; occasionally there is a gem, even a little masterpiece.

The superior work of a talented student is quickly noticed by instructor and fellow-students, then by members of the medical and surgical staff and then by visiting physicians. The student is asked to make drawings for them, which may start him on the way to getting a job.

Applicants

It is generally accepted that medical illustrating is an intricate, highly specialized form of art requiring for its mastery systematic full time study over a period of from two to four years or even longer, according to the talent, speed and preliminary training of the applicants.

They come from colleges, art schools and high schools. I have found that good material may come from any of these.

1. Some applicants are born artists with exquisite technic and a poetic temperament but entirely ignorant of the basic branches of medical science and for some reason quite unteachable.

2. Others have a college background with a fine grasp of the medical aspects of their studies but are awkward in drawing; their eyes and hands do not work together.

3. A rare group of applicants is gifted in science as well as in art.

4. The last group is without talent in either. The applicants of this group assert that they are fascinated by medicine and its dramatic service to humanity and want to help, but mere interest in the subject is not enough. However, there are even here notable exceptions.

The applicant may be a man or a woman. The best age is between twenty and twenty-four.

The qualifications in order of their importance are:

1. Keen interest in science, in nature and in all living things.

2. Ability to study intelligently, to observe accurately and to doubt the statements of authority.

3. Ability to draw and paint from nature free hand and with artistic charm.

4. Ability to visualize, to imagine a picture based on previous study and then give it reality on paper, either in contour alone or with convincing plasticity.

5. Technical skill in drawing, a trustworthy eye guiding an obedient hand, preferably the right.

6. Ability to stick to a task with tenacity and to be resourceful in the face of obstacles.

7. Good general health and normal vision.

Every medical artist worthy of the name realizes that he has to know the entire human body and the entire field of medical illustrating before he can discover the branch for which his special talent and his chief interest and inclination fit him best. A medical student does the same and for the same reason.

Moreover, in many institutions an illustrator has to serve several departments and be prepared to draw all types of pictures in every known technic.

An Evaluation of Max Brödel and His Amazing Work

Good illustrations are to a fine medical article what show-windows are to an outstanding department store. People walking along the street stop and look at the window display and then enter the store. So medical readers are attracted to an article by the fine pictures and then linger to scan the medical treatise.

When Mr. Henry Walters and I were considering the founding of the Department of Art as Applied to Medicine he wrote and said, "Tell me what you want." I promptly told him of what van Calcar, the famous artist, had done for medicine when he illustrated Vesalius' atlas on anatomy, and I pointed out what Brödel might do for the medicine of this generation.

I knew then of Max's wonderful qualifications but I had little idea that he would be the potent factor in the advancement of medicine in our generation that he later became.

The last seventy-five years have shown marvelous strides in inventions and in making things easier for mankind. We have the telephone, the radio, and recently the instruments helping those who are hard of hearing. Our trains are infinitely more speedy and more comfortable. Automobiles enable one to travel to all parts of the country quickly, and the airplane can take us to Europe in less than a day. I could mention many other important improvements but you know what they are as well as I do.

Let us see what has happened in medicine and surgery. We in the medical profession have, I am proud to say, kept pace with the steady advance in the other branches of human endeavor. Typhoid has, in large measure, disappeared. The deaths from pulmonary tuberculosis have been greatly reduced. Lockjaw when taken early has lost its horror; diphtheria, which caused so many tragedies in years gone by and which would frequently take two or three children out of a family within a week, can now be avoided if proper inoculation is carried out. The threat of smallpox can be eliminated where people have the good sense to be vaccinated, and most of them have.

Let us turn for a moment to what surgery has done in this period. Many tumors are successfully removed from the brain. Tumors of the neck are frequently taken away. The chest was formerly a forbidden area except where pus was to be withdrawn; now the chest wall is collapsed in cases of tuberculosis. A part of or an entire lung can be removed for malignancy, and in some cases the heart has been sutured

so that not only has the life of the patient been saved but also that of the person responsible for the stabbing. You are all familiar with the operations on the stomach, the gallbladder, the intestines and the appendix. The waterways in men and women have been carefully studied; kidneys can be removed, tumors of the bladder taken out, and untold thousands of American men who formerly became slaves to the use of the catheter, with its frequent inflammation of the bladder, can now have their prostates removed when they are in good condition and can go on living comfortably for many years. Then we have the youngsters with crooked arms and legs who become useful citizens when these members are straightened.

The time was ripe for Max. He came just as medicine and surgery were making greater strides than they had done in centuries and when many new illustrations were necessary. Max came to us fifty years ago. It seems but yesterday and I cannot help thinking of the Biblical quotation, "For a thousand years in Thy sight are but as yesterday when it is past."

Let us consider Max Brödel's qualifications when they had become fully developed.

1. He was a wonderful artist.
2. He was a fine anatomist.
3. He was a remarkable investigator.
4. He was an excellent teacher.
5. He was a lovable character, so much so that it was always a pleasure to grant his requests.
6. He was one of the country's outstanding pianists. I mention this because music was balm of Gilead to his soul.

Let us consider for a moment Brödel's friends. Howard A. Kelly was for years his Chief. Dr. Kelly during his lifetime did more for the advancement of gynecology than any other man who has ever lived. Franklin P. Mall was Professor of Anatomy and had the largest collection of human embryos in the world. Max had made drawings for Mall in Carl Ludwig's laboratory in Leipzig, and it was through Mall that he came to Dr. Kelly. Naturally, Brödel was given every facility in teaching his students anatomy in Mall's dissecting-room, and when Brödel wanted to study any embryological problem he was welcome to use this material which had been sectioned and was in excellent condition for study. Dr. William H. Welch had known Brödel in Leipzig and if Max wanted to do anything in the autopsy room he was at once given the opportunity.

Max, when he came to Baltimore, had a rather meagre knowledge of the English language, but he soon remedied that. In due time he grew to know Henry Mencken, one of America's greatest English scholars—a

man who can handle the English language just as skillfully as one of the best surgeons can wield a scalpel. For no one did Max have a deeper respect or affection than for Henry L. Mencken.

With the outstanding qualifications possessed by Max Brödel, with every possible help from the leaders in surgery, anatomy, embryology, pathology and English at his disposal, and with the advances in medicine and surgery coming along so rapidly, what else could one expect from Brödel but a phenomenal career? He was never idle, and when he played he really played.

If one wishes to see just what Max Brödel and his students have done, let him go to any of the leading medical libraries, pick out the outstanding medical journals and books of from fifty to one hundred years ago and put them in one pile, and then pick out the leading medical publications during the last fifty years and compare the two. This procedure will show the startling advances made in medical illustrating during the last fifty years. Max was largely responsible for this epoch-making improvement. He established a fine technic and set a very high standard.

Max Brödel was born on June 8, 1870 and died on October 26, 1941. During his span of life he revolutionized medical illustrating and placed it on a very high plane. His pioneer work in medical illustrating has already been of inestimable value to medicine and surgery, and the appreciation of his remarkable contribution will grow greater and greater as the years go by.

Although he left us in 1941 he still lives in his many drawings, in his many students, and in a personality that will be remembered as long as any of his old friends live.