

Pittsburgh, 20 January 1960

To the members of the Algol 60 committee:

Re: The proposal of Peter Naur of 17 Jan. on function-procedures.

The ambiguity arising in the use of procedures without parameters can be resolved in what I feel is a superior way to that suggested by Naur. Consider the following table in which X denotes the correspondent (in the call of the procedure P) of the formal parameter U in the procedure declaration of P.

Case	X is a	X is called as	Action induced by the call
✓ 1.	variable	name	a) X is substituted for all occurrences of U in P. Then b) P is executed.
✓ 2.	"	value	a) The assignment $U := X$ is executed. b) P is executed.
3.	label	name	same as case 1.
4.	"	value	undefined (see note 1.)
✓ 5.	array	name	same as case 1.
✓ 6.	"	value	a) A multiple assignment of all the values of the components of X to become the values of all their corresponding components in U is executed. b) Execute P.
✓ 7.	expression	name	a) The auxiliary procedure <u>Procedure</u> \$n ; <u>begin</u> \$n: \$n := X <u>end</u> \$n; is defined. (see note 2.) b) Substitute the name \$n for X in the call. c) same as case 9.
✓ 8.	"	value	same as case 2.
✓ 9.	procedure	name	same as case 1.
10.	"	value <i>undefined</i>	same as case 2. (see note 3.)

The above table disposes of the question raised by Naur. In the interests of preventing unnecessary "identity" procedures, the term "expression" is limited to those containing other than a single occurrence of a single variable (or constant).

Note 1. In principle all quantities are distinguished by formal declaration with the exception of variables and labels. Thus while the semantics should be as in 4, operationally cases 3 and 4 will be treated like 1 and 2.

Note 2. \$n is an internal identifier.

Note 3. The value of a procedure is determined as specified in Document 27.

It might be argued that case 7. not be defined. However it is treated in such a simple way and the operational intent is so transparent that it seems silly to leave it undefined.

I should like to go on record as being strongly opposed to Naur's proposal and recommend the above as an amendment to documents 27 and 28 with the recommendation that the substance of that trinity define the concept of procedure.


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Peter; Turansky died on 16 Jan. Thus the report is to be dedicated to his memory. app.