# EARLY YEARS IN MACHINE TRANSLATION

## MEMOIRS AND BIOGRAPHIES OF PIONEERS

Edited by

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# THE GEORGETOWN PROJECT AND LÉON DOSTERT
## RECOLLECTIONS OF A YOUNG ASSISTANT

MURIEL VASCONCELLOS

### 1 *My initiation*

After a couple of false starts at other colleges and some detours by way of the working world, in the fall of 1955 I was ready for serious study and had been accepted with advanced standing at Georgetown University's Institute of Languages and Linguistics in Washington, D.C. The Institute was off-campus in the downtown Dupont Circle area. It was only in its sixth year, and the excitement of the new academic experiment was in the air. It was the first school to require a heavy component of linguistics for students of language, and mastery of two languages for students of linguistics. The curriculum was tough: candidates even for an undergraduate degree had to write a thesis and be examined orally by a board of six professors. I had the intention of studying full-time to finish my bachelor's degree as quickly as possible. My "detours" had enabled me to set aside enough money for the purpose. However, on my first day at school I made the life-changing decision to inquire about part-time jobs for students. Before I could think twice, I found myself *studying* part-time and *working* full-time for Professor Léon Dostert, founder and director of the Institute. I had been hired as his secretary. My new employer had a certain reverence for the word *secretary*, which to him meant "keeper of the secret," and I was to be his trusted right hand for the next five years.

Although the Institute had a dozen or so projects humming in 1955, "mechanical" translation was Léon Dostert's passion and priority. At the time of my arrival, he was basking in the recent success of the Georgetown-IBM experiment, which he had brokered by enlisting the talent of the Institute's brilliant Czech linguist, Paul Garvin, and obtaining financial support and the use of scarce computer resources from IBM through a personal connection with none other than its president and chairman "T.J." Watson, Jr.[1]

The experiment had produced English translations of a small set of highly constrained Russian sentences using a computer program that performed

[1] Dostert met Thomas John Watson, Jr. (1914-1993) during an earlier phase of his career when he called world attention to IBM by using its equipment to prove the feasibility of simultaneous interpretation, first at the Nuremberg war crime trials and later at United Nations headquarters.

dictionary lookup, analyzed morphology, and applied some simple grammatical rules (Garvin 1967; Zarechnak 1979: 20-33). Well, at least it was a beginning ...![2] IBM made certain that the event was widely covered by the press. By the time I arrived, Georgetown was the focus of international attention. My very first assignment was to send offprints of a report on the experiment (Dostert 1955) to a list of linguistic luminaries and power-brokers of the time.

My next assignment was to help put together a funding proposal to the Central Intelligence Agency—three words which one dared not speak aloud. Allen Dulles[3] was director of the Agency and a good friend of Dostert's from their days with "Wild Bill" Donovan[4] in the Office of Strategic Services. "Allen" had promised Georgetown a sizable sum of money for MT research—by far the largest grant awarded for machine translation up to that point.[5] All we had to do was put together that pesky budget and those endless pages of rationales, planned activities, project milestones, and curriculum vitae! Our efforts produced a document of the required heft. I remember that Christine Montgomery came in to give us a hand as the deadline neared. We all had a vested interest in seeing that the proposal got funded, and we breathed a collective sigh of relief when it was finally delivered to 2430 "E" Street—the Agency's mysterious downtown mail drop.

## 2 *The director*

Léon Dostert was undoubtedly a true genius. His brilliance gave flight to a giant imagination, which he combined with persistence and persuasive charm. Constantly coming up with ideas, he would not rest until they came to life, and in the process he would motivate a host of stalwart supporters, from lowly students to people in the highest places, who willingly outdid themselves to make his dreams come true. Throughout his life, wherever he went, he managed to create lasting relationships with the people he met, and to engage them in the advancement of his projects.

A number of these people were highly influential. For example, he was on friendly terms with Dwight Eisenhower, for whom he had served as personal interpreter during World War II, and there were times during my watch when he would appeal to "Ike," who by that time was sitting in the White House. One of

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[2] Those who would disparage the work done at Georgetown should be careful to distinguish between the 1954 experiment and the serious research undertaken from 1956 to 1963.

[3] Allen Welsh Dulles (1893-1969), younger brother of John Foster Dulles (1888-1959), who at the time of the MT project was U.S. secretary of state (1953-1959).

[4] William Joseph Donovan (1883-1959), head of the Office of Strategic Services (1942-1945), World War II precursor of the CIA.

[5] The National Science Foundation was the "front" for the grant. The initial award was for three years: $100,000 for the first year, $125,000 for the second, and $186,000 for the third (total $411,000). Subsequent grants amounted to an additional $1,317,239. Of the entire sum, 93.5% was contributed by CIA and 6.5% by NSF. Paul Howerton was the CIA project officer.

his very good friends was Thomas "Tommy-the-Cork" Corcoran, long-time adviser to Democratic presidents. Corcoran was a key power behind Lyndon Johnson, and during the pre-election excitement of 1959-1960, Dostert, a staunch Democrat, sometimes fed ideas to the Johnson campaign which would appear as headlines in the next day's paper. I can still hear him say, "Get Tom on the phone. I think Lyndon should say . . ." I mention these examples to show what a great gift Dostert had for getting the serious attention of people who could make things happen. I feel certain that the prominence he gained for MT through this network of movers and shakers was an important factor in the field's evolution.

Léon Dostert began life on May 14, 1904, in Longwy, France, just a short distance from the borders of Belgium, Luxembourg, and Germany. (For the record, his middle name was Émile. He wanted his friends to refer to him as "Léon Dostert," and his professional signature was "L.E. Dostert." He disliked "Léon E. Dostert" because there were no other "Léon Dosterts" that the initial was needed to distinguish him from.) The family were poor peasants. His father disappeared early on, and he was raised by his mother and grandmother. From the outset he showed a facility for languages, which he had the chance to cultivate because of Longwy's pivotal location at the junction of three foreign borders. During World War I, he helped to provide for the family by smuggling materials—for example, copper tubing wrapped around his chest—across one border or another. More important, Longwy was occupied by the Germans and later liberated by the Americans, so he had an opportunity to interpret for the soldiers on both sides. He used to tell of the time when the Germans had asked for a light bulb, he explained their request in French, and a few moments later the room lit up. For him it was thrilling to feel the power of making that light come on, and there and then he decided to dedicate his life to communication across language barriers.

In 1920 Léon migrated to the United States, sponsored by Henry St. Pierre, a U.S. soldier who had befriended him during the liberation of Longwy. Living with Henry's family in Pasadena, California, and working as a grocery clerk to pay his expenses, he finished high school and went on to enroll at Occidental College in Los Angeles. But his dream was to study languages and diplomacy. In 1926 he transferred his credits and traveled east to Georgetown University. He earned a bachelor's degree in foreign service (1928), a bachelor's in philosophy (1930), and a master's in languages from Georgetown (1931), following which he completed coursework toward his doctorate at Johns Hopkins University (1931-1935). Also, from 1926 until 1939 he taught French at Georgetown, rising from instructor to full professor. During those years he forged many life-long ties. One of the people with whom he was to maintain a long-term connection was Father Edmund Walsh, S.J., founder of the University's School of Foreign Service.

When World War II broke out, his linguistic skills were once again in demand for strategic purposes, and he went into the U.S. Army with the rank of major. In addition to working for the OSS and as personal interpreter to Eisenhower in Africa, he was also liaison officer to the French supreme commander in Algiers, Charles de Gaulle. But it was after the war that he made his greatest contribution. Still in the Army, and a colonel by that time, he was assigned to organize language services from and into English, French, German, and Russian at the Nuremberg war crime trials. Watching the difficulties involved in whispered interpretation, not to mention consecutive interpretation, he came up with the idea of equipping the delegates with earphones and having the interpreters speak through a microphone from a soundproof booth on the sidelines. He is remembered as the father of this technology.

In 1946 Dostert went on to New York to introduce electronically transmitted simultaneous interpretation at United Nations headquarters, then still located at Flushing Meadow. However, in that case politics proved to be much more of a hurdle than in Nuremberg. He had gotten IBM to donate the equipment; the challenge was to win over the users. The delegates thought the earphones were cumbersome and undignified, and they were in the process of having them removed when, at the eleventh hour, Dostert finally managed to get one committee with an open-minded chair from Colombia to try out the system. It worked, and he got a reprieve. Within a short time, simultaneous interpretation was an established reality at United Nations headquarters.

With the UN challenge behind him, in 1948 Dostert accepted a job in Geneva as administrative counselor with the International Telecommunications Union. He had not been there long when Father Walsh sought him out and invited him to go back to Georgetown and create the Institute of Languages and Linguistics under the umbrella of the Foreign Service Institute. Dostert accepted happily; Georgetown was his first love. The two men set to work. Space was found in a row of old townhouse mansions near Dupont Circle. They took special pains with the Multi-Lingual Room, where simultaneous interpreters would be trained. In its time, it was a showcase: seats with earphones and microphones were arranged around a horseshoe-shaped table (the original Georgetown Round Table), and six fully equipped booths lined the perimeter of the room. Needless to say, IBM donated the equipment. The Institute opened its doors in the fall of 1949.

## 3 *The Georgetown MT project*

Léon Dostert's involvement in MT probably began with his attendance at the 1952 conference at the Massachusetts Institute of Technology, where he presented a paper entitled "Ordinary Translation and Mechanical Translation." He came home from the MIT meeting with a new mission. He was determined

to tackle MT at the Institute. Before long, preparations were under way for the Georgetown-IBM experiment.

Dostert brought three main convictions to the MT table. First, all research should be based on naturally occurring language. He envisioned a mammoth aligned corpus with the original texts linked to criterion human translations. The challenge for linguists was to match the existing target output. They should never "fake" a corpus to fit the linguistic capabilities of their system. Second, the task should be approached empirically. He advocated a hybrid system that started with a cohesive grammatical framework but which allowed for further piecemeal development based on the realities of text corpora. The grammar should be philosophically consistent: he especially liked Tesnière (1953, 1959), whose work came to be reflected in the GAT system. Third and last, Dostert always assumed that postediting would be necessary. The goal was merely to improve the translation system so that human intervention could be reduced as much as possible.

Dostert was not a published linguist, or even a scientifically trained one, although he was extremely well read and up to date in the field. He once learned that Winfred Lehmann had referred to him behind his back as "a wart on the field of linguistics"—but that didn't faze him in the least. His contributions were in the form of broad strokes, not details. He brought faculty to the Institute whose work made sense to him. He achieved just the right balance of trusting his people to do the jobs he assigned to them and at the same time following and understanding their work and giving them encouragement. And he got people to work together.

Even before the before the project got officially under way in June 1956,[6] Dostert had started to assemble the Georgetown team. He drew first from the regular Institute faculty (by assigning them to the MT project, he was able to charge part of their salaries to its funds, and this helped him to balance the overall budget). Then there was a cadre of people who came recommended by the folks at that address on "E" Street, whose salaries were delivered to us by hand in wads of rolled-up hundred-dollar bills. Bright graduate students at the Institute were also recruited. And finally, experts from elsewhere were invited to join the team. Or rather, I should say *teams*.

There were two subgroups from the outset, as well as other smaller teams. Dostert wanted different approaches to be tried, and he purposely set up friendly competition among the researchers. However, they were all supposed to work on the same corpus, a large volume of parallel Russian-English text in the field of organic chemistry. The first subgroup was headed by Paul Garvin, who was assisted by graduate students Madeleine Mathiot, Christine Montgomery, and Dorita Lochak. Garvin named his approach the "Fulcrum Analysis Technique." Michael Zarechnak, also a linguist on the Institute's

[6] The first moneys were received on September 27, 1956.

faculty, led the second subgroup, which at first included Antonina Boldyreff, Bedrich Chaloupka, Eugen Kalikin, and Milos Pačak. As this team's approach gained ascendance, it grew to sizable proportions. Among the people who joined later were David Korn, Ross Macdonald, Melrad Mellen, John Moyne, Dorothy Pedtke, Mariana Poltoratzky, Jane Pyne, Philip Smith, Michael Sushko, and Peter Toma. This subgroup developed what they called the "General Analysis Technique." Later, when the work of this group prevailed in the Pentagon demonstration, its initials GAT were reinterpreted to stand for "Georgetown Automatic Translation."

A sampling of the subjects on which papers were published by members of the GAT group[7] gives an idea of the linguistic problems addressed: dictionary structure (#3, A. Boldyreff et al.); the GAT matrix (#4, M. Zarechnak); morphological analysis (#5, #22, M. Pačak et al.); dictionary lookup (#6, P. Toma); idiomatic structures (J. Moyne, M. Zarechnak, et al.); interpolation routines (#9, J. Pyne et al.); syntagmatic analysis (#10, E. Kalikin); syntactic analysis (#11, M. Zarechnak and J. Pyne); resolution of number and case (#13, #14, E. Kalikin); lexical choice (#15, M. Zarechnak et al.); verb transfer and synthesis (#16, J. Moyne); rearrangement #21, J. Moyne et al.); nested structures in Russian (M. Zarechnak and M. Mellen); resolution of multiple meaning (M. Pacak and M. Zarechnak).

In addition, individuals and smaller teams were assigned specific tasks that did not depend on the particular linguistic approach adopted by the subgroups. A biochemist who knew Russian was hired to verify the accuracy of the criterion and experimental translations, and to be available for consultation on technical points in the text. Nancy Lou Fargo, Eugene Pantzer, and Joan Rubin were given the job of developing English synthesis codes. Dan Belmore and Phil Smith worked on the problem inserting definite and indefinite articles in the English translations. Later the Institute's Russian-born librarian, Ariadne Lukjanow, had an idea for a "code-matching technique," somewhat similar to the approach of Ida Rhodes,[8] and was invited to join the project, along with her team of adherents. In addition, part-time programmers (mainly moonlighters from IBM and the Pentagon) were hired to work with the linguists.

Even though the CIA grant was for research on Russian, Dostert believed that insights could be gained from linguists specialized in other languages as well. With this thought in mind, he invited A.F.R. "Tony" Brown, then a professor of Semitic linguistics at the Institute, to think about how he might address the MT task. Brown, using a French corpus, wrote a program which he called the "Simulated Linguistic Computer." Eventually he took over the programming of GAT. Arabic, which had been designated a priority

[7] Georgetown University's Lauinger Library has a complete collection of the project's papers under the series designated by the call number PN 242.GA3.

[8] See references spanning the period 1959-1966 in W.J. Hutchins (1986), 361-362.

language by the U.S. government, was tackled by Nancy Kennedy, a graduate student at the Institute. For Chinese, also a priority, Dostert turned to Anna Chennault, widow of General Claire Chennault,[9] who joined the project in 1958. Work was done on Czech by Bedrich Chaloupka and Milos Pačak, while Melrad Mellen did some analysis of Serbo-Croatian. There was also an initiative to analyze English, undertaken by Ross Macdonald, and translate into Turkish, with Sabahat Sansa doing the target synthesis.

All these people came together at the Friday morning seminar, which was the highlight of the week. The various groups and individuals would take turns presenting their work and answering questions from colleagues. Sometimes the discussions got rather heated. Ultimately, most of the seminar presentations by staff and consultants were memorialized in the series of occasional papers referred to above.

In addition to keeping everyone up to date on work in progress, the Friday seminars were also a forum in which visitors—for example, Margaret Masterman-Braithwaite, from the Cambridge Language Research Unit in England—reported on MT developments elsewhere. Dostert also used the seminars as a vehicle for challenging the staff with new ideas. Either he would ask someone to bone up on a subject—for example, symbolic logic, which he thought was significant for MT research—or he would invite linguists from other universities to come and present their ideas. An important concept introduced in this way was the notion of transformations derived from kernel sentences, developed by Zellig Harris at the University of Pennsylvania (Harris 1951, 1954). One of his students, Jane Pyne, joined the Georgetown project in 1957; bringing her mentor's ideas with her, she helped to incorporate them into the GAT system.[10] George Trager, in turn, gave a series of seminars on semology. Martin Joos was also invited to speak at one of the Friday seminars.

Not all the visitors were presenters. I remember the day when we were honored by the presence of Allen Dulles, director of CIA, who heard a presentation on the GAT system and Peter Toma's "Serna" programs in particular.

## 4 *The Pentagon demonstration*

Peter Toma joined the GAT group in the early spring of 1958. A polyglot and a programmer, he had recently attracted international attention with an experimental MT system he developed at the California Institute of Technology in Pasadena, California. It was decided that Toma would put the GAT system into a form that could be processed by the IBM 705 (Toma 1959). Starting with his own morphological analysis, he went on to spend the next

[9] Claire Lee Chennault (1890-1958), leader of the Flying Tigers in China.

[10] This was before the work of another Harris student, Noam Chomsky (1957) became well known.

several months programming all the GAT algorithms that had been developed up to that point.

In the fall of 1958 it was decided to put GAT to the test: there would be a public demonstration of the system. A passage of 100,000 running words in the field of organic chemistry was selected by the sponsor and keypunched onto cards. The Georgetown staff was allowed to examine the text in advance so that the dictionary could be updated as necessary. In addition, there would be a random text of 1,500 words which no one on the project could see in advance. To prepare for this challenge, programmers and computer time at the Pentagon were made available to the project. Peter Toma supervised the Pentagon group and worked intensively with them over the next several months to complete and test the GAT programs. The demonstration took place on June 8, 1959. I was there myself, and I remember the excitement as sentences in Russian went in one end of the computer and (reasonably) understandable English came out the other. The words were printed in block letters on paper tape. The style of the language was clumsy, but we all knew that this was an important milestone in the history of machine translation. It was the first demonstration of significant continuous output. While many people put their shoulders to the wheel to make this moment happen—and a number of them, particularly Peter Toma, gave unstintingly of their time far above the call of duty—it could not have happened without the vision, persistence, and skillful leadership of Léon Dostert.

## 5 *The Congressional hearings*

The GAT demonstration was good enough to set off intense reactions. At the time, post-Sputnik fever was at its height. The U.S. government had been caught short, and one of its priorities was to step up its monitoring of scientific and technical literature in Russian. Thus, administrators welcomed MT as a valuable tool—possibly even a miraculous cure-all—for speeding up access to key information and greatly extending their coverage. On the other hand, language experts, particularly translators, saw the machine's output as woefully inadequate. It was difficult to understand and could be misleading in both subtle and serious ways. They considered that the effort required for postediting was being grossly underestimated. They began to create a stir. First came the jokes—"The spirit is willing but the flesh is weak"—then the heavy artillery.

Congressional hearings were convened for May 11-16, 1960. The MT projects were a 'boondoggle', its detractors claimed—a waste of taxpayers' money. Human beings were already handling all the material that needed to be translated.[11] On the MT side, many thought that translators were afraid of losing

[11] J. Bagnall, chairman of the CIA committee on the exploitation of foreign language publications, stated at the hearings that the Russian output of scientific information was 780 million words a year and that 53 million words, or less than 7%, were being translated by the government (U.S. House of Representatives 1960). While Bagnall claimed that the rest of the material didn't need translation, administrators were less certain.

their jobs. When the time came for the hearings, Dostert carried the banner for MT. We all trooped up to Capitol Hill to support our leader and our cause. I remember so clearly listening to the arguments on both sides and feeling disdain for the latter-day Luddites. Dostert was brilliantly persuasive. Not only that, two of the committee members were already in his corner: Congressman King had been his student at Georgetown, and Congressman Thomas Dodd was also a Georgetown graduate. Between them, Georgetown and MT won the day—or at least a reprieve. Funding was renewed for another three years. However, during this period the anti-MT forces were busy marshaling support, and ALPAC got under way in 1964. By that time Léon Dostert had moved on and was no longer in a position to take up the good fight.

## 6 *Final thoughts*

My story ends here. I left the Georgetown project in November 1960. Other people came and went after my departure. Dostert left[12] and the grants ended on March 31, 1963. Ross Macdonald took charge of the final wrap-up and authored a comprehensive report (1963) which gives a full account of Georgetown's activity in machine translation from the beginning.

In recalling my years on the project, I am impressed by how little has changed in the last four decades. In those days I saw only one side of the various points in debate. Today I see all sides, and I realize how complex the MT picture really is. One thing is clear: the Georgetown project—probably because it brought together so many different people and perspectives—managed to foreshadow most of the key issues that remain with us until today. What seemed chaotic and antagonistic at the time was in fact a blueprint for the future, drawn with uncanny vision by Léon Dostert.

## 7 *Selected writings by Léon Dostert on MT (in date order)*

Dostert, L.E. 1955a. "The Georgetown-IBM experiment". *Machine translation of languages: fourteen essays*, ed. W. N. Locke and A. D. Booth, 124-135. Cambridge, Mass: Technology Press.

Dostert, Leon E. 1955b. "Approach to mechanical translation". *Report on the Sixth Annual Round Table Meeting on Linguistics and Language Teaching*, ed. R.H.Weinstein, 114-122. Washington, D.C.: Georgetown U. P.

Dostert, Leon E. 1956. "Organization and method in mechanical translation work". *Mechanical Translation* 3(2).35.

Dostert, Leon E. 1957a. "Practical objectives of machine translation research". *Research in machine translation: report of the Eighth Annual Round Table Meeting on Linguistics and Language Studies*, ed. L.Dostert, 181-186. Washington, D. C.: Georgetown U. P.

Dostert, Leon E. 1957b. "Brief history of machine translation research". *Research in machine translation: report of the Eighth Annual Round Table Meeting on Linguistics and Language Studies*, ed. L.Dostert, 3-10. Washington, D. C.: Georgetown U. P.

[2] After leaving Georgetown, Dostert went back to Occidental College to head up its department of languages and linguistics. He was still holding that position when he died unexpectedly on September 1, 1971, while attending a conference in Bucharest, Romania.

Dostert, Leon E. 1959. "Approaches to the reduction of ambiguity in machine translation". *Journal of the SMPTE* 68(4).234-235.

Dostert, Leon E. 1963. "Machine translation and automatic language data processing". *Vistas in information handling, volume 1: The augmentation of man's intellect by machine*, ed. Paul W.Howerton and David C.Weeks, 92-110. Washington, D.C.: Spartan Books.

## 8 *Other references*

Chomsky, Noam. 1957. *Syntactic structures.* The Hague: Mouton

Garvin, Paul L. 1967. "The Georgetown-IBM experiment of 1954: An evaluation in retrospect". *Papers in Linguistics in Honor of Léon Dostert*, ed. W.M. Austin, 46-56. The Hague: Mouton.

Harris, Zellig S. 1951. "Discourse analysis". *Language* 28.18-23.

Harris, Zellig S. 1954. "Transfer grammar". *International Journal of American Linguistics* 20(4).259-270.

Hutchins, W.John. 1986. *Machine translation: past, present, future.* Chichester: Ellis Horwood.

Macdonald, R.Ross. 1963. General report, 1952-1963. Preface by L.E. Dostert. Washington, D.C.: Georgetown University Machine Translation Research Project.

Tesnière, Lucien. 1953. *Esquisse d'une syntaxe structurale.* Paris: Klincksieck.

Tesnière, Lucien. 1959. *Eléments de syntaxe structurale.* Paris: Klincksieck.

Toma, Peter. 1959. *SERNA system*, ed. John A.Moyne. Washington, D.C.: Georgetown University Institute of Languages and Linguistics. (Machine Translation Programming Paper 1: General Analysis Technique, Russian-English)

United States. Eighty-sixth Congress, second session. House of Representatives, Committee on Science and Astronautics. 1960. *Research on Mechanical Translation: Hearings before the Special Investigating Subcommittee...May 11, 12, 13, and 16, 1960.* Washington: Government Printing Office.

Zarechnak, Michael. 1979. "The history of machine translation". *Machine translation*, ed. B. Henisz-Dostert, R.R. Macdonald, and M. Zarechnak, 1-87. The Hague: Mouton.

## *Biographical details of the author*

*Muriel Vasconcellos* (née Habel) was born on May 5, 1933, in New York City. Her husband, Silvio de Vasconcellos, was a Brazilian humanist scholar. She earned her bachelor's, master's, and Ph.D. degrees from Georgetown University. Her undergraduate studies were in Spanish and Portuguese, with a minor in linguistics, while her graduate studies were in linguistics with minors in Portuguese and Spanish. In her doctoral dissertation (1985) she analyzed the capture of theme and focus in published translations from the Portuguese.

Her experience on the Georgetown MT (1955-1960) project sparked a lifelong interest in translation. She worked as a translator first for the Organization of American States and then for the Pan American Health Organization (PAHO), where in 1979 she again became involved in machine translation. From that time until her early retirement in 1992 she headed up MT research and its practical implementation at PAHO, and from 1988 onward she was in charge of all translation services for Spanish and English. She has over 90 publications in the fields of linguistics, translation theory, and machine translation.

In 1991 Muriel helped to found the International Association for Machine Translation (IAMT) and became the first president of the Association for Machine Translation in the Americas (AMTA). She served in the latter position for six years and as president of president of IAMT for two years. She is now editor of the official IAMT publication, *MT News International.* In September 1999 she received the IAMT award of honor for her service to the MT field.

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