



# A.M.A. ARCHIVES OF PATHOLOGY

## Masters of Modern Pathology: Jakob Erdheim

S. M. RABSON, M.D., Los Angeles

An examination of Erdheim's bibliography makes clear the chief fields of his labors—skeleton and organs of internal secretion, from aberrations of which he himself suffered. The papers include those now considered landmarks: hypophyseal changes during pregnancy, hypophyseal-duct neoplasia (the "Erdheim tumor"), the role of the parathyroid glands in calcium metabolism and dentition, secondary parathyroidal hypertrophy in rickets and osteomalacia, osseous changes in acromegaly and the relation of eosinophilic adenomas to that disturbance, and aortic cystic medial necrosis. The bibliography, however, is misleadingly short. Many contributions are of great length, some totaling well over 100 pages, and treat several aspects of the given problem. In addition, for every publication bearing his name, there are a half-dozen ascribed to his pupils, the titular authors, who were, however, only the mechanism of his inspiration and guidance. Above all, he was a teacher, devoted to the molding of pathologists as well as clinicians; and, to those who were fortunate enough to work under his direction, he exemplified irreproachable standards of professional ability and intellectual honesty.

Born in 1874 in what was then Austrian Galicia, he was raised and educated in small towns. His family, relatively well-to-

do merchants, was conspicuous in a Jewish community of dreary poverty, exposed to latent, and sometimes overt, anti-Semitism. According to a biography of E. M. Lilien, a playmate who later became a prominent graphic artist, the town was devoid of natural beauty and cultural advantages. At

JAKOB ERDHEIM, M.D.  
1874-1937



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Thanks are due Drs. Albert Mueller-Deham and Leo Lowbeer for their assistance. Aware that any personal portrait is incomplete, the author welcomes any correspondence from Erdheim's pupils.

the age of 20, Erdheim began his medical studies in Vienna, graduating in April, 1900, when he joined the staff of the university pathological institute. Weichselbaum, then its chief, was interested in skeletal problems. Within a year, the new member published his first paper, devoted to branchial-cleft derivatives, with emphasis on the parathyroids. In 1908 Erdheim was named *Assistent*, and also clinical professor when he assumed additional duties at a children's hospital. Upon appointment as pathologist to the Vienna Municipal Hospital, in 1924, he achieved the status of full professor and also the right to conduct classes for academic credit. He died April 18, 1937. His last paper was posthumous (1938), coinciding with Hitler's march into Austria, when the last nails were driven into the coffin of Viennese medicine, born 150 years earlier.

What was Erdheim like? How did he work? These questions should be answered while his students can still recall the facts with reasonable clarity, and before time clouds the human outline in deceptive memory. Few facets of Erdheim, the man, were concealed from those of us who spent many months in his institute. It was 30 years ago that I first saw him; 5 years later I said goodbye to him for the second, and last, time.

In the large white-tiled autopsy room, Erdheim towered above the others. Despite his great height, his head was of normal size, his hair gray, fine, and closely clipped. The pale-brown eyes behind metal-rimmed spectacles could be at once demanding and disconcertingly expressionless. The face, in keeping with his disability, was an odd blend of adolescent boy and old woman, and the skin, covered by a delicate, barely perceptible fuzz, was soft and faintly brown.

His arms were disproportionately long, as were the broad fingers, which could be firm in grasp and delicate in touch. The wide pelvis easily supported the drawstrings of his white cotton trousers. Excessively long, his legs terminated in the

largest pair of feet yet known to me. Over his clothing was a long yellow oiled-silk apron, which, thanks to his technique at autopsy, was rarely soiled by more than a few fine drops of blood. Thin white cotton gloves, such as were formerly worn by waiters, protected his rubber gloves.

He spoke a soft Austrian German in a pleasant tenor voice. Though he read English fluently, and apparently knew it well enough to arbitrate disputes between Americans over nuances in word meaning, he never spoke it, at least not in our hearing. This may have been due to that sensitiveness which made his public appearances so infrequent. I cannot recall his attending any professional meeting during my second stay with him. At that time, too, he refused an invitation to lecture in America; if he visited the United States, he said, hiding his shyness behind this subterfuge, it would be at his own expense.

His life centered in the hospital, and it was his home as well. In his quarters in the same building with the resident staff, the light shone late at night and before dawn on winter days. Beginning in secondary school, he had risen daily at 5 a. m., and this Spartan regimen he was prepared to recommend to his students. When I returned on my second visit, he arranged my schedule thus: one hour each for the three meals; seven hours of sleep (ashamed of my indolence, I had lopped off an hour). With paternal firmness, he settled my 14-hour working day.

By 7:30 a. m. Erdheim was already on duty, reviewing bacteriological material with a resident. As was common in the microbiological doldrums before the introduction of sulfonamides and antibiotics, this chore was somewhat cursory. Autopsies were begun at 8:00 a. m. and continued until they were completed, sometimes not before early afternoon. After a midday dinner, brought to his office, the Professor napped for an hour on a couch. Then he went over the surgical microscopic material with the residents, often telephoning the

surgeons, better to correlate anatomical and clinical findings. As a former student expressed it, he never operated in a clinical vacuum behind "the paraffin curtain." Afterward, he worked with persons engaged on special problems. Supper, too, was fetched from the hospital kitchens. This over, Erdheim either engaged in his own work or continued to supervise his students' efforts. After it was after 10:00 p. m. before our weary mentor retired to his room, even then very likely to continue working.

Sunday was free of routine duties for him, although he occasionally looked into the necropsy room in the morning. On that day he might leave the hospital to visit members of his family, which included his brother, a surgeon. At no time did Erdheim boast the services of an associate pathologist, and once, with only a single resident on his staff, he alternated with his junior on Sunday necropsy duty for several months. Except for his holidays, this was the pattern of his existence.

The development of pathologic anatomy in Central Europe rested on certain social and statutory bases, primary among which was the legal right of administrators of governmental hospitals to order the examination of the bodies of any and all patients dying within their walls. Since, in Austria, there were few other hospitals, this meant virtually universal necropsy except for those dying at home. Constantly emphasizing the unique opportunities thus resulting to medicine, Erdheim was a vigorous critic of any procedure suggesting mutilation of the body, lest the laity take offense and seek to alter the law. As a case in point, a "buttonhole" in the skin of the neck would evoke a short, but blistering, reprimand: *Maladroitness* or carelessness was to blame, and either was reprehensible. The greatest skill was employed in removing the entire skeleton; in one case nothing remained except the face and finger and toe tips. The envelope of skin was then draped about a wooden scaffolding, and

form and substance restored with sawdust packing. Embalming was a rare practice in Vienna.

On Erdheim's service, of the more than 2,000 necropsies performed annually, half came from the 1,000-bed municipal general hospital, of which the pathological institute was a division. The department also served adjacent institutions (old people's home and hospitals for chronic diseases), with a combined population of over 12,000 persons. Because of limitations of laboratory space and personnel, only a third of the 3,000 dying in those establishments were examined, and these cases were selected by the clinicians concerned with their care. I recall only a single day when the prosectors were without work, truly a red-letter occasion. More typical was another day: Erdheim, six necropsies; the chief resident, five, and another resident and I, each three.

Rarely was a clinical staff absent from necropsies on the bodies of its patients. Not only the interns and residents but the attending physicians and surgeons, and ordinarily also the heads of the services, were already on hand when the skin was incised. Erdheim, whom the other seniors greatly respected, usually asked questions. Thus, thanks to the clinical information and the ready gross anatomical diagnosis, each autopsy during its very performance became a clinicopathological conference. So it was that Vienna had achieved eminence as a center of medical education before two wars accomplished its destruction.

The head and bowel were routinely included in every postmortem examination; the assisting technician (*Diener*) or medical student removed the skullcap and opened the gastrointestinal tract after its removal from the body by the prosector. Lest artifacts be introduced into the gross appearance of organs, water was used sparingly. Instead, a well-wrung-out sponge collected blood and exudates and blotted cut surfaces. "Water," said Erdheim, "is a good servant, but nothing more." In an adjacent room, a band saw and frozen-



section apparatus afforded means for rapid study and diagnosis before the necropsy was completed. There were no dictating machines or stenographers; only several undergraduates were on hand to write down the protocols, consisting exclusively of diagnoses.

In common with the Viennese school of pathological anatomy, Erdheim stressed necropsy technique, careful observation, and gross anatomical diagnosis. Buttressed by his high intelligence and long experience, he maintained that microscopy is necessary only when something new appears: The microscopic picture once seen, diagnosis is made the next time with the unaided eye. "One trouble with American pathology," he commented, basing his observation on conversations with visitors from the United States, "is the reluctance to make diagnoses at the autopsy table. You ask the clinician to wait until the microscopic slides have been completed, forgetting that, while you have few autopsies, he has many patients. The clinician learns best while all details of the case are still with him, which means, at autopsy. A week or two later is too late."

An American student once challenged Erdheim's ability to make gross diagnoses in renal disease. Happily picking up the challenge, the Professor proposed that the visitor himself prepare sections from the next hundred bodies examined. (In preparation of sections, he always advised the pathologist himself to be competent in histological technique, so that he might criticize his technician's work from knowledge and experience, rather than from reading and hearsay.) When the task was done and diagnoses compared, Erdheim was wrong only once.

Whether of gross or microscopic findings, a description was to be a true image of the prosector's thinking. When the thinking included doubt or misgiving, it was obligatory to report this. "Otherwise," said the Professor, "the reader will assume you were positive, that you had no reserva-

tions. Of course, you can solve the dilemma by omitting all mention of that of which you are uncertain; at least, in that way the reader will not be misled." The intellectual honesty which prompted this insistence on clarity was modeled on that of his former chief, Weichselbaum. According to Erdheim, Weichselbaum's honesty was illustrated in one of his standard practices. Whenever microscopy uncovered the error of his own gross anatomical diagnosis, it was his custom to give both protocol and slides to a subordinate for completion of the report. This insured against any attempt of the ego to overlook or mitigate the contradictory evidence.

An autopsy over, the organs were carefully dried, spread out in a numbered metal pan, covered, and temporarily stored in the refrigerator, and the body removed. When all necropsies of the day had been completed, Erdheim seated himself on a tall stool before the marble-topped dissection table, where he examined each tray of specimens while the protocol was read aloud. He corrected and commented, interpolating, as an aid to memory, a few lines of the essential clinical and anatomical features. From the specimens he laid aside material for his undergraduate and postgraduate demonstrations, and for current and future research projects. At his suggestion, blocks were taken for infrequent microscopic study.

Each prosector was obliged to type his own reports, unless he could prevail upon a willing or an unresisting medical student to do it for him. Nowhere in the three-storied institute was a secretary employed, and, like his juniors, Erdheim did his own typing or victimized a subordinate for this purpose. In fact, there was only a single histology technician, who did the surgical pathology almost exclusively, interrupted by feuding with Erdheim. Inadequate assistance in the laboratory added up to an appalling waste of time and skill, chiefly his own, and was, in part, the price of a perfectionism which also rejected intellec-

tual waywardness and technical clumsiness. Undoubtedly, the perfectionism was aggravated by lack of those benign influences associated with a normal endocrine apparatus, and by the knowledge that men of lesser talents secured hospital and university posts denied him. This denial, in turn, could be ascribed to his psychic and physical constitution, and to recurring differences with hospital administrators. Finally, there was his religion; anti-Semitism had by no means died with the death of the Austro-Hungarian Empire in 1918. Once, in a rare display of that self-hate exhibited by minority groups, he asserted that Jews, in general, lacked the manual dexterity of non-Jews; this was probably the only false statement of major importance I ever heard him make.

From today's vantage point, various aspects of the institute's finances seem somewhat strange. The costs of all special studies, whether carried out by regular members or guests of the department, came not from the division's official budget but from a special fund which defrayed the costs of all supplies, as well as the pay of the *Diener*, who, in addition to his regular duties, made and stained the celloidin-embedded sections. The fund was supplied by payments from medical journals for articles from Erdheim's service. Such payment once was regular practice; *Virchows Archives*, for example, paid \$5 to \$10 for contributions, at the time a not inconsiderable sum, since it was equivalent to room rent for several months. The resources of the fund were incongruously housed in an old cigar box (Erdheim himself did not smoke) locked in a clothes closet in the Professor's office. From it came the pennies to reimburse a *Diener* for carfare or bank notes to settle accounts with large suppliers.

The initiation of a special project was preceded by long discussion with Erdheim. Believing with Claude Bernard that one case thoroughly investigated is worth many superficially pursued, the emphasis was on

the quality of the study, not on the dimensions of the material. The field of research might be new; it might resurvey abnormalities in the light of newer methods of study, or it might include reexamination of diseases becoming less common and likely to disappear, a motivation responsible for reports on the osseous and articular features of syphilis. There was little animal experimentation, in part perhaps because Erdheim had come to believe the study of Man to be primarily Man, and the necropsy room provided ample proof to support him.

If a wide range of material was indicated, it was available. One American, supplied with pieces of skull from every age group, was able to compare microscopically the youthful expansion and the senile contraction of the cranium. I myself was set the task of reporting on cartilaginous and bony changes in the ankylosed knee joint; for this, two examples proved adequate. The two specimens were serially divided with the band saw; then each piece was radiographed, chiefly for orientation of the many subblocks from which the microscopic sections were made.

To save the investigator's time and labor, each structure encountered in the microscopic section had its own abbreviation; despite this, the survey of a single section might cover five closely typed pages, so thoroughly were the diggings mined. The student read the description aloud, adding and correcting as Erdheim reviewed the slide. Reading the last line with the satisfaction of a job well done, his joy was short-lived. Without raising his head from the microscope, Erdheim delivered the blow. "Now, let's write!" he said tersely, and, to the junior's astonishment, there followed another page or two of added description. To explain or apologize for the oversights was futile and self-defeating. Explanation only provoked a curt, marrow-chilling "*Wozu reden? Schade um die Zeit!*" ("Why waste time talking!") Of course, he was right; the omission had been made

good, and, hopefully, the next attempt would justify the teacher's patience.

At one "Let's write," the Professor described myriads of Russell bodies. Then I saw them for the first time, however often I might have looked at them. This was an invaluable lesson and illustrated the ego's tendency to ignore the existence of the unfamiliar, thereby "saving face" in the presence of a challenge. For this reason, much remains to be explored, even in more commonly encountered disturbances; hence, Erdheim's tireless reworking of seemingly routine conditions.

When the entire collection of slides had been reviewed, the microscopic elements and all page references to their descriptions were listed on a large accounting sheet. With its aid, gross, microscopic, and radiologic features fell into place. Only now was the literature explored, a precaution calculated to exclude prejudice at the outset of, or during the course of, the investigation. Then began the actual composition, which, for the foreigner who knew German only as a second or third language, was no easy task. Photomicrography was planned with Erdheim, and one of the residents served as camera man. After a reasonable time, the Professor called for the entire protocol, including the researcher's literary efforts, and a new period of gestation and waiting began. Then we knew why the lights burned early and late in his room. Before bed at night and before the 7:30 a. m. bacteriological review, Erdheim was writing our papers, even to the legends for the illustrations. For this best of all reasons, a student's publication could never be identified as that of a novice. Erdheim's name appeared only as director of the institute.

For this unofficial labor, he received not a penny from the student (who paid the hospital a few dollars a month for use of locker and laboratory coat), the hospital, or the university. In this, he was unlike his Central European colleagues, who usually charged good fees for their instruction.

Of course, most of them were married and had families to support, while Erdheim's own worldly needs were extraordinarily modest. This he recognized, and he was, on the whole, unconcerned about the financial practices of others. Once, when I announced a projected trip to Berlin while he recuperated from an illness, he mentioned a well-known pathologist there with whom I might work. "Yes," he said, "you'll have to shove money down his gullet, but he's worth it!" Erdheim accepted as a student anyone who agreed to work on his terms. Each new associate meant an additional burden on him, but to this he never alluded.

This was Erdheim at work, but the picture would be incomplete without those features which fascinated, baffled, and bewildered his colleagues. In the absence of an audience, the mere performance of an autopsy had no meaning; to him, his time seemed wasted. For this reason, I sought, whenever possible, to serve as his assistant. During the 30-40 minutes of the necropsy, Erdheim at times talked without interruption, but customarily not about pathology. Only when something unusual was uncovered or I asked a question did he refer to the matter at hand. Once, as his fine scissors opened the common bile duct, he remarked: "The novice betrays himself in his dissection of passages. Either he stops at the obstruction, thus overlooking it, or else he plows through it and destroys it."

His monologues, a kind of obbligo to the necropsy, followed the lines of his nonprofessional interests—travel, history, and the natural sciences. One autopsy was devoted to an engrossing description of the life of a single species of tree ant (probably subsequent to an intensive reading of Fabre, a favorite author); another, to polar life. One dissection remains in memory only because of an amazed observation he made while examining the kidneys. He had spent the previous Sunday afternoon on a picnic (there is a photograph of him in Tyrolean costume, leather breeches, and all!), and



he was still astonished at the behavior of another guest. "Do you know what he did?" he demanded rhetorically, and, without waiting for an answer, "He picked up a tomato and ate it as you or I would an apple—without oil and vinegar!"

At another autopsy I spoke of an article on thyroid disease, done years before under his aegis; its author's name is now an eponym for a neurological disturbance. "Yes," Erdheim remarked, "when Schilder was staining sections, his laboratory coat rivaled Joseph's; but the results were beautiful." Other autopsies stimulated stories of his experiences in the First World War, when, for part of the conflict, he commanded a mobile laboratory. Knee-deep in Balkan snows, he performed necropsies while the guns thundered overhead. In a wartime publication, he explained the appearance of cholera among swimmers in the Adriatic Sea: The discharging wastes from transports and hospital ships depressed the salinity of the adjacent waters enough to permit survival of the vibrios. On another occasion scurvy broke out among the enlisted men; to save their own funds, the officers had been pilfering from the general mess. Erdheim announced a carefully planned antiscorbutic diet for the troops, adding drily: "I have never seen a single case of scurvy among officers." The pilfering stopped.

Like his work, his vacations were intensive. Before a visit to Rome, his non-medical reading for two years was devoted exclusively to this city. Once there, he was on his way from sunrise to sunset. "A German tourist spoke to me in the Forum," he reported later, "and asked me where he was. Of course, I not only told him about the Forum, but even gave him the complete history of the very stone on which he stood." Knowing Erdheim, one could be sure the story was not apocryphal. Needless to say, he required a week's rest in a sanatorium before he could return to the institute.

Difficult though he was to live with, no one was more compassionate during another's illness. When a laboratory cleaning woman came down with appendicitis, the chief of surgery delayed starting his holiday to perform the operation; a junior surgeon would not do, the Professor told him. Let a student be indisposed, as I was, and Erdheim sent emissaries, advised medical care, and saw that the invalid was adequately nursed. But woe to the man who, on his recovery, assumed this to be the "basic Erdheim"; quickly, and with painful embarrassment, he learned his error.

He was not unconcerned with his own social problems, however, and occasionally sought to copy those who were more successful. As an instance, I once came across a long-unused croquet set in a laboratory closet. Erdheim had heard that Aschoff, whom he greatly respected, played tennis afternoons with staff members. In less vigorous emulation, he "persuaded" his juniors to join him in croquet, but he soon wearied of it. Nor was he lacking in the light touch. Once, in a mellow mood, he announced the criterion for skill at microscopy: when one can fall asleep at the microscope without betraying the fact—the head neither obviously falls back, nor falls forward to receive the firm, revealing imprint of the ocular on the offending eyelids.

Of the magnificent triangle of Erdheim's, the investigator and the mentor comprised two legs, the demonstrator of pathological anatomy, the third. Each Saturday morning, before a group of undergraduates, he held forth. Handling the specimens with loving care, he was a dedicated priest initiating the novice into the secrets of his calling. With his great frame bent over the table, he invoked the organs to take up their premortem activity before the onlookers' very eyes. Similar sessions were held periodically for foreign post-graduates, and as many as 80 doctors listened spellbound, despite no, or a minimal, knowledge of German; they, nonetheless,

carried away far more than the gist of the demonstration.

What was the secret of his great power as demonstrator and lecturer? He himself analyzed it well in "The Psychology of Postgraduate Teaching," his own title to the preface of his contribution ("Tuberculosis of the Calvarium") to the Libman "Anniversary Volumes." The postgraduate audience, he wrote, is composed of men varying in age, experience, knowledge, special interests, and intellectual receptivity, the last already diminished by the years since graduation. Further, he went on: "Each has tasted of the tree of bitter knowledge . . . [suffering] unavoidable but sensitizing mishaps and failures in practice." Then he described the psychic depression engendered by the failures, and the role of memory, sharpened by the emotional trauma, in helping to avoid similar future mistakes. Largely to escape the risks of this depression, the physician enrolls in postgraduate courses, where he bears no responsibilities and where the instructor presumably has already experienced the stings of error and the psychic penalties of misjudgment. Here, Erdheim believed, was the contradiction inherent in postgraduate teaching. The student has "the pleasure of learning without the accompanying psychic depression," the emotional requisite in the learning process. How to resolve the contradiction and compensate for the defects of learning-without-pain?

With this in mind, the lecturer approaches his audience of postgraduates, to whom, more than to undergraduates, he "must be a striking personality, for whom teaching has become a passion. It is personality which works upon and impresses one's fellows. Because his auditors no longer enjoy pristine memory, the instructor . . . must so impregnate the dry, purely matter-of-fact with his personality that the two remain intimately associated. It is by using this haptophore group, so to speak, that he secures retention in the hearer's mind."

Between my two visits, Erdheim contracted typhoid during an epidemic initiated by the faulty water supply of a Viennese dairy, whose owner's two sons, ironically, perished. When I returned in 1932, I found him in a suburban sanatorium, this time with a "top-secret" illness. The residents hinted at peptic ulcer. Only years later, in America, I learned it was tuberculous pleuritis, a condition which incapacitated several members of his staff over the years. It was during this illness that one day it was my lot to bring Erdheim his mail, slides for review and opinion, as well as the rare biopsy specimen which comprised his meager private practice. After he had cut a small object into blocks, he asked me whether I knew the identity of the patient. I shook my head. "It comes from the mouth of Professor Freud," he said. "If that man doesn't stop smoking, he's going to die of cancer." He did, but he outlived his pathologist by two years.

Erdheim died in his sleep while his medical attendant was absent from Vienna. Accordingly, there was no one legally qualified to sign the death certificate, and the autopsy was performed at the Medicolegal Institute. The subject of the necropsy would have been chagrined to know that postmortem changes were already advanced; death probably came hours before, in a warm room. His temper would not have been improved by the knowledge that the skull was not opened. The heart (none of the organs was weighed) was large; coronary ostia were not narrowed, but the arterial lumens were of hair's width, thanks to calcific sclerosis. A fresh thrombus occluded the descending branch of the left coronary artery, accompanied by fresh infarction; myocardial scarring was also recognized. Nephrosclerosis was present.

The penis was small ( $2 \times 1.5$  cm.), as was the glans. The testes, located in the inguinal canals close to their exits, were infantile (bean-sized) and composed of "pale-gray, gelatinous" tissues. It was reported that the prostate was strikingly



small, and each spermatic cord was infiltrated with fat. While the right breast was grossly made up of fat, the left also included gray tissues, apparently glandular.

Anginal symptoms, present on effort for several years, had responded well to the usual treatment. The patient disagreed with the diagnosis of coronary arterial disease, insisting that the pain was produced by fibrosis, secondary to the former pleuritis, which involved the vagus nerve. It is obvious that this fanciful explanation was designed to avoid enforced changes in his normal existence; at the time of his death, Erdheim was working 16 hours a day.

The single physical memento of Erdheim consists of a fine collection of dried bone specimens, which I labeled for him 30 years ago. It was originally bequeathed to a brilliant pupil (Dr. Ernst Freund), who died in America before he could receive it. By this time, the Germans had taken over Austria, and the collection was included in the personal baggage of another student, who brought it to Dr. Henry L. Jaffe, of New York, to whom it had been willed by the original legatee.

Like Freud, Erdheim and his great Viennese colleagues exercised an inestimable, world-wide influence on medicine. With their passing, and with the coming of the Nazi barbarians, Vienna disappeared as a great medical center. Yet Erdheim's influence remains to me, as it does to all his students, the prime mover in my professional life. Deprived of many of the normal pleasures, and without obvious neurotic conflict, he dedicated himself to science. His deprivation was Medicine's gain.

4963 Los Feliz Blvd. (27).

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