DISCUSSION AND QUERIES

A NOTE ON "THE DEVELOPMENT OF MULTISET THEORY" [BLIZARD *1991*]"

D SINGH

Department of Humanities
Indian Institute of Technology
Bombay 400 076
India

Blizard's survey paper [Blizard *1991*] is an up-to-date and lucid account of the development of multiset theory. However, to my knowledge, a few significant pieces of work from the early history of multiset theory may be added Blizard's account.

Angelelli found a very early reference to the multiset concept in the work of Marius Nizolius (1498 – 1576). In particular Angelleli has vindicated a number of reflections of Leibniz and others on Nizolius' notion of *multitudo*, saying [Angelelli *1965*, 319] that "...it is not perhaps clear whether Nizolius' *multitudo* comes closer to 'class' or 'heap'," but adding in a footnote [Angelelli *1965*, 320] that "Nizolius' *multitudines* might still be heaps in the sense of Quine and Goodman."

Brink [*1987*] and Hailperin [*1986*] find the notion of multiset present in the work of Boole. It is noted in [Brink *1987*, 1], with emphasis (rightly, I think) that [Hailperin *1976*] "...is the link to the historical background of multisets. For indeed multisets do have a history," and that the credit for introducing them "should go to George Boole's [1854] *Laws of Thought*." This emphasis is missing in Blizard's [*1991*, 330] "attempting to 'make sense' of Boole's algebra of logic'." Hailperin has justified, by introducing 'signed heaps' the assertion that Boole's *Laws of Thought* may be interpreted as a treatise dealing with multisets. More specifically, in [Hailperin *1976*, 88], we are told that "*To obtain a meaningful interpretation of Boole's system we have to use not the notion of a class but that of a heap,*" and in [Hailperin *1986*,136], that "*To obtain a meaningful interpretation of Boole's system we have to use not the notion of a class (class = set) but that of a multiset.*" However, on the question of whether Boole himself really had this