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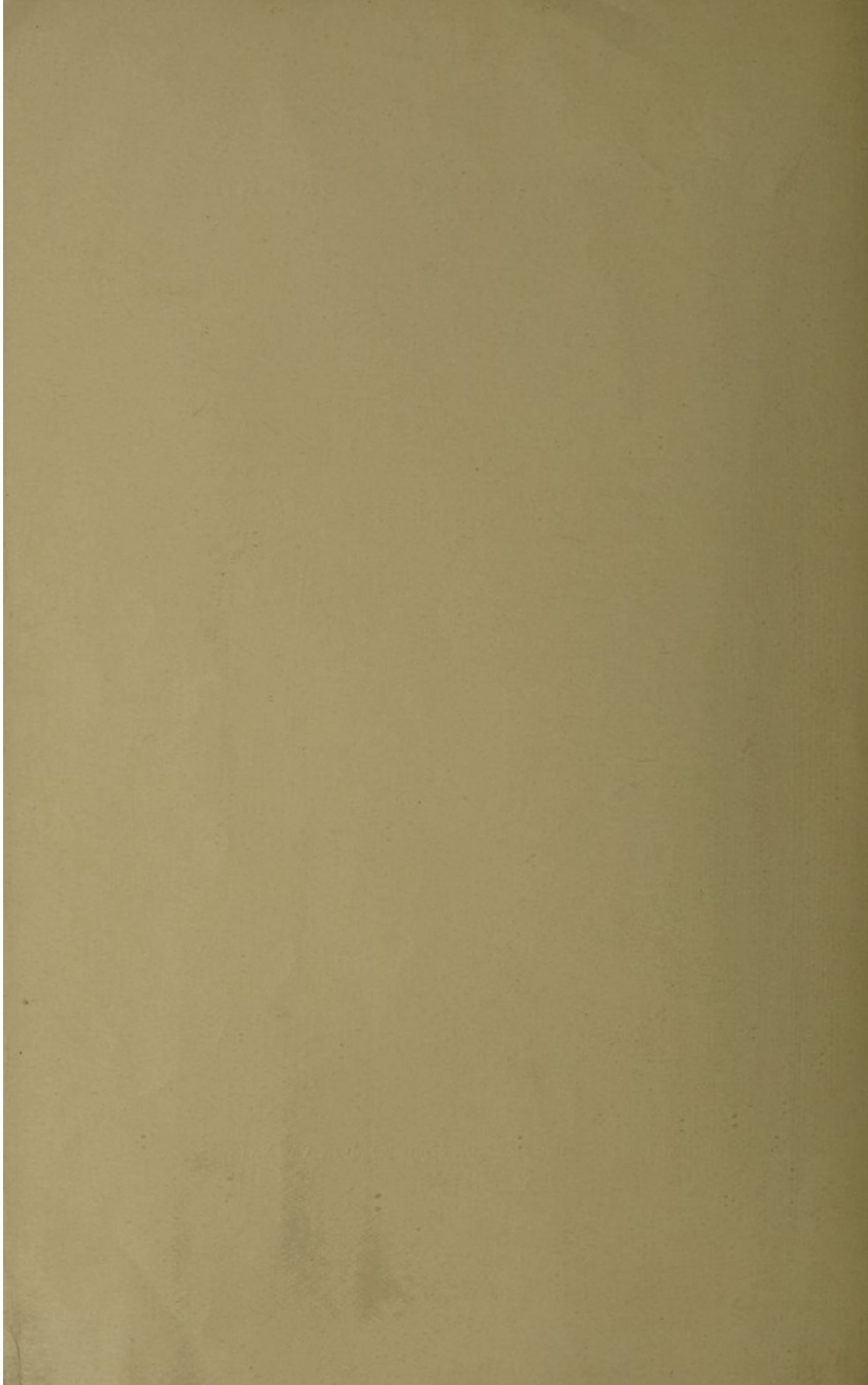
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JOHANNES EVANGELISTA PURKINJE
(1787-1869)

By Dr. VICTOR ROBINSON
EDITOR OF "MEDICAL LIFE," NEW YORK

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By Dr. VICTOR ROBINSON

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To tarry at a discovery to its complete exhaustion, a discovery which casts a glamour about other names, was not Purkinje's habit. Driven from one discovery to another, he leaves the details to others; his works are stimulating data for further research. In addition, there are two rare qualities in this exalted spirit: respect for the youngest of talents, and modesty in not speaking of himself: both of these go with his noble character, but they are also to blame for Purkinje's achievements not being honored as they should be.

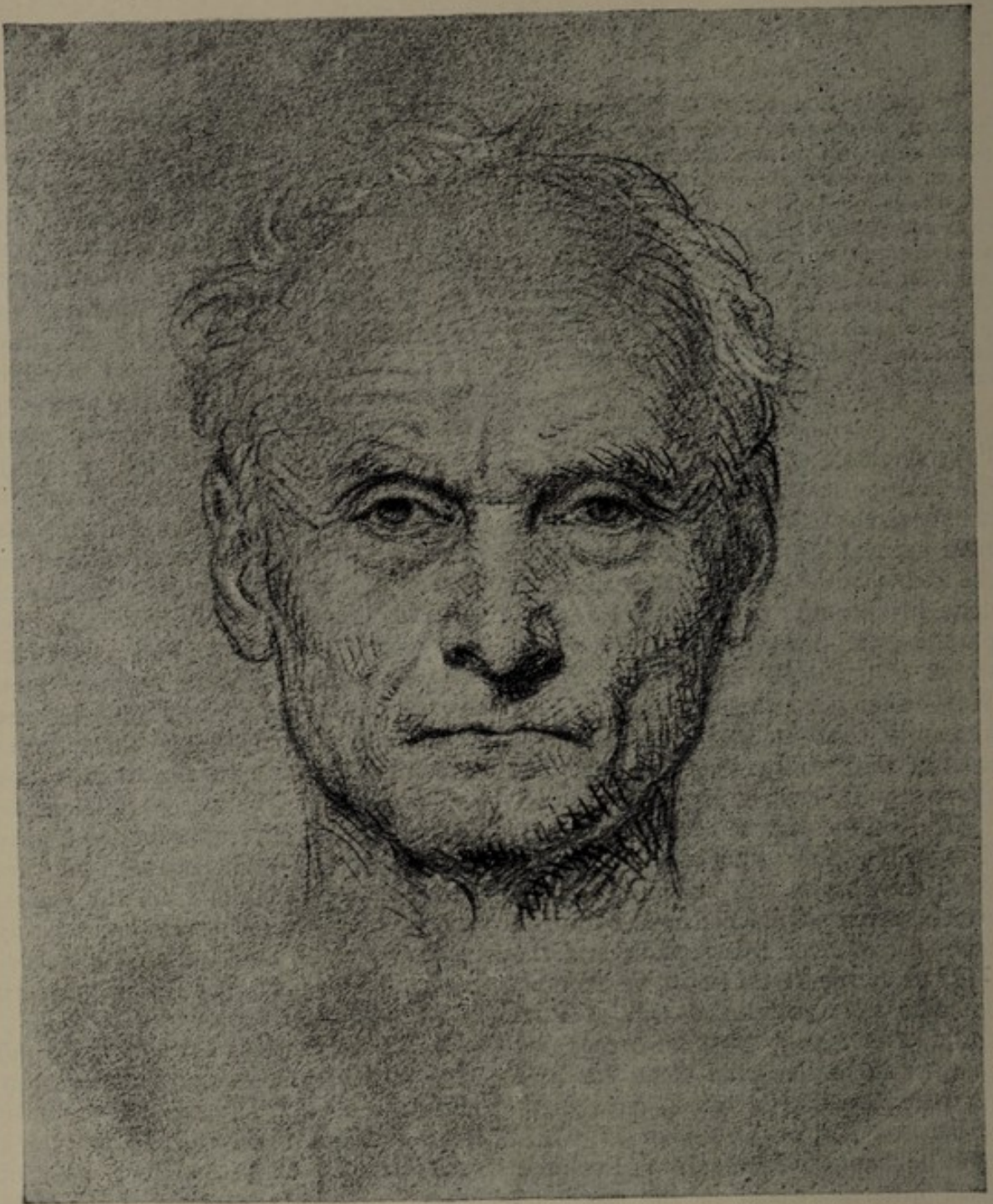
—*Th. Eiselt, 1859*

THE village of Libochowitz is not on the average map, but it lies near Leitmeritz on the Elbe, a town situated amid such natural beauty that it is known as the Bohemian Paradise. Man has ever done his utmost to despoil all earthly paradise, and during that terrible period which history calls the Thirty Years' War—when a whole generation of humanity shed its blood over myths—most of the families that still remained above ground departed from this region.

The call of the soil is strong, and though the plow turn up bullet and skull, corn grows well on land that has been watered with blood. The healing years passed over Libochowitz, and the fields of Baron Herberstein were under the care of Agricultural Official Purkinje. His family must have occupied quarters in the baronial home, for here his wife, Rosalie Safranek, gave birth to her son Jan on December 17, 1787. Thus Johannes Evangelista Purkinje came into the world in the castle of Libochowitz, and not in a "peasant's hut," as is stated by R. Burton-Opitz and others. For purposes of biography, it is more interesting to be cradled in a peasant's cottage than in a nobleman's palace, but history is inexorable.

The young Purkinje attended school in his native village, and took lessons in music and singing, in accordance with the Czech fashion of those days. His voice paved the way for his further education, and he was sent as a chorister to the Piarists in Moravia, where he devoted himself to philology. He graduated from the normal school in Mikulov, and then completed the course in the gymnasium. When it became necessary to select a profession, Purkinje found that he had grown accustomed to the Piarists and was attracted to pedagogy, and for these reasons entered the Order of the Piarists as a teacher of ancient languages. His novitiate year was spent in Stará Voda near the Silesian border, whence he was transferred to Stražnic; after 1806 he proceeded to Litomyšl—all little towns which mean nothing to the reader unless he be Czech. The peace of monastic teaching must have appealed to him in many ways, yet he did not take the vow, and Fichte lured him from the monastery to the university. He had already learned French and Italian—later supplemented by various other modern tongues—and had read widely.

He bade farewell to the Piarists, and came to his country's capital to study philosophy. At Prague he occupied himself also with literature, and for a time thought of becoming a man of letters. He was as frugal as David Hume, and the meager fees he received by tutoring enabled him to live, for in those days scholars possessed the secret of subsisting on ideals. His chief pupils were the young barons, Schutterstein and Ferdinand Hildebrandt; Purkinje



PURKINJE
By JOSEPH MÁNES

looked forward with keen pleasure to accompanying the latter to the Stavnic Mining Academy in Slovenia, but his dream was shattered when Hildebrandt joined the allies in the campaign against Napoleon.

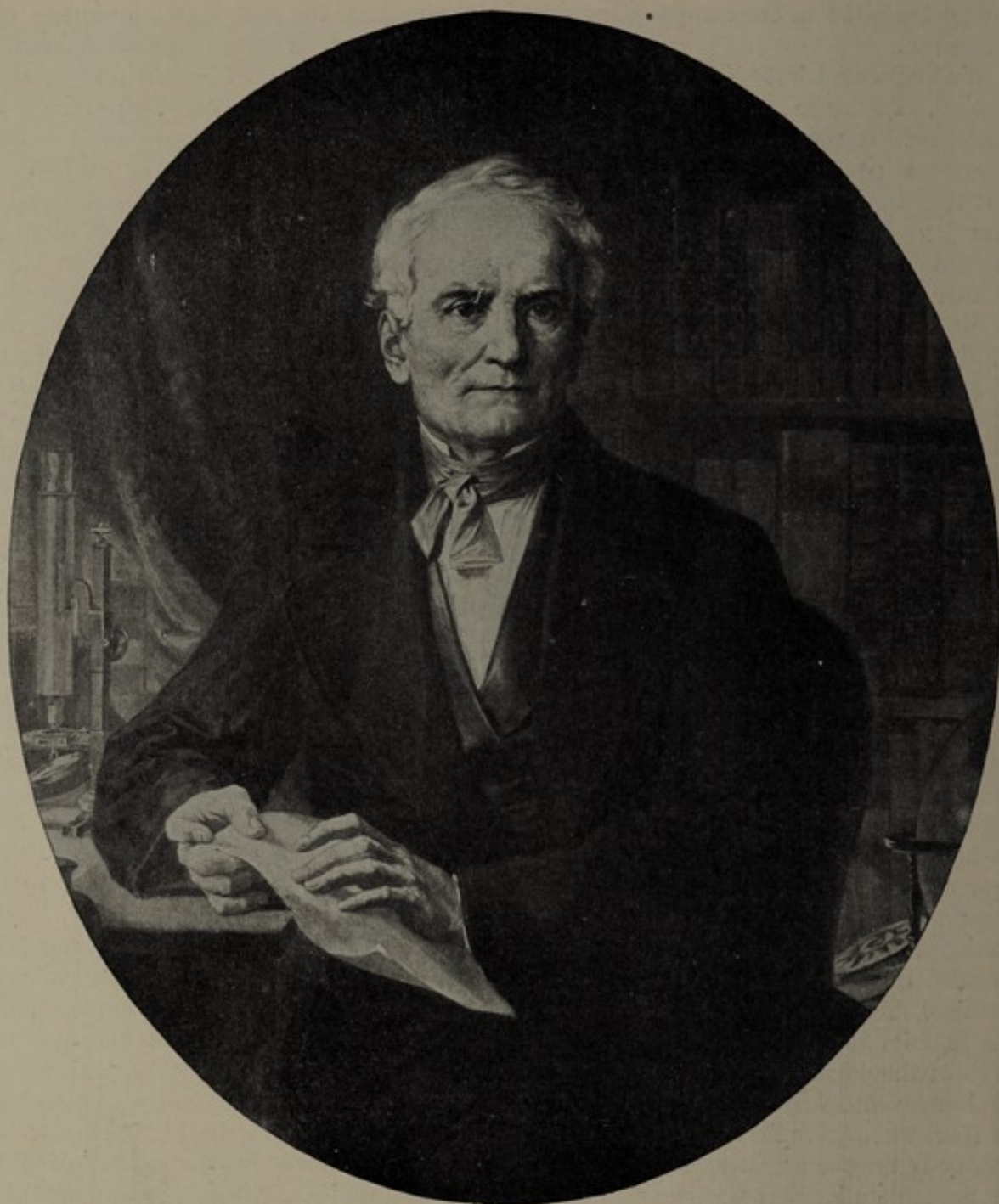
Well-educated but still without a profession, Purkinje now decided upon medicine. It was never his intention to become a practicing physician, but he felt that the medical sciences would give him an insight into nature. Even toward the conclusion of his medical studies, the pedagogue's mantle clung to him, and he thought of asking the aid of the Hildebrandt family to establish a special teaching institution of the natural sciences, and he contemplated a visit to Switzerland to acquaint himself with the methods of Pestalozzi and his disciples. In 1818 he acted as assistant in anatomy and physiology under Rotenberg and Ilg, and in 1819 graduated with a dissertation on the subjective aspects of vision. He was already thirty-two years old, an age at which many famous scientific careers have closed.

The year 1819 was a troubled one for German students. August von Kotzebue, not content with his popularity as a playwright, had returned from Russia to his fatherland in the capacity of the czar's spy. Establishing a weekly newspaper, he ridiculed the students for their national aspirations, and especially mocked their efforts to secure free institutions. A clever man, the columns of his journal were funny and cruel, but a certain theological student had no sense of humor and killed him. The dagger of Karl Sand gave Metternich his opportunity to muzzle all Germany. Freedom of speech and press were abolished by the Carlsbad Decrees, students were condemned to death for wearing a ribbon, private papers in private houses were searched without warrant, journalists went into hiding, the naturalist Oken fled to Switzerland, professors and pupils emigrated to America and privy

councillor Wilhelm von Humboldt, throwing down his portfolio in despair, relinquished politics forever to devote himself to the mysteries of the Basque tongue and the old Kawi language of Java. Wise Wilhelm von Humboldt! It is always a relief to turn from the world to the cloisters of culture.

In this year the bitter genius of Schopenhauer gave to the German people his masterpiece, but they were in no condition to read the "World as Will and Idea." They paid more attention to a pamphlet written by Hartwig Hundt, later suppressed by the censorship, in which the novelist made the suggestion, "As for the children of Israel, let them be sold to the English who could employ them on their Indian plantations instead of the blacks. In order that the tribe may not increase, let the men be emasculated, and their wives and daughters lodged in the houses of shame." In times of reaction, all sorts of ideas come to people's heads. Through the turmoil and general consternation, one man remained Jove-like, aloof, serene, going forward with his love affairs and work: Goethe, unperturbed by Napoleon, was unaware of Metternich. Among innumerable other activities, carrying on his researches in colors, Goethe read Purkinje's thesis with admiration, admitted that it stimulated him greatly, and quoted it frequently. The Bohemian physiologist, like the rest of the world, came to the oracle at Weimar, and Goethe was astonished at his personality and devotion to science. "Such an auto-didactic and self-tormenting, talented Piarist," said Goethe, "represents a strange contrast in the midst of the Protestants." It was inevitable that among Goethe's crowded laurels should be entwined this leaf:

I have taken the liberty of dedicating to you the second edition of my researches on "Sight from the Subjective View-point," since I could not resist making my strenuous mental efforts a memorial of my sentiments. Let us disregard



PURKINJE
OIL PAINTING BY PETER MAIXNER

the fact that the work has been reprinted at the same time in a medical journal; this was not according to the original intention, and is a tribute which my poverty has been compelled to pay to booksellers as the manuscript wandered around hopelessly for a year. I hope this little volume will stir up a little more the phlegmatic interest of the Germans.

I wish to draw Your Excellency's attention to the appearance of the color-spectrums which could also be exploited in the field of applied art, inasmuch as according to the personal observations of Wach, the Berlin painter, the shady parts in colored drapery yield a clear dark color only when they obtain a light covering of contrasting hue, when the objective produced by the subjective which has been created by the illuminative parts are eliminated.

I am also sending you a specimen of my researches in the development of the bird's egg before laying.

May you enjoy, with God's help, yet for a long time, your life so precious to us all.

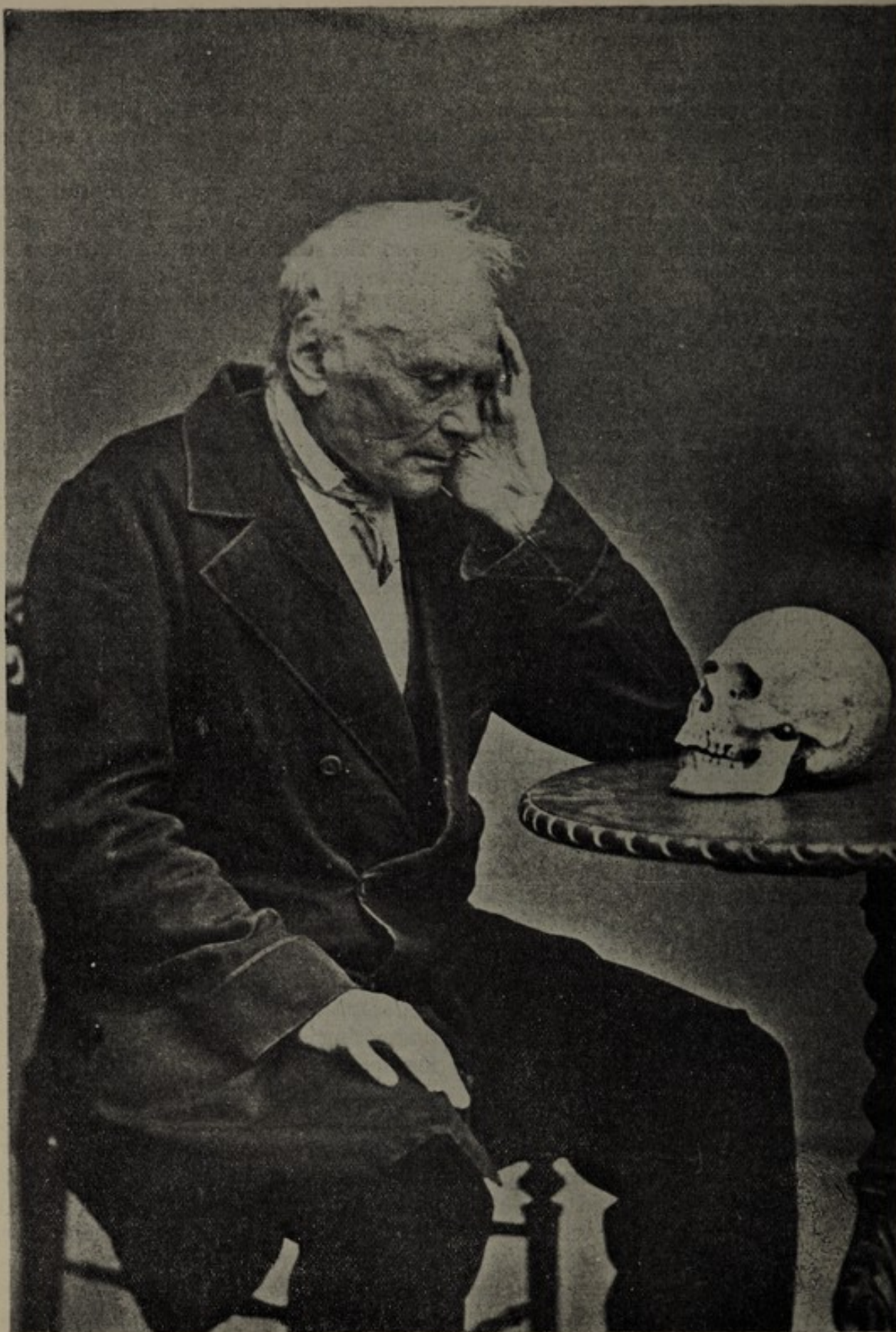
J. EV. PURKINJE

While serving as house-tutor in Blatná in the family of Baron Hildebrandt, Purkinje had met the Baroness Adelaide Desfours. In those days literature was potent to move men and women, and after reading Schultze's poem, "Enchanted Rose," Adelaide confessed that "she felt in her heart the magic spell and her life blossomed out into full bloom." She found herself overwhelmed with love for the gifted tutor, but an aristocratic lady must be discreet, and love was translated into friendship. Twenty-two of her letters, written to Purkinje after his graduation, remain as evidence of this stifled passion: in the last of her correspondence, she tells him of her mother's death, reproaches him with not having answered her former letter, and while informing him that she has rejected a proposal, advises him to marry. Purkinje remained silent, but he did not forget, and in later years published Kacer's version of "Enchanted Rose."

Before this edition appeared, Ernst Daniel August Bartels, probably the first professor of physiology in Germany, was called from Breslau back to the

older university of Marburg where he had previously taught. Purkinje was among the candidates for the vacant chair, and was rejected by the professors who did not look with favor upon the unknown Slav. They did not reckon, however, with two great European powers who stood behind Purkinje, and since the combination of Goethe and Alexander von Humboldt was irresistible, Purkinje in 1823 went to Breslau in spite of the faculty. He found himself an unwelcome guest of the university, and his chair was not lined with velvet. Naturally he spoke German with a tinge of Czech accent, and the anatomist Otto sarcastically informed him that if he wished to be understood, he would better lecture in Latin. Purkinje was not eloquent in expounding theories, and when he hinted that up to the present a lecturer in physiology was "merely a mechanism by means of which the theories of the old masters were repeated again and again," his classes dwindled in indignation and the faculty circulated a petition for his removal.

Later Purkinje stirred up more trouble by asking for a microscope. The authorities could not understand why a physiologist needed a microscope, and they sighed for the good old days of Bartels. There was the famous Bartels, becoming a Geheimrat and climbing to the Berlin chair; writing many books on *Naturphilosophie*, medicine and theology; diagnosing all diseases with the most learned phrases and knowing enough to denounce such new-fangled notions as Laennec's stethoscope; and yet he never needed a microscope. If this were permitted to go on, the university would be cluttered up with apparatus and specimens, and the students would be occupied in performing experiments instead of reading van Helmont and Haller and Bartels. Evidently the arguments failed to convince Purkinje, for in an unoccupied corner of the college building he



PURKINJE
A CONTEMPORARY PHOTOGRAPH

opened the first physiological laboratory. Had John Hunter tried to install his museum in St. George's Hospital, he would not have aroused more opposition than Purkinje with his laboratory, which seemed to his colleagues utterly useless in medicine. Moreover, Otto, officious and esthetic, objected strongly to the stench. Purkinje solved the difficulty by transferring the laboratory to his own house, and thereafter he lived and dined and slept in the midst of physiological equipment—including the unavoidable odors. His wife was not supposed to complain, since she was the daughter of the scientist Rudolphi.

In estimating the place of Purkinje in science, it should be remembered that he antedated the great experimental physiologists whose names are so familiar to-day. When Purkinje published his thesis in 1819, Johannes Müller was just entering the University of Bonn, Claude Bernard was a child of six, Brown-Séguard and Carl Ludwig were infants, Du Bois-Reymond was celebrating his first birthday, Brücke was uttering his first cry and Helmholtz and Huxley were yet unborn.

The test of a scientist's character is his relationship to obscurer workers. Marshall Hall, in announcing the existence of a system of excito-secretory nerves, did not mention Henry Fraser Campbell, for he had never heard of the American. Dr. Campbell, insisting that he had anticipated Marshall Hall and Claude Bernard in this discovery, forwarded to the English investigator a long letter and abstracts of his publications. The great Marshall Hall, then in his last illness, could easily have been too occupied to concern himself with the claims of the Georgia physiologist, and Campbell would have been forgotten. Instead, he sent a communication to the *Lancet*, giving the young doctor such full and generous credit that Campbell was encouraged to collect his essays into a volume which he dedicated to Marshall Hall "in high admiration of his genius,

and in heartfelt acknowledgment of his liberality." This idyll of physiology is rare enough, while contests over priority are frequent, wordy, often vindictive and seldom settled. Instances in which teachers appropriate the labors of their pupils with inadequate recognition are not unknown even at the present day.

In this respect, Purkinje was particularly chivalrous and free-handed: he frequently incorporated his most important researches into dissertations which were signed by his students. Of course it was Carl Ludwig who developed this habit into a fine art. When Martin Barry, notable as the first to observe the union of the spermatozoon with the ovum, worked with Purkinje and showed him his essay on fiber, Purkinje translated it for him and had it published in Müller's *Archiv*. Another pupil was Gabriel Valentin, who increased our knowledge of taste and touch, of nucleus and nucleolus, and whose "Manual of the Development of the Fetus" was the first systematic treatise on embryology—a mighty worker was Valentin in his day, ranging various fields, but his name has been almost submerged under the never-ceasing output of his successors. It was not the fate of Purkinje to leave behind him a school like Johannes Müller or Carl Ludwig, but we may say of him as Helmholtz said of Müller: "Whoever comes into contact with men of the first rank has an altered scale of value in life. Such intellectual contact is the most interesting event that life can offer."

Purkinje could have made his discoveries in a hayloft, yet academic life must have had its attractions, for he retained his chair for over a quarter of a century. His work was the most important produced in the Silesian university until the advent of Ferdinand Cohn, who after building the foundations of bacteriology at Breslau, helped Robert Koch lay the corner-stone there by his demonstration of the life-history of an-

thrax: Cohn wrote the great news to Darwin, and the old biologist replied, "I well remember saying to myself, between twenty and thirty years ago, that if ever the origin of any infectious disease could be proved, it would be the greatest triumph to science; and now I rejoice to have seen the triumph."

Gradually the personal character and exceptional attainments of Purkinje gained recognition at Breslau. Students came to his classes and laboratory, his colleagues acknowledged his services, his small salary was increased to more respectable proportions, much-desired apparatus was secured and in time the Prussian government erected for him a separate building devoted exclusively to physiology—this first Physiological Institute was opened on November 8, 1839, and forty years passed before Berlin followed Breslau. Purkinje had reached his goal, but the fire of his genius had exhausted itself, and most of his great discoveries, the mere list of which still amazes us, had already been made in his own home. He admitted that "many promising investigations await the time when I shall have regained my lost love of work," but the fallow years proved that the ardor of youth had gone. He was indeed pleased at the tribute to his labors and science, although he no longer had the strength or enthusiasm to nauseate and sicken himself with huge doses of digitalis in order to study disturbances of vision. Moreover, administrative duties and requisitions for supplies are incompatible with research. It is pleasant to be a director or a dean, but who ever heard of a dean discovering anything? Purkinje now neglected his hard-earned compound microscope to translate the lyrics of Schiller into Czech.

The following letter written by Purkinje during his latter years at Breslau exhibits his interest in his seventeenth century countryman, the great school-

master whose theological performances were unfortunate, but whose name will always survive in the history of education as one of the first rationalists in pedagogy. We are indebted for this letter to the courtesy of Purkinje's grandson, Dr. Cyril Purkyně, director of the Státní Geologický Ústav Československé Republiky:

Breslau, August 29th, 1844.

My dear friend:

That I am with you in spirit, although far away for the past two years, you may judge from my effort to join you and share with your vicissitudes until death. With the assistance of Mr. P. H. Klebelsberk I have obtained Austrian citizenship for which I applied last year, and this year I have presented through this same gentleman my request for the chair of physiology at the University Praha, to Count Kolowrat. I doubt whether it would be advisable to inform Mr. Nádherný regarding this step, as he seems to shun my free thinking, although he himself has recently suggested to me to apply for transfer. My petition for citizenship has been presented upon his advice, and perhaps without need. His second suggestion was to send a petition to the Emperor, although my citizenship definitely includes my right (for which I have asked) to apply for appointments to the institutes of learning in Austria. I presented myself to Türkheim and later upon the advice of K. to Kolowrat. We shall see what the result will be. From the enclosed letter of the Rev. Sidewice, Lésno, Prussia, you will note that I have reopened negotiations for the purchase of the manuscript of Comenius and that they now seem to be more approachable, perhaps because of the fact that the Gymnasium Director, Mr. Scholer, who was the one who chiefly insisted to retain and exhibit the manuscript together with the relic and portrait of Comenius in the gymnasium library, has now been transferred to Erfurt. I do not see from your letter that Čelakovský could have given you any information about it, as you certainly would not have been silent on the subject and thus frustrated my many years' effort.

I would have replied to your letter earlier, but I did not want to come to you empty-handed and so I copied for you from Comenius' own manuscript, rewritten and reedited church songs, introduction, which might be published in the Musejnik as an example of writing of that time.

Should the Museum Committee definitely not wish these manuscripts, please have them send

me a few lines in German for my verification. You will kindly return to me Sidewice's letter.

I look forward to an early response from you and with my respectful greetings to your wife and kisses to your children, I am,

Your devoted

JAN PURKYNĚ

As previously stated, Purkinje's first work was in physiological optics. Thrice he wrote his name in this field: Purkinje's figures, Purkinje's images and Purkinje's phenomenon. A bibliography of the contributions to these subjects during a century would show how a large number of investigators received their impulse from Purkinje. The work of Purkinje was germinative, for even if it consisted of only a few paragraphs, it proved reproductive. His method of lighting the retina, his measurements of the curvatures of the lens and cornea, his studies of the refracting surfaces of the eye with mirrors not only anticipated the ophthalmoscope of Helmholtz, but even made it inevitable.

The name of Francis Galton is usually associated with the foundation of fingerprint identification, but seventy years earlier, Purkinje wrote: "The wonderful arrangement and design which are on the palm of the hand and upon the sole of the foot, and especially the little hollows on the fingertips, the papillary lines, command our attention." He then proceeded to describe with accuracy the unchanging character of fingerprints, illustrated with various figurations. His pioneer work is of value to all criminologists, and the English penitentiary inspector, Major Arthur Griffiths, author of the "Chronicles of Newgate," writes: "The permanent character of the finger-print was first put forward scientifically in 1823 by J. E. Purkinje, an eminent professor of physiology, who read a paper before the University of Breslau, adducing nine standard types of impressions and advocating a system of classification which attracted no great attention." With G. Rosche,

we may call Purkinje the old master of dactyloscopy.

Most pre-Virchovian workers, including Purkinje, are rather roughly handled in the "Cellular Pathology," but Virchow credits Purkinje with having devised the term *corpora amylacea*; he also introduced the terms *enchyma*, *cambium*, *protoplasm* and others—almost reminding us of Walther Flemming who in a single year increased the nomenclature of cytology with *mitosis*, *amitosis*, *karyomitosis*, *dyaster*, *karenchyma*, *net-knot*, *spireme*, *mitome*, *karyoplasm* and *interfilar substance*. Richard Mead, relying on the experiments of Galen, felt safe in swallowing the poison of vipers, but Purkinje broke new ground in some of his self-experiments with belladonna, camphor, digitalis, opium, stramonium and turpentine.

Every investigator of the first rank has conducted a host of minor researches, and among Purkinje's innumerable ones may be mentioned: an early paper "On the World of Dreams," now over a century old, which should be read to-day in the light of Freudism; the contribution to acoustics, "On Tartini's Tones"; his auscultation experiment, by which he was able to determine the points of rest and motion of a vibrating plate, without employing Chladni's sand; his work on rhizopods, the nautilus, and embryology of the tadpole; his original description of the peculiar formation of the skin of cucumber plants, and his observations of the methods of fertilization in the plant world.

More important investigations, and belonging chiefly, but not exclusively, to his first sixteen years at Breslau, were his contribution to photometry; his observation that deaf-mutes can hear through the bones of the skull; his experiments upon the production of vertigo which paved the way for the knowledge of nystagmus; his work with Pappenheim on artificial digestion which antedates Schwann, including the demonstra-

tion of the dissolving power of acidulated infusion of pancreatic juice; his researches with Valentin on ciliary epithelial movement and the explanation of its independence of the nervous system; his original description of bone, cartilage, blood-vessels, gastric glands and special organs; his discovery of the sudoriferous glands and their ducts; of the flask-shaped Purkinjean nerve-cells with their axones and branching dendrites which form the characteristic features of the cerebellum, and of the Purkinje fibers in the cardiac muscle. In microscopy he was the first to use the microtome, microphotography, Drummond lime light, glacial acetic acid, potassium bichromate and Canada balsam.

There is much confusion in regard to discoveries of the nucleus: standard general and medical dictionaries give incorrect information, and Loey, although he devotes much space to it, in no way clarifies the subject. We have frequently read the statement that Purkinje in 1825 discovered the nucleus of the human ovum; this is manifestly impossible when we remember that the mammalian ovum itself was not discovered until two years later by von Baer. What Purkinje did discover was the nucleus or germinal vesicle in birds, announcing his find in the *Gratulationsschrift* to Blumenbach; he was likewise the first to use the term *protoplasm* for the embryonic formative substance. Misstatements concerning Purkinje are prevalent: for example, Littré, in his classic *Dictionnaire de Medecine*, actually refers to him as *anatomiste hongrois*; while Dorland, after thirteen editions of his popular dictionary, repeats this error, and gives the date of his death as 1850! A man whose connection with the cell doctrine was as intimate as Purkinje's deserves more accuracy on the part of lexicographers. If Schleiden and Schwann are the fathers of the cell-theory, Purkinje is

at least its great uncle, for prior to Schleiden and Schwann he taught that organs consist of cells and nuclei, and suggested the probable identity in the structure of animal and plant cells. In this, however, he was not without various forerunners.

Since the universal cell is now recognized as the basis of life, we should be familiar with a chronology of cytology, and many of the earlier dates and facts will be found in that storehouse of biological knowledge, Johannes Müller's book. It is a pity that this great manual of physiology should have been superseded by later productions, for in numerous respects it has never been equaled. Even to-day, with a little editing and some foot-notes, it would serve admirably, for as far as we recall, the only passage that is entirely obsolete is the following: "Woman is distinguished by her modesty, meekness, patience and amiability; by her readiness to sacrifice her own good and herself for the sake of others; by her tenderness, sympathizing disposition, and piety. The field of her activity is her home and family."

If it be asked why Purkinje spent twenty-six years in a foreign country, the answer is simple: for the same reason that Kaspar Wolff, the founder of modern embryology, journeyed from his native Berlin to spend his last thirty years in Russia. Purkinje had applied for a chair in Prague, but they were filled with long-lived occupants, or the authorities appointed what Huxley would call a "safe nobody." Wolff may have grown accustomed to Catherine the Great, but in spite of his success at Breslau, Purkinje felt an expatriate, and cast many longing glances toward his own soil—more than once he sought an opportunity for returning, but Bohemia was not yet ready for her greatest son. Purkinje was a true Czech, and Tyl's "Kde domov muj" stirred him as if he were a gymnasium

student. Fortunately for his reputation, he was not guilty of the extravagances of the great Swedish anatomist, Olof Rudbeck, who, ignoring his real discoveries, regarded the "Atlantican" as his chief work—huge folios claiming that after Noah's flood, the land which Japheth sought and found was Sweden, the Almighty's favorite spot on earth. How men of intelligence can do these things is really beyond comprehension.

Purkinje finally returned to Prague as professor of physiology. "Well do we remember," says a Czech writer, "how Purkyně's coming in 1850 was celebrated not only in Prague, but in all the provinces." Old and famous, he was no longer compelled to fight for a laboratory: the Austrian government gave him a splendid one, with a capable assistant and an adequate salary. Purkinje was over sixty, and he proved that apparatus alone can not make discoveries.

It would be entirely erroneous, however, to believe that he had retired, or that his intellectual activity was at an end. The days of his epochal discoveries were indeed over, but he had made enough for an entire institute of research. He now busied himself with Czech politics, and whoever did that in the mid-nineteenth century was much occupied—he was elected to the senate and served with exemplary diligence. The pen is often the staff of age, and Purkinje wrote copiously; he was a founder and editor of the journal of natural history, *Ziva*, and for several years one of its principal contributors. He vitalized the *Journal* of the Bohemian Museum, and his popular essays in the Bohemian language stimulated interest in nature. He continued to develop the ideas of Pestalozzi, and discussed the establishment of orphan asylums from a scientific standpoint. Josef Klika was able to produce a lengthy monograph devoted exclusively to "Purkinje as a Pedagogue."

There are few scientific workers of the scope of Purkinje of whom as little is generally known. His name does not once occur in Baas, although that thick and valuable volume is at times overloaded with forgotten names. If an explanation is sought of this and similar omissions elsewhere, it is found partially in the fact that Purkinje, by returning to Prague and not identifying himself with the Vienna school, stood apart from the main stream of German medicine—indirect but potent testimony of the influence of the Vienna school. Distinguished medical travelers, such as Richard Bright and those who followed in his footsteps, have left their impressions of medical Vienna, but Prague was out of the way.

It would not be correct, however, to cite Purkinje as an example of genius overlooked by his contemporaries and neglected by posterity. Even when he ceased to keep up with the progress of physiology, and younger giants overstepped his own frontiers, he was not disregarded. In fact, to read nice things about himself he was not obliged to follow the usual custom and wait for the obituary notices. In 1859, the distinguished Eiselet published an accurate analysis of Purkinje's work, occupying twenty printed pages; in 1867, an appreciative biographical sketch appeared in *Svetozor*, concluding with the passage:

... the greatest reward and one which is dearest to him is the unbounded affection with which our entire nation clings to him, the proof of which was apparent last summer when he passed through some parts of the land. Wherever he appeared citizens endeavored to honor him; the day of his coming was a day of celebration. He is truly not only honor-deserving, but a really lovable personage. Whoever sees him must love him. He has lived eighty years, and certainly not in leisure, but he still walks with vigor and enjoys splendid health; it seems as though nature herself wishes to mark her ardent admirer and worker.

His faculties are excellent, and he who would count upon his "aged memory," would be much surprised. His humor retains its original fresh-

ness; he likes to be in company and contributes to conversation his characteristic wit. He has never known idleness and despises it now: he must be active, always, either in his own branch, or he finds other work and pursues it with youthful enthusiasm. Only recently he translated the "Evangelium" of Sallet, and Barthriari's "Book of Love"; he edited the original Austria Polyglotta, and learned the difficult Magyar tongue: he practices his violin, etc.

We can not do better in taking leave of this noble and beloved son of our nation than to call heartily *Mnogaja leta!* [many years].

In 1868, the Bohemian Medical Society at Prague published a quarto—*Quod bonum, felix, faustum fortunatumque sit, Joanni Ev. Purkyně, diem semi-saecularem X. dec. 1868 summorum in medicina honorum in alma antiquissimaque universitate Pragensi celebranti gratulatur.* . . . The obituary notice in the *Proceedings* of the Royal Society of London, after summing up his unusual achievements, states:

In 1848 he attended the meeting of the Slavonic races in Prague, and was present at the celebration of the five hundredth anniversary of the foundation of the university, when the degree of doctor of philosophy was conferred upon him. A long-cherished wish to be enabled to pass the remainder of his days in his native country was gratified. . . . His election as a foreign member of the Royal Society took place in 1850. He was corresponding member of the French Institute, member of the academies of Vienna, Berlin and St. Petersburg and of many other learned societies. He retained his vigor of body and mind up to the last days of his life. His death, after an illness of no long duration, on the 28th day of July, 1869, was mourned by every class of society in Bohemia.

When we think of that trinity of astronomers, Horrocks, Gascoigne, Crabtree: Jeremiah Horrocks, discovering the transit of Venus across the sun, and in terror that his Sabbath duties as a parish curate would prevent him from observing this phenomenon, practically a beggar, without leisure for science, in broken health, dead at the beginning of his twenties, and from his grave

teaching a Newton; his friend, William Gascoigne, inventor of the micrometer, slain in his youth at Marston Moor, leaving his work unfinished; his other friend, William Crabtree, corrector of the Rudolphine Tables, likewise disappearing early from the banquet of life in an unknown manner—we are thankful that Purkinje, like Goethe and Humboldt, was spared by fate to write *Finis* to his labors. At the time of his death, Purkinje was in his eighty-second year. Happy is the pioneer who becomes a patriarch, and at whose bier a grateful and sorrowing nation bows its head.

Now that Purkinje's beloved Bohemia has emerged as an independent country, the Republic of Czechoslovakia is adding new laurels to the name of Purkinje. Kamil Lhoták v. Lhota, professor of pharmacology at Prague, edited a handsome volume of Purkinje's original monographs. Paul J. Hanzlik, of Stanford University, informs us of the sad fact that Dr. Lhoták died young of gastric carcinoma, but no doubt other devoted hands will carry on the work. Professor Hanzlik has also directed our attention to two volumes recently issued by the Czech Medical Society of the personal correspondence of Purkinje, containing letters sent to him from a considerable number of people in all walks of life and from all over Europe—the nobility, statesmen, publicists, poets and scientists.

Foreign countries have also not forgotten him. E. Thomsen, of the University of Copenhagen, published in the *Skandinavisches Archiv für Physiologie* a study of Purkinje for which he received a gold medal. In a personal letter to Henry Jerry John, of the Cleveland Clinic, Dr. Thomsen writes: "There does not exist any reprint of my article on Purkinje. That work was written when I was a poor student, unable to buy reprints!"—here, then, is an important function for the photostat. Dr. John is the chief Purkinje student in

this country, and after several years of effort has collected, in many volumes, practically everything that has been written by and about his illustrious countryman. We can not permit this occasion to pass without acknowledging our indebtedness to Dr. John for placing at our disposal his patiently accumulated data and the illustrations which adorn his essay; when we add that Dr. John himself is planning a biography of Purkinje, yet readily granted prior use of his material, his generosity will be realized. A definitive biography of Purkinje, sixty years after his death, is much desired, for his influence lives: the *Quarterly Cumulative Index Medicus* for 1928 seems to contain more references to Purkinje and his work than to any other physiologist of his era. It is the glory of Purkinje that he holds a foremost place among the investigators who found physiology a speculative subject and left it an experimental science.

Hradčany Hill with its castles and cathedrals has seen a thousand years of battle, and for centuries the waters of Vltava have been reddened by intolerance. Towers upon towers, and those black Towers of the Abandoned. This is the story of Prague, and it is also the story of every capital in Europe. Climbing the Petrin, looking over Prague to the Giant Mountains, and from the heights of Moravia's frontier to the Bohemian Forest, how magnificent would be the view if we did not know that every inch of soil was blood-stained. Prague is beautiful—Humboldt calls it the most beautiful inland town of Europe—and to enter this historic threshold would be a feast for the soul,

could we but forget the aggressions of kings and the endless strife of conflicting sects in the name of the Prince of Peace. . . . That wonderful old clock with the moving apostles and the crowing cock is still ticking the time—the clock that told the hours before Columbus set sail for America and immortality. Those countless moss-grown tombs in the ancient and crowded burial-ground of the Jews—under the elder-trees, the teacher tenderly surrounded by his thirty-three scholars. To Prague in his broken years came that master of the moon, Tycho Brahe, and here are his remains and relics; after him followed a pock-marked vagabond from a public-house to capture a planet for a mad emperor—John Kepler's "Commentaries on Mars" helped fulfil the prophecy of Libussa: "I see a city whose glory touches the stars." Monuments of monarchs and warriors—several recently removed from the public squares and hidden in museums. Let these medieval spirits disappear forever, until there glows across humanity's sky the sunrise that shall never set, burning away the barriers that divide the human race, revealing at last to the children of Mother Earth that none can be aliens and all are brothers. . . . Wandering through the streets of Prague, in the aimless yet interested fashion of tourists, we came suddenly upon a simple house with a plain tablet stating that this was the house of Purkinje. To the student of science this is the most inspiring spot in all Prague, for here lived the man who standing humbly before truth, read many of nature's secrets, and thus enlarged the human horizon.

