LEE: From Mike Shapiro again: "What comment do you have on the current trends in FORTRAN extensions?"

BACKUS: Well, I have some remarks on that in my paper. Not about FORTRAN extensions in particular, but about programming languages in general. I'm not in favor of any of them. I think conventional languages are for the birds. They're really low level languages. They're just extensions of the von Neumann computer, and they keep our noses pressed in the dirt of dealing with individual words and computing addresses, and doing all kinds of silly things like that, things that we've picked up from programming for computers; we've built them into programming languages; we've built them into FORTRAN; we've built them into PL/I; we've built them into almost every language. The only languages that broke free from that are LISP and APL, and in my opinion they haven't gone far enough.

LEE: John, thank you very much.

FULL TEXT OF ALL QUESTIONS SUBMITTED

BOB BEMER

How about a word on how long it took Sayre and Goldberg to pick up Best's section when he left?

M. A. BREBNER

With respect to FORTRAN, what do you consider was the best design decision, and what do you feel was the worst design decision?

DAVE DAHM

Why did you decide to put the variable being assigned on the left rather than the right of the "=" sign?
Where did the idea of the subscripted variable come from originally?

BILL DERBY

What language was used for your FORTRAN compiler, and how easily did it translate to the 704's successor?

KEN DICKEY

How were the bounds of your Monte Carlo simulation flow analysis (section 4 of compiler) arrived at (i.e., how did you bound your system)?

HAROLD ENGELSOHN

In the initial stages of planning, was there any conscious effort to allow for data processing as well as algebraic manipulation? If not, when were alphabetization capabilities, for example, added to FORTRAN?

Full Text of All Questions Submitted

AARON FINERMAN

FORTRAN, as you noted, was greeted without enthusiasm by a skeptical if not hostile audience. To what, then, do you attribute its rapid acceptance? Was it the ease of programming (compared to assembly language), efficient object code produced, or that it was simply the thing to do? As a (skeptical) manager at the time I have my perspective, but would like yours.

BERNIE GALLER

Bob Graham's early study (at Michigan) of the source code for FORTRAN showed that after the initial parse of a statement to determine its type, the original statement was passed to another module, and the analysis started over. Is this correct? Why wasn't information already at hand passed on to the next module?

HELEN GIGLEY

Why was the decision to check at the bottom of the DO loop made?
Why were the letters I through N designated for implicit integer variables?

JOEL GYLLENSKOG

Why was the decision made to remove blanks from the syntax? Why were key words rather than reserved words used?

RICHARD MILLER

What outside groups (i.e., outside of your design team) had influence in the design phase? Was it a pure IBM effort?
Comment: The optimality of DO loops as opposed to IF GOTO type loops has been seen since then in parallel processor software projects at Illinois. In particular in optimization phases.
The looping construct and the conditional construct—who wanted them, how much support was given by the hardware?

ROGER MILLS

Was it your plan to have a subroutine facility in the very beginning, or did FORTRAN I show the problem?

DIT MORSE

What do you remember about the interrelationship of the original language design and the hardware specifications of the 704?

N. D. PETERSON

For possible inclusion in the final post-meeting proceedings:

Future prospects of FORTRAN in terms of Structured Programming and adapting it to be better suited to structured programming.

Comments on extensions and FORTRAN-based package to handle expressions of the following kinds in source programs:

(1) Matrix algebra such as IBM's Scientific Subrouting Package.
(2) Differential equations such as MIMIC (Air Force).

Concerning FORTRANSIT: What connections existed, if any, between Perlis's IT and IBM's FORTRANSIT? Any other comments on the historical significance of FOR-TRANSIT?

JURIS REINFELDS

Why and when was the decision made to interpret FORMAT's? Does this not contradict the assumption of "efficient execution code"?

BOB ROSIN

One recalls the all too frequent FORTRAN diagnostic message which read something like: "Error in pass ONE PRIME". What was this pass, and who wrote it?

MIKE SHAPIRO

What comments do you have on current trends in FORTRAN extensions?

Your paper tries to dispel the legend that three subscripts comes from three index registers. Yet later FORTRAN for a seven index register machine had seven subscripts. What are your current thoughts on how many subscripts we need in "FORTRAN-like" languages?

T. B. STEEL JR.

Would you comment on the extent to which other work—specifically PACT—influenced the FORTRAN development?

NANCY STERN

I noticed that in your May, 1954, article, the term "programmer" was used. From your experience, when did the term "programmer" replace "coder"?

SELDON L. STEWART

Independently compilable subroutines versus local precedures:

(1) Given the value of independent compilability to programming libraries and complicated (systems) programs, why has this feature been so rarely included in higher level languages other than FORTRAN and its descendents?

(2) Was the assigned GOTO conceived of as a mechanism for implementing local procedures? If not, what was its origin?