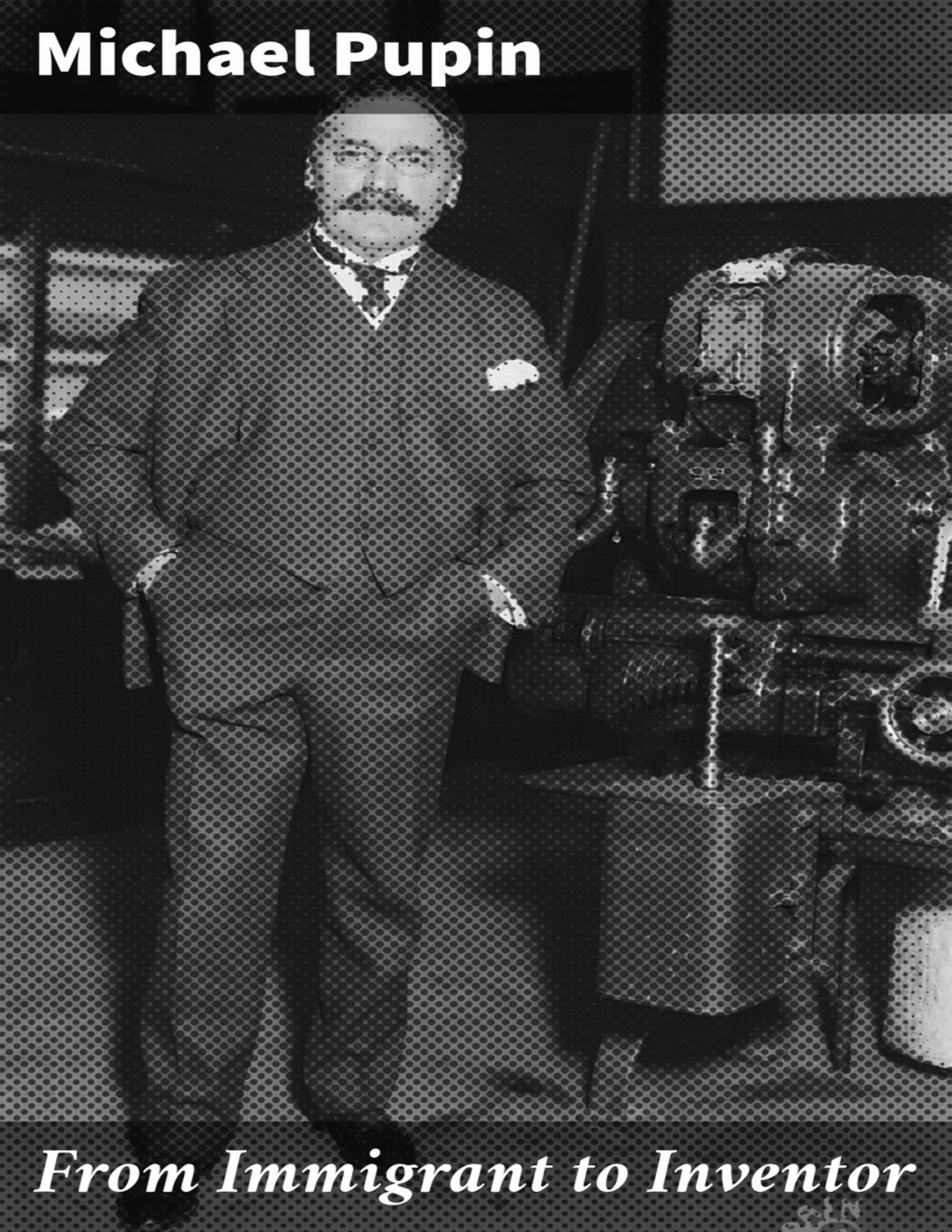
Michael Pupin



From Immigrant to Inventor

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PREFACE

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Looking back over the development of this volume throughout the year or more during which I have been writing it, it seems to me that I cannot better express the end I have had in view than to repeat here what I wrote at the beginning of Chapter XI:

“The main object of my narrative was, and still is, to describe the rise of idealism in American science, and particularly in physical sciences and the related industries. I was a witness to this gradual development; everything that I have described so far was an attempt to qualify as a witness whose testimony has competence and weight. But there are many other American scientists whose opinions in this matter have more competence and weight than my opinion has. Why, then, should a scientist who started his career as a Serbian immigrant speak of the idealism in American science when there are so many native-born American scientists who know more about this subject than I do? Those who have read my narrative so far can answer this question. I shall only point out now that there are certain psychological elements in the question which justify me in the belief that occasionally an immigrant can see things which escape the attention of the native. Seeing is believing; let him speak who has the faith, provided that he has a message to deliver.”

MICHAEL PUPIN.

ILLUSTRATIONS

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I
WHAT I BROUGHT TO AMERICA

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When I landed at Castle Garden, forty-eight years ago, I had only five cents in my pocket. Had I brought five hundred dollars, instead of five cents, my immediate career in the new, and to me a perfectly strange, land would have been the same. A young immigrant such as I was then does not begin his career until he has spent all the money which he has brought with him. I brought five cents, and immediately spent it upon a piece of prune pie, which turned out to be a bogus prune pie. It contained nothing but pits of prunes. If I had brought five hundred dollars, it would have taken me a little longer to spend it, mostly upon bogus things, but the struggle which awaited me would have been the same in each case. It is no handicap to a boy immigrant to land here penniless; it is not a handicap to any boy to be penniless when he strikes out for an independent career, provided that he has the stamina to stand the hardships that may be in store for him.

A thorough training in the arts and crafts and a sturdy physique capable of standing the hardships of strenuous labor do entitle the immigrant to special considerations. But what has a young and penniless immigrant to offer who has had no training in any of the arts or crafts and does not

know the language of the land? Apparently nothing, and if the present standards had prevailed forty-eight years ago I should have been deported. There are, however, certain things which a young immigrant may bring to this country that are far more precious than any of the things which the present immigration laws prescribe. Did I bring any of these things with me when I landed at Castle Garden in 1874? I shall try to answer this question in the following brief story of my life prior to my landing in this country.

Idvor is my native town; but the disclosure of this fact discloses very little, because Idvor cannot be found on any map. It is a little village off the highway in the province of Banat, formerly belonging to Austria-Hungary, but now an important part of the kingdom of the Serbs, Croats, and Slovenes. At the Paris peace conference, in 1919, the Rumanians claimed this province; they claimed it in vain. They could not overcome the fact that the population of Banat is Serb, and particularly of that part of Banat where Idvor is located. President Wilson and Mr. Lansing knew me personally, and when they were informed by the Yugoslav delegates in Paris that I was a native of Banat, the Rumanian arguments lost much of their plausibility. No other nationality except the Serb has ever lived in Idvor. The inhabitants of Idvor were always peasants; most of them were illiterate in my boyhood days. My father and mother could neither read nor write. The question arises now: What could a penniless boy of fifteen, born and bred under such conditions, bring to America, which under any conceivable immigration laws would entitle him to land? But I was confident that I was so desirable an acquisition to America

that I should be allowed to land, and I was somewhat surprised that people made no fuss over me when I landed.

The Serbs of Idvor from time immemorial always considered themselves the brothers of the Serbs of Serbia, who are only a few gunshots away from Idvor on the south side of the Danube. The Avala Mountain, near Belgrade in Serbia, can easily be seen from Idvor on every clear day. This blue and, to me at that time, mysterious-looking peak seemed always like a reminder to the Serbs of Banat that the Serbs of Serbia were keeping an eye of affectionate watchfulness upon them.

When I was a boy Idvor belonged to the so-called military frontier of Austria. A bit of interesting history is attached to this name. Up to the beginning of the eighteenth century the Austrian Empire was harassed by Turkish invasions. At periodically recurring intervals Turkish armies would cross her southern frontier, formed by the Rivers Danube and Sava, and penetrate into the interior provinces. Toward the end of the seventeenth century they advanced as far as Vienna, and would have become a serious menace to the whole of Europe if the Polish king Sobiesky had not come to the rescue of Vienna. It was at that time that Emperor Leopold I, of Austria, invited Charnoyevich, the Serb Patriarch of Pech, in old Serbia, to move with thirty-five thousand picked families of old Serbia into the Austrian territory north of the Danube and the Sava Rivers, to become its guardians. For three hundred years these Serbs had been fighting the Turks and had acquired great skill in this kind of warfare. In 1690 the Patriarch with these picked

families moved into Austria and settled in a narrow strip of territory on the northern banks of these two rivers. They organized what was known later as the military frontier of Austria. 1690 is, according to tradition, the date when my native village Idvor was founded, but not quite on its present site. The original site is a very small plateau a little to the north of the present site.

IN THE HOUSE ON THE LEFT WITH THREE WINDOWS, A TYPICAL PEASANT HOUSE OF IDVOR, PUPIN WAS BORN
On the right is the spire of the church on the village green

Banat is a perfectly level plain, but near the village of Idvor the River Tamish has dug out a miniature canyon, and on the plateau of one of the promontories of this canyon was the old site of Idvor. It is connected to the new site by a

narrow neck. The old site was selected because it offered many strategical advantages of defense against the invading Turk. The first settlers of the old village lived in subterranean houses which could not be seen at a distance by the approaching enemy. Remnants of these subterranean houses were still in existence when I was a schoolboy in the village of Idvor, over fifty years ago. The location of the original church was marked by a little column built of bricks and bearing a cross. In a recess on the side of the column was the image of St. Mary with the Christ Child, illuminated by a burning wick immersed in oil. The legend was that this flame was never allowed to go out, and that a religious procession by the good people of Idvor to the old monument was sure to avert any calamity, like pestilence or drought, that might be threatening the village. I took part in many of these processions to the old deserted village, and felt every time that I was standing upon sacred ground; sacred because of the Christian blood shed there during the struggles of the Christian Serbs of Idvor against the Turkish invaders. Every visit to the old village site refreshed the memories of the heroic traditions of which the village people were extremely proud. They were poor in worldly goods, those simple peasant folk of Idvor, but they were rich in memories of their ancient traditions.

THE OLD MONUMENT ON STARO SELO, THE OLD VILLAGE, WHERE THE ORIGINAL SETTLERS OF IDVOR LIVED IN SUBTERRANEAN DWELLINGS

As I look back upon my childhood days in the village of Idvor, I feel that the cultivation of old traditions was the principal element in the spiritual life of the village people. The knowledge of these traditions was necessary and sufficient to them, in order to understand their position in the world and in the Austrian Empire. When my people moved into Austria under Patriarch Charnoyevich and settled in the military frontier, they had a definite agreement with Emperor Leopold I. It was recorded in an Austrian state document called Privilegia. According to this ancient document the Serbs of the military frontier were to enjoy a spiritual, economic, and political autonomy. Lands granted to them were their own property. In our village we maintained our own schools and our own churches, and

each village elected its own local administration. Its head was the Knez, or chief, usually a sturdy peasant. My father was a Knez several times. The bishops and the people elected their own spiritual and political heads, that is, the Patriarch and the Voyvoda (governor). We were free and independent peasant landlords. In return for these privileges, the people obligated themselves to render military service for the defense of the southern frontiers of the empire against the invading Turks. They had helped to drive the Turks across the Danube, under the supreme command of Prince Eugene of Savoy, in the beginning of the eighteenth century. After the emperor had discovered the splendid fighting qualities of the Serbs of the military frontier, he managed to extend the original terms of the Privilegia so as to make it obligatory upon the military frontiersmen to defend the empire against any and every enemy. Subsequently the Serbs of the military frontier of Austria defended Empress Maria Theresa against Frederick the Great; they defended Emperor Francis against Napoleon; they defended Emperor Ferdinand against the rebellious Hungarians in 1848 and 1849; and in 1859 and 1866 they defended Austria against Italy. The military exploits of the men of Idvor during these wars supplied material for the traditions of Idvor, which were recorded in many tales and stirring songs. Reading and writing did not flourish in Idvor in those days, but poetry did.

Faithful to the old customs of the Serb race, the people of Idvor held during the long winter evenings their neighborhood gatherings, and as a boy I attended many of them at my father’s house. The older men would sit around

the warm stove on a bench which was a part of the stove and made of the same material, usually soft brick plastered over and whitewashed. They smoked and talked and looked like old senators, self-appointed guardians of all the wisdom of Idvor. At the feet of the old men were middle-aged men, seated upon low stools, each with a basket in front of him, into which he peeled the yellow kernels from the seasoned ears of corn, and this kept him busy during the evening. The older women were seated on little stools along the wall; they would be spinning wool, flax, or hemp. The young women would be sewing or knitting. I, a favorite child of my mother, was allowed to sit alongside of her and listen to the words of wisdom and words of fiction dropping from the mouths of the old men and sometimes also from the mouths of the middle-aged and younger men, when the old men gave them permission to speak. At intervals the young women would sing a song having some relation to the last tale. For instance, when one of the old men had finished a tale about Karageorge and his historic struggles against the Turks, the women would follow with a song describing a brave Voyvoda of Karageorge, named Hayduk Velyko, who with a small band of Serbians defended Negotin against a great Turkish army under Moula Pasha. This gallant band, as the song describes them, reminds one of the little band of Greeks at Thermopylæ.

Some of the old men present at these gatherings had taken part in the Napoleonic wars, and they remembered well also the stories which they had heard from their fathers relating to the wars of Austria against Frederick the Great during the eighteenth century. The middle-aged men had

participated in the fighting during the Hungarian revolution, and the younger men had just gone through the campaigns in Italy in 1859 and 1866. One of the old men had taken part in the battle of Aspern, when Austria defeated Napoleon. He had received a high imperial decoration for bravery, and was very proud of it. He also had gone to Russia with an Austrian division during Napoleon's campaign of 1812. His name was Baba Batikin, and in the estimation of the village people he was a seer and a prophet, because of his wonderful memory and his extraordinary power of description. His diction was that of a guslar (Serbian minstrel). He not only described vividly what went on in Austria and in Russia during the Napoleonic wars in which he himself participated, but he would also thrill his hearers by tales relating to the Austrian campaigns against Frederick the Great, which his father upon his return from the battle-fields of Silesia had related to him. I remember quite well his stories relating to Karageorge of Serbia, whom he had known personally. He called him the great Vozhd, or leader of the Serbian peasants, and never grew weary of describing his heroic struggles against the Turks in the beginning of the nineteenth century. These tales about Karageorge were always received at the neighborhood gatherings with more enthusiasm than any other of his stirring narratives. Toward the end of the evening Baba Batikin would recite some of the old Serbian ballads, many of which he knew by heart. During these recitations his thin and wrinkled face would light up; it was the face of a seer, as I remember it, and I can see now his bald head with a wonderful brow, towering over bushy eyebrows through

which the light of his deep-set eyes would shine like the light of the moon through the needles of an aged pine. It was from him that the good people of Idvor learned the history of the Serb race from the battle of the field of Kossovo in 1389 down to Karageorge. He kept alive the old Serb traditions in the village of Idvor. He was my first and my best teacher in history.

The younger men told tales relating to Austrian campaigns in Italy, glorifying the deeds of valor of the men of Idvor in these campaigns. The battle of Custozza in 1866, in which the military frontiersmen nearly annihilated the Italian armies, received a great deal of attention, because the men who described it had participated in it, and had just returned from Italy. But I remember that every one of those men was full of praise of Garibaldi, the leader of the Italian people in their struggles for freedom. They called him the Karageorge of Italy. I remember also that in my father's house, in which these winter-evening gatherings took place, there was a colored picture of Garibaldi with his red shirt and a plumed hat. The picture was hung up alongside of the Ikona, the picture of our patron saint; on the other side of the Ikona was the picture of the Czar of Russia, who only a few years before had emancipated the Russian serfs. In the same room and hanging in a very conspicuous place all by itself was a picture of Karageorge, the leader of the Serbian revolution. The picture of the Austrian emperor was not there after 1869!

The Serb ballads recited by Baba Batikin glorified the great national hero, Prince Marko, whose combats were the combats of a strong man in defense of the weak and of the

oppressed. Marko, although a prince of royal blood, never fought for conquest of territory. According to the guslar, Prince Marko was a true champion of right and justice. At that time the Civil War in America had just come to a close, and the name of Lincoln, whenever mentioned by Baba Batikin, suggested an American Prince Marko. The impressions which I carried away from these neighborhood gatherings were a spiritual food which nourished in my young mind the sentiment that the noblest thing in this world is the struggle for right, justice, and freedom. It was the love of freedom and of right and justice which made the Serbs of the military frontier desert their ancestral homes in old Serbia and move into Austria, where they gladly consented to live in subterranean houses and crawl like woodchucks under the ground as long as they could enjoy the blessings of political freedom.

The military frontiersmen had their freedom guaranteed to them by the Privilegia, and, in exchange for their freedom, they were always ready to fight for the Emperor of Austria on any battle-field. Loyalty to the emperor was the cardinal virtue of the military frontiersmen. It was that loyalty which overcame their admiration for Garibaldi in 1866; hence the Austrian victory at Custozza. The Emperor of Austria as a guardian of their freedom received a place of honor in the selected class of men like Prince Marko, Karageorge, Czar Alexander the Liberator, Lincoln, and Garibaldi. These were the names recorded in the Hall of Fame of Idvor. When, however, the emperor, in 1869, dissolved the military frontier and delivered its people to the

Hungarians, the military frontiersmen felt that they were betrayed by the emperor, who had broken his faith to them recorded in the Privilegia. I remember my father saying to me one day: “Thou shalt never be a soldier in the emperor’s army. The emperor has broken his word; the emperor is a traitor in the eyes of the military frontiersmen. We despise the man who is not true to his word.” This is the reason why the picture of the Emperor of Austria was not allowed a place in my father’s house after 1869.

As I look back upon those days I feel, as I always felt, that this treacherous act of the Austrian emperor in 1869 was the beginning of the end of the Austrian Empire. It was the beginning of nationalism in the realm of Emperor Francis Joseph of Hapsburg. The love of the people for the country in which they lived began to languish and finally died. When that love dies, the country also must die. This was the lesson which I learned from the illiterate peasants of Idvor.

OLYMPIADA PUPIN, MOTHER OF MICHAEL PUPIN
From a photograph taken in 1880

My teacher in the village school never succeeded in making upon my mind that profound impression which was made upon it by the men at the neighborhood gatherings. They were men who had gone out into the world and taken

an active part in the struggles of the world. Reading, writing, and arithmetic appeared to me like instruments of torture which the teacher, who, in my opinion at that time, knew nothing of the world, had invented in order to interfere as much as possible with my freedom, particularly when I had an important engagement with my chums and playmates. But my mother soon convinced me that I was wrong. She could neither read nor write, and she told me that she always felt that she was blind, in spite of the clear vision of her eyes. So blind, indeed, that, as she expressed it, she did not dare venture into the world much beyond the confines of my native village. This was as far as I remember now the mode of reasoning which she would address to me: “My boy, if you wish to go out into the world about which you hear so much at the neighborhood gatherings, you must provide yourself with another pair of eyes; the eyes of reading and writing. There is so much wonderful knowledge and learning in the world which you cannot get unless you can read and write. Knowledge is the golden ladder over which we climb to heaven; knowledge is the light which illuminates our path through this life and leads to a future life of everlasting glory.” She was a very pious woman, and had a rare knowledge of both the Old and the New Testaments. The Psalms were her favorite recitations. She knew also the lives of saints. St. Sava was her favorite saint. She was the first to make me understand the story of the life of this wonderful Serb. This, briefly stated, was the story which she told me: Sava was the youngest son of the Serb Zhupan Nemanya. At an early age he renounced his royal titles and retired to a monastery on Mount Athos and

devoted many years to study and meditation. He then returned to his native land, in the beginning of the thirteenth century, and became the first Serbian archbishop and founded an autonomous Serbian church. He also organized public schools in his father's realm, where Serbian boys and girls had an opportunity to learn how to read and write. Thus he opened the eyes of the Serbian people, and the people in grateful recognition of these great services called him St. Sava the Educator, and praised forever his saintly name and memory. Seven hundred years had passed since St. Sava's time, but not one of them had passed without a memorial celebration dedicated to him in every town and in every home where a Serb lived.

This was a revelation to me. Like every schoolboy, I attended, of course, every year in January, the celebrations of St. Sava's day. On these occasions we unruly boys made fun of the big boy who in a trembling and awkward voice was reciting something about St. Sava, which the teacher had written out for him. After this recitation, the teacher, with a funny nasal twang, would do his best to supplement in a badly articulated speech what he had written out for the big boy, and finally the drowsy-looking priest would wind up with a sermon bristling with archaic Slavonic church expressions, which to us unruly boys sounded like awkward attempts of a Slovak mouse-trap dealer to speak Serbian. Our giggling merriment then reached a climax, and so my mischievous chums never gave me a chance to catch the real meaning of the ceremonies on St. Sava's day. My mother's story of St. Sava and the way in which she told it made the image of St. Sava appear before me for the first

time in the light of a saint who glorified the value of books and of the art of writing. I understood then why mother placed such value upon reading and writing. I vowed to devote myself to both, even if that should make it necessary to neglect my chums and playmates, and soon I convinced my mother that in reading and writing I could do at least as well as any boy. The teacher observed the change; he was astonished, and actually believed that a miracle had occurred. My mother believed in miracles, and told the teacher that the spirit of St. Sava was guiding me. One day she told him in my presence that in a dream she saw St. Sava lay his hands upon my head, and then turning to her say: “Daughter Piada, your boy will soon outgrow the village school of Idvor. Let him then go out into the world, where he can find more brain food for his hungry head.” Next year the teacher selected me to make the recitation on St. Sava’s day, and he wrote out the speech for me. My mother amended and amplified it and made me rehearse it for her over and over again. On St. Sava’s day the first public speech of my life was delivered by me. The success was overwhelming. My chums, the unruly boys, did not giggle; on the contrary, they looked interested, and that encouraged me much. The people said to each other that even old Baba Batikin could not have done much better. My mother cried for joy; my teacher shook his head, and the priest looked puzzled, and they both admitted that I had outgrown the village school of Idvor.

At the end of that year my mother prevailed upon my father to send me to a higher school in the town of

Panchevo, on the Tamish River, about fifteen miles south of Idvor, quite near the point where the Tamish flows into the Danube. There I found teachers whose learning made a deep impression upon me, particularly their learning in natural science, a subject entirely unknown in Idvor. There I heard for the first time that an American named Franklin, operating with a kite and a key, had discovered that lightning was a passage of an electrical spark between clouds, and that thunder was due to the sudden expansion of the atmosphere heated by the passage of the electrical spark. The story was illustrated by an actual frictional electrical machine. This information thrilled me; it was so novel and so simple, I thought, and so contrary to all my previous notions. During my visit home I eagerly took the first opportunity to describe this new knowledge to my father and his peasant friends, who were seated in front of our house and were enjoying their Sunday-afternoon talks. I suddenly observed that my father and his friends looked at each other in utter astonishment. They seemed to ask each other the question: “What heresy may this be which this impudent brat is disclosing to us?” And then my father, glaring at me, asked whether I had forgotten that he had told me on so many occasions that thunder was due to the rumbling of St. Elijah’s car as he drove across the heavens, and whether I thought that this American Franklin, who played with kites like an idle boy, knew more than the wisest men of Idvor. I always had a great respect for my father’s opinions, but on that occasion I could not help smiling with a smile of ill-concealed irony which angered him. When I saw the flame of anger in his big black eyes I

jumped and ran for safety. During supper my father, whose anger had cooled considerably, described to my mother the heresy which I was preaching on that afternoon. My mother observed that nowhere in the Holy Scriptures could he find support of the St. Elijah legend, and that it was quite possible that the American Franklin was right and that the St. Elijah legend was wrong. In matters of correct interpretation of ancient authorities my father was always ready to abide by the decisions of my mother, and so father and I became reconciled again. My mother's admission of the possibility that the American Franklin might, after all, be wiser than all the wise men of Idvor, and my father's silent consent, aroused in me a keen interest in America. Lincoln and Franklin were two names with which my early ideas of America were associated.

During those school-days in Panchevo I passed my summer vacation in my native village. Idvor, just like the rest of Banat, lives principally from agriculture, and during harvest-time it is as busy as a beehive. Old and young, man and beast, concentrate all their efforts upon the harvest operations. But nobody is busier than the Serbian ox. He is the most loyal and effective servant of the Serb peasant everywhere, and particularly in Banat. He does all the ploughing in the spring, and he hauls the seasoned grain from the distant fertile fields to the threshing-grounds in the village when the harvesting season is on. The commencement of the threshing operations marks the end of the strenuous efforts of the good old ox; his summer vacation begins, and he is sent to pasture-lands to feed and to rest and to prepare himself for autumn hauling of the

yellow corn and for the autumn ploughing of the fields. The village boys who are not big enough to render much help on the threshing-grounds are assigned to the task of watching over the grazing oxen during their summer vacation. The school vacation of the boys coincided with the vacation of the good old ox. Several summers I passed in that interesting occupation. These were my only summer schools, and they were the most interesting schools that I ever attended.

The oxen of the village were divided into herds of about fifty head, and each herd was guarded by a squad of some twelve boys from families owning the oxen in the herd. Each squad was under the command of a young man who was an experienced herdsman. To watch a herd of fifty oxen was not an easy task. In daytime the job was easy, because the heat of the summer sun and the torments of the ever-busy fly made the oxen hug the shade of the trees, where they rested awaiting the cooler hours of the day. At night, however, the task was much more difficult. Being forced to hug the shade of the trees during daytime, the oxen would get but little enjoyment of the pasture, and so when the night arrived they were quite hungry and eagerly searched for the best of feed.

I must mention now that the pasture-lands of my native village lay alongside of territory of a score of square miles which in some years were all planted in corn. During the months of August and September these vast corn-fields were like deep forests. Not far from Idvor and to the east of the corn-fields was a Rumanian settlement which was

notorious for its cattle-thieves. The trick of these thieves was to hide in the corn-fields at night and to wait until some cattle strayed into these fields, when they would drive them away and hide them somewhere in their own corn-fields on the other side of their own village. To prevent the herd from straying into the corn-fields at night was a great task, for the performance of which the boys had to be trained in daytime by their experienced leader. It goes without saying that each day we boys first worked off our superfluous energy in wrestling, swimming, hockey, and other strenuous games, and then settled down to the training in the arts of a herdsman which we had to practise at night. One of these arts was signalling through the ground. Each boy had a knife with a long wooden handle. This knife was stuck deep into the ground. A sound was made by striking against the wooden handle, and the boys, lying down and pressing their ears close to the ground, had to estimate the direction and the distance of the origin of sound. Practice made us quite expert in this form of signalling. We knew at that time that the sound travelled through the ground far better than through the air, and that a hard and solid ground transmitted sound much better than the ploughed-up ground. We knew, therefore, that the sound produced this way near the edge of the pasture-land could not be heard in the soft ground of the corn-fields stretching along the edge. A Rumanian cattle-thief, hidden at night in the corn-fields, could not hear our ground signals and could not locate us. Kos, the Slovenian, my teacher and interpreter of physical phenomena, could not explain this, and I doubt very much whether the average physicist of Europe at that time could

have explained it. It is the basis of a discovery which I made about twenty-five years after my novel experiences in that herdsmen’s summer school in Idvor.

On perfectly clear and quiescent summer nights on the plains of my native Banat, the stars are intensely bright and the sky looks black by contrast. “Thy hair is as black as the sky of a summer midnight” is a favorite saying of a Serbian lover to his lady-love. On such nights we could not see our grazing oxen when they were more than a few score of feet from us, but we could hear them if we pressed our ears close to the ground and listened. On such nights we boys had our work cut out for us. We were placed along a definite line at distances of some twenty yards apart. This was the dead-line, which separated the pasture-lands from the corn-field territory. The motto of the French at Verdun was: “They shall not pass!” This was our motto, too, and it referred equally to our friends, the oxen, and to our enemies, the Rumanian cattle-thieves. Our knife-blades were deep in the ground and our ears were pressed against the handles. We could hear every step of the roaming oxen and even their grazing operations when they were sufficiently near to the dead-line. We knew that these grazing operations were regulated by the time of the night, and this we estimated by the position of certain constellations like Orion and the Pleiades. The positions of the evening star and of the morning star also were closely observed. Venus was our white star and Mars was called the red star. The Dipper, the north star, and the milky way were our compass. We knew also that when in the dead of the night we could hear the

faint sound of the church-bell of the Rumanian settlement about four miles to the east of us, then there was a breeze from the corn-fields to the pasture-lands, and that it carried the sweet perfume of the young corn to the hungry oxen, inviting them to the rich banquet-table of the corn-fields. On such nights our vigilance was redoubled. We were then all eyes and ears. Our ears were closely pressed to the ground and our eyes were riveted upon the stars above.

The light of the stars, the sound of the grazing oxen, and the faint strokes of the distant church-bell were messages of caution which on those dark summer nights guided our vigilance over the precious herd. These messages appealed to us like the loving words of a friendly power, without whose aid we were helpless. They were the only signs of the world’s existence which dominated our consciousness as, enveloped in the darkness of night and surrounded by countless burning stars, we guarded the safety of our oxen. The rest of the world had gone out of existence; it began to reappear in our consciousness when the early dawn announced what we boys felt to be the divine command, “Let there be light,” and the sun heralded by long white streamers began to approach the eastern sky, and the earth gradually appeared as if by an act of creation. Every one of those mornings of fifty years ago appeared to us herdsmen to be witnessing the creation of the world—a world at first of friendly sound and light messages which made us boys feel that a divine power was protecting us and our herd, and then a real terrestrial world, when the rising sun had

separated the hostile mysteries of night from the friendly realities of the day.

Sound and light became thus associated in my early modes of thought with the divine method of speech and communication, and this belief was strengthened by my mother, who quoted the words of St. John: “In the beginning was the word, and the word was with God, and the word was God.”

I believed also that David, some of whose Psalms, under the instruction of my mother, I knew by heart, and who in his youth was a shepherd, expressed my thoughts in his nineteenth Psalm:
“The heavens declare the glory of God....”

“There is no speech nor language, where their voice is not heard.”

Then, there is no Serb boy who has not heard that beautiful Russian song by Lyermontoff, the great Russian poet, which says:
“Lonely I wander over the country road,
And in the darkness the stony path is glimmering;
Night is silent and the plains are whispering
To God, and star speaketh to star.”

Lyermontoff was a son of the Russian plains. He saw the same burning stars in the blackness of a summer midnight sky which I saw. He felt the same thrill which David felt and through his Psalms transmitted to me during those watchful nights of fifty years ago. I pity the city-bred boy who has never felt the mysterious force of that heavenly thrill.

Sound and light being associated in my young mind of fifty years ago with divine operations by means of which