Errata in *Modern Logic*

Modern Logic contains a number of minor typos and slips in its first printing. Most of these are inconsequential or easily spotted by the reader, but some could be misleading, so I have separated out *errata* of the latter sort into their own section. Most *errata* of both sorts are corrected in the third printing. I am sorry to say that the first printing also contains a substantial technical error, though fortunately it occurs in a rather peripheral part of the book, Chapter 6.7. I added semantic tableaux at the last minute, well after the referees were through with the manuscript, and in my haste, misremembered the Jeffrey algorithm (pp. 212–213) as constituting a decision procedure for *all* of monadic predicate logic (without identity). In fact, as rapidly became apparent to me in the course of writing the Instructor's Manual, the algorithm is a decision procedure only for sequents of monadic predicate logic in which *neither the conclusion nor any premise contains certain patterns of nested quantifiers.* In the first printing, this makes nonsense of Example 2, p. 214 (which anyway had other errors in it) and of the discussion preceding it (the bottom paragraph on p. 212). The whole section was rewritten for the third printing of the book; for those who own only the first or second printing, the rewrite is an appendix to the Instructor's Manual and is posted on my web site at http://www.tulane.edu/~forbes/.

You can tell which printing you have from the copyright page of the book: in the first printing, four lines from the bottom, the series of numbers begins with "1" and ends with "2", while in the third it begins with "3" and ends with "4". (There is also, at least in Europe, a second printing, whose number series begins with "3" and ends with "2". This printing is *un*corrected from the first printing.) If you are purchasing a new copy of *Modern Logic* or ordering copies for a class, you should

specify "First edition, third printing", until a fourth or later printing, or a second edition, is available.

So far as I am aware, the third printing contains no serious errors, but there are still a few minor ones. I have used *still in 3* in the errata-listing to indicate such errors. If you have the third printing and are reading this document on screen, you can search for *still in 3* to identify the remaining errata quickly (to search a pdf file displayed in a web browser window you need Acrobat Reader 3.01 or better).

❏ Corrections to Ch. 6.7

Replace Example 2 with a tableaux for, say, problem 19, $(\exists x)(Fx \leftrightarrow Gx)$ ⊨ $(\forall x)Fx \leftrightarrow (\forall x)Gx$. In the exercises, replace 'Repeat problems 1–30' with 'Repeat problems 1–19, 22 and 23'; 'for each of 1–30' with 'for each of these'; and 'by constructing closed' with 'by constructing open'.

My mistake could be put to a constructive purpose by getting students to apply the Jeffrey algorithm correctly to Example 2, limiting them to whatever they can exhibit on one sheet of paper.

❏ Misleading errata

p. 133, 10↓: replace 'Δ/r' with 'Δ/q'.

p. 137, 11↑: after 'negation' insert ", the conditional, or '⋏'".

p. 184: in line 1, replace 'Fb' with 'Fa'; in line 5 replace the second and third occurrences of '(iv)' with '(iii)'; in line 6 replace both occurrences of 'Fb' with 'Fa'.

p. 262: in problem I.13 (top of page) replace '∨ Ryz' with '∨ Rzz'.

p. 277 (still in 3): the last sentence of the paragraph immediately below the list of three property-groups should be replaced by: "A *nonempty* relation may be asymmetric and anti-symmetric, or non-symmetric and anti-symmetric ($\leqslant$), or symmetric and anti-symmetric (identity). And so long as no instance of 'Rxy & Ryz' is true, it may be transitive and intransitive."

p. 302, 8↑: replace '(∃w)' with '(∀w)'.

p. 331: in problem 8 the conclusion formula should be '(∃x)◇~Fx → ◇(∃x)~Fx'; in problem 9 the conclusion formula should be '◇(∃x)~Fx → (∃x)◇~Fx'.

❏ Minor errata

p. 17, 14↓ (still in 3): better: "'and' need not express conjunction".

p. 27, 21↓: replace 'our example' with 'Example C on the next page'.

p. 28, 17↑: replace 'easy' with 'not difficult'.

p. 30, 1↑: insert '[' on left.

p. 34, problem (8), 2↓: replace 'role' with 'roll'.

p. 34, problem (12), 2↓ (still in 3): replace 'should' with 'would'.

p. 38, 10↓: replace 'E' with 'X', and throughout parse tree following.

p. 40, problem (2): replace second 'P' with 'R'.

p. 41: there is a reproduction failure in the paperback tho' not in the hardback.

p. 42, 16↑: replace '(6)' with '(7)'.

p. 44, 3↓: replace 'IV.4' with 'IV.5'.

p. 48, 15↓ (excluding figure): insert x-ref at end of line, 'page 24'.

p. 54, 13↑ (still in 3): replace "for '→'" with "for '↔'".

p. 62, 9↓ (still in 3): delete paren before 'because'.

p. 64, 12↓ (excluding figure): replace 'A & B' with 'B & A'.

p. 65, numbered example (2): replace 'C' with 'E'.

p. 68, bottom paragraph: ignore clause for ⋏.

p. 69, 6↓ (still in 3): ignore disjunct about ⋏.

p. 84, bottom line: replace '(g)' with '(7)'.

p. 95, line 5 of proof: replace '2,4' with '4,2'.

p. 96, 20↓: insert 'the' before 'assumptions'.

p. 100, numbered example (1): replace 'E' with 'H'.

p. 101: 21↓: replace 'Example 2.1' with 'Exercise 2.1'. 5↑: replace 'Example 2.1' with 'Exercise 2.1' and '89' with '98'.

p. 104; 2↓: after 'line k' insert '(j < k or k < j)'; 5↓: after 'schematically' insert ', with j < k'; 12↓: after '/j' insert 'j < k, k < j or j = k (if the last, n = 1 and a_1 = j).

p. 107, footnote: replace '~~E' with 'DN'.

p. 121, 3↓ (still in 3): replace 'S ∨ T' for 'A' with 'S ∨ T' for 'B'.

p. 123, sequent (r): delete last paren.

p. 124, 5↓, 7↓ (still in 3): replace 'DN' with 'DN$^+$'.

p. 127, III: I will add the problems ~(A & B) ⊢ ~(B & A) and A → B, ~A → B ⊢ B in a future printing.

p. 133, Rule of Df. The wording can be improved: the sequent $\Gamma \vdash p \leftrightarrow q$ may be expanded into the sequent $\Gamma \vdash (p \to q) \mathbin{\&} (q \to p)$; and the sequent $\Gamma \vdash (p \to q) \mathbin{\&} (q \to p)$ may be contracted into the sequent $\Gamma \vdash p \leftrightarrow q$.

p. 139, top line: (j) should be labelled 'Assumption'.

p. 151: 16↓ (still in 3): 'A, B, D and E above'.

p. 154, penultimate paragraph: insert 'of each other' at end.

p. 156 (still in 3): in (10.a), (10.s) and the following discussion, use 'z' in place of 'x'.

p. 158: first sentence should read, '…using names, predicates and the existential quantifier as appropriate'.

p. 163: in (21.a), replace 'wise' with 'happy'; correspondingly, in (21.s), replace 'W' with 'H'.

p. 165: first sentence should read, '…using names, predicates and quantifiers as appropriate'; in II(b), put parens around 'Fx & Ex'.

p. 168, last bulleted paragraph: insert 'or quantifier' in second line before '*c*'.

p. 172, 7↑: insert 'a different' before 'one'.

p. 189, 15↓: replace 'Fa' with 'Ga'. Insert '(no!)' in line 5 of Example 4.

p. 193, footnote: replace '~~E' with 'DN'.

p. 194 (still in 3): replace 'DN' with 'DN⁺' in the middle paragraph.

p. 197: Insert '(no!)' in line 6 of Example 2.

p. 199: Insert '(no!)' in line 6 of Example 3.

p. 200, 13↓ (still in 3): replace sentence beginning 'Since' with 'These provisos are all satisfied: 'a' occurs in line 5, but what matters is whether it occurs in *the lines line 6 depends on*, other than 3. So our application…'

p. 202, bottom line (still in 3): replace '3,4,11 ∃E' with '2,3,11 ∃E'.

p. 203, 6↓: replace 'line 3' with 'line 5'; in the bottom line, reverse the sequent (the problem as stated is Example 6).

p. 206: in line 9 of the proof, replace '1,9 →E' with '1,8 →E'.

p. 220 (still in 3): in (3.s), reverse the conjuncts.

p. 227: in (17.c) and (17.s), puts parens round 'Uxy & Ky'.

p. 228, 3↓ (still in 3): replace 'P' with 'S'; lower, '18.1' should be '18.a'.

p. 229, 18↑: replace 'Vax' with 'Vxc'.

p. 231, 3↑: insert 'with' before 'similarly'.

p. 232, 13↓: delete parens.

p. 233 (still in 3): change '2.a' to '2.s'.

p. 241: insert ⅄ in first line of lexicon definition.

p. 247 (still in 3): in (7.e) replace 'Fzyx' with '(Pz → Fzyx)' and in the line following, what substitution yields is '(∃y)(Py & (∀z)(Pz → Fzyx))'.

p. 248, 2↑: replace 'W_' with 'W_,_'.

p. 249, 15↑: insert 'by z' after 'reading of y'.

p. 256, 6↑: replace '⟨x,y,z⟩' with '⟨y,x,z⟩'.

p. 259, 2↓: replace 'premise 2' with 'premise 1'.

p. 261, second last line of text: replace '§5' with '§7'; in problem 6 replace '⊢_NK' with '⊬'.

p. 262: In problem III.2, replace '(∃x)(∀y)(y ∉ x)' with '(∃x)(Sx & (∀y)(y ∉ x))'.

p. 268, problem I.13: delete the last paren in the second premise.

p. 272: in the proof of Example 4, line 8 is by 3,7 &I, and lines 12 and 14 are by 6 &E. The first premise in the display of (2.6) should contain 'R' in place of 'L'.

p. 273: in the proof of Example 5, line 22 depends only on 2,6,7,12.

p. 274, problem I.4: delete '(∀y)'; problem I.10: the last 'x' should be 'y'.

p. 278, 13↓: replace '(∀x)Rxx' with '(∀x)~Rxx'. 14↓: replace 'Rab → ~Rab' with 'Rab → ~Rba'.

p. 281, 4↑: replace '(c)' with '(3)'.

p. 304, 13↓: replace 'B′w*' with 'B′w'.

p. 308, Example 2: line 7 is by 2,6 →I.

p.326, Example 2 (still in 3): line 2 is an Assumption, not a Premise; line 16 should read: □(∀x)Mx → (∀x)□Mx   2,15 →I.

p. 328, Example 4: line 2 is an Assumption, not a Premise.

p. 329, Example 5: lines 11, 12 and 13 depend on 5,10; line 13 is by 12 ∃I; line 20 is by 1,2,19 ◇E.

p. 337, fn. 4, 2↑: replace '~~E' with 'DN'.

p. 360, 4↑: replace 'SS numbers' with 'name'.

p. 361: in solution to 2.3.15, put 'F' for 'I'.

p. 368: in solution to 4.5.4, lines 4–6 all depend on 4, not 3.

p. 369: in solution to 4.6.10, line 9 is by 8,7 →E; line 14 is by ∨E on 13.

p. 370: III.8, line 9, is by DS, not MT

pp. 374–5: replace 'all' with 'every' throughout solution to 5.3.3.

p. 375 (still in 3): the third instance mentioned in the solution to 6.1.8 should be 'Hc → (∃y)(Jc & Iy)'.

p. 378: line 9 of I.17 is by 8, SI (PMI)

p. 377: line 6 of solution to 6.4.I.2 is by ∃E.

p. 378: line 4 of solution to 6.5.8 is by 3 SI, not 2 SI.

p. 379: line 12 of (8) is by ∃E; 2↓: depends on 1,5; 3↓: uses ∃E; 5↓: 13 DN.

p. 381, bottom: in (a) the formula should read '(∀x)(Tx → ~(∃y)(P y & Sjxy))'; in (b) the formula should read '(∀x)(Tx → ~(∃y)(Py & Sjxy)).

p. 383: line 14 of (I.3) is by 13, 6 →E; line 18 of (I.3) is illegal – to make it legal, change (4) to 'Fb & Hb)' and put 'b' for 'x' in deriving (11) and (13); line 11 of (I.7) is by 3,4,10 ∃E.

p. 386, (III.2): in lines 1 and 2, insert '(∀z)' after '(∀y)'; in lines 6 and 8, change 'twice' to 'thrice'.

p. 387, solution to 9.4.6: line 6 is by 3,5 &I; line 7 is by 6, ◇I.

p. 388, solution to 9.4.19: add line 9, '□(◇A → B)' by 8 □I, depending on
1. In the solution to 9.5.5, change 'u[F] = {α}' to 'u[F] = {∅}', 'w*[□Fa] =
⊤' to 'w*[□Fa] = ⊥', and 'w*[($\forall$x)(□Fx ↔ □Gx)] = ⊥' to 'w*[($\forall$x)(□Fx ↔
□Gx)] = ⊤'. In the solution to 9.6.5, line 5 is by $\forall$E. This solution, though
correct, uses an unnecessary maximum formula '◇Fa → ◇($\exists$x)Fx' and a
shorter proof is possible.

p. 389, solution to 9.6.19: line 12 depends on 4,7.