LINEAR INDEPENDENCE FOR CORK

R.E. Harte

In Summer 1978, Question 4 of the Second Arts Matrix Theory paper at U.C.C. begins as follows:

> "Explain what it means for a finite subset of a real vector space to be linearly independent. If $\{x_1,x_2,x_3\}$ is linearly independent and t is real, show that
>
> A $\{x_1-tx_2,x_2-tx_3,x_3-tx_1\}$ <u>linearly independent</u> $\iff t \neq 1$".

The embarrassing fact is that the solution is wrong, but in a rather subtle way. In fact provided the three vectors x_1, x_2 and x_3 are distinct from one another, the statement (A) is correct, as can be and was verified by Second Year Arts students. Suppose however

B $\qquad x_1 \neq x_2 \neq x_3$

still assuming that the set $\{x_1,x_2,x_3\} = \{x_1,x_2\}$ is linearly independent, then:

C $\{x_1-tx_2,x_2-tx_3,x_3-tx_1\}$ <u>linearly independent</u> $\iff t = 0$.

Finally if $x_1 = x_2 = x_3 \neq 0$ then the statement (A) is again valid.

MORAL: linear independence should be defined for sequences, not sets.

Mathematics Department,
University College,
Cork.

COMPUTER SCIENCE AND THE MATHEMATICS CURRICULUM

Anthony Karel Seda

> "As soon as an Analytical Engine exists, it will necessarily guide the future course of the science. Whenever any result is sought by its aid, the question will then arise - By what course of calculation can these results be arrived at by the machine in the shortest time?"
>
> Charles Babbage, 1864.

§1. Introduction

In any discussion of computer science and its relationship with mathematics, from an educational viewpoint, certain obvious questions come to the fore:

(1) What is the role of mathematics in computer science education?

(2) What is the role of computer science in mathematics education?

(3) What is, or has been, the response of mathematicians to computer science in relation to the mathematics curriculum?

There are two viewpoints, at least, from which these questions can be contemplated. One is that of the computer scientist engaged in teaching/research in a third level institution peering over the ramparts at the mathematicians. The other, which is ours, is that of the mathematician similarly engaged in teaching/research and similarly peering at the computer scientists. Having thus declared my vantage point, and for reasons of space, I wish to concentrate here on Question 1. and only to touch on Questions 2 and 3. Specifically, I wish to bring to the attention of readers of the *Newsletter*