

50 YEARS OF PIERRE GY'S "THEORY OF SAMPLING"—WCSB1: A TRIBUTE

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This conference is dedicated to one man's distinguished achievements in science and technology. The title tells it all: "50 years of Pierre Gy's Theory of Sampling".

To put this tribute in perspective, I suggest a view of the situation in one "representative" discipline which only discovered the Theory of Sampling (TOS) a few years ago - and which is still experiencing severe pains in getting to grips with the reality that much of its "data" has in fact have been generated by processes which are more-or-less in total neglect of TOS. This discipline is known as chemometrics.

Chemometrics is barely thirty years old, but already there are many stories, if not legends of how difficult it was breaking new ground within the various fields and sciences in which chemometrics went to work: analytical chemistry, manufacturing, process technology, engineering, geology, and medicine to name but a few. Difficult because this new holistic type of data analysis apparently competed with statistics etc. At the end of the day when all these stories have been told, chemometricians have every reason to be proud of what they have achieved. They can point to the current very healthy status and drive within their discipline.

Many other scientists have experienced a similar struggle in their own career. Some of them have struggled much longer than others, perhaps up to a decade before a breakthrough occurred. A select few of the founding fathers of chemometrics have consistently contributed to this "new discipline" for the last 25 years, more or less in this constant battle mode. One can respectfully look to the present state of chemometrics with great pride, and awe, for all the effort put in.

Consider now a parallel story, only *substitute* chemometrics by sampling—and double the length of this period - not 25 years, but 50 years. Also, consider that you would have to do this work on your own for most of this extended time ...

Unusual? —To say the least!

ENTER PIERRE MAURICE GY



Pierre Gy at "Majorskaya" tea salon, Lappeenranta, Finland. Dec. 1998

(Photo: Kim H. Esbensen)

Biography:

Family: b. Paris, July 25, 1924; s. Felix and Clemence (Gourdain) Gy; m. Sylvia Duchesne, 1946; children: Genevieve, Anne, Caroline.

Education: Degree in Chem. Eng. Paris Sch. Physics & Chemistry, 1946; Ph.D. Physics, U. Nancy, 1960; Ph.D. Math., U. Nancy, 1975.

Memberships: Mem. AAAS; Am. Inst. Mining Engrs. (hon); Can. Inst. Mining and Metallurgy; N.Y. Acad. Sciences.

Honours: Medal, Mining and Metall. Inst. Japan, 1958; 2 gold medals Soc. de L'industrie Minerale, 1963, 1976, Lavoisier medal French Soc. Chemistry, 1995.

Publications: 9 books; 175 papers; innumerable lectures, courses

Professional career: Chem.engr. CMCF, Congo, 1946-49; research engr. Minerai & Metaux., Paris, 1949-1952; from head mineral processing labs to tech. mgr., 1952-1962; industrial sampling and blending consultant, Cannes, 1963-present.

Founder: Internat. Sampling Inst., France.

Avocations: Photography, mountain climbing

HOW WCSB1 CAME TO BE

As chairman of SSC6 (the Sixth Scandinavian Symposium in Chemometrics), I invited Pierre as a special guest lecturer in August 1999. While a contribution on the "Theory of Sampling" (TOS) was planned for the SSC6 proceedings, it quickly transpired that it would not be possible to do anything even close to the justice this discipline deserve with an average-length proceeding contribution (10-12 pages or so). Thus the idea of a more worked out introduction to TOS in chemometrics and related data analysis sciences was born. The lack of knowledge of TOS in this scientific realm was simply too great. It was decided that now was the time to present a much more comprehensive introduction.

A special situation now opened up. It was too much of a coincidence that TOS originated in 1950, and that the first presentation and published article appeared in 1951 and 1953. Soon one idea followed another - while the 50 years' anniversary of TOS, as well as the turn of the millennium, loomed large and suddenly very close. Knowing full well the workload involved, I summoned up the courage to ask Pierre to write a new, updated introduction to the Theory of Sampling, complete with a comprehensive bibliography. It was argued that this was exactly what the science of chemometrics needed. The 75-year *young* gentleman initially balked somewhat at this suggestion, quite understandably, but after he reconsidered the issue several times he came back with a scholarly opus in the form of a three-part tutorial series which - instead of being published in the above 1999 SSC6-proceedings, you will find occupying the place of honor in the coming proceedings issue of WCSB1. We owe Pierre a very big thank-you for his willingness to undertake this hard work.

THE "AUTOBIOGRAPHY" OF TOS

But what originally appeared as flat out impossible was to have Pierre write his own personal scientific history. Those who know him well also know that Pierre is a most generous and gracious man - he is willing to do *almost* anything to grant the wish of a friend or fellow scientist. But ask him to talk of himself as a scientist and of his scientific achievements - this is where the story ends! He simply is extremely disinclined towards anything that even remotely perhaps could be viewed as "self-agrandissement" (*such a restraint is a rare thing in academia indeed*).

Never-the-less there was no end to the sweat and toil that went into trying to convince Pierre why Science (capital S) still needed such a biography of the originator of TOS... Suffice to say that in the end the wish of the science community at large prevailed, and success came in the form of: "*50 years of Sampling Theory - a personal history*" (*coupled with a complete scientific bibliography*). This is where Pierre tells his own scientific history of TOS within the convoluted industrial, academic, professional, and personal web of his life. Fascinating is but a poor qualifier! Only few, if any, scientific disciplines have been graced with a similar personal introduction to an *oeuvre* as monumental as that of Pierre Gy's contributions to the field of science and technology.

You will be greatly pleased to find this contribution in this conference documentation.

THE MAN BEHIND TOS

Before focusing on the scientific reasons that we are here honoring Pierre Gy for his life's work, I would like to take this opportunity to present a few of Pierre's personal attributes - some of which perhaps fall outside the strict scope of science and TOS, but which are equally important in giving a more comprehensive and thus more complete picture of the man behind the science, which Pierre is too humble to describe himself.

THE SCIENTIST



The bread-and-butter of scientific interaction: meetings, symposia, conferences

Pierre Gy, extreme left, was 30 years old when this picture was taken, 1954. OECC Mission (North America).

At the extreme right of picture: the Norwegian representative prof. Magne Mortenson, Technical University of Trondheim.

(Photo: unknown)

For the record: For a man who has published nine books, 175 papers, given more than 200 lectures, workshops and courses, it bears noting that Pierre Gy has never held an academic position (*sic*), and thus has deliberately *chosen* to work almost exclusively without the personal interaction of the scientific and social interaction at the daily workplace. There is very little need to emphasise how this runs completely contrary to the gamut of every day conditions for the overwhelming part of most scientists. Unusual? - Indeed!

THE SPORTSMAN

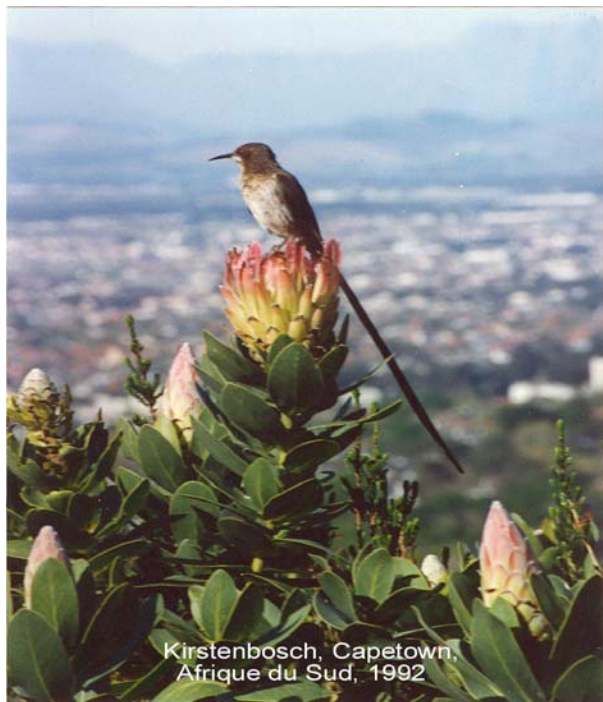


For the record: It is only some 10 years ago that Pierre, *very* reluctantly, stopped taking his regular (weekly) long distance swims (10 km laps, or more...) in the Mediterranean, and he last scaled the Alps in the summer of the year of 1999 - as indeed he has done in almost every year of his adult life when vacationing with his wife Sylvia and family in the northern Alps.

Pierre Gy in 1975, Suisse-Italie (just turned 50).

(Photo: Pierre Gy)

THE PHOTOGRAPHER



When conversing with Pierre there is always an occasion where he suddenly wants to show you some of his extensive collection of photographs from all over the world. In the course of his consulting work Pierre has visited five of the Earth's six continents time and again, which accounts for his private photo collection now totalling some 20.000 extremely interesting and beautiful entries.

“Sugarbird” - an example of Pierre's excellence in photography.

(Photo: Pierre Gy)

THE SIGNIFICANCE OF TOS

The Theory of Sampling (TOS) is of the highest significance for all sciences, for technology, and industry where *proper sampling* is on the agenda. Sadly, it has for most of its existence been largely overlooked in academia, if not totally neglected, but this has in no way anything to do with the scientific content and/or the merit of TOS. Perhaps even the opposite: It is true, for many, that the mathematical language of TOS *may* appear somewhat difficult at first sight. However, in the last 10 years or so a major improvement in this state of affairs has been noticeable. Pierre's own 1998 Wiley book: “Sampling for Analytical Purposes”, as well as many current didactic efforts by an entire younger generation in this field have completely flattened this stock objection to serious attention to TOS. Today there are relatively many types of courses taught on TOS, mostly by professional consultants and experts, but the situation within academia also shows sign of yielding.

This tribute is only a brief introduction to some of the most important scientific and personal reasons why the scientific community is finally presenting a fitting tribute to a singularly inspiring man's immense scientific contributions - in the form of a world conference dedicated exclusively to sampling. The proceedings from WCSB1 by itself will also be part of this tribute. The proceedings will be used quite specifically as a general introduction to the role of proper sampling within a broad range of professions and sciences: analytical chemistry, mineral processing, process technology, engineering, geology, medicine... The proceedings are meant to transgress new borders!

The work of teaching sampling for the last three years would for me have been very much more difficult were it not for the spearhead efforts of Pentti Minkkinen of Lappeenranta University of Technology, Finland. Professor Minkkinen has almost single-handedly lifted the burden of teaching TOS to chemometricians and others for nearly 10+ years now, for a long part of this time in splendid isolation (*he truly is the stuff that chemometric legends are made of*). In fact it was as an opponent to one of Professor Minkkinen's recent Ph. D. students, the three of us met for the first time in 1998.



Pierre Gy (1998), flanked by what he insists on calling his “young partners” regarding the role of teaching TOS to the world (*Minkkinen, Gy, Esbensen*).

(Photo: Timo Mikkola, Lappeenranta Technical University, Dec. 1998;
Lars Petersen, ACACSRG, Aalborg University Esbjerg, Oct. 2001)

I also extend my most sincere thanks to Dominique Francois-Bongarcon for his very many invaluable internet interactions and our brief, but essential airport encounters, without which the early preparations and organizational planning for WCSB1 would surely have come to nothing!

I consider it a privilege and an honor to have been able to perform the academic public service of organizing, hosting, and chairing WCSB1. I thank Pentti and Dominique for their encouragement in this task.

Pierre ends his personal account later in this volume with the statement: “The relay is now beginning to be handed over to a younger generation of professors, engineers and other *proper samplers*.”

To this the three of us say:

“May this beginning last very long indeed”.

The entire WCSB1 conference is conducted with our greatest scientific admiration and our warmest personal affection.

Kim H. Esbensen