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Letters

[Editor's note: To complement the late Jean-Claude Risset's obituary in this issue's News section, we solicited these letters of tribute from individuals who knew him well. The letters were received in December 2016 and January 2017. As they reveal, we say farewell to not only a giant of our field but also a splendid human being.]

Jean-Claude Risset—A Source

While it is with ineffable sadness that I write these words following the death of Jean-Claude Risset, I also feel joy and wonder in having known him, as I reflect on his musical and scientific contributions to the field of computer music and the formative beginning of our professional association and long friendship.

Jean-Claude Risset and I met for the first time at Stanford University in the spring of 1967, two years after we began our work with computers, he at Bell Telephone Laboratories (BTL) and I at the Stanford Artificial Intelligence (AI) Laboratory. He had traveled to Los Angeles for a conference and then to the Stanford AI Lab, where we met (certainly at night, when I was allowed to use the computer system as an unfunded researcher). I knew of Risset from Max Mathews, but I had no idea what I was in for. I played for him my demonstrations of moving sounds in a quadraphonic loudspeaker space. He knew about the all-pass feedback delay, a key component of the artificial reverberator in my demonstration, as it was developed by M. R. Schroeder, a colleague of Mathews at BTL, but he had not heard until then the spatial richness of a four-channel projection.

Then he played for me his experiments in the synthesis of instrument

tones. I was stunned; the sounds were as sparkling and lively as was he.

Risset showed me how, with careful listening and attention to small details, he had produced sounds that were dynamic and fluid, with all of the allure of acoustic sounds. I was struck especially by the fact that he based only one of the simulations—the brass tones—on computer analysis; most he had created using his ear as his guide. His reliance upon his ear was so important to me because I did not have a scientific education and rich technical background as did he, but we did share the ability to listen and hear critically. Encouraged by one another's work and having similar interests in research and composition, especially increasing our understanding of perception with the controls that Mathews' program provided us, we were filled with hope for a medium that was virtually unknown in the larger world of contemporary music.

On December 18 of the same year, 1967, I visited Risset at BTL. I played for him what I had discovered only weeks before when I selectively increased vibrato depths and rates of a sinusoid to audio frequencies that modulated the frequency of a second sinusoid, producing tones having many or few partials, both harmonic and inharmonic. He copied the MUSIC IV algorithm and my data, recognizing the efficiency in generating time-dependent spectra using frequency modulation synthesis. (An inveterate note taker, he also marked the date, which otherwise I would not know, as I had no training in research and my lab notes were undated.) He encouraged me in my pursuit of this work at a time when few others did. Several years later I used this algorithm to synthesize brass-like tones based on the insight he had gained in his earlier computer analysis. The quality and efficient computation of these simulations were critical in

Yamaha's consideration of their first all-digital family of synthesizers.

It has often been a topic of discussion why Risset, and then I, first focused on the simulation of acoustic orchestral instruments. The answer reveals the strategy within Risset's long-term goal and the sophistication of his thinking about what is the sound of an acoustic instrument—what is its "timbre." There are several reasons, and from the point of view of psychoacoustic and perceptual research, the first is obvious. (1) The sounds are ideal simulation targets (control) as they are so ingrained and easily identified, providing the researcher a sense of the perceptual proximity of test tones to target tones. (2) An instrument cannot be represented by a single tone, as there are infinite possible variations through pitch, loudness, duration, articulation, etc. Risset felt very strongly that understanding the contextual complexity of an instrument's timbre from the very outset was essential to achieving nuanced musical expression. (3) Orchestral instruments have been highly refined through generations of craftsmen to meet the expressive requirements of the evolving musical landscape. Risset felt ours was a similar path, understanding as much as possible of this rich platform, especially at the perceptual level, from which to refine the sounds of this new digital domain. From this platform, he stepped into the realm of pure imagination and creation that was, as Mathews had explained in his famous paper, unbounded by technical limitations.

Risset's first composition for computer was incidental music for the play *Little Boy*, from which he assembled *Computer Suite from Little Boy* (1968). In this work, he made full use of his elegant instrument simulations, the recipes for which he published in *An Introductory*

Catalogue of Computer Synthesized Sounds (1969).

But it is in *Mutations* (1969) where his earlier studies paid off, where pure imagination and creation took hold, where he created his breakout work that would leave its imprint on his works that followed (as well as on my own). At an extraordinary moment of insight and invention, Risset composed the spectrum of a sound such that the frequencies of its partials are derived from the pitch space of which it is a part. He created inharmonic spectra, in which at one instant the partials cohere as idiophones imprinted with the pitch material and at another they detach and flee independently through time, diaphanous and supple, providing an intimate structural link between pitch and timbre—defying their common definition as being independent characteristics of a tone. Risset had unlocked timbre, or the quality of a sound, from the idea of a physical source, real or imagined, creating complex structured sound spectra that cannot exist in the natural world but that embrace the deep roots of “pitch” in a millennium of tradition. He had opened the door to the concept of composing the sound itself, not arranging sounds in time but composing time within sound, an idea that he imaginatively extended in his works and that remains as an underexplored terrain, one of his great gifts to future generations and his own—the opening of *Mutations* directly inspired my *Phonē* (1981).

Jean-Claude Risset felt deeply committed to the culture of which he was a part, traveling widely and teaching with exceptional intellectual generosity. Over the years, Risset and I shared many lecture/concerts in many places, often with Max Mathews, Risset’s former mentor, the two of them having the highest mutual regard. Our own bond was

rooted in the early years of discovery, the description and excitement of which was always an essential part of our lectures. He gave purpose and direction to the many students and colleagues who were attracted to him. His knowledge was encyclopedic, but what he revealed to us was always in context, illuminating and enriching our thoughts, our research, our music. He left us with his own music and writings, beautiful and profound—he is gone, but he did not disappear.

John Chowning
Marseille, France (27 November 2016) and Palo Alto, California, USA (8 January 2017)

Through a shortcut in space-time, Jean-Claude Risset was given very early access to the bull’s-eye of the target: that of the mystery of music.

Still, it took a subtle mixture of aptitudes for wonder and also scientific clairvoyance to grasp, in the same look, the deployment of forms in both the concrete space of the world and the abstract dream of listening.

Among other lucid dreamers—Max Mathews, John Pierce, and John Chowning—who transformed the austere environment of the first computers into miraculous machines, it was Risset who discovered, through a completely new crossroads, the astonishing role of “time inside sound,” rather than the usual “sounds in time.”

Paradoxical, like dream sleep.

If, through a historical accident, I had the privilege of presenting in Paris his *Mutations* (along with Chowning’s *Turenas* and a spatial concert *d’oiseaux* [concert of birds] by Jean-Claude Roché), it was then through an entirely natural volition on my part that the Groupe de Recherches Musicales (GRM) became

for Jean-Claude Risset a frequent base of support, a place and also a bond of friendship.

Brightly shining evidence of this, at the other extremity of our life paths: his *Elementa*, composed to salute the 50th anniversary of *musique concrète*.

I loved his exigency, his impeccable rigor, his proud modesty. And I share his infinite project:

... mettre en scène des rencontres intimes entre sons acoustiques, traces audibles d’un monde matériel visible, et sons immatériels qui suggèrent un monde illusoire, imaginé, une autre réalité, purement intérieure et sonore

[... to stage intimate encounters between acoustic sounds, audible traces of a visible material world, and immaterial sounds that suggest an illusory, imagined world, another reality, purely inner and sonorous]

—Risset in *Du songe au son: Entretien avec Matthieu Guillot (Perspectives musico-logiques contemporaines)*, Paris: L’Harmattan, 2008

Having entered fame early, Jean-Claude Risset has permanently settled there,

... dans la lumière, avec finesse [in the light, with finesse]

—words by Mallarmé addressed to Debussy, concerning *Prélude à l’après-midi d’un faune*

François Bayle
Paris, France

Au revoir, Jean-Claude Risset

During 2016, we had been having discussions with Jean-Claude about

musical preservation and how composers will have difficulties in the future to have their music performed in good condition. It was always a pleasure to discover his insights, worries, and vision about what music was and could be in the future; he lived through almost all the history of electroacoustic music since its birth, and having his perspective and thoughts was indeed unique for me and the GRM. Now he was concerned about how his music would survive him and how good conditions for its performance could be ensured in the future.

I could have written this sentence many times in the past regarding each visit of Jean-Claude, either when composing a work in the GRM studios, or for a concert or conference where he would always spend time with us so we could explain our activities and sometimes institutional problems. We would talk and have discussions about music, technology, preservation, or the future evolution of tools. We would always leave with an “*au revoir,*” see you soon!

Indeed, he was a unique man, fascinated by sounds and sound creation; he probably lived one of the most fascinating experiences in music, and this was to discover how sounds are made and how they can be synthesized. He was a pioneer of sound invention who then turned his discoveries towards music in all its forms and developed a personal and recognizable musical style, be it acoustic, instrumental, or mixed music.

The GRM met Jean-Claude Risset in the 1960s; in that period the GRM was starting to explore and understand what was happening with computers and music and what its potential could be. Contacts were made with Bell Labs, despite the resistance from Pierre Schaeffer regarding any kind of preconceived music—and for

him, programming sounds necessarily implied preconception. Nevertheless, François Bayle, who was then director of the GRM, commissioned from Risset the first digital work of our repertoire, *Mutations* (1969), first performed at the UNESCO meeting for Music and Technology in Stockholm in 1970. Schaeffer appreciated the music of Risset, and Risset had a profound respect for him and his work.

Since then, Jean-Claude traveled on a parallel path to ours, exploring his own roads and his strong interest in sound hybrids, where field-recorded sounds interact with instrumental and synthesized sounds, as in his wonderful work *Sud*—which is not only one of the outstanding works of the GRM repertoire but which was analyzed by thousands of young students when the French Education Ministry proposed the work as the reference music during the year 2000; students studied it and discovered its richness and were fascinated while listening to it, as so many have recalled to us. He indeed opened the ears of future musicians.

We are sad today, the GRM is sad; we have lost a great musician, unique researcher, wonderful teacher, but mainly a friend. Somebody who would enjoy listening to what others did, always ready to make an enriching comment, with deep understanding of what music moves in us and what it brings to humanity. Jean-Claude will stay with us, in our hearts and minds and with his music, and we will always think of him with a soft *au revoir*.

Daniel Teruggi
Paris, France

[Editor's note: Teruggi is the director of GRM. A couple of recent interviews in French can be found on the GRM Web site: <http://www.inagrm.com/deces-jean-claude-risset>.]

Jean-Claude Risset was a personal friend as much as a colleague. We met in Sweden in 1970 at the UNESCO conference on music and technology. I also met Risset's mentor Max Mathews at the same time, and he became my mentor as well. Jean-Claude and his wife Rozenn stayed with me in Vermont many times, as I stayed with them in Paris and Marseille. We drank too many martinis, took picnics in French villages and in Sequoia, California. We laughed a lot (I remember a half-dozen of his jokes), shared news of our children and grandchildren, hiked, skied, and cooked together, especially when he taught at Dartmouth and when I was a resident at the Camargo Foundation in Cassis (20 minutes from Marseille). He knew how to use computers to compose his truly original electroacoustic music, and I hardly did. The focus of each of our encounters was four-hand piano music: Mozart, Ravel, Debussy, and even a piece I composed for him, *Quatre regards sur le Parc de Roi d'Espagne*, a pun on Messiaen's work and the name of the Marseille suburb where Jean-Claude and Rozenn lived most of their married life. In his memory, I have composed a new four-hand piano piece, *À la mémoire de Jean-Claude Risset*. Other pianists will have to play it. He was truly my brother.

Jon Appleton
Princeville, Hawaii, USA

When Jean-Claude Risset left us on 21 November 2016, the news struck us hard.

Jean-Claude's foundational work in computer music and in the analysis, synthesis, and perception of musical sound contributed in an absolutely decisive way to establishing this field of musical research in which we work every day. Jean-Claude had participated in the founding

of the Institut de Recherche et de Coordination Acoustique/Musique (IRCAM) alongside Pierre Boulez. At the institute's outset, he directed the computer department, and later, the ATIAM program. This master's level program—whose initial letters stand in French for acoustics, signal processing, and computer science applied to music—has since trained several hundred young researchers in the science of sound and music. Thus, very early on, this exceptional researcher and artist had also set up facilities for higher education in order to identify and train young creative personalities and ensure the discipline's future.

A tutelary figure for IRCAM as well as for the whole world of new music and musical science, Jean-Claude Risset possessed an unlimited benevolence and open-mindedness, along with his farsightedness. He inscribed himself permanently in our imagination like those great figures who at times in history, from Pythagoras to Helmholtz and beyond, have advanced the quadrivium of the musical sciences, or who, like a Rameau, have achieved the rare alloy of a personal musical elegance and a systematic understanding destined to illuminate the path forward.

Some time ago, a historic conference opening in Athens brought together, in a moving manner, the two friends and pioneers Jean-Claude Risset and John Chowning at a major international symposium on computer music. The audience was captivated by a summary of how the digital alchemy of music, so familiar to us today, was first distilled in those feverish years at Bell Labs and at Stanford's Center for Computer Research in Music and Acoustics before coming to modern technological foundries, among them IRCAM, which was once home to both Risset and Chowning. This retrospective

conference on the emergence of modern musical research was accompanied by the performance of some of their compositions, followed by a surreal round table at the archaeological site of Plato's Academy on the theme "A tribute to the Platonic view on the mathematical nature of music." Thus, on a day of that Hellenic limpidity, which suited him so well, surrounded by his travel companions and the electronic charm of cicadas, all Risset's luminous passions were witnessed: his rigorous creativity, his beautiful intelligence, his youthful wisdom—this is the image that we will treasure forever.

G rard Assayag
Paris, France

Since 21 November 2016, the door to Jean-Claude Risset's office has not been opened, and the sound of his keys, modulated by the trace of his gestures, will be forever missed. With the passing of Jean-Claude, it is an entire era that has become history. Jean-Claude was one of the last computer music pioneers, and one of those who opened the road to brand-new world of unheard sounds.

We had the privilege of being part of Jean-Claude's research team until he retired in 2000. In spite of Jean-Claude's intense activities abroad during this period, he was always extremely inspiring and open-minded. The team strongly benefited from his large international network, and we got to meet many influential researchers working in the field at that time, such as Max Mathews, John Chowning, David Wessel, Jon Appleton, et al. (See Figures 1 and 2.)

Jean-Claude was a very tolerant group leader who was always enthusiastic about our work and ideas and who never tried to interfere with our various initiatives and research

Figure 1. LMA, Marseilles, 1990. From left: Jean-Claude Risset, Daniel Arfib, Nathalie Delprat, Pierre Dutilleux, Philippe Guillemain, an internship student, Sabine Meunier, Max Mathews, John Chowning, and Richard Kronland-Martinet. (Photo: Rozenn Risset.)



interests. Even if he was particularly attached to art-science interactions, Jean-Claude knew that discoveries could not be imposed from above and that the roads towards new findings were not straight and sometimes had to diverge from the initial goal. It was in this spirit that he allowed one of us (R. Kronland-Martinet) to explore a new, purely mathematical decomposition method, the wavelet transform, that was totally unknown at that time. Thanks to this initiative, the very first applications with wavelets were performed on sounds and musical signals.

Jean-Claude's attachment to surprising detours that sometimes appear in research can also be perceived in his musical pieces in which he brilliantly experimented with the ductility of sounds through new, tentative computer tools. He even went further and experimented with visualizations of sound representations, as on the cover of the CD *Sud • Dialogues • Inharmonique • Mutations* published by INA-GRM in 1987, which displays one of the first images of wavelet transforms applied to a sound.

Figure 2. LMA, Marseilles, 1995.
From left: Jean-Claude Risset, Sølvi
Ystad, Daniel Arfib, Jon Appleton,
Max Mathews, Richard
Kronland-Martinet, Marjorie
Mathews, and Thierry Voinier.
(Photo: Rozenn Risset.)



Jean-Claude liked to experiment and discover new possibilities of sound creation, but he also knew how to formulate his expectations and adapt his methods to reach his perceptual and aesthetic goals. He was the typical example of an art-science researcher or a science-art artist. He constantly juggled between the paradigm of scientific research and that of artistic research. Arts and science were intimately linked in his mind, and this was not always easy for his fellow researchers to accept, in particular at the Laboratory of Mechanics and Acoustics in Marseilles, which is resolutely oriented towards formal sciences. It was undoubtedly because of his kindness and his power to convince that our colleagues specializing in mechanics accepted that their ears were titillated by the “bizarre” sounds and even more “bizarre music” that emanated from our studios, at that time poorly soundproofed. We still remember the irruption of one of these colleagues into the studio, who exclaimed, “Could you please

stop strangling animals? We aren’t managing to work next door!”

Jean-Claude was a wise man in the noblest sense of the word. We often compared him, with amusement, to a true encyclopedia. He had an answer to everything, and everything interested him. When from time to time we were lucky to teach him something new, his eyes sparkled with gratefulness, like a child who discovers a present. We owe so much to the fabulous interdisciplinary culture that Jean-Claude developed. Even if we joined his team trained as fundamental scientists, Jean-Claude incited us to develop a critical mind and a desire to always place the human, and in particular our auditory perception, in the center of our research. His scientific convictions, particularly those related to the ecological approach to perception, as well as his interests in philosophy and arts, have influenced us forever. It is as a continuity of these ideas that our group more recently established a new sound synthesis paradigm called the {action-object} paradigm, based

on the notion of sound invariants that enables an intuitive control of sounds and a perceptual navigation in various sound spaces. Jean-Claude very quickly showed a strong interest for this approach, and he was recently preparing a musical composition based on sound metaphors stemming from this paradigm. Even if his ideas of a piece in which the piano interacted with the metaphors seemed to be well on the way, this piece will forever only be known by him.

A few years ago we started to toy with the idea of creating a new interdisciplinary art-science lab here in Marseilles in order to gather the many local communities, both scientific and artistic, that work on sound-, image-, and music-related issues. This was one of Jean-Claude’s old dreams that he mentioned in a report on the importance of art/science/technology interactions, commissioned by the French Ministry of Research in 1998. He was extremely excited about the idea of creating such a new interdisciplinary structure that favored collaborations between artists and scientists from different research fields, and he immediately agreed to support our initiative. As a member of the steering committee of this project (see Figure 3), he actively participated in meetings with future actors of the lab as well as with several decision-makers of the various institutions that were likely to support the project (Aix-Marseille University [AMU], French National Research Center [CNRS], and the French Ministry of Culture).

On 1 January 2017, the new laboratory, called PRISM (Perception, Representations, Image, Sound, Music), was officially created. Unfortunately, Jean-Claude never got the opportunity to participate in this new, exciting adventure, but his contribution to its creation will never be forgotten.

Figure 3. Marseilles, 2016. The PRISM steering committee. From left to right: Jacques Sapiega, Mitsuko Aramaki, Sølvi Ystad, Rémi Adjiman, Jean Vion-Dury, Jean-Claude Risset, Richard Kronland-Martinet, Peter Sinclair, and Claude Vallée. (Photo: Gaëtan Parseihian.)



Dear Jean-Claude, your passing has left us with a painful feeling of emptiness, but we promise to do our best to conserve your spirit and enthusiasm for our field, your generous way of transmitting knowledge to young and old people, and also your subtle humor and your capacity for enjoying life, good food, and wine. We only blame you for one thing: Why did you leave us this early?

Richard Kronland-Martinet, Mitsuko Aramaki, and Sølvi Ystad
Marseille, France