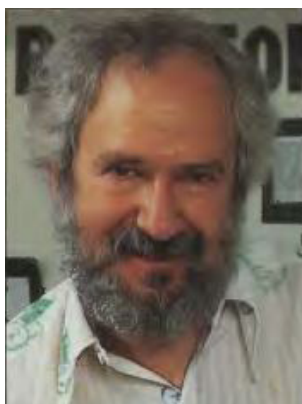# LLX

The Last LOGO Exchange

Published by Tom Lough

May 2015

Dedication

This special issue is dedicated to Seymour Papert, in appreciation of the countless priceless contributions he has made to education. As a result of his efforts, teachers and students around the world have been enriched beyond measure. Although he is no longer active in education due to injuries from a 2006 traffic accident in Hanoi, he continues to inspire and encourage others. Thank you, Seymour, for the gift of Logo, and for the gift of yourself!
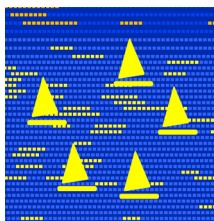
EVER FD!

LLX Staff Directory

Founding Editor ———————————————— Tom Lough

Founding Contributing Editors —————————— Glen Bull
Steve Tipps

Founding International Editor ——————————— Dennis Harper

Editors-in-Chief ———————————————— Sharon Yoder (deceased)
Dorothy Fitch
Gary Stager

LLX

The Last LOGO Exchange

Published by Tom Lough   **May 2015**

From the Founding Editor

Hello, dear *LX* reader,

Welcome to this special edition: the *LLX*, the *Last Logo eXchange* issue. It's a little late — about 19 years or so!

When the Fall 1999 issue was published, Editor **Gary Stager** had exciting plans for the immediate future. Unfortunately, that was the final regular edition, with no closure — until now. Thanks to **Michael Tempel** and the Logo Foundation, all 117 issues are available online, as well as this special edition to help wrap things up after such a long interval. It's as if the *LX* procedure below has finished and it's now time to tidy up.

```
TO LX
REPEAT 117 [PUBLISH]
END
```

We hope you enjoy this issue. You will find a half-dozen articles by *LX* notables, presenting a variety of perspectives on the "old days," the post-*LX* years, and a peek at what may be ahead.

Before we get started though, I would like to send out a hearty THANK YOU to all who contributed to this *LLX* issue. You gave of your time and your talent in this true labor of Logo love. Much appreciated!

OK, let's get going!

In the same way that the *National Logo Exchange* started so long ago, let's begin this special edition with pieces by **Steve Tipps** and **Glen and Gina Bull**, our founding contributing editors and columnists. Steve gives us a comforting perspective that everything is "for now" and perhaps we could look at Logo in that way. Or, maybe some of Logo is forever. Hmm. Take a read and draw your own conclusions.

Glen and Gina were the most prolific of all *LX* contributors. Over the years, they addressed just about every imaginable aspect of Logo and Logo-related technology. In their article, they bring us an informative historical perspective, and then fast-forward to the present and near future.

The next major *LX* player on the team was **Dennis Harper**, who helped establish the *International Logo Exchange* and then perpetuated the *LX* international coverage. After a brief acknowledgement of the past, Dennis starts with a reference to Seymour Papert's 2006 accident, and sketches out a hope-filled action scenario for the future.

Sharon Yoder took over from me as editor in 1987 and expanded the publication as an official journal of the International Council for Computers in Education (ICCE) and later of the International Society for Technology in Education (ISTE). She served as editor until 1995, with a distinguished record of service. Her untimely passing in 2011 has left a void in the educational technology community that cannot be filled. We remember Sharon fondly with a memorial on page 12.

Dorothy Fitch was well-known in the Logo community, and the *LX* benefitted immensely when she became a regular contributor in 1989. She served as the *LX* editor from 1995 to 1997. In her article here, she sketches out her Logo pathway and brings us up to date in her current Logo activity. She also shares her delight in re-discovering some gems within the earlier *LX* pages and invites other readers to do so as well.

Gary Stager needs no introduction, but I feel compelled to give him one. Among the foremost of enthusiastic Logophiles, Gary delights in helping others around him to grow. He brought this developmental energy to the *LX*. He established a close working relationship with Seymour Papert and continues to perpetuate his legacy to this day.

I appreciate the opportunity to offer a few reflections of my own, along with some hopes for the future.

Thanks once more to **Michael Tempel**, President of The Logo Foundation, for his support and assistance both in posting all of the *LX* scanned issues and in developing this final issue.

Finally, on page 24, I offer a special thanks to the nearly 300 colleagues who wrote the articles and columns for the *NLX*, *ILX*, and *LX* over the years. Without you, none of this would have been possible.

EVER FD!
Tom Lough

For Now or Forever? A Logo Reflection
by Steve Tipps

Can it be 30+ years since Glen Bull banged on my back door with an exciting discovery of Seymour Papert's *Mindstorms*? The adventure that started that day consumed us for almost a decade of learning and teaching about Logo abetted by the nudges and demands of Tom Lough, turtle wrangler and general factotum of the *National Logo Exchange* and the *International Logo Exchange*. Tom has now put our work and the work of many other Logophiles into archival form and made it accessible again, and he has asked me for my reflections about Logo. As usual, I was up against deadline, hoping for inspiration, sweating the clock.

Just for Now

Then on Sirius XM, I heard a song entitled "For Now" from the Tony award-winning musical *Avenue Q*. The characters, both human and super-human puppets, sing about things that exist "just for now," such as their unemployment, friendships, troubles, politicians, and hair (ouch). The song insists that whatever is good or bad will change because "now" is only temporary. "Everything in life is only for now." *

Thirty years ago, not having the prescience of the residents of *Avenue Q*, Glen, Tom, and I may have imagined that Logo would last forever. This was a way for students and teachers to join together in mathematical exploration and discovery. We were in thrall of Papert and sure that everyone would see that Logo was the answer to school improvement.

From 1982 through 1990, we and many others in the Logo community wrote articles and books for various versions of Logo with the intention of providing information and examples for teachers. (This included a wild six-month effort from a team of Glen, Sharon, Tom, me, and three others to write a series of Logo books to be produced for the introduction of a new IBM computer called the PCjr, a woefully inadequate machine which was not on the scene for very long. Unfortunately, it helped to usher the robust IBM Logo software off the stage as well.)

As residents of Logo Land, we attended and sponsored several national and regional Logo conferences throughout the 1980s. In 1984, the elementary mathematics textbook I co-authored had a major section on Logo; subsequent editions had smaller treatments, then an appendix, then a sentence and reference, then nothing.

Throughout this time, we understood that learning and teaching Logo required an approach that challenged both teachers' and students' understanding of their roles in the classroom. And the final nail was put in Logo with the strong turn to academic testing and accountability standards. No time was available for turtles.

Rounding for Home

One of the last Logo articles I wrote was for a 1988 University of Virginia Logo conference. "Logo and Its Cousins" suggested that other "programs" also had aspects of exploration and teaching the computer to do things without formal programming. The notion of electronic exploration, discovery and control from many different sources has been borne out over time.

Tools such as word processing, spreadsheets, and databases provide opportunities to input information and to control how that information was organized and presented. Electronic games and simulations became more like "microworlds" where you had to learn to live in a new environment and figure out how to survive. Whether "realistic" or fantastic, these required discovery of underlying rules and procedures, interpretation of symbols, and multiple efforts at living through the trials. With our twenty-first century technology, omnipresent apps enable us to play, organize, create, and communicate in ways I think not even Alan Kay** could have imagined.

Which brings me to the questions. What aspects of Logo live on with us and what aspects were transient, temporal, and trendy? What about Logo was "just for now" and what is "forever?" In Logo fashion, I will not try to answer these questions but pose them for the reader to consider. I note, however, that though my hair is gone my head is still in place!

Steve Tipps
tippsrs@gmail.com

*"For Now" Lyrics by Robert Lopez and Jeff Marx from *Avenue Q*
**Alan Kay, a technology visionary, who predicted the Dynabook, a computer that was "book-like" and widely available as a personal appliance.

Logo Revisited:
A Historical Perspective
by Glen Bull and Gina Bull

Today it is commonplace that computers and technology permeate almost every aspect of education. In the late 1960s, though, the idea that computers could serve as a catalyst for thinking about the way children learn was a radical concept.

In the early 1960s, Seymour Papert joined the faculty of MIT and founded the Artificial Intelligence Lab with Marvin Minsky. As a mathematician and educational theoretician working in a technology-rich environment, he was in the right place with the right background to consider the educational possibilities of technology.

A Personal History

Papert summarized a decade of work in his seminal book, *Mindstorms: Children, Computers, and Powerful Ideas*, published in 1980. After reading it, we attended a workshop by Dan and Molly Watt in which we had the opportunity to explore Logo directly on one of the first versions that ran on a microcomputer. (Early versions of Logo had been implemented on minicomputers and time share systems.) We secured a grant of ten TI-99/4 microcomputers with Logo from Texas Instruments, and used them to offer an educational computing course on Logo at the University of Virginia.

This had several serendipitous consequences. Tom Lough was enrolled in a graduate program in physics. Because our course was offered at noon, and the physics building was adjacent to the education building, Tom was able to enroll in the course. As a result of this interest, Tom established a Logo publication, the *National Logo Exchange*, and asked us to contribute a monthly column. We planned a national conference on Logo, and were subsequently invited by Papert to co-sponsor a joint conference on this topic with MIT.

This engagement with computers in a radically different way caused Gina to return to school for a graduate degree in computer science. Although her undergraduate degree was in history of art, her prior interactions with Logo allowed her to test out of several computer science courses, including the introductory assembly language course. She subsequently wrote a thesis on real-time control systems for manufacturing machinery. Her advisor, Paul Reynolds, provided this as a model thesis to other graduate students. To provide context, enrollment of women in computer science was even less common at that time than today. There were only three other women in Gina's cohort in computer science.

Papert's vision also had a strong influence on the educational computing program at the University of Virginia, directly and indirectly influencing its graduates who went on to found their own programs. These graduates included Tom Lough, who went on to a career at LEGO Education and at Murray State University after completing a doctorate in instructional technology. This personal history is paralleled by comparable experiences by countless others at other academic institutions.

A quarter century later, after publication of more than 200 articles, chapters, and books, may provide a useful time to consider the cumulative impact of Logo, both as a computing language and as an educational philosophy.

Three Major Contributions

Papert made three major contributions to educational computing that influenced the entire field, both directly through his work and that of his colleagues, and indirectly through today's practitioners.

1. *Thinking about Thinking*

   The computer was initially conceived as a delivery system for presenting content. This perspective viewed the computer as a teaching machine that could tutor the child. Papert, in contrast, suggested that children could learn by teaching the computer (i.e., through programming). The computer, in effect, would become a tutee, taught by the child. Papert's vision was that through this approach, the computer could serve as an environment for "thinking about thinking."

   Papert subsequently commented, "At that time the concept of computers in education was synonymous with CAI (computer assisted instruction). I believe

that "Teaching Children Thinking" was the first published paper to suggest that the child could be in charge of the machine, not the machine in charge of the child, by offering what was a new image of children using computers as tools for creativity." (Seymour Papert, *Teaching Children Thinking*, MIT Artificial Intelligence Memo 247, 1971. ftp://publications.ai.mit.edu/ai-publications/pdf/AIM-247.pdf).

2. *Tools for Children*

Papert's second insight was that this approach would require an educational language designed specifically for children. Logo, created in 1967 at Bolt, Beranek, and Newman by Wally Feurzeig and Seymour Papert, was the first programming language designed specifically for children. It has had an impact that continues to this day, through continuing innovations in the MIT Media Lab.

3. *Connecting Computers to the Physical World*

Papert's third insight was that computers could allow children to learn by interacting with the physical world. Papert comments, "In our context the computer is not merely a device for manipulating symbols. It actually controls real, physical processes: motors that turn, trucks that move, boxes that emit sound. By programming it, the child is able to produce an endless variety of actions in a completely intelligible, controlled way." (Seymour Papert, *A Computer Laboratory for Elementary Schools*, MIT Artificial Intelligence Memo 248, 1971. ftp://publications.ai.mit.edu/ai-publications/pdf/AIM-246.pdf).

An Overview of Logo

The computing language was named after the Greek word for "word." This term emphasizes the use of Logo with language (words and sentences) as well as mathematical computation, and references its heritage as a dialect of LISP (List Processing), often used for artificial intelligence research. A key feature of Logo is that the built-in commands of the language can be used to create new programming commands: words constructed by children.

Papert made use of robots in the MIT Artificial Intelligence laboratory to create "floor turtles" (so called because of the hemisphere-shaped dome) that could be guided by children's commands.
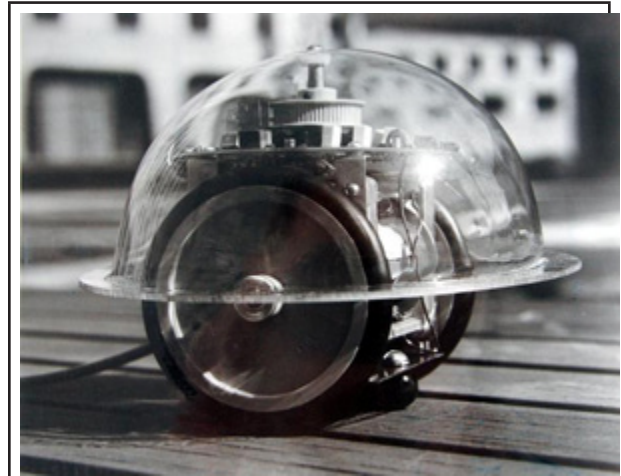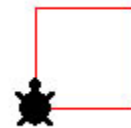

Figure 1. A floor turtle. (Photo courtesy of Terrapin Software, www.terrapinlogo.com)

A pen in the belly of the turtle could be used to plot figures. For example, the command **FORWARD 100 RIGHT 90** repeated four times would produce a square drawn by the turtle.

REPEAT 4 [FORWARD 100 RIGHT 90]

Figure 2. Teaching the turtle to draw a square.

Each sequence of commands could be defined as a procedure in its own right. The procedure to make a square, for example, could be defined as SQUARE.

```
TO SQUARE
REPEAT 4 [ FORWARD 100 RIGHT 90]
END
```

Procedures defined in this way served as building blocks for other actions. By turning the turtle 10 degrees before drawing each square, for example, the following pattern emerges:
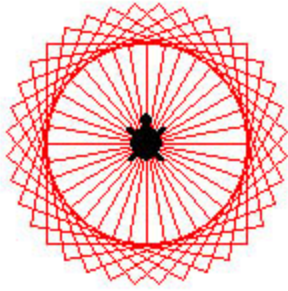
REPEAT 36 [SQUARE RIGHT 10]

Figure 3. Using the SQUARE procedure to draw another figure.

By defining a series of procedures that added new commands to the language, students taught the turtle to draw. The computer, in effect, was the tutee, taught by the child.

Logo Revisited and Updated

There are two related educational projects, both developed within the MIT Media Lab, that might be regarded as direct descendants of Logo and the floor turtle. One is LEGO Mindstorms, a robotic construction kit developed in partnership with the LEGO company. The seeds for this development date back to Papert's work in the 1960s. They continue through the work of the *LEGO Papert Professor of Learning Research* Mitchel Resnick and his colleagues through exploration of ideas that lie at the intersection toys, computers, and learning.

The children's programming language Scratch (http://scratch.mit.edu), developed by the Lifelong Kindergarten group directed by Resnick, also reflects the heritage of Logo. Scratch allows students to create new procedures that are added to the language just as Logo did. However, Scratch incorporates a web-based drag-and-drop interface that reflects today's mobile computing environments. At last count, students have developed and shared more than nine million Scratch scripts via the web, making this computing language one of the most important entry points for learning about computer science and engineering.

We are using both tools to advance work in the Commonwealth Engineering Design Academies. These are a series of laboratory schools that we established working in collaboration with the

School of Engineering and the Curry School of Education at the University of Virginia. Two schools, the Buford Engineering Design Academy and the Sutherland Engineering Design Academy, are using advanced manufacturing technologies such as 3D printers and computer-controlled die cutters to design and fabricate automata.

For example, the toy giraffe is a playful automaton designed by University graduate students collaborating with middle-school students at the Buford Engineering Design Academy. The figure was constructed using folded card stock fabricated with a die cutter. The crank-slider mechanism and gear were fabricated with a 3D printer. The automaton is driven by a LEGO motor controlled by Scratch.


Figure 4. An automaton fabricated using a 3D printer and a computer-controlled die cutter.

Providing students with these kinds of design opportunities can give them a great feel for movement and the mechanics involved in machine processes. These automata also do a superior job of demonstrating systems thinking with input, process, output, feedback, and control.

The automaton shown in Figure 5 uses a LEGO motion sensor to detect when a hand approaches it and then uses a LEGO motor to activate the automaton. A Scratch program, shown in Figure 6, waits until the gap between an approaching object and the motion sensor registers a value of less than 50, and then rocks the snake forward and back again.
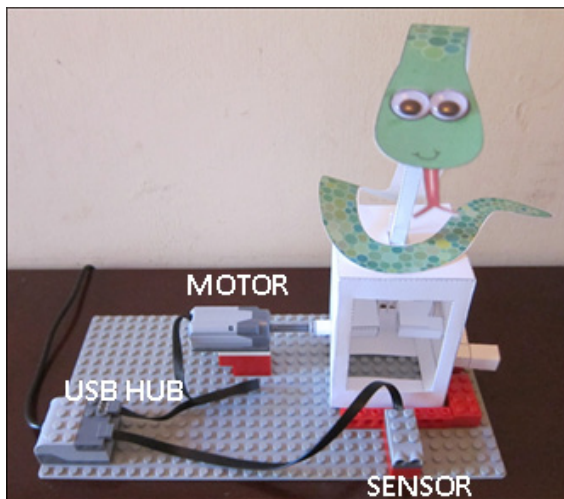
Figure 5. An automaton that uses LEGO motors and motion sensors to interact with children
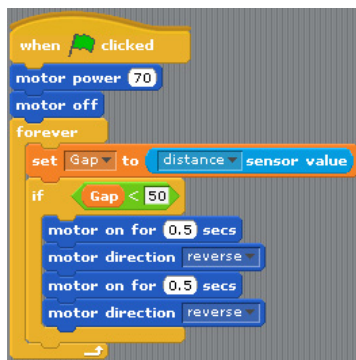
Figure 6. The automaton is controlled by Scratch.

The version of Scratch that controlled the automaton was installed on a Raspberry Pi computer. This computer, available for $25, is the size of a credit card, making it accessible and affordable. Papert's vision of (at least) one computer per child may have seemed like a fantasy in the 1960s when the least expensive computers were hundreds of thousands of dollars. However, it is now clearly within reach, as computers become smaller and even more affordable in the future.

Papert's Reflections on His Heritage

In 2005 we invited Papert to publish an article reflecting on the impact of his work. The entire article, published in *Contemporary Issues in Technology and Teacher Education*, can be accessed here:

http://www.citejournal.org/vol5/iss3/seminal/article4.cfm

In that article, Papert offered the following thoughts:

> There is a direct line of descent from 'Teaching Children Thinking' via my 1980 book, *Mindstorms: Children, Computers and Powerful Ideas,* to the launching by LEGO of its robotic construction system named LEGO® Mindstorms ™, which has now introduced millions of children to programming along the lines described in 'Teaching Children Thinking.'
>
> "In my model of change, the importance of this is that it gives another degree of depth and concreteness to the idea that simple elements of engineering and of computer science are relevant in the elementary school." Papert, S. (2005). You can't think about thinking without thinking about thinking about something. *Contemporary Issues in Technology and Teacher Education, 5*(3/4), 366-367.

Papert also noted that just as new ideas must be reconstituted to fit the child's mental structures (a process that Piaget termed "assimilation"), change in schools involves similar adjustments (i.e., "accommodation" in Piagetian terms). Papert offered the hopeful observation that the kinds of accommodation foreshadowed in *Mindstorms* are beginning to occur in school environments.

There are indications that Papert may be correct. A rationale for the increased emphasis on real-world connections suggested by Papert's vision can be found in the Next Generation Science Standards (NGSS 2013). These standards call for increased integration of engineering in science teaching, both to provide context through real-world examples incorporating science principles, and to provide students with useful workforce skills. The *Framework for K–12 Science Education* (NRC 2011) on which the standards are based concludes that this will "provide opportunities for students to

deepen their understanding of science by applying their developing scientific knowledge to the solution of practical problems."

The work in engineering design academies described above builds on this rationale. These schools were constructed with support from the National Science Foundation, planning support from the Commonwealth of Virginia, and funding contributed by local government. Support from all three levels of state, national, and local government reflects increasing commitment to this type of work in schools. This example has been replicated at many other sites across the nation, suggesting that Papert's hope that schools may be at the beginning stages of assimilation and accommodation may be correct.

If this proves to be the case, these continuing advances will be built upon theoretical insight and applied practice in schools begun by Papert nearly fifty years ago. These activities provide excellent scaffolding for the study of systems thinking and engineering design while also allowing for student creativity and expression, both powerful motivators for all learners.

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Glen Bull is a Professor of STEM Education and co-director of the Center for Technology and Teacher Education in the Curry School of Education at the University of Virginia.

Gina Bull is a computer systems engineer in Information Technology and Communications at the University of Virginia.

Both their personal and professional lives have been profoundly influenced by a lifelong engagement with Logo.

Current Logo Links

Microworlds
http://www.microworlds.com

Terrapin Logo
http://www.terrapinlogo.com

NetLogo
https://ccl.northwestern.edu/netlogo

Scratch
https://scratch.mit.edu

TurtleArt
http://turtleart.org

Kinderlogo
http://www.kinderlogo.com

Logo Resources

The Logo Foundation
http://www.logofoundation.org

Gary Stager
http://www.stager.org/logo.html

Recurring Logo-related Activities

The Logo Foundation
http://www.logofoundation.org/summer

Constructing Modern Knowledge
http://constructingmodernknowledge.com

Logo-Related Products

LEGO
http://www.lego.com/en-us/mindstorms

GoGo Board
http://www.gogoboard.org

Logo: Smiles, Sadness, and Hope
by Dennis Harper

I just finished reading a few issues of the *International Logo Exchange* that I used to put together with the help of Tom Lough. The people, places, and dreams of those early days can't help but put a smile on my face. Unfortunately, it also brings on the sadness of lost possibilities for millions of students who have not benefited from this wonderful learning environment.

With a Ph.D. in International Education from the University of California, I spent much time researching Logo's effect on teaching and learning throughout the world. My dissertation compared Logo using teachers in Malaysia, Senegal, and Los Angeles. I wrote a book in 1989 entitled *Logo: Theory and Practice* that contained input from many of the *Logo Exchange* authors, along with reflections on my work in countries like Russia, Bulgaria, Brazil, Australia, Malaysia, Singapore, Costa Rica, and the Netherlands. I remember my wife escorting me to a hot and humid room in Malaysia and telling me not to come out until the book was finished…yes, the smiles.

After the Smiles

But then the sadness...Seymour Papert's tragic accident, the demise of the *Logo Exchange*, the advent of *No Child Left Behind*, and the corporate takeover of education all contributed to the decline of Logo implementation in the schools.

NCLB, in my mind, was the major force that swung the pendulum from creating thinkers to creating test takers, at least in the US. Instead of programs like Logo providing students the opportunity to learn by doing and creating, the country moved to "common" core and "standardized" testing. Schools and teachers were now judged on how well every child could do the same thing in the same way and teachers' time was dominated by test prep.

Technology being integrated for discovery changed to technology prepping students for tests. Instead of students becoming mathematicians and thinkers by using Logo, students learned how to get answers to pass math exams.

About five years ago, Gary Stager and I surveyed the vendors at the national ISTE conference and found only a handful of them had products where students produced things with technology. The vast majority of vendors were producing products that did things *to* students: keeping them off the Internet, keeping track of their attendance and grades, providing test prep and practice, etc. Gary formed the Constructivist Consortium from the few vendors like LCSI that gave kids a chance to discover and create.

Companies that touted they could improve test scores flourished. Companies like LCSI and Terrapin didn't have a chance against the test makers, online tutorial/video producers, online courses, and large charter school groups aimed at increasing test scores. The more profits these companies make, the more they "convince" politicians they need more of the same.

A dysfunctional Congress and president seem incapable of seeing through the phony "reform" efforts touted by big business and remembering what made America powerful – the creativity of its people. Being common and standard is not why Americans went to the moon, invented the Internet, and created the iPhone.

FD to Hope

Although these developments are discouraging, there does seem to be some movement of the pendulum. Creative billionaires like George Lucas fund Edutopia and pledge to increase spending on project-based and constructivist education. The Buck Institute of Education is moving forward with a research agenda aimed at Project Based Learning (PBL). Teachers are beginning to balk at too many high-stakes tests; the Common Core State content standards and practices are giving lip-service to using technology in constructivist ways to improve the way students learn.

So what can we do? Fifteen year ago I founded a nonprofit called Generation YES based on two pillars: (1) constructivist projects and (2) student technology leaders. I believed that a major impediment to widespread Logo implementation was that it was too focused on preparing overburdened teachers.

Today, matters are even worse. Teachers are accountable for what happens to test scores and there is little time for anything else.

The Generation YES model gives equal weight to the 92% of a school's population that are not teachers or staff – the students. Today's students have the smart phones, video games, social networks, etc., that make them much more tech savvy now compared to the *Logo Exchange* days. Just maybe, they can see the value of Logo and convince educators and the public of its capability to truly reform education.

Check out this rare video by Seymour Papert where he talks about Generation YES's combination of technology and "kid power" — http://vimeo.com/9473209.

Kids may be our future but they are also here now. Check out http://www.thefivethings.org/dennis-harper/. History has shown that youth can change the world. All it takes is leadership…and Logo!

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Founder and CEO of the Generation YES Nonprofit Organization
http://genyes.org
360-528-2346

In Memoriam
Sharon Yoder Burrowes Moursund
(1942 - 2011)

When Sharon wrote her first *LX* article for the April 1983 issue (with help from her young son, David), I knew we had a "live wire" with a strong connection to the real world classroom. This was followed by a second article in the January 1984 issue, with others appearing later.

She was born of German-Irish parents and grew up on a Wooster, OH, farm. With a BA in mathematics and a MS in education, as well as a burning interest in computers, she came upon the Logo scene at the perfect time! She was fun to work with, and took deadlines seriously, which I came to appreciate! After several years in the Wooster school system, she worked for LCSI for a short time, and then moved to Oregon.

By the summer of 1987, she was well established at the University of Oregon in Eugene, and helped to manage the transition of the *Logo Exchange* from Meckler Publishing to the International Council for Computers in Education (ICCE) Logo Special Interest Group (SigLogo).

She served as the *LX* editor-in-chief for eight years, the longest tenure of any others. Under her leadership, the journal expanded its coverage and incorporated the efforts of many colleagues. She taught university courses and wrote a number of books on educational technology topics, many in collaboration with her husband, David Moursund.

I remember her as a caring person, a passionate teacher, and an enthusiastic Logophile! Her strong-willed determination always found a way to meet any challenge she tackled. Knowing her and working with her was a delightful experience. I appreciate all that she did to nurture the *LX* and to bring it into full maturity as a refereed journal.

I miss her, both as a friend and as a colleague.

Tom Lough

Then and Now:
The More Things Change, the More They Stay the Same
by Dorothy Fitch

What a privilege it is to be part of this endeavor. I was very pleased when Tom Lough called me to tell me about his project of scanning every issue of *Logo Exchange* (*LX*) and posting them on the Logo Foundation's website. He asked me if I were on board with that concept. Recently, he asked if I, as a former *LX* editor, would write up some reflections about *LX* and Logo and their impact on my life.

Browsing through the *LX* journals that are now on the web, I realize what a great resource they are, and a trip down Memory Lane for me. The familiar names of so many great Logo educators and their enthusiasm for Logo, creative and powerful ideas, and desire to share their work brought back a flood of memories. The ever-improving technology was also interesting to note, from the most basic layouts of early issues, to the more recent polished journal presentations. Remember when we all had long, numeric e-mail accounts at CompuServe?

My career has taken me in various directions, but never far from Logo. I feel as though my life has now come around full circle. You'll see how that happened below.

So how did I get started with Logo, how did I contribute to *LX*, what have I been doing since then, how has Logo returned to my life on a daily basis, and what *LX* has done for me lately?

Starting out with Logo: 1980-1997

My Logo days started in the early 1980s, while I was an elementary school music teacher in Nashua, NH. I taught myself Logo when the school got its first computer—a 48K black-and-white Bell & Howell clone of an Apple II.

I collaborated with a first grade teacher to develop a set of single-keystroke Logo activities in five levels that were appropriate for her young learners. Thus was born *Kinderlogo*, published in 1984, first by Krell Software, then by Terrapin Software.

After eight years of teaching music and getting more and more involved with computers, I took a leave of absence to start Microschool, a small five-computer classroom in Merrimack, NH. I gave workshops to teachers and taught Logo (and other things) to kids, and developed computer education curricula for several school districts.

My favorite Logo-related story from those years was when a local police detective knocked on my door. He said that a bus driver had overheard a student talking about how he was learning how to break into computers at my little computer school. What the boy was referring to were the Logo input commands I was teaching him, well before the days of passwords being so ubiquitous.

The Logo print statement was: [What is your password?] An input command accepted a word and the result was compared with the stored value. It was a simple programming lesson.

I explained this to the detective and told him that our computers weren't even connected to the outside world. Fortunately, the detective understood what I told him and, in the course of our conversation, we figured out that we had gone to junior high school together. No harm done, and a great story.

The publication of *Kinderlogo* led to my being offered the position of Director of Product Development at Terrapin. What a wonderful job!

My LX Days: 1989-1997

My "official" *Logo Exchange* days started in September of 1989, when Sharon Yoder, then Editor-in-Chief, invited me to become a Contributing Editor and to develop a "Beginner's Corner" column. I did this through the summer of 1995, and loved it. I am glad to see that these pieces have recently been put to use, as you will see later in this article.

In the Summer 1995 issue of *LX*, Sharon wrote her farewell editorial, and I was introduced as the new Editor-in-Chief. I served for the next two years, and thoroughly enjoyed working with the contributing editors, reviewing manuscripts that were submitted, and sharing all that Logo can do with the *LX* community.

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During this time, I was also Director of Product Development at Terrapin Software (1987–1997). It was the best "work" I could imagine. Every day was spent working on projects that facilitated the use of Logo and communicating with Logo users from around the globe. I met so many amazing Logo educators, some only by e-mail and telephone. I attended many Logo conferences where I met even more. They all made me think of new possibilities with Logo.

After LX: 1997-2008

All good things must come to an end, and after my work at Terrapin and *LX*, I was introduced to a company that made assistive technology hardware and software. I started writing user guides and ended as Vice President of Software Development. A former colleague from Terrapin brought me into the company, and later another one joined us. So Logo was still in the air.

We developed assessment software for students with significant special needs using Director software from Macromedia (now an Adobe product). Its scripting language, Lingo, was Logo's first cousin, perhaps even its sibling. With just a few syntax differences, Lingo was a snap to learn. Additional multimedia capabilities made it a pleasure to use. When the business was sold in 2008, the software division was not part of the new company's vision, so my job there ended.

Back to Logo: 2009-present

BK 100! (...to turn a Tom Lough trademark phrase)

In 2009, my retired husband and I moved from New Hampshire to Sahuarita, Arizona, just south of Tucson. I had been out of work for over a year, but found a position at the local primary school. The school had just installed a computer lab and I was its first teacher. What fun it was to design a curriculum for over 700 K-2 students! I saw 30+ classes each week for a half-hour and had the flexibility to do essentially whatever I wanted with the students.

Of course, the first thing I did was request money to purchase Logo. I then set out to rewrite *Kinderlogo* for Terrapin's latest version of Logo. Having 700+ testers during its development was invaluable! Terrapin republished *Kinderlogo* in 2011. From

1984 to 2013…that's a lifespan of a software product of nearly 30 years!

Kinderlogo now has its own website, www. kinderlogo.com, which describes the activities and presents a gallery of pictures created by my students and those in other schools. Users do not need Logo installed to use *Kinderlogo*, as it uses its own runtime application. Last year, I had a fun Skype conversation with third graders in New York who wanted to show me their creations and suggest ways to enhance *Kinderlogo*. A recent question as to whether one could import a background picture, such as a map, into *Kinderlogo* led me to think of more fun activities to do with my students.

In addition to *Kinderlogo*, we also used Bee-Bot robots (from Terrapin Software), which the students love to program. This latest version of the floor turtle was very engaging and they loved spending time with Bee-Bot. I created custom mats so the students could direct Bee-Bot to pictures of local birds, dinosaurs, and musical instruments. Read more at: http://doc.terrapinlogo.com/doku.php/stories:sahuarita_primary_school

And the second graders loved *Crystal Rain Forest,* also produced by Terrapin. This Logo adventure is at the upper limit of their capabilities, so most need some help along the way. It took 4 to 5 weeks to complete, but they got through it, and then wanted to start it all over again!

In addition to Logo and robots, we loved to explore science using different technologies. A grant allowed me to purchase a weather station for the school. Students recorded the temperature, wind speed, and rainfall twice daily and we looked at trends. We could see current weather conditions online at http://www.weatherlink.com/user/spsweather. We also monitored an eagle nest via a web camera in Iowa. In the spring, after the eggs hatched, we checked the chicks each week and watched them as they grew.

I created a website so that students can show their parents what they did in the computer lab and access their favorite activities on the web from home. Google **SPS Fitch** to find the site.

When periodically given the opportunity to do any activity they did all year, a great many children still chose *Kinderlogo*.

After running the computer lab for five years, I have recently retired. The one thing that almost prevented me from retiring was not being able to watch these young students explore and learn with Logo. However, I have put together a booklet of 52 ideas for using *Kinderlogo* with young learners as a way of providing these additional learning opportunities. You can download a copy of this booklet free from www.kinderlogo.com.

What Has LX Done for Me Lately?

In the process of writing this article, I looked through the years of *LX* issues posted online. I rediscovered some great ideas that I would like to try with students.

- Students make quilt pieces of a specific size that I can print out, "stitch" together, and hang on the wall [Quilts: November 1990. Vol. 9, No. 3, page 4].

- The cover of the May 1991 issue had dinosaurs drawn by second graders using Logo. And at that age, they do love dinosaurs! What a fun project for them.

- Even though we rarely see snowflakes here, the "Snowflakes" article I wrote more than a decade ago has inspired me to try it again this year [Winter 1991/92, Vol. 10, No. 2, page 8].

- Ihor Charischak's article "Hundred Board Patterns" [Spring 1996, Vol. 14, No. 3, page 7] is an activity that was definitely valuable for my first graders. They explored number grids up to 100 in their classrooms, and I adapted the Color Grid activity in *Kinderlogo* to be 10x10. Then they were able to explore patterns made by filling in various number patterns as they count by 2s, 3s, 5s, etc. We also used the 10x10 grid to explore multiplication concepts with second graders. Thank you, Ihor!

- I had forgotten about my "Flags of the World" article [Winter 1992/93, Vol. 11, No. 2, page 7]. This is a great activity for students at Level 4 in *Kinderlogo*. Here,

they can fill areas with color as well as pick up and put down the turtle's pen. They could use Google to look up a country's flag that was simple enough to draw in *Kinderlogo*.

In closing, I would like to thank Tom Lough and Michael Tempel for making these wonderful resources available. I am grateful to Sharon Yoder, who initially invited me to be a part of *Logo Exchange* and shared her experience and advice during my years as editor. I was very sad to hear of her passing in 2011.

I also appreciate the support of Terrapin Software for allowing me to include work on *Logo Exchange* as part of my job there. Finally, I thank my husband, John Munier, who has encouraged me every step of the way in whatever I chose to do.

I would love to hear from all my Logo friends. Please let me know what you have been up to!

Dorothy Fitch
dorothy@kinderlogo.com

The End?
by Gary Stager

The *Logo Exchange* has been an incalculable force for good in my life.

I began teaching Logo to children and teachers in 1982 and began reading *Logo Exchange* not long after its inception. Minutes after I arrived at MIT for my first Logo conference in 1985, I met Tom Lough. As a twenty-two year-old still scarred from poor high school math and science experiences, participating in a conference at MIT was pretty heady stuff. Tom could not have been more welcoming. Despite being different in many ways from other Logo aficionados, Tom's remarkable generosity of spirit made him a beloved leader of the community. This was no small feat. *Logo Exchange* somehow managed to serve the competing interests, egos, and radical agendas of the Logo community while nurturing readers interested in academic research, practical classroom ideas, and school reform.

Logo Exchange was the mighty small town newspaper serving educators around the world. Its quality, longevity, and impact are a testament to Tom's curiosity, work ethic, and remarkable ability to bring people together. Here, Tom continues in his role as Logo Land's beloved Justice of the Peace.

By the late 1980s, I had taught hundreds of Logo workshops for teachers in the New York/New Jersey region and presented papers about Logo at many conferences. Around that time, I began writing a regular column for *Logo Exchange* called, "Stager's Stuff." That column was my first foray into journalism, curriculum development and professional writing. I have since published hundreds of magazine articles, dozens of academic papers, innumerable blog posts, Logo manuals and a few books. Logo programming made me feel smart, and contributing to *Logo Exchange* helped me find my voice. I suspect many other contributors share that experience.

In 1990, my life was changed forever when I was invited to present a paper about Logo and scientific thinking at the World Conference on Computers in Education (WCCE). Presenting that paper would allow me to realize a lifelong dream of visiting Australia. Not long after arriving in Australia, a local academic named Jeff Richardson came looking for me. One of his graduate students, Garry Chapman, was to present his first academic paper at the same conference, on the same panel, and his paper was based on a *Logo Exchange* article of mine. Jeff wanted to make sure that I would be nice to his protégé. Jeff has been one of my closest friends ever since and I have also worked with Garry several times.

At WCCE I also met amazing kids and educators who were using personal laptops for Logo programming. They represented the closest thing any of us had ever seen to Papert's vision of a computer culture. Since WCCE, I was able to lead professional development at the world's first 1:1 "laptop schools," earn a Ph.D. from the University of Melbourne, and make more than fifty trips to my second home "Down Under."

To Edit

Being asked to become Editor-in-Chief of *Logo Exchange* (1997) is one of the great honors of my life. Although Tom somehow found a way to pay a small stipend to contributors while he was self-publishing *LX*, there was zero pay and no production budget once the International Society for Technology in Education took over.

Leading *Logo Exchange* was truly a labor of love that I am extremely proud of. Although the publication frequency was reduced, it became a peer-reviewed journal. We worked hard to serve the diverse interests and passions of the Logo community. Peter Reynolds contributed fantastic illustrations, and Seymour Papert contributed the important essay, "[Looking at Technology Through School-Colored Spectacles](#)," I even commissioned Brian Silverman to write one of my all-time favorite meditations on learning and technology in "[What I Did On Three Summer Vacations](#) (illustrated by Peter H. Reynolds). It may be hard to believe, but *Logo Exchange* began publishing entire issues on the World Wide Web in 1997 — a development that ISTE resisted and most educational institutions would embrace only years later.

Although my memory is hazy about the details, I helped Michael Tempel and Marian Rosen organize a National Educational Computing Conference preconference event called Logosium, a one-day Logo conference co-sponsored initially by the Logo Foundation and ISTE's SIGLogo, featuring presentations and hands-on workshops. A total of nine Logosia were held from 1994 through 2002, with leadership passing from the Logo Foundation

to SIGLogo in 1998. Logosium was repeatedly the best-attended and most profitable preconference event at ISTE's annual conference. Seymour Papert attended the 1999 Logosium, an event held in Philadelphia while NECC was in Atlantic City. Festive bus rides became a staple of Logosium. Irvine hosted while NECC was in San Diego and the Atlanta Logosium was held at The University of Georgia in Athens.

The joy of editing *Logo Exchange* is tempered by being its last editor. Despite my flaws and imperfections, the simple fact is that ISTE lost interest in Logo and was no longer interested in publishing *Logo Exchange*. This was at a time when ISTE was going through leadership changes and engaged in a shift towards courting corporate sponsors more than powerful ideas. No explanation was ever provided for why ISTE eliminated our special-interest-group (SIGLogo) and its journal, *Logo Exchange.* After Tom's leadership of *LX* and the selling of the journal to two different organizations, it just seemed too hard to keep educational computing's longest-running publication viable.

Educational computing was now called edtech or ICT. Computing was a thing of the past. Despite the evidence that the Logo community (and *LX*) taught hundreds of thousands of teachers to teach programming, suddenly the goal of children programming computers, rather than being programmed by them, was dismissed as too difficult to do and unfashionable to discuss.

Clerical skills and web surfing were the new lower expectations set for children. Banal standards were used to sell a large range of products and services, while NECC (later the ISTE conference) became a giant trade show at the expense of scholarship or powerful ideas. The revolutionary energy and vision of the 1980s Logo community would be smothered by a much larger universe of tech directors concerned with buying stuff, compliance, and managing networks.

One look at contemporary conferences, magazines or journals about "technology in education" should leave any reader in agreement with Papert's assertion that the edtech community had become idea averse. Kid power and children programming computers were never great for industry but by the end of the 90s, they seemed extinct. Empowered

children and their teachers are less prone to buy canned products to cure whatever ails education at the moment. Kids writing their own software are less dependent on publishers. Shockingly, Logo, Papert, and the work of the Logo community have been all but erased from the books about learning and technology, most notably the textbooks used in teacher education programs.

To the Future

Logo Exchange may be dead, but Logo certainly is not. Millions of children create and collaborate in Scratch, a descendant of Logo. I still teach MicroWorlds and TurtleArt, plus various Logo-like robotics systems to kids and teachers regularly.

Those encountering Logo for the first time share the same joy and wonder kids did thirty years ago. Teachers who remember Logo programming from earlier in their careers or their own childhood are eager for it to return to their classrooms. The dream of "Mathland" and powerful ideas is alive and well, even if underground during the current draconian educational climate.

With the demise of SIGLogo, I created the Constructivist Consortium, a loose confederation of companies committed to creativity, children, and computing. Such an organization had never been created before or since. LCSI, FableVision, Inspiration, Tech4Learning, SchoolkIT, and Generation YES pitched in to support another half-dozen or so ISTE pre-conference events called Constructivist Celebrations. It was heartwarming to see market competitors helping teachers use each other's software tools. The Consortium fizzled out around 2013.

My Constructing Modern Knowledge institutes bring Logo and constructionist learning to more educators each year while my web site, The Daily Papert, introduces the wit and wisdom of Seymour Papert to a new generation. Our new book, "Invent To Learn – Making, Tinkering, and Engineering in the Classroom," makes a strong case for the seminal role Logo and its early advocates played in setting the stage for the contemporary maker movement. I still teach Logo (MicroWorlds EX, Scratch, Turtle Art, Snap!) several times per week in classrooms or workshop settings. Our publishing company, Constructing Modern Knowledge Press, creates print and digital books designed to support and inspire constructionism.

Constructing Modern Knowledge (now in its 8th year) fulfills a void Papert and I often discussed. We both believed that the educational technology community was not thoughtful enough about learning and our friends in the progressive education community had not given serious thought to modernity. There needed to be a venue where a bridge could be built between both worlds and allow adults to take off their teacher hats and put on their learner hats for four uninterrupted days of learning by doing with a mountain of objects to think with. The work I began with Logosium and The Constructivist Celebration has been supercharged at Constructing Modern Knowledge. I am indebted to my old Logo friends who form the basis of our amazing faculty — Cynthia Solomon, Dan Watt, Molly Watt, Marvin Minsky, Claudia Urrea, Edith Ackermann, Brian Silverman, and Artemis Papert. Legendary progressive educators, including Eleanor Duckworth, Deborah Meier, Alfie Kohn, Lillian Katz, Lella Gandini, David Loader, Jonathan Kozol, plus jazz musicians, historians, artists, treehouse designers, astronomers, historians, and other great bricoleurs, have combined forces to help hundreds of educators embrace the power powerful ideas.

Going forward, my one major concern is that children and teachers still need powerful versions of Logo to serve as incubators of knowledge and vehicles for self-expression. The diminution of computing to the "app" level and corresponding devaluing of software development makes it incredibly difficult to develop Logo programming environments, with modern functionality, low threshold and no ceiling. We desperately need a Logo for Arduino, for example. If the Logo community fails to overcome this challenge, Logo may indeed die – not because it isn't great for kids, but because nobody will pay for it.

I am incredibly grateful to Tom for asking me to share my story and for his efforts to preserve *Logo Exchange* online. I hope this encourages many others to read the great issues and to tell their stories of what Logo meant to them and their students.

I, for one, can't wait to go BK 1000 and revisit all of the great issues that Tom has collected, scanned, and shared.

Gary Stager
gary@stager.org

Logo: A Springboard to the Future?
by Tom Lough, Founding Editor

Oh, what a ride we had with the Logo turtle! But is it over? Or is it just getting started? As Gary Stager suggested in his preceding article, *Logo Exchange* may be dead, but Logo itself is another story — at least we hope that is the case!

The seventeen-plus years of *Logo Exchange* issues make up a significant body of work, and I am grateful to the Logo Foundation for the opportunity to provide a PDF file of each of the 117 issues for the public. I am also grateful to the many colleagues and friends who made the whole thing possible. In this article, I would like to "bookend" the *Logo Exchange* experience with a perspective on the beginning, some comments about the journey, and then a perspective on the end. Hmm. In a sense, I suppose this article would be something like the Logo procedure in the editorial.

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TO LX
REPEAT 117 [PUBLISH]
END
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With that as an outline, let's begin!

TO LX

Back in the heady days of the early 1980s, technology was moving into the schools in exciting ways! In my high school physics classroom, I had been looking for a programming language to use, but could not find anything that seemed suitable. By the time I started graduate work at the University of Virginia, Logo burst onto the scene. As soon as **Glen Bull** and **Steve Tipps** introduced me to the concept of procedures, I was hooked!

My wife, **Posy**, was an elementary school teacher at the time, so it was relatively easy for me to imagine that teachers like her were going to need some additional help if they decided to use Logo in their classrooms. Thus was born the idea of a Logo newsletter for teachers. In the spring of 1982, I brought the idea to Glen and Steve, and asked them if they would write monthly columns. Once they both agreed, then it was up to me to get things rolling.

We discussed the name of the newsletter, and settled on *National Logo Exchange*, because it suggested an exchange of information among Logo users, exactly what we wanted to promote.

In May of that year, I heard that *Byte* magazine was planning a Logo issue. I called them up to see if I could send a notice about our newsletter, and they said they had one column inch remaining on their "Clubs and Newsletters" page. If I could get them my text within 24 hours, they would include it!

Fortunately, the post office had just recently started their overnight express mail delivery. I remember so well composing the five lines, putting them in an envelope, and racing to the post office, arriving just before it closed! By a margin of five minutes, I managed to get the information there in time. We lucked out with a tiny notice in the August 1982 Logo issue of *Byte* magazine, and that made all the difference in the world!

When the *Byte* Logo issue came out, it included our notice, and we eagerly awaited out first subscriptions. But then, reality set in, and we realized that we were going to have to publish something as well! With columns from Glen and Steve, I felt I could write a few other features and fill up eight pages with interesting and helpful Logo information. We selected FORWARD 100 as our motto, to reflect our enthusiasm for Logo and its potential in education. We wanted to press on in a FORWARD direction with our efforts to bring Logo to a position from which it could influence our children and to give 100% support to teachers and parents. We peppered everything with FD 100!

But, if this was to be a newsletter for teachers, then I wanted to celebrate teachers in it! My heart's desire was to have an article by a teacher for the lead of each issue. But how to do that for the first issue? In another miracle, there arrived in our July 29 mail a letter from a fifth grade teacher in Round Rock, Texas, named **Linda Nix**. She said that she had heard about our Logo newsletter from Theresa Overall at the Lamplighter School in Dallas, and decided to write an article about her classroom experience with Logo! Amazing! And just in time!

We positioned her article in the upper right column of page 1 of volume 1, issue 1, cranked up the dot matrix printer, and we were all set!

PUBLISH

I remember going over to X-High Graphic Arts for the printing of our first issue. After the printer had installed the plates on the press and had loaded in the ink, he turned to me and asked, "How many copies do you want?" At that point, we had exactly 12 paid subscribers, so I blurted out, "Print one thousand copies!" As it turned out, later subscribers were very interested in our back issues, and we sold just about every one of those thousand copies!

Soon, we were joined by others who believed in the *NLX*, an affectionate acronym it quickly acquired. Teachers, parents, and interested others began sending in articles. In the April issue, **Sharon Yoder (Burrowes)** made her first appearance as an author, not knowing that an exciting period of editorial service was waiting in the future for her.

For our second year, we "graduated" from a dot matrix to a daisy wheel printer. This gave a much cleaner and more readable look.

We also began expanding our features. **Robs Muir** proposed a problem-solving column that we nicknamed **NLXual Challenges**, with a first appearance in the November 1983 issue. Robs' fascinating problems provided us with curiously engaging questions for several years.

In April, 1984, **Griff Wigley**, one of our very first subscribers, began a series of columns in which he reviewed various Logo products and provided a lectionary of Logo readings. With tongue in cheek, we dubbed his column the **NLXionary**. Well, no one complained or groaned too loudly, so I guess we got away with it!
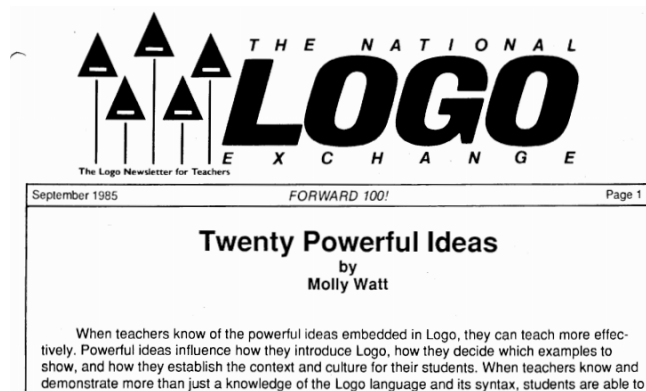
Starting with the September 1984 issue, we changed our masthead again. This was the first time we used the "five turtles" graphic, which became a fixture in the following years.

THE NATIONAL LOGO EXCHANGE
Volume 3 Number 1 · FORWARD 100! · September 1984

LOGO and DOS: Classroom Partners by Nancy Parks Sopp

NLX went international! **Hillel Weintraub** joined us from Japan with a column called **Ma-e 100**, which was Japanese for FD 100. He reported on Logo activity in the Land of the Rising Sun. In the same issue, **Barbara Elias** joined us with her column featuring dissertations based on Logo, and **Jim McCauley** made his first appearance with his popular **Q & A** column. Also, the **Teacher to Teacher** review column began, featuring **Ann Cairns Federlein**, **Jim Fry**, **Lou Wichert**, and **Regina Bowden** at various times.
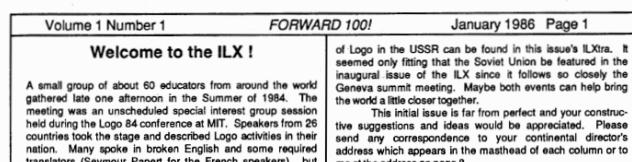
Then, in the October 1984 issue, **Donna Lanyi** and **Jane Toth** began their well-received column, **TurtleTips**, designed especially for beginners. Things were popping!

Then, suddenly with the September 1985 issue, we turned the corner! Over the summer we had invested in one of those brand new Macintosh computers along with a new type of printer — called a laser printer(!) — and a layout software called *PageMaker*. Wow! We were uptown!

THE NATIONAL LOGO EXCHANGE
The Logo Newsletter for Teachers
September 1985 · FORWARD 100! · Page 1

Twenty Powerful Ideas by Molly Watt

When teachers know of the powerful ideas embedded in Logo, they can teach more effectively. Powerful ideas influence how they introduce Logo, how they decide which examples to show, and how they establish the context and culture for their students. When teachers know and demonstrate more than just a knowledge of the Logo language and its syntax, students are able to

Also, **Rebecca Poplin** began a new column called **Teacher Feature**, which highlighted the work of a selected Logo teacher each month.

We began negotiating with **Dennis Harper** to take on editor-in-chief duties for a new *International Logo Exchange (ILX)* publication starting up in January 1986 and featuring Logo activities all over the world.

The International LOGO EXCHANGE
The Newsletter for Logo Users Around the World
Volume 1 Number 1 · FORWARD 100! · January 1986 Page 1

Welcome to the ILX !

At the Logo 85 conference at MIT, Dennis and I recruited a team of five international editors: **Horacio Reggini** (Latin America), **Anne McDougall** (Australia), **Hillel Weintraub** (Asia), **Richard Noss** et al. (Europe), **Michael Friendly** (North America), and **Fatimata Seye Sylla** (Africa). Although the *ILX* was published as a separate newsletter for only one year before being folded into a larger *Logo Exchange* magazine format, it quickly established itself as the leading comprehensive source of Logo information around the world.

In the spring of 1986, Meckler Publishing offered to purchase the *NLX* and *ILX*, and combine them into a magazine or journal format called simply *Logo Exchange*. Since the size of the operation by this time was quite challenging, we accepted the offer, and I agreed to stay on as editor for a year. Starting with the September issue, we enjoyed a larger, more comprehensive format.

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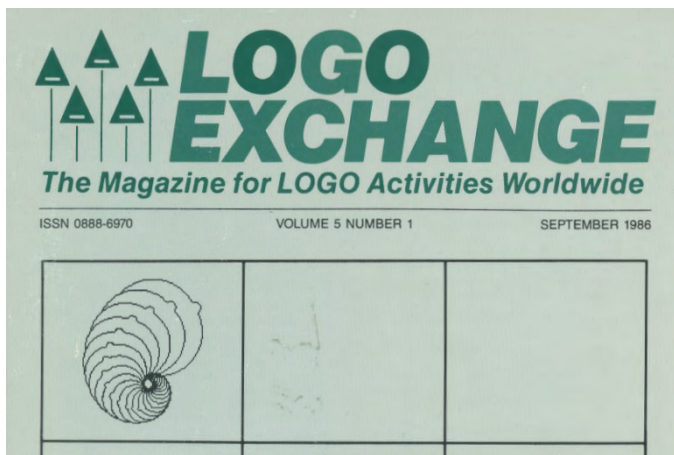
We revised our beginner column by adding in veteran elementary school teachers **Elaine Blitman** and **Barbara Jamile**.

Judi Harris enriched the pages of *LX* with her new column, **Logo LinX**, which provided links for Logo into the various curriculum areas, and **Sandy Dawson** debuted his new **MathWorlds** column.

Glen Bull and **Paula Cochran** introduced their **Special Talk** column for Logo users and special education applications. **Douglas Clements** started up a column called **Testudinal Testimony** that reported on academic research related to Logo.

Linda Sherman began offering a Logo cartoon featuring two turtles, Jacques and Elsie, and invited *LX* readers to submit captions for the cartoon frames. (If I remember correctly, we selected the turtle names to correspond to the two main Logo companies of the day, Terrapin Logo and LCSI.)

Barbara Randolph took over our Logo Penpal program and set up a **LogoPals** column to communicate with participants.

All in all, the 48-page September 1986 *LX* issue was a wonderful culmination of the work of many people, with the masthead listing 23 contributors.

After hosting a successful East Coast Logo Conference and a year of publishing, unfortunately Meckler did not view the *LX* as a viable commercial interest and passed it over to the International Council for Computers in Education (ICCE), which later became the Society for Technology in Education (ISTE). ICCE/ISTE published all subsequent issues as the official journal of the Logo Special Interest Group (SIG). By then, I knew it was time for new editorial blood to come on board.
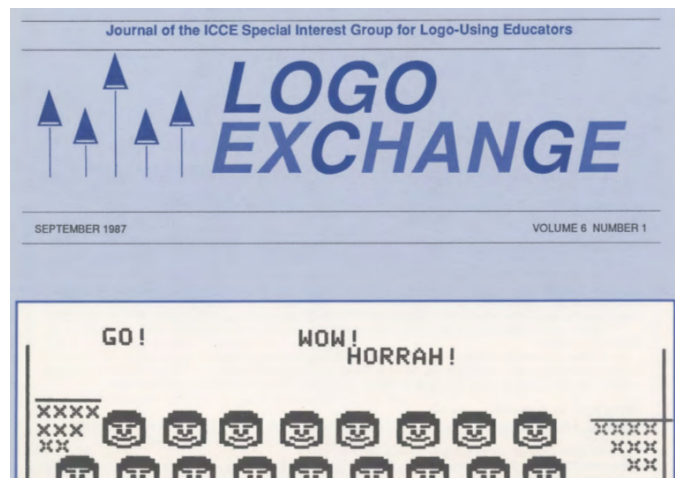
Sharon Yoder Burrowes agreed to take over as editor, and I stayed on as "founding editor," with the opportunity to write a monthly contribution. **Steve Tipps**, having written his acclaimed **Tipps for Teachers** column for five years, decided to move on to other professional opportunities.

As the official journal of ICCE/ISTE and under Sharon's leadership, *Logo Exchange* began a period of stability. More features and columnists were added, along with the interchange of information with ICCE/ISTE.

Special note: Sharon served as the *LX* editor from September, 1987, until the summer issue of 1995. She passed away on September 15, 2011, and is greatly missed by her family and her Logo community members. Thank you, dear Sharon, for your enthusiasm, your energy, your passion, and your dedication.

Dorothy Fitch took over the editorial reins with the Fall 1995 issue, bringing with her a wealth of Logo experience from her teaching and her work at Terrapin.
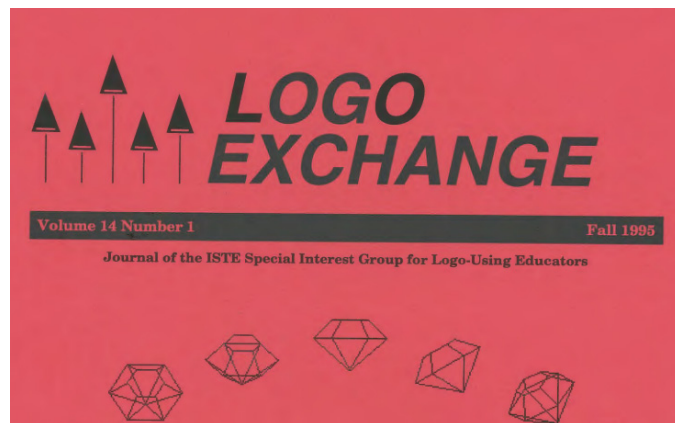
The Summer 1996 issue marked the end of a long series of columns by **Glen Bull**, who had been joined at various times by **Paula Cochran** and his wife, **Gina**.

With the Fall 1997 issue, **Gary Stager** became the editor-in-chief. His international experience and his passion for Logo propelled the publication into exciting directions.
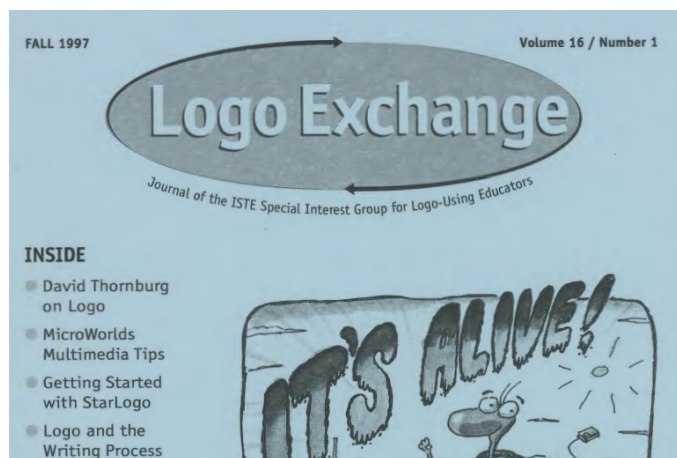
With the beginning of the 1999 school year, Gary began the celebration of *LX*'s 18th year and announced plans for expanding the *LX* even more. Unfortunately, the untimely dissolving of the Logo SIG brought to an end the publishing run.
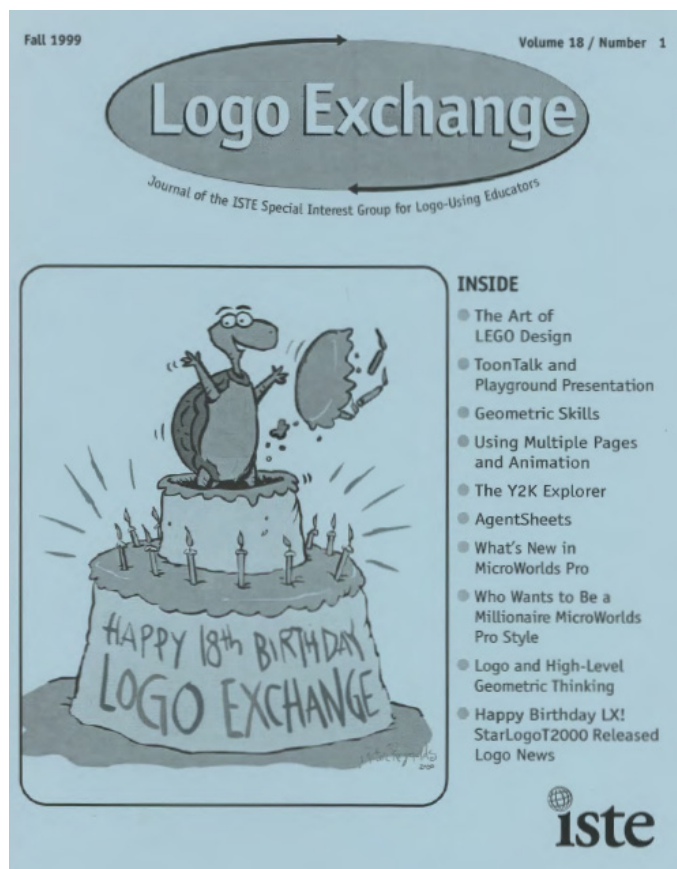
END

Now, wait a minute! Even though END is used to signal the end of a procedure, I'm not at all sure that it should be used to signal the end of the *LX*. Oh, sure, we REPEATedly PUBLISHed for 117 issues. But, instead of the END, I would like to suggest that it signalled the BEGINNING of something else.

I believe that the *LX* has served as a springboard for new and exciting developments for Logo and for educational technology in general.

What can I offer in evidence of this wild claim? Well, for one thing, in an attempt to sketch out the breadth and depth of the influence of Logo, we could do a sort of "Where Are They Now?" type of exercise. Here are just a few of the many examples for some of the *LX* columnists and article authors from back in the day.

Glen Bull and his research group at the University of Virginia are at the forefront of the digital fabrication movement, bringing his project-based perspectives to the game.

Dennis Harper is the founder and CEO of GenYes, an organization dedicated to students as technology leaders and as trained assistants to teachers.

Gary Stager is a defining leader of the maker movement, and travels the world to present exciting keynote presentations and workshops. His recent book, co-authored with Sylvia Libow Martinez, clearly shows the impact of Logo on his life.

Judi Harris, one of the more prolific of the *LX* columnists, is now a faculty member at the College of William and Mary, where she is at the forefront of a number of educational technology initiatives.

Take a look at the many, many others listed on page 24, but the point is that members of the original Logo community from the *LX* days now occupy positions of leadership throughout educational technology organizations today. Through these leaders, I believe that the spirit of Logo, the child-centered heartbeat of the Logo philosophy, is alive and well. That gives me great hope for the future.

I realized that this concept could also be represented by revisiting the five turtles that adorned the *LX* masthead for so many years. Here, instead of traveling in a coherent arrangement and a definite direction, they appear to be on different pathways on an interesting topology, spreading their Logo ideas wherever they go. (You might also have remembered this from the front cover and masthead of this issue of *LLX*.)
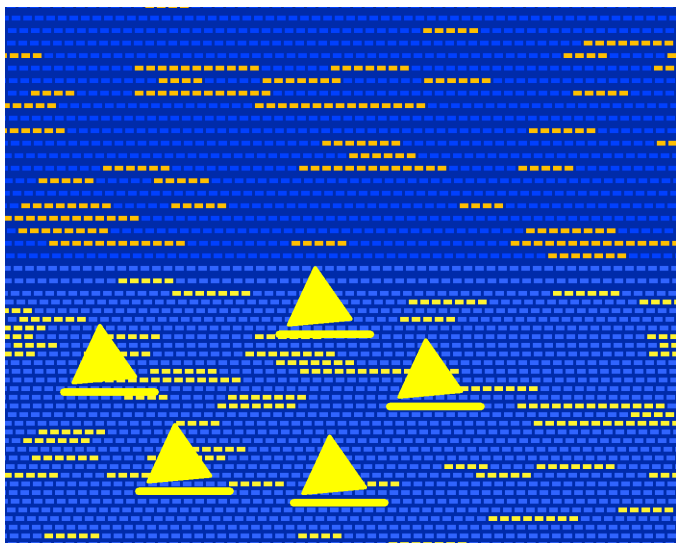
This beautiful graphic is courtesy of **Artemis Papert**, Seymour's daughter, who made a requested revision to the July design of the 2014 TurtleArt calendar (shown above). If you haven't played with [TurtleArt](#) yet, try it! I think you will like it!

And In Closing

In closing this, my final *LX* article, I would like to finish as I began back in 1982, with a reference to a teacher — but not just any teacher. I'm talking about the very same teacher we featured on the front page of *NLX* Volume 1, Number 1: **Linda Nix!**

In a recent trip to a conference in Texas, I took a few extra days for visiting around. I was able to find Linda and to meet with her! What fun to sit down and talk about an event that took place more than 30 years ago to get the very first issue of the *NLX* out the door, and everything that happened since then!

Linda is now retired from teaching but stays busy with service projects. It was delightful to spend some time with her at last!

Meeting in person for the first time in January 2014 Linda Nix (l.), retired Round Rock, TX, elementary teacher, and Tom Lough (r.) hold a copy of the first issue of the National Logo Exchange newsletter published in September of 1982. An article by Nix was featured on the front page. Photo courtesy Tom Lough.

I also want to thank my dear wife, **Posy**, for the many hours of help she provided in the *LX* office back in the day. None of this would have happened without her, I assure you. She was assisted by a small but dedicated and enthusiastic office staff that we appreciated so much. On the next page, I thank the many colleagues who were so generous with their writing and programming talents, and whose articles and columns made each *LX* issue so special. Without them, there would have been no *LX*.

With that, dear readers, I close my final article in this *LLX* issue. I would like to thank from the bottom of my heart everyone who contributed in any way to the *NLX*, *ILX*, and *LX*. Because of your collective efforts, we have this body of work to offer today. Additionally, I thank all of our earlier subscribers, all of our current web readers, and the Logo Foundation. Through the efforts of everyone together, we have not only experienced a remarkable journey, but have made a difference for students and teachers along the way.

Let's keep our next motto in mind as we address the future.

EVER FD!
Tom Lough
tom.lough@gmail.com

And in conclusion...

This *LLX* back cover is dedicated to those who made possible the 117 issues of *Logo Exchange* publication: the teachers, learners, enthusiasts, movers, and shakers who wrote the articles and columns. Here is a listing of those nearly 300 amazing contributors, in the approximate order they appeared during the span of publication. Thank you, dear colleagues, for your priceless service! You have touched the lives of countless thousands of teachers and students all around the world through your writing, and many of you continue to do so through your present-day activities.

FD 100 indeed! Tom Lough

Linda Nix, Steve Tipps, Glen Bull, Sandy Towberman, Elaine Blitman, Jay Sugarman, Bonnie Rifkin, Jim Fry, Sharon Burrowes Yoder, David Burrowes, Linda Razzano, Pat Reilly, Elizabeth Pearce, Shoneen Gervich, Nancy Sopp, Michael Burke, Jan Cardwell, Robs Muir, Lynne Mass, Andrew David, Duane Yee, Joan Rainey, Pat Stevens, Lois Tepper, Griff Wigley, Nola Sheffer, Cathy Frank, Hillel Weintraub, Kendall Young, Sue Mangiapane, Paula Cochran, Jason Gervich, Barbara Elias, Jim McCauley, Ann Cairns Federlein, Donna Lanyi, Jane Toth, Ihor Charischak, Mary Bonness, Regina M. Bowden, C. M. Chmielowski, Nancy Kovatch, Patrick Saisich, Lou Wichert, Cathy Frank, Robbie Wigley, Tony Stavely, Harold Nelson, Jan Cardwell, Michael Tempel, Mario Bourgoin, Leslie Thyberg, Mark Lindsay, Molly Watt, Rebecca Poplin, Joyce A. Tobias, Kathleen Nutting, Paul Lorentzen, Arun Keshap, Gayle Lawrence, James Hurley, Louise Robinson, Mary Lou Miller, Doris Schroeder, Margo Hirsch, A. J. (Sandy) Dawson, Marge Stouffer, Parnelli Sharp, Gail Lovely, Dennis Harper, Horacio Reggini, Anne McDougall, Richard Noss, Michael Friendly, Fatimata Seye Sylla, Ceil Humphreys, Judi Harris, Gerry Eddy, Dan Watt, Eduardo Cavallo, Patricia Dowling, Donna Nelson, David Chesebrough, Barbara Jamile, Douglas H. Clements, Barbara Hyink, Gary Stager, Charlotte White, Linda Sherman, Amparo Molina de Caviedes, Barbara Randolph, E. Paul Goldenberg, Bill Craig, Edwina Walsh, Ric Manning, Chuck Thompson, Peter Rawitsch, Michael T. Battista, Brian Silverman, David A. Smith, Uri Leron, Reinhold Wappler, Gina Bull, Ron Bierema, Ginny Nyahay, Johnny W. Lott, Eadie Adamson, Marie Balet, Lou DeLucia, Ken Johnson, Harry Pinxteren, Cara Garcia, David Moursund, Barbara J. Putnam, Cheryl Wissick, Carol Ganz, Jose Armando Valente, Charles R. McNerney, Donald T. Piele, Jim Noyes, Michael Katz, Theodore M. Norton, Howard A. Peelle, Jun-ichi Yamanishi, Jeff Richardson, Mel Levin, Joel Hillel, Celia Hoyles, Thomas Bannon, Judith Enz Clauss, Jandy Bird, Diane Miller, Rina Zazkis, Stan Burech, Linda Burech, Michael Muir, Judy Zeiter, James H. Wiebe, Malorie L. Wiebe, Joanne Ronkin, Jessica Kahn, Dorothy Fitch, Phil Firsenbaum, Charles E. Crume, Cleborne D. Maddux, Sue Eskridge, Chris Appert, Brian Harvey, Glenda Bentz, Jandy Bird, Kwok-Wing Lai, Mitchel Resnick, Lani Telander, Henri Picciotto, Richard Austin, Marie Tada, Rina Zazkis, Jim King, Frank Corley, Ralph Olliges, Helen Miller, Mark Horney, Paula G. Sarver, Bert Eliason, Mark L. Evans, Hazem I. Sayed, Jose Filipe Matos, Francisco Quesada, Mary F. Salter, Judith Menken, David Bell, Ron Hackett, Jane F. Kern, Susan Wells Rollinson, Judith Kull, Carole Rivera, Der-Thanq Victor Chen, Seymour Papert, Emily Myers, Teri McNee, Molly Kniffen, Chris Held, Janet Koske, Michael D. Moynihan, Eleonora Badilla-Saxe, Y. S. Give'on, Nitsa Movshovitz-Hadar, Rina Hadass, Orlando Mihich, Julie Sarama Meredith, David Rockwell, Paul B. Clark, Graham O'Neil, Robert Macdonald, Dan Robinette, JoAnn Karaffa, Hob Brown, Paul M. Wexelblat, Donna Rosenberg, George Trombley, Kay Matsushige, David Melman, John Gough, Nancy Flynn, John M. Sklar, Ken Large, Valerie Rosenthal, Elizabeth Early Feller, Marion Barfurth, Susan van Gelder, James Blodgett, Sandra Siu, Margie Mason, Kara Ryan, Ralph Olliges, Irene Smith, Mark Steinberger, Eileen Boyle Young, Jody McQuillan, David P. Kressen, Christine A. Johanek, Kathleen H. McClaskey, Kim Joyce, Todd Kent, Laura M. Halleen, Peggy Walkey, Jody Krupski, Chuck Friesen, Jim Muller, Kathryn A. Verzoni, Marian Rosen, Nan Youngerman, Diane M. Manuel, Robert M. Berkman, Manorama Talaiver, Michael Lipinski, Morton Goldberg, Robert M. Packard, Medhat H. Rahim, Donna Cutler-Landsman, Theodore Norton, Don E. Ryoti, Geraldine Kozberg, William J. Spezeski, Jenny Betts, David D. Thornburg, Carolyn Dowling, Alan Epstein, Pam Gibbons, Daniel E. Kinnaman, Robert Tinker, Fred D'Ignazio, Catie D'Ignazio, Donald Bourdon, Olga A. Tuzova, Mark Brown, Tracy Riley, Paula Don, Pamela E. Morgan, Bill Kerr, Michael A. Gelman, Nicola Yelland, Jennifer Masters, Adam Smith, Susan Ohanian, Martin Boyle, Gail Marshall, Ken Kahn, Vanessa Colella, Eric Klopfer, Bernard Newsome, A. A. diSessa, Bill Engel, Pat Greene, John Hayes, Stephen Costa, Uri Wilensky, Estella P. de los Santos, Barba Patton, Omar M. S. Hamed, Jason Farr, Damien Baum, Fred G. Martin, Patrick Mahaney, Alexander Repenning.