SUPPLEMENT AND CORRIGENDUM
of the book
Attila Nagy, Special Classes of Semigroups
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Preface

Page vii, line 2: ...in which ...

Page viii, line 14: ...camera-ready version ...

Chapter 1

Page 2, line -1, -2. -3: We remark that if N denotes a nil semigroup then N^1 will denote the semigroup which can be obtained from N by the adjunction of an identity element (also in that case when $|N| = 1$).

Page 3, 24-26: If S is a semigroup then let S^0 denote the semigroup $S \cup \{0\}$ arising from S by the adjunction of a zero element 0 unless S already has a zero element and $|S| > 1$, in which case $S^0 = S$.

Page 6, line 17: α_H defined by $a\alpha_H b$ if and only if $a = b$ or there is ...

Page 9, line 8: semigroups if and only if, for every $a, b \in S$, ...

Page 9, line 11: ... the assumption $a \in S^1bS^1$ implies $a^n \in S^1b^2S^1$

Page 14, line 7: **Definition 1.36** A 0-simple (a non-trivial simple) semigroup is called completely 0-simple (completely simple) if it contains a primitive idempotent. The trivial semigroup is considered as a completely simple semigroup.

Page 17, line 13: ... which determine the ...

Page 19, line 16: ... a group G with a sandwich matrix $P = (p_{j,i})$ normalized by $p_{j,i_0} = p_{j_0,i} = e$ for all $i \in I, j \in J$ and some $i_0 \in I, j_0 \in J$, where e is the identity element of G, and let $\mathcal{T}_I$ and ...

Page 21, line 7: ... by two letters. (We note that the restriction of the number of variables is not essential.) We suppose ...

Page 22, line -5: Conversely, if α is a ...

Page 29, line 15: Hence $J \subset I$.

Page 29, line -6: ..., by Lemma 2.7

Chapter 2

Page 35, line 6: assumption $a \in S^1bS^1$ implies $a^n \in S^1b^2S^1$ for ...

Page 35, line -1: $(xy)^p \in x^{2^k}S^1$.

Page 36, line 1: Assume $2^k \geq n$.

Chapter 3

Page 57, line 10: ... chain condition.

Chapter 4

Page 63, line -1: $a^{2n} = a^{n+1}a^{n-1} = ba^n a^{n-1} = ba^{2n-1} = \ldots = b^n a^n$

Page 65, line 14: ... and a positive integer m.

Page 66, line 12: By induction for n.

Page 67, line -12: $ab^n \; \rho \; b^{n+1} \; \rho \; b^n a$

Chapter 5

Page 69, line -8 and -9: The right text is the following: We note that, in [106], an $\mathcal{R}$-commutative ($\mathcal{L}$-commutative, $\mathcal{H}$-commutative) semigroup is called a right c-semigroup (left c-semigroup, c-semigroup) if the condition $x \in S^1$ in Definition 5.1 is satisfied such that $x \in S$.

Page 71, line 9: is a commutative congruence. Then, ...

Page 73: Everywhere on page 73, instead of $\mathcal{R}$-commutative semigroup, $\mathcal{L}$-commutative semigroup, $\mathcal{H}$-commutative semigroup should be written right c-semigroup, left c-semigroup, c-semigroup, respectively.

Chapter 7

Page 95, line 22: $(\alpha \leq \delta)$

Page 95, lines 22, 24, 25: ... $\mathcal{R}$-commutative.

Page 95, line -6 and -5: Moreover, $B \cong E_S$ and so B is conditionally commutative. As E_S is a homomorphic image of S, it is $\mathcal{R}$-commutative. Thus B is $\mathcal{RC}$-commutative.

Page 100, line 10: Theorem 7.4 ([55]) If S_1 is an abelian group then S is commutative.

Page 101, line 5: $|S_0| = 1$ and so $S = G^0$ is commutative which contradict the assumption for S.

Page 102, line -8: So $|R| = 1$ which is a contradiction. Thus ...

Page 107, line -6: (ii) S is isomorphic to R or R^0 or R^1, where R is a two-element right zero semigroup.

Page 107, lines -3, -2, -1: We remark that Theorem 7.7 and Theorem 7.8 show that the class of $\mathcal{RC}$-commutative Δ-semigroups form a proper subclass of the class of RGC_n-commutative Δ-semigroups. More precisely, a semigroup is an RGC_n-commutative Δ-semigroup if and only if it is either an $\mathcal{RC}$-commutative Δ-semigroup or a two-element right zero semigroup with an identity adjoined.

Chapter 9

Page 133: Theorem 9.20 is correct, but using the results of "Nagy, A. and P.R. Jones, *Permutative semigroups whose congruences form a chain*, Semigroup Forum, 69(2004), 446-456", we can give more information: A semigroup S is a medial Δ-semigroup if and only if it satisfies one of the following conditions.

(i) S is a commutative Δ-semigroup.

(ii) S is isomorphic to either R or R^0, where R is a two-element right zero semigroup.

(iii)S is isomorphic to the semigroup $Z = \{0, e, a\}$, obtained by adjoining to a zero semigroup $\{0, a\}$ an idempotent element e that is both a right identity element of Z and a left annihilator of $\{0, a\}$.

(iv) S is isomorphic to the dual of a semigroup of type (ii) or (iii).

Page 134, line -3: Let $x \in K$ and ...

Page 135, line 1: ... that $(c, c^2) \in \alpha$.

Chapter 10

Page 160, line -6: Let e_1 and e_2 be arbitrary elements of E. It is a matter of checking to see that $H = \{e_1, e_2\}$ is a normal complex. Let ξ denote the congruence on S defined by H. Assume $(k, s) \in \xi$ for some $k \in K_0$ and ...

Page 160, line -2: $x = 1$.

Page 161, line 3: ..., k and s generate ...

Page 161, line 12: ..., $k_1 g = k_1 h$ which ...

Page 165: By the new version of Theorem 9.20 (see *Page 133*), Theorem 10.19 can be formulated as follows: A semigroup S is a right commutative Δ-semigroup if and only if it satisfies one of the following conditions.

(i)S is a commutative Δ-semigroup.

(ii)S is isomorphic to either L or L^0, where L is a two-element left zero semigroup.

(iii)S is isomorphic to the semigroup $Z = \{0, e, a\}$, obtained by adjoining to a zero semigroup $\{0, a\}$ an idempotent element e that is both a right identity element of Z and a left annihilator of $\{0, a\}$.

Pages 165-173: By the new version of Theorem 10.19, the validity of the last part of Chapter 10 has expired. The assertions are correct, Construction 10.2 gives an example, but the new results about right commutative Δ-semigroups show that there are no other examples.

Chapter 12

Page 189, lines 1, 2: Let $S = \mathcal{M}(I, G, J; P)$ be a completely simple semigroup expressed ...

Chapter 13

Page 201, line 11: ... normalized by $p_{j,i_0} = p_{j_0,i} = e$ ...

Page 206: **Theorem 13.9** ([52])

Page 208, line 17: $(\ )\psi_{\alpha,\beta}$ of G_α into G_β.

Page 208, line -13: ... translational hull $\Omega(K)$ and ...

Page 210, line 18: ... G_α into G_β, ...

Chapter 14

Page 219, line 20: (vi) S is a T1 or a T2R or a T2L semigroup.

Page 221. lines 5 - 8: If $|S_1| = 1$ then S is a T1 semigroup. If S_1 is a two-element left zero semigroup then S is a T2L semigroup. If S_1 is a two-element right zero semigroup then S is a T2R semigroup.

Page 221, line -14: Theorem 14.11 ([54]) S is a T1 semigroup if and only if ...

From page 221, line -11 to page 222, line 3: Proof. As a T1 semigroup is weakly exponential, by Theorem 1.58, it is obvious.

Chapter 15

Page 242, lines 17 - 21: If $S_a = S$ for all $a \in S$ then $a \in S_{a^2}$ which contradicts the fact that S does not contain idempotent elements. Thus the theorem is proved.

Page 245, line 9: ... N or N^1, where N is a commutative nil Δ-semigroup.

Chapter 16

Page 250, Theorem 16.2: **Theorem 16.2** *([28]) If a semigroup S is $n_{(2)}$-permutable $(n \geq 4)$ then it is $(1, 2n-4)$-commutative.*

Page 256, line 6: . By Theorem 16.2, Lemma 16.3 and the fact that the $2_{(2)}$-permutable semigroup are commutative, S is $(1, 2n-3)$-commutative.

Page 256, line 13: . Since S is $(1, 2n-3)$-commutative then,

Page 257, line 9: . Since an $n_{(2)}$-permutable semigroup is $(1, 2n-3)$-commutative

Page 257, Proof of Theorem 16.9: Proof. Using Theorem 16.2, Lemma 16.3 and the fact that the $2_{(2)}$-permutable semigroup are commutative, our assertion follows from Theorem 15.13.

Page 258, Proof of Theorem 16.11: Proof. Using Theorem 16.2, Lemma 16.3 and the fact that the $2_{(2)}$-permutable semigroup are commutative, our assertion follows from Theorem 15.15.

Page 258, line 8: ... N or N^1, where N is a commutative nil Δ-semigroup.

Page 258, Proof of Theorem 16.12: Proof. Using Theorem 16.2, Lemma 16.3 and the fact that the $2_{(2)}$-permutable semigroup are commutative, our assertion follows from Theorem 15.16.