ERRATA IN ‘SIMPLICITY THEORY’ (OXFORD LOGIC GUIDES 53)

(1) The original draft of the book started with Chapter 0 and the publisher changed it to start from Chapter 1. Thus there may exist numbering discrepancy in finding referred indexed results. If you fail to find it then try to add 1 to the chapter number.

(2) In Example 1.2.8(3), (N, +, 0) should be replaced by (Z, +, 0). Note that < is definable in (N, +).

(3) In Proposition 2.5.4(3), ‘the empty set’ should be changed to ‘any set.’

(4) In Theorem 3.3.1, normality $A \downarrow_C B$ iff $A \downarrow_C BC$ should be added.

(5) In the first paragraph of Remark 4.2.3(1), only the following weaker claim holds. There is some $d$-indiscernible $J = \langle c_i | i < \omega \rangle$ such that $b = d'F$ with $d \equiv d'$, $a_i = c_i'/E$ and $c_0' \equiv_{bao} c_0$. (Hence still if $a_i$’s are real then $I = J$ is $d'$-indiscernible): Assume the length of $I$ is sufficiently large and choose real $u_i$ such that $u_ia_i \equiv_b c_0a_0$. Then apply Lemma 1.1.5 to get a $d'$-indiscernible $J_0 = \langle c_i' | i < \omega \rangle$ based on $(u_i)$ over $d$, so that $I \equiv_b J' = \langle c_i'/E | i < \omega \rangle$. Let $f$ be a $b$-automorphism sending $J'$ to $I$, and we put $d'J = f(dJ_0)$. Note that for some $j$, we have $c_j' a_0 \equiv_b c_0(c_j'/E) \equiv_d u_ia_j \equiv_b c_0a_0$.

The following is a counterexample of the original claim: $T$ in two binary relations $E, R$ says $E$ is an equivalence relation having infinitely many infinite classes, and $R$ is symmetric and irreflexive such that for any $x$ there is unique $y$ with $R(x, y)$; for any $a, b$ with $\neg E(a, b)$ there are unique $a', b'$ such that $E(a, a'), E(b, b')$ and $R(a', b')$. We can choose representatives $a_i$ of distinct $E$-classes such that $(a_i/E)_i$ is 0-indiscernible.

But if $R(a_0, a_1)$ then there are no $c_1, c_2$ with $E(a_j, c_j)$ ($j = 1, 2$) such that $a_0c_1 \equiv a_0c_2$. Still there is 0-indiscernible $(a_i')$ such that $E(a_i, a_i')$, so no two of $(a_i')$ satisfy $R$.

(6) The following revision of Section 5 is made in [2].

(a) In Lemma 5.1.6(1), the last stage of the stated proof need not work and it is correctly reproved in [2] Corollary 2.4].

Date: June 14, 2021.
(b) In Proposition 5.1.14, the proof of (1) \( \Rightarrow \) (2) does not work when \( A \) is a hyperimaginary, so (1) and (5) should be deleted out. Thus Corollary 5.1.15 is not true. A counterexample (a double covering of a circle by another circle) is given in [2, Section 3].

(7) The following fact should be used in a couple of places in the book (e.g. in the proofs of Corollary 5.1.8 and 5.1.9(3)(b) \( \Rightarrow \) (c)) when we want to extend a bounded type-definable equivalence relation on a type-definable set to the whole universe.

**Fact 0.1.** Let \( E(x, y) \) be an \( A \)-type-definable bounded equivalence relation on (the solution set of) a type \( \pi(x) \) over \( A \). Then there is an \( A \)-type-definable bounded equivalence relation \( F \) on \( \mathcal{M}^{x} \) such that \( F \leftrightarrow E \) on \( \pi \).

**Proof.** It is proved in [3, Proposition 5.11] that \( x \equiv_{A}^{KP} y \) (on \( \mathcal{M}^{x} \)) is finer than \( E \) on \( \pi \). Thus we can put

\[
F = (\pi(x) \land \pi(y) \land E(x, y)) \lor x \equiv_{A}^{KP} y.
\]

\[\square\]

**References**

