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Correspondence

An impossible program

To the Editor,
The Computer Journal.

Sir,

It seems to me that a point has been missed by your correspondents on this subject. I too, think that Mr. Strachey's proof* is at fault, for this reason:

The Program P includes the procedure $T(P)$ and it is possible for some particular argument of T that T may itself loop, so that since P includes $T(P)$ the investigation $T(P)$ must include the investigation $T[T(P)]$, and this must include an investigation of all parts of $T(P)$ including $T[T(P)]$ i.e. $T[T(P)]$ includes $T\{T[T(P)]\}$, which must in turn include an investigation of all parts of $T[T(P)]$ including $T\{T[T(P)]\}$ and so on.

When P is executed an infinite recursion with no means of escape will result, i.e. a closed loop exists in T when its argument is P.

P will loop, but since the loop is internal to T, $T(P)$ will not take any value and there is no contradiction. It is clear that if T exists it is restricted to investigating programs not including itself, but no proof of the impossibility of *this* program has been given.

Yours faithfully,

B. E. BOUTEL

34 The Hoe,
Carpenders Park,
Watford, Herts.
10 August 1965.

* This *Journal*, January 1965, p. 313

To the Editor,
The Computer Journal.

Sir,

I must apologize to Mr. ApSimon. I did not intend* to ask him to accept a non-existent proof involving a hypothetical fraction. I actually intended to refer to a non-existence proof of a hypothetical function, but my handwriting seems to have betrayed me.

Yours etc.,

C. STRACHEY.

Churchill College,
Cambridge,
5 August 1965.

To the Editor,
The Computer Journal.

Sir,

Mr. Strachey seems to have proved that, if R may include $T(R)$ and the function $T(R)$ always terminates, then the function $T(R)$ does not exist. Are these useful conditions? May not $T(R)$ without one or both of them exist?

Yours faithfully,

J. H. G. PHILLIPS.
MICHAEL IRISH.

The National Cash Register Co. Ltd.,
88/92 Baker St.,
London, W.1.
23 September 1965.

* This *Journal*, July 1965, p. 176.