

Between Science, Music and Politics

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When I was a schoolboy, I dreamt that when I grew up, I would have two professions simultaneously: I would be a natural scientist and a composer. But even before that, as a small child, I had always imagined music: when I got up in the morning, washed, brushed my teeth, or when I went to bed at night. To each of these daily duties belonged a different kind of musical ceremony, and these imaginary music pieces didn't change: there was a certain going-to-bed march, and so on. Unfortunately, we had no musical instruments at home, only a gramophone and a collection of bakelite discs. My favourite piece of music was "The Dance of the Dwarves" from Grieg's Peer Gynt Suite. Somewhat later, when I was six, I got bored with the Dwarves and replaced them with the first movement of Beethoven's Fifth Symphony and Wagner's "Feuerzauber", which attracted me because of its incredible orchestral colour and unusual harmonies.

Sounds and colours (also smells, forms, letters and numbers) were connected in my imagination. I only heard later about "synesthesia". My brother, who was five years younger, had "absolute pitch" and was much more talented than I in music, but when we discussed about music and colours, it turned out that he didn't experience these connections at all.

It is somehow strange that I became a composer, that is, a "musician". The environment of my childhood was extremely unfavorable to a career as a musician. When my brother was eight, a violin teacher persuaded my parents that, since he was so gifted, it would be a pity if he did not take violin lessons. I was 13 and tried to convince my father that I also wanted to learn an instrument. My father had a very deep love of music but he had very precise limits: for him, music existed only from Bach to Schubert and meant mainly the German concert repertoire and Italian opera. Wagner and even Brahms were not "real" music for him, Rossini and Verdi were acceptable, also Bizet, but he had no knowledge of Debussy. He was a wonderfully intelligent and cultivated man who had an astonishingly rich knowledge of natural and humanist science as well as of literature. He actually became an economist because he was very poor in his childhood and he began to work at a bank in Budapest and it sent him to a university. So

he learned economy. In fact, his dream was to be a scientist; in those times biochemistry did not exist; he wanted to be an experimental doctor.

He had a very ambitious idea. He simply wanted to discover the mystery of life. Of course, his life went in a different direction. He wrote several books on economy, ethics, and philosophical works.

But, I had also this wish to discover what life is, which was from him. This is not genetic, but this is education. I simply followed the wish of my father. He had a big dream; on one of the Adriatic islands, he would have a huge laboratory. And he would work with many other people at this laboratory and they would find out what life is. Of course, it was a totally naive thing. It was still at the beginning of the 20th century. And I thought that I had to do what my father wanted. I never succeeded. Because, in life, there are generally things that you can choose if you wish. But, sometimes, there are other situations that you cannot choose. And in my life, I went through two dictatorships. First, it was the Nazi dictatorship, Hungary was not exactly like in Germany. But it was later, when the Soviet army occupied both Romania (and Hungary). I was not born in Hungary but in Romania; and after the Soviet occupation, not immediately, but three years after, the first communist system was forced on both Romania and Hungary. When I was young, I absolutely believed in the left socialist idea with my father. But, it was the ideal socialism, which I call surreal socialism, which taught me that all totalitarian systems are not good. Maybe for certain sciences, to be linked with army is OK; but generally it is not very good. Well, I won't go in this question further.

Let me go back to my childhood. When I was a child, I wanted be a king. I wanted be exactly a king of Romania. I was born in a very small town in the middle of Transylvania, which became a part of Romania after World War I; I was born after the war. My father could speak Romanian. In the small town, only the authorities, the police and so on could speak Romanian. It is a totally different language. My language is Hungarian. Hungarian is a very isolated language. So, we used to learn at school and I wonder whether it is still so now. For me, I was used to hearing different languages in Romania. I could hear people speaking Romanian but I could not understand. The Romanian king died at the age of 27 when I was four years old. The younger king was still alive, who was a bit older than I was but still he was also a child. And I made a big complaint to my parents, 'I want to be a king!' Of course, it was not possible. And

then, I created for myself a country. The name was ‘Keliveria’ but the name itself is of no importance.

My father regarded music as a danger for me, as I was a child with overly extravagant fantasies: I drew elaborate maps of a non-existent country and its cities, wrote descriptions of the geological constitution of the mountains, deserts and rivers, also studies about the social system, and invented a thoroughly “logical” language, even working out the grammar. The legal system and social structure were completely liberal and perfectly just. I didn’t bother with illness and death. The cities had neither doctors, nor hospitals, and no cemeteries. It was a kind of “land of milk and honey” with no government, no money and no criminals. But it was not a fairy tale land, rather a seemingly rational, high-tech world with a perfectly functioning everyday life. There were no problems to solve, no mistakes. There were schools, but no boring homework, and the whole population was dedicated to the sciences and arts. Nobody had to work since machines produced and regulated everything. The engines needed no repair, the homes no cleaning.

My preoccupation with this Utopia began when I was five, that is, when my brother was born. When I was 14, I turned simultaneously to organic chemistry and composition, and the imaginary country began to melt away.

It was only after my brother had been taking violin lessons for a year that my father consented to let me learn the piano. As we didn’t have an instrument at home, I had to go every day to practice at the house of one of my mother’s lady-friends who was away at work. She had an old and quite bad piano, which was never tuned, but at least I could use it for a couple of hours a day.

I don’t know whether in the beginning I had enough talent for music. Being a composer does not necessarily mean to focus exclusively on music. In science and art—as in business, politics and sports—we find people who concentrate on a single subject and usually the monomaniac pursuit of a well defined goal can lead to excellent results. There is, however, another type of creativity in which the attention is less monolithic, but spread over a broader territory of interests. I definitely belong to this second type and would feel very unhappy if I were a narrow specialist. I have always been very enthusiastic about many different realms of knowledge.

I began to read before I was three. I was not taught but was able to gradually decipher the letters by myself, always asking the grown-ups for the meaning of this or

that letter or number, so that I could already read books by the age of three. For my third birthday, I was allowed to wish for gifts and I asked for a soccer ball, a tricycle and a Hungarian children's edition of the "1001 Nights". I eagerly began to read the book; first I had difficulty with certain letters, for instance the letter "h" and the combination "fi" were unclear because in the print of this particular book the dot on the "i" was omitted after an "f".

Synesthetic connections also became significant. I now know that Rimbaud imagined that colours were associated with certain letters, that he wrote a wonderful poem about this, and that Messiaen imagined "coloured" music. This also applies to me, but my colour associations are different. In tonal music, a major chord is always pink or red, a minor chord green. Even more stable for me have always been the connections between colours and numbers. As I mentioned before, I was born in 1923 in a very small town situated in the exact geographical center of Transylvania, a territory settled by Romanians, Hungarians and Germans, which belonged to Hungary for many centuries, then from 1867 to 1919 to the Austro-Hungarian Empire and finally became a part of Romania after 1919. Therefore, the postal stamps I saw in my childhood were Romanian, they showed the image of the king and had certain fixed colours corresponding to the price of the stamp. Even when the king changed (which happened three times during my childhood), the colours of the stamps remained the same. A domestic letter needed a 6 lei stamp, which was brown-violet, a 7.50 lei stamp for a letter to neighbouring Hungary was ultramarine, the stamp for other countries, 10 lei, was dark blue. The number 3 will always be for me carmine red, number 5 light green: the combination of numbers and colours that I saw on the stamps of my childhood is forever fixed in my mind. It thus follows that "0" has no colour, it is transparent because a 0 lei stamp didn't exist.

Many children begin to collect stamps during elementary school. Naturally, this applied to me as well, and through philately, I developed an interest for geography and for faraway peoples and their cultures.

When I was six years old, the whole family moved to Cluj, a city of approximately 130,000 people at the time. It was then considered to be the main city of Transylvania, it had a Romanian university, Romanian and Hungarian theaters, a Romanian opera house, also a symphony orchestra, which played at the opera, and a public library. In the Hungarian theater, there were often chamber music concerts.

At the time, the Hungarian-speaking population was in the majority and among them were also Hungarian Jews, to which my family belonged. Most Jews were “assimilated” to the Hungarian culture, religion being without any importance (except for the small orthodox minority).

When I was ten years old, I went to the Romanian “liceu” and had to learn the language very quickly, also French (I could already speak a little German and had many German books). The eight years of “liceu” correspond to high school and include very strict examinations after the fourth and eighth year. But I only attended the “liceu” for seven years: I spent my last school year in another country, in the same school building, however.

Let me turn back to elementary school. When I was eight years old, I fell from some cliffs I had been climbing and hurt my knee so badly that I had to stay in bed for over three-quarters of the year. I was delighted to miss school because then I had plenty of time to read. My interest in geography concentrated more and more on Africa. The compact form of this continent on a map appealed to me. I began to read many books about Africa, not only travel descriptions, but also geographical and ethnographical textbooks. In those early days, I could not foresee that African music south of the Sahara would become, fifty years later, one of the major impulses for my own compositions.

When I was 13, my passion began to shift from geography to chemical experiments. I got a university textbook on inorganic chemistry, and in a drawer, originally reserved for toys, I placed a tiny “laboratory”. I once managed to produce a small—though spectacular—explosion on the balcony of our apartment, which prompted my grandmother, who happened to be in the adjacent room, to move out. A year later my interest in these experiments faded. In school we began to study organic chemistry, and I had no equipment to experiment in this field. The drawings in our excellent Romanian textbook showed complicated molecules: it was especially the many hexagonal and pentagonal carbon cycles which evoked in me a passion for “structures”. I thought that organic chemistry was the most exciting thing in the world. This was certainly due in part to Domnul Cadaru, a truly excellent and devoted physics and chemistry teacher.

I was also (and still am) deeply interested in mathematics and in my first two years of high school, I was quite good at simple algebra because we had a competent

teacher. But when I turned 13, the new mathematics teacher had no gift for teaching. This was Domnul Murariu who was a wonderfully kind and humane man and I loved him very much as a person, but not as a teacher. He was just unable to explain anything clearly. Maybe he was himself not too sure of the material he was teaching. On the other hand, he was a “political ally” as he hated the right wing government and especially the right extremist “Iron Guard”, who were the militant Romanian Nazis.

I guess that a main source of my later compositional fantasies and structural ideas was organic chemistry. The most impressive image in my fourth level high school chemistry book was that showing the structure of chlorophyll, the green component of most plants. It is a rather complicated organic compound, characterized by a bivalent magnesium atom (that is, with a double positive electric charge), lurking at the center of the molecule, like a spider in the middle of its web. This magnesium governed compound can bind carbon dioxide and give off oxygen, re-establishing the balance in the atmosphere. As we know, animals have an opposite metabolic process, inhaling oxygen and exhaling carbon dioxide. In the chemistry book, on the page where chlorophyll was explained, it was mentioned that haemoglobin was the active compound necessary for respiration in animals. The “spider” in the middle of this web is an iron atom, whose behaviour is essentially different from that of the magnesium atom: it has valences of changing numbers, that is, changing positive electric charges, like a Shiva with many arms. The book also mentioned that, at that time (this was in 1937), the chemical structure of haemoglobin was not yet known.

This unanswered question immediately inspired me to fantasize about devoting my whole life to organic chemistry: I would first discover the structure of haemoglobin, also those of other proteins, and then successfully solve the “mystery of life”. I could not know that someone else had the same dream, this was the Viennese chemist and molecular biologist Max Perutz, who worked in the Cavendish laboratory of Cambridge University in England. He was somewhat older than I, and had all the professional knowledge, which I lacked. By a happy chance, I know him personally—and regard him as a great scientist and wonderful person —and realize that I share with him a common quality: the ability to follow a path, step by step, stubbornly, never giving up, no matter how complex the problem. In fact, Perutz took years to decipher the structure of the haemoglobin molecule, as the methods of chemical analysis were not adequate for the task. By chance, Perutz worked in the same laboratory as the great

crystallographer Bragg, who applied X-ray spectroscopy as a method of examining crystals. By using Bragg's method, Perutz could "photograph" the haemoglobin crystals with X-ray refraction. This happened in the late forties, but it took many years—until the early sixties—for the details of the whole (extremely entangled) structure to be mapped out.

Even before this task was finished, Perutz' method was used by two of his students, Crick and Watson, in the same laboratory. They discovered the structure of ribonucleic and desoxyribonucleic acid, which became the famous "double helix", carrier of genetic information. This crucial discovery happened in 1953. Both Perutz's as well as Watson's and Crick's work represent the "giant step" in the direction of understanding what life is. However, they did not exactly solve the "mystery of life". If we give up looking for mysteries, we can concentrate better on partially solving greater problems. Science cannot serve to clarify holistic enigmas: only the detailed working out of well asked questions can give valuable results.

Comprehensive answers are usually weak and belong to either religion or philosophy. When I was dreaming about explaining "life", at 13-14, I was too young for philosophy. Later, my father, a very sincere and honest man, encouraged me to read various philosophical writings so that by the time I was 17, I was acquainted with many different ontological and metaphysical discourses — I even wrote my own epistemological study, thinking that I had solved the ultimate questions of "being" and knowledge. However, at that time, "concrete" imaginations of sounding music became more attractive, and anyway I preferred mathematics to abstract labyrinths of thought.

In those tormented years of puberty, the "musical ceremonies" of my early childhood still existed but in a transformed manner. On my way to and from school, which took about twenty minutes, I would imagine a piece of music, for instance a symphony or a concerto (on shorter walks it would be an overture). This imagined music was never abstract, but "performed" before my inner ear, mainly by a large orchestra. In some way, I listened to these pieces as if I were a concert goer listening to real musicians and singers. My stylistic models were Beethoven, Schumann, Berlioz, Tchaikovsky, whose music was the kind I sometimes heard at symphony concerts or listened to on the radio, but the "fantasies" were entirely my "own" music.

Usually I imagined these music pieces while walking on the street or in parks. The most beautiful place in Cluj was (and I hope still is) the huge and opulent botanical

garden, which belonged to the University. On the other hand, sitting without moving reduced my musical fantasy.

When I was 14, that is, exactly at the time when I began taking piano lessons, we had to move again. Our previous apartment (from age 10 to 14) had been further from the center of the city, in a calm area. There, my father had a separate room, where he could keep his more than 3,000 books and work in peace, writing there several textbooks on economy and ethics and a utopic novel. All these books were published, but very few people read them.

In appearance, the new apartment was luxurious and quite close to the city's main square, with its huge gothic church. My mother, who was an ophthalmologist, needed a "better address" for her practice. On the other hand, the new apartment was much too small: my father lost his work room and his many books had to be stored in the cellar. He didn't seem unhappy however: the year was 1937, and as the threat of a new big war became imminent, he postponed work on his next book till "after the war" in an imaginary future—he wasn't expecting to die.

My brother and I were crammed in a small room, we had separate beds, but had to do our schoolwork at the same table and constantly disturbed each other. Even the piano, which belonged to my mother's friend, found its way into this small room so that, in the end, we could hardly move. But this hired piano (which was out of tune and rather bad) was a joy for me. My brother practiced violin in the adjacent drawing room, which made it impossible for my father to enjoy his after-lunch cigar and nap.

Although we always annoyed each other very much, my brother and I shared a very intense friendship. I continuously fell in love with different girls (always in secret, being overly shy), but no girl could ever become more important to me than my beloved brother. I admired his skill on the violin and when he changed to the viola later on—in the hope of getting a chance to play in a string quartet—he made even more progress. It's impossible to say if he would have become a professional musician because he was killed in the Nazi concentration camp of Mauthausen, in the spring of 1945, shortly after his seventeenth birthday.

With the annexation of Austria to Germany, the danger of a new war became concrete. Somewhat before, in January 1938, my father came back from a trip to Berlin with the conviction that very soon Hitler would attack the whole of Europe. He saw demonstrations of the Nazi mob in the streets, listened to the march songs and slogans

and was sure that there was no way back: Hitler and his gang were so deeply convinced of their victory that they were blind to the risks.

Among all these signs of alarm, everyday life went on as usual. I did my school-work (a bit superficially and reluctantly), played pieces for violin and piano with my brother, later trios with a cellist school-friend. At the same time, in addition to practicing the piano, I was composing. I also began to study mathematics more seriously. My father tolerated my music studies but he wholeheartedly encouraged my interest in mathematics. I spent two summers at my aunt's and uncle's in the pretty and peaceful town of Târgu-Mureș, eagerly working on self-chosen homework: I had a textbook of "simple" geometric (planimetric) constructions with ruler and compass—in fact, these problems were not so simple. Though mathematics and music composition are quite distant areas of thought, their common feature is consistency and discipline. I would guess that my skill in planimetric constructions had a beneficial influence on my counterpoint exercises years later, also on the harmonization of chorale melodies in Bach style. In both geometric constructions and composition, there exist certain rules, not arbitrary nor absolutely obligatory, but rather "rules of behaviour", which developed through centuries of tradition. There is however an important difference: while the rules of geometric constructions are "fixed" and "objective", in music they can be changed more freely because the criteria of "objective reality" is missing. From the viewpoint of the person writing a musical pastiche (for example a Bach-style fugue) or solving a planimetric problem only with a pencil, paper, a ruler and a compass, the process of problem solving is similar in many aspects. When I began to compose my series of piano studies many years later, in the mid-eighties, I strongly felt this similarity: in each piece, I construct a musical texture from self-chosen pitches and rhythmic constellations, following self-given rules or limitations, half free and half enslaved to the rules. Without rules and consistency, I would produce a random result, while rules that are too strict would kill the "spirit" of the music. Somewhat looser rules, which should never reach mathematical and logical consistency, are necessary for musical constructions.

There exists a concept that mathematics and music are closely related, maybe located in adjacent areas of the brain. I cannot prove or disprove this, but loving both mathematics and music, and having a certain skill in both areas, I think that music and mathematics are essentially different. The semi-consistency of music is more similar to

the semi-consistency of the grammar of natural languages. Spoken natural languages consist of sequences of well defined, filtered noises, which carry the meaning of what is said. “Meaning” in music is, however, a much vaguer and unstable category. As opposed to natural languages (or most natural languages, because in Chinese and Bantu, pitch also has a meaning-carrying function), music uses less filtered noises and more definite pitch and harmonic spectra as carrier substratum.

Let me turn back to my mathematical interest. In 1938, I began to study mathematics privately with Márk Antal, together with two of my gifted classmates. He was an elderly mathematics teacher who had had to leave Budapest because he was a registered member of the Communist Party, which was illegal in Hungary, but tolerated in Romania. However, being a Hungarian refugee, he was unable to get a school teaching position and therefore gave lessons. Márk Antal was the prototype of the “maverick genius”, he was a legend in the eyes of the young people of the city who had scientific interests, and he was regarded as a hero because he was a persecuted communist. He had the special gift of being able to explain the whole architecture of mathematics in a crystal clear manner. My favorite subjects were calculus and analytical geometry, but we were also introduced to areas which were not included in the school curriculum, such as vector and matrix calculation, projective geometry and topology.

Of course, being 15, I had to earn some money, not only to pay for Professor Antal’s lessons, but also for the piano’s hire fee, my piano lessons, and also to contribute to the family expenses. This was usual among middle-class people. I gave mathematics lessons (and even Latin, in which I was not good enough) to schoolboys and girls who had failed their examinations. I was even somewhat proud that I could explain mathematics as clearly as my “idol” Professor Antal. I continued this private tutoring even after I had finished school and was already studying at the music conservatory.

Meanwhile, on the 1st of September 1939, Germany, together with the Soviet Union, attacked Poland. There was no fearing the war anymore, it was there. In the beginning, nothing in our private lives changed. That the Soviets were allies of Nazi Germany came as a shock to communist believers. Professor Antal was such a deeply “religious” communist that he looked for excuses. My father and I could not swallow this slap on the face, although we were both believers in the “left”. I stopped my

lessons with Professor Antal and he angrily “excommunicated” me. My father spent all of his evenings and part of the nights glued to the radio, believing that the BBC was the one and only source of the truth.

There were lies everywhere. The only beacon in this tormented world were the BBC and the person of Winston Churchill. And this is still my conviction today.

In the summer of 1940, a dramatic change took place in Romania. I was 17 then, and it was after the end of my seventh “liceu” year. Germany had already occupied the Netherlands, Belgium, two-thirds of France, Denmark and Norway, and secretly planned to attack its ally the Soviet Union. For this undertaking, Hitler needed both Hungary and Romania as allies. He forced Romania to cede the northern half of Transylvania to Hungary. (A humiliated Romania was the first country to break its alliance with Nazi Germany and go over—in 1944—to the Soviet side.) Thus Cluj once again became Hungarian and reassumed its older name Kolozsvár. The right wing governments of both Hungary and Romania considered Jews and socialist believers (as my parents were) as their enemies. The “liceu” became the Hungarian “Gymnasium” and I suddenly found myself having to pass my final examination in Hungarian instead of Romanian. Soon Hungary entered the war on the side of Nazi Germany. The Romanian army, the authorities, the university and a part of the population had all withdrawn from Kolozsvár.

For the moment, the war still seemed to be merely virtual, taking place in the newspapers and on the radio. I passed the final examinations at the Gymnasium and also the entrance examination for physics and mathematics at the faculty of science at the Kolozsvár University. (A Hungarian University had been established immediately after the entrance of the Hungarian army in Kolozsvár.) But even so, I was not accepted because there was a “*numerus clausus*”, which allowed only one student of Jewish origin in natural sciences. This one place was given to another student, not to me. On the other hand, I did pass the entrance examination to the newly established Music Conservatory, where the director ignored the antisemitic law. This protected me from immediate conscription for war duty, because university-level schools allowed their students to enjoy a postponement from military service. (This deferment soon became invalid.)

I was quite astonished that I was accepted in the class for music theory and composition, since I had not the slightest idea about this profession. Of course, I had

many scores, piano pieces, choral works, chamber music, even a “big” symphony for large orchestra. I was able to do solfège and musical dictation without preparation. Maybe it was the quantity of pieces which impressed the committee. I had no idea about instrumentation nor about orchestration. I only owned the second volume of the well-known instrumentation book by Albert Siklós, so I had some idea about how an orchestra worked, but no idea about the basic ingredients, that is, about the instruments themselves. With one exception however: I had learned to play timpani three years before and had played in an amateur orchestra Haydn and Mozart symphonies, some Rossini overtures, Bizet suites, etc. This helped me imagine the sound of a smaller orchestra.

At the conservatory, my main teacher was Ferenc Farkas, to whom I owe a great deal. Although he had a weak personality and behaved in an opportunistic manner towards the right wing government in Hungary, he acted extremely correctly towards me. He wanted to teach me everything he had learned from his teacher Ottorino Respighi in Rome, so that I could become his “master-student”. This meant practical technical knowledge of the highest level, especially in instrumentation. He was also an excellent and strict harmony teacher, especially for the harmonization of chorale melodies in Bach style. Farkas had a supreme gift for “voice leading”, that is, the correct traditional treatment of the voices in tonal harmonic progressions. He didn’t teach actively, he only corrected my exercises by filling the piece of music paper with red pencil markings. I had to re-work the exercises till there was no more red pencil.

I didn’t improvise very well because my piano playing was too weak but I could write short pieces in any given style, and imitating Mozart, Bach, Couperin became a passion. It was detrimental to my development as a young composition student that I had no rivals in the composition class in Kolozsvár, emulation being the main trigger for professional quality. I only enjoyed this later in Budapest.

I was in the third year of my quietly progressing composition studies when they were suddenly interrupted in January 1944. I received a mobilization telegram from the military, ordering me to report, in less than 24 hours, to a work battalion in the southern Hungarian city of Szeged. This January day was a turning point in my life: when I came back from work duty and a short Soviet captivity in October of the same year, I found strangers living in our apartment, my parents and my brother had vanished. Only much later did I learn about Auschwitz. I saw my mother, who survived, months

later, but never again my father and my brother. Kolozsvár became once again the Romanian Cluj and I was called up into the Romanian army to fight against Hungary and Nazi Germany. But I came down with a tuberculosis infection and had to spend three months in the hospital, thus being spared the fate of fighting in the war.

When the war ended, in 1945, and since the laws against the Jews had been repealed, I faced the choice of either studying physics or composition. In the meantime I felt passionately attracted to music as a profession and so I chose to continue with my composition studies. My dream was to meet Bartók. I knew that he had emigrated to New York, but hoped to see him in Budapest. Because of the political change, I once again automatically became a Romanian citizen. To get to Budapest, I had to cross the border to Hungary on foot, illegally, because there was no possibility of getting a passport. Even if both Hungary and Romania were now part of the huge Soviet Empire (in fact they were colonies), they were still nominally separate countries. Only the official party élite had the right to travel, but hundreds of restrictions existed even for them.

In September 1945, I easily passed the entrance examination for the Franz Liszt Music Academy in Budapest, which from then on became my “second home”. My teacher—and György Kurtág’s, who has remained a close friend—was Sándor Veress. He was the opposite of Farkas: a man of total integrity, very much like Bartók. On the other hand, he was a much less skilled teacher than Farkas. With Veress I studied Palestrina-style counterpoint, form analysis, and had to compose in any given style, as I had done in Farkas’ class.

Budapest had not been totally bombed, as had been the case with German cities, but because of the three-month Soviet siege and the street fighting, the buildings had been partly destroyed or heavily damaged. There were no more windows, no heating and very little to eat. For years after that, I lived from day to day, always having to find a place to sleep at night. I did my counterpoint exercises mainly at the Music Academy library. Students could eat once a day either at the Academy or at the University. In the morning and evening, I had only tap water to drink. Life was bearable, however, because with the exception of some shrewd businessmen and the communist party élite, practically everybody lived the same way. Although we all grieved over our vanished families and friends, there was a euphoric hope for a better future. I saw myself in Budapest, a city full of wonderful musicians and excellent concerts: Sándor

Végh performed Beethoven and Bartók with his string quartet, Otto Klemperer became the chief conductor of the opera, symphony concerts were given by first-rate conductors such as Erich Kleiber and Leonard Bernstein. The harshness of our present life was compensated by the possibility of a future in a “democratic” country. We were unaware that the Soviets had already begun to build, gradually and clandestinely, the new totalitarian slavery.

Because the everyday living conditions were so unfavourable to my studies and my work as a composer, I traveled, on foot, back and forth to Romania as often as I could, always illegally. In Cluj, I had my mother, who worked as an ophthalmologist in a hospital, and my girl friend Brigitte, a medicine student, whom I had promised to marry. There I could live and work, giving mathematics lessons, as I had done before.

Unfortunately, Bartók never did return to Budapest, he died in New York in September 1945. I spent the whole year 1947 with boring and partly hopeless bureaucratic procedures. Because I was a Romanian citizen, I was residing in Hungary illegally. I applied for Hungarian citizenship and this proved to be a hurdle race through innumerable offices. The bureaucrats usually showed goodwill but the process was a tangled maze. I finally did get citizenship but no passport. In 1948, it became nearly impossible to cross the border illegally. The Romanian guards used trained dogs and shot without warning. In the meantime, communist regimes had been installed in both Hungary and Romania. My teacher Veress had a passport and could escape to Switzerland. After several changes of composition teachers, I started my last year of study in 1948-49 with the same excellent Ferenc Farkas, with whom I had begun in Kolozsvár.

Because a composer could not make a living just with composition, I turned to ethnomusicology, which had been one of my main fields of interest. I received a one-year scholarship to study folklore in Romania. The fact that I was fluent in Romanian made this undertaking easier. By chance, the Hungarian ambassador to Bucharest, Jenő Széll, was a good friend. He was a “true communist believer” and like all believers was horrified when communist rule became real. Through him, I could get a passport, valid for Romania, and a visa. In October 1949 I traveled legally from Budapest to Cluj, for the first time since the war. I saw my mother and could marry Brigitte, and the next day I was already on the train to Bucharest.

In Bucharest, the famous Folklore Institute housed Constantin Brăiloiu's extremely rich collection of music recorded on wax cylinders. He had originally worked with Béla Bartók. The excellent folklorist Emilia Comișel taught me to notate melodies by listening to these wax cylinders—a rather risky undertaking because the cylinder became unusable after five to eight listenings. From January 1950, I was in Cluj, working in the same field. There the outstanding expert was János Jagamas, an ethnomusicologist of Armenian origin. I went with him to different villages, transcribing folk music by ear (mainly Hungarian, but also Romanian folk songs). There were no more wax cylinders and tape recorders had not yet been introduced.

I had already spent the whole scholarship money on my first night in Bucharest. The Hungarian embassy, not knowing how much money I had, had reserved a hotel room meant for “Western” visitors. The next day, the nice people at the embassy set up a “bed” for me in the ambassador's bathtub. For the next few weeks, I had to improvise: but then again, I had been well trained for this as a student in Budapest. The people in Bucharest had practically nothing to eat. One could already feel the “socialist economy”: the shops only sold shoe polish. In Cluj I shared a tiny room with Brigitte and hundreds of bugs.

As my ideal was Bartók, I shared some common values with the post-Bartók Hungarian composers. My music belonged to the “new Hungarian school” of the time. Earlier, in Budapest, I had written some songs and piano pieces which were more personal than the two movements for string quartet I had written later on in Cluj as examination pieces for the Budapest Music Academy. These showed uncertainty, maybe fear. “Modern music”, which included most of Bartók's dissonant works, was banned, so was “modern” visual art and literature. “Socialist realism” was the prescribed party line and this was pure propaganda machination. I had been one of those “left intellectuals” who naively believed in a “better society”. “Real socialism”, however, forcibly set up by the Soviets (in all countries occupied by the Soviet army), was the ruthless suppression of all human rights and the destruction of the economy. It meant a spy system, lies, denunciation, disinformation. In the summer of 1949, hundreds and thousands of “true communists” were accused of absurd crimes and found guilty in show trials, which were staged first in Budapest and shortly after in Bucharest. Many hundreds were killed, many thousands disappeared in prisons and camps, among them some of my close friends. Even Jenő Széll, the pure hearted idealist communist, was put

in prison somewhat later. I was only happy that I resisted the pressure of several of my teachers and friends (among them Veress, an innocent party member) to join the Communist Party.

Back in Budapest, in August 1950, I volunteered to transcribe some of Bartók's wax cylinder recordings at the Museum of Ethnography. Kodály would have liked me to accept regular work at the Academy of Sciences, where I would have been the editor of the huge Hungarian folklore collection. But since I had destroyed a few wax cylinders at the museum, I felt that I was not qualified for this type of work. Kodály was not pleased but he nevertheless recommended me for the position I dreamt of. And so I was appointed as teacher of harmony and counterpoint at the Franz Liszt Music Academy in September 1950.

I divided my output as a composer in two distinct groups: on the one hand, I wrote "forbidden" music, for example "Musica ricercata" for piano and the String Quartet Nr. 1 (which is still close to Bartók); on the other hand, I tried to avoid the obligatory "socialist realism" by writing "inoffensive" folkloristic pieces (for instance, many of my chorus pieces). I then realized, around 1952, that I could not compromise. I stopped writing "Hungarian nationalistic" pieces and concentrated on my teaching duties. "Musica ricercata", the String Quartet and other non-conformist pieces had no chance of ever being performed, nor printed.

Stalin died in 1953 and the Soviet Empire gradually tumbled into an unbalanced state: the revolt of the East Berlin workers in June 1953 could not have been imagined during the dictator's rule. This triggered political earthquakes such as the demonstrations in Poland and hectic government changes in Hungary, which finally led to the outbreak of the Revolution on October 23rd 1956. It was not planned, but was a spontaneous uprising out of general despair. I demonstrated with my students in the midst of the crowd. A week later, newly arrived Soviet tanks and troops crushed the revolution. Vera, my second wife, and I decided to illegally cross the border to Austria on foot at night. Like so many others, I felt unable and unwilling to live in the ruthless world of totalitarian gangster dictatorship.

I left my job and my students behind, also my mother, who had moved from Cluj to Budapest in the meantime. Vera and I had not the slightest idea where to go, where we could live. Chance happenings led us to stay in the closest place, Vienna. Vera could study psychology at the Vienna University. I had already changed my musical

style very much during the exciting year of 1956. I imagined a kind of music without melody or rhythmic shape, a kind of musical standstill, made up of chromatically filled-up static blocks of sound. According to my synesthetical associations, these musical buildings were colorless, only black, grey, white. I finished “Visions”, the first piece of this new musical style, in the summer of 1956, It later became the first version of my piece “Apparitions”.

Maybe the most crucial occurrence of my life was the short four-month scholarship I received in February 1957 from Herbert Eimert, who was the head of the modern music programs at the West German Radio in Cologne. I managed to stay, with interruptions, for almost three years. I finally met all those Western colleagues of my generation whose works were banned in Hungary. Several of these composers became friends, first of all Maderna, Stockhausen, Koenig, Evangelisti, later also Boulez and Kagel. Although the “practical” side of life was still rather difficult, I had food and heating and I was definitely rid of any party repression. My colleagues accepted me in their avantgarde circles in Cologne, Darmstadt and Paris. I applied myself first to learning the studio techniques of electronic music and composed three electronic pieces. I came back to instruments and voices however because I was unsatisfied with the possibilities of the studio. But I did learn to be “myself” in the Cologne studio. At the age of 34 I was still a beginner. My idea was to use the individual orchestra instruments—in analogy to the sinus tones in the studio—as components of a complex sound of a “higher order”. This was the constructive base of my orchestra piece “Atmosphères”. This piece was performed in 1961 in Donaueschingen, then a center of modern music. I began to experiment combining voices singing nonsense “phonetic” texts and chamber ensemble, for example in “Aventures” from 1962. Meanwhile, I was living as a free-lance composer, traveling back and forth between Cologne and Vienna, teaching at the Darmstadt Music Courses, also acting as a guest teacher in Stockholm. I was warmly encouraged, not only by Eimert, but also by Herbert Hübner in Hamburg, Hans Otte in Bremen, Karl Amadeus Hartmann in Munich, and Karl Birger Blomdahl, Bo Wallner, Magnus Enhörning, Sven-Erik Bäck and Ingvar Lidholm in Stockholm.

My competence in teaching traditional subjects was unknown outside of Hungary so that I had no chance of getting a regular position. But maybe my insecure and wandering life served my development as a composer better.

This nomadic life, however, came to an end during the seventies. In 1969-70,

I had a one-year scholarship in West Berlin (from the German Academic Exchange Service). In 1972, I spent a half year at Stanford University, California, as “composer in residence and guest lecturer”. Back in Europe, I was appointed teacher of composition at the Hamburg Music Academy and taught there from 1973 to 1989.

“Micropolyphony” is the most important technique I developed. By this, I mean orchestral (or vocal) webs of such complexity that the individual voices become inaudible. There results a steady transition of the overall timbre. The “Requiem”, which was performed in Stockholm in 1965, is one of the last pieces in which I used this technique. Applied to chamber music, it was still valid for my String Quartet Nr. 2 and for the Chamber Concerto, at the end of the sixties. Many stylistic experiments and changes—triggered mainly by my experimental piece for 100 metronomes from 1962, which is a maze of rhythmic superpositions—led me in the mid-eighties to my most constructivistic works, the piano Etudes and the Piano Concerto. I also experimented with non-tempered harmonies, in my Violin Concerto (from the early nineties) and more radically in the “Hamburg Concerto” (1999) for horn solo and chamber orchestra, which includes four natural horns that produce irregular combinations of harmonics—that is, the harmonics are natural, their combination-spectra very unnatural.

As a parting word, I would like to add a message for young composers:

Try to receive the best possible education in traditional harmony and counterpoint, as this forms the basis of compositional craft. A good teacher is important, but you learn the more valuable lessons from reading and playing scores and from listening to music. The orchestration books of Rimsky-Korsakov or Koechlin play a similar role: while being useful, they can never replace your own analysis of musical masterpieces such as Haydn’s symphonies or Stravinsky’s orchestral works. In the end, you must be the one to impose the highest possible standards on your music. Therefore a word of caution: avoid working in a hurry or accepting too many commissions. Fame comes to those who persevere, not to those who set out to become stars.

With this perseverance you will then perhaps be awarded the wonderful Kyoto Prize, the most generous gift an artist can receive. Thank you, Dr. Inamori for your noblesse and generosity; vivat honest art and honest science.