Imrich Fabrici
Erratum to the paper "Semigroups containing covered one-sided ideals"

ERRATUM TO THE PAPER
"SEMIGROUPS CONTAINING COVERED
ONE-SIDED IDEALS"

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Theorem 4 in the paper [1] is not correct. It should be replaced by the Theorem given below.

We say that the principal left ideals of a semigroup S are updirected if for every $a, b \in S$ there is $c \in S$ such that $\{a, b\} \in S^1 c$.

Theorem. *All proper left ideals of a semigroup S are covered iff the principal left ideals of S are updirected.*

Proof. (a) Suppose that there exist two elements $a, b \in S$ such that there is no $c \in S$ with $\{a, b\} \not\in S^1 c$. It is sufficient to show that there exists a left ideal of S which is not covered. Consider the left ideal $L = \{x \in S / a \not\in S^1 x\}$. We have $b \in L$, since $a \in S^1 b$ would imply $\{a, b\} \in S^1 b$. Next for any $d \in S - L$ we have $a \in S^l d$, hence (by supposition) $b \not\in S^1 (S - L)$, hence $b \not\in S(S - L)$. This proves that L is not covered.

(b) Suppose that for every $a, b \in S$ there exists an element $c \in S$ with $\{a, b\} \in S^1 c$. Let L be a proper left ideal of S. Choose $x \in L$, $y \in S - L$. Then there is an element $z \in S$ such that $\{x, y\} \in S^1 z$. We have $z \in S - L$, since otherwise $y \in S^l z \subset S^1 L \subset L$. Hence $x \in S^1 z \subset S^1 (S - L) = S(S - L) \cup S - L$ and $x \in S(S - L)$. Therefore $L \subset S(S - L)$, so that L is covered.

The principal left ideals of a semigroup S are updirected, in particular if S is itself a principal left ideal.

REFERENCES

[1] FABRICI, I.: Semigroups containing covered one-sided ideals, Math. Slovaca, 31. 1981, 225—231.

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