A note on a paper of Heatherly

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We make the following remarks concerning Lemma 2.4 and Theorem 2.5 in [2]. We now present some examples in which the conclusions of Lemma 2.4 and Theorem 2.5 fails. Throughout this note N stands for a left near-ring.

Example 1. Let $N=\{0, 1, 2, 3, 4, 5\}$. Define addition as modulo 6 and multiplication by the following table (see CLAY [1] on (0, 1, 4, 3, 4, 1)).

	0	1	2	3	4	5
0	0	0	0	0	0	0
1	0	1	2	3	4	5
2	0	4	2	0	4	2
3	0	3	0	3	0	3
4	0	4	2	0	4	2
5	0	1	2	3	4	5

Then N is a finite near-ring with $a^2=a$ for all a. Here $N=N_1\oplus N_2$ where $N_1=\{0, 3\}$ and $N_2=\{0, 2, 4\}$ are ideals of N. Clearly 3 is a nonzero right distributive element of N but 2 and 4 are not right distributive elements of N_2. Hence in this case Lemma 2.4 and the first part of Theorem 2.5 (1) fails.

Example 2. Let N be a finite zero symmetric near-ring with a nonzero right distributive element d and contains no nonzero nilpotent elements. Let $(G, +)$ be a finite non abelian group. Define on $N\times G$ addition as componentwise and multiplication as follows:

For (n, g), $(m, h)\in N\times G$,

$$(n, g)*(m, h) = (nm, h) \quad \text{if} \quad g\neq 0 \quad (nm, 0) \quad \text{if} \quad g=0.$$

Then $(N\times G, +, *)$ is a near-ring (see PILZ [3]). Now obviously $N\times G$ is a finite near-ring without nilpotent elements and $(d, 0)$ is a nonzero right distributive element. Here $N\times G$ is not abelian under addition. Thus the second part of Theorem 2.5 (1) fails.

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References

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[2] H. E. HEATHERLY, Near-rings with out nilpotent elements, *Publ. Math. (Debrecen)* **20** (1973), 201—205.
[3] G. PILZ and Y. S. SO, Generalized distributively generated near-rings, *Arch. Math.* **37** (1981), 150—153.

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