Comments on Two Papers by R. Gow in the December 1995 IMS Bulletin

Concerning the article on Bourbaki's problem in the December 1995 issue of the IMS Bulletin, I discovered that a theorem of L. K. Hua (*On the automorphisms of a field*, Proc. Nat. Acad. Sci. U.S.A. **35** (1949), 386-389) answers the problem that I raised. I am grateful to my colleagues Fergus Gaines and David Lewis for information on the problem, and also to Professor Larry Harris for related correspondence. If I had remembered an earlier paper by Fergus Gaines (*How to compose a problem for the International Mathematical Olynpiad?*, Irish Math. Soc. Bulletin **28** (1992), 20-29), I would not have written the article.

Concerning another article written by us in the same issue of the Bulletin (*Some Galway professors of mathematics and of natural philosophy*), Professor Alastair Wood has kindly informed me that Morgan Crofton's father was not the successor of G. G. Stokes's father as Rector of Skreen, Co. Sligo, as stated in the article. His successor was the Rev. George Trulock, who was Rector from 1834 until 1847. The Rev. W. Crofton was in fact the successor of Trulock, and died in Skreen in 1851.

Rod Gow,
Department of Mathematics,
University College Dublin.

A LINEAR SYSTEM OF IMPULSIVE DIFFERENTIAL EQUATIONS

Michael Brennan and Finbarr Holland

Abstract A linear system of impulsive differential equations that models an example from pharmacokinetics is investigated. The example is where a drug is administered periodically at certain fixed times resulting in a jump (called an *impulse*) in the concentration level of the drug. The case where the same dosage is applied at each of these fixed times is considered. Both necessary and sufficient conditions are sought to guarantee that an effective concentration level of the drug is maintained in the body.

Introduction

Impulsive differential equations are used to describe physical processes that undergo instantaneous perturbations. As in the study of ordinary differential equations, the study of impulsive differential equations is motivated by many practical examples from the physical sciences, [1, 2]. In this paper, we look at a linear system of impulsive differential equations, a special case of which may model the concentration of a drug in the bloodstream and an organ, like the heart or liver. Our results here generalize those obtained by Stewart, [3, pp. 758-759], who considered the scalar case.

The paper begins by describing a first order linear system of impulsive differential equations in terms of a constant real matrix K. We call the solution vector ϕ of the system an *admissible* solution when it lies in the region between two specified concentric spheres in $\mathbf{R}^d$. The initial dosage vector c and the time T (length

AMS (MOS) 1991 Mathematics classification: 34A37.