FORTH, ESPERANTO, and the Tower of Babel

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Abstract

Esperanto, a logical, efficient and expressive "engineered" language for spoken and written communication, celebrates its 100th anniversary this year. Millions of persons use it worldwide as an international, non-political second language.

Last year at this conference, I described the remarkable similarities between the development of this human language and the Forth computer language, and I extrapolated some messages for Forth's first century of growth. Esperanto activities touch upon Forth in computer-specific ways, as well. This year, I will focus in on issues including Esperanto as a "neutral" conversion language for computerized language translation, international computer exchanges in Esperanto, and the search for a Esperanto-friendly computer language which could be a version of Forth.

The Well-Known Tower of Babel Effect

The biblical description of the Tower of Babel paints a strong image which is applicable both to Esperanto and Forth. Noah's descendants, still one people, built this giant brick tower to celebrate their glory and to plant their permanent roots in the Plain of Babylon. God perceived that this proud people would gain power faster than sense of purpose. Perhaps sensing an early collision course with nuclear arms build-ups, biological warfare and acid rain, God instead gave them a variety of languages. Construction of the tower halted in confusion, the city became Babylon, the language impasse became babble, and the United Nations is still trying to get it together.

Many of us share a conviction that English is the new international language, although we would be quick to disqualify that variant which still enjoys a limited popularity in Great Britain. But either way, in much of the world's business, Spanish is more universal. Written Chinese has been used successfully across many languages and peoples for three thousand years, but from our central perspective in the United States we prefer to think of this as a foreign anomaly. (Not unlike the Metric system.)

Like Spanish, Chinese, Russian, and any kind of English, Esperanto has not become the universal second language, either. Despite significant advances in communications technology, the Tower of Babel remains a true obstacle. Most of the people in the world simply cannot talk with each other, or read each other's letters. But Esperanto is by far the best candidate for a true interlanguage. Compare. Esperanto is apolitical, is ridiculously easy to

learn compared to all comers and especially to English or Chinese, it makes efficient and consistent use of a limited base vocabulary and is nonambiguous in writing and pronunciation, it has had its advantages validated by millions of users for a century, and it has received the blessings of many experts and official organizations (several of which even have used it themselves).

Babbling Computers

The Tower of Babel Effect affects computers as well as people. In 1969, Jean Sammet published Programming Languages, the first comprehensive historical survey of the field. The cover illustration was a Tower of Babel with a ramp of spiralling computer languages, 117 of them! And that was before C, Forth, Pascal, and hundreds more which we, or at least some of us, know today.

Even more, the Tower of Babel Effect has been affecting the cross-product of computer language and human language. For example, BASICs vary significantly on different computers. And if you think English computer manuals written by Japanese can be confusing, imagine yourself modifying Japanese BASIC programs, of which there are many! I will not discuss variations within Forth; three days of prior talks should have accomplished that!

This Tower of Babel Effect has given grief to the artificial intelligence community. (The oxymoron, "Artificial intelligence," is itself an excellent example of these problems.) One of the original applications of artificial intelligence was language translation. Of these original tasks, many expected it would bear the earliest commercial fruits, but in fact it came in last. In retrospect, that's no surprise. To measure AI translator ability, phrases were translated from English to Russian, then back to English. Think about these sample runs. "The spirit is willing, but the flesh is weak," was returned as "The wine is good, but the meat is rotten." "Out of sight, out of mind," was returned as "Blind idiot." Computer precise, but also quite wrong.

Esperanto to the Rescue?

Here are some practical ways Esperanto is being used now, and some to think about for its second century.

Esperanto is already improving the above AI translation problem. The Dutch company BSO is translating between natural languages indirectly, through an intermediary layer of computerized Esperanto. Intuitively, one can imagine that the problem would be only two times the one for each complex and highly idiomatic language, rather than their cross-product, as only one table is required for each language, no matter how many others it is to be translated from or to. The BSO Distributed Language Translation project reports good preliminary results.

Esperanto currently has millions of users. Its literature includes about 10,000 book titles and more than 170 periodicals, published in over 40 countries. There are many Esperanto radio shows, and special Esperanto sub-

ject areas support their own periodicals and international meetings. Computers are one such topic. I have brought along an issue of Fokuso Internacia Komputado, a popular computer magazine published in Hungary. In it is information on east European microcomputers, alongside information from Silicon Valley and elsewhere. One theme is an Esperanto-based programming language. Although many are proposing a version of BASIC, I am rooting for a version of Forth which could be called Forto; in Esperanto, that means "strength."

Esperanto has been successfully taught to low-motivation users, much more quickly than other languages. For example, European Rotary Clubs have sponsored a joint summer camp for children, who couldn't converse between their four or five languages. In two to three weeks, all were jabbering in Esperanto.

In some NATO military exercises, a modified Esperanto has been used as the language of the "enemy forces." It was quickly serviceable, although perhaps not as much so as with the children mentioned above.

Construction of the South African national railway system was done using Esperanto to coordinate engineers and laborers otherwise unable to share their own English, Afrikaans, and various native languages.

For the future, I urge you to encourage the general offering of Esperanto as one of the foreign language options in American schools. This is where it could be most popular. What American student, having to learn some foreign language, wouldn't choose one which is four times easier to learn? At the same time, it teaches the fundamentals of most western languages. It introduces the interested user to an international community of pen pals, and takes one more step beyond humanity's Tower of Babel.

If humanity is again to speak one common language, would the God of the Old Testament still find it bad? The question is more than a theological one, and sense of purpose remains the key. Albert Einstein, somewhat more recently, said: "Technological progress is like an axe in the hands of a pathological criminal." And, of course, he remains right. Your highest priority, and mine, must be to re-focus a common, and wiser, sense of purpose.

Bibliography

The Tower of Babel is described in The Old Testament (Genesis 11).
An up-to-date brief, readable and even well-illustrated overview of the many
    computer languages, including Forth (pp.7-9, 105-107) and including Jean
    Sammet's famous 1969 "Tower of Babel" cartoon (p.68): Computer Languages ("Understanding Computers" series, Time-Life Books Inc., Chicago, 1986).
Programming Languages: History and Fundamentals, by Jean Sammet (Prentice-Hall, Englewood Cliffs, NJ, 1969).
Of the thousands of books and magazines published in Esperanto, there exist
    detailed accounts of the history and internal issues in the development
    of the language and movement. An excellent English-language book both

for content **and** for further references is: The Esperanto Movement, by Peter G. Forster (Mouton Publishers, London & New York, 1982).

There are many Esperanto specialty publications, including this popular international quarterly about computers: Fokuso Internacia Komputado (Komputista Grupo de HEA, Budapest, Pf. 193, Hungary 1368).

Hard to find, but a fine small book combining social, historical, and political information about Esperanto along with American-Esperanto and Esperanto-American dictionaries: Esperanto, The World Interlanguage, by G.A. Connor, D.T. Connor, Wm. Solzbacher and J.B. Se-Tsien Kao (Thomas Yoseloff, New York & London, 1948, 1959, 1966).

Pictures simplify learning Esperanto word roots for children and grown-ups alike. Try Praktika Bildvortaro de Esperanto, by Corinne Clarke and Ray Burrows (Oxford University Press, Great Britain, 1979).

Esperanto itself is easy to learn, and Esperanto organizations exist in most major cities. [Three additional Esperantists identified themselves from among the attendees at the 1986 Rochester Forth Conference.] I have brought a few introductory Esperanto brochures and will be pleased to share them with interested listeners.

For more information or to place U.S. orders for foreign publications, contact: The Esperanto League for North America, P.O. Box 1129, El Cerrito, CA 94530.