Known Typographical Errors in the First Edition, First Printing of Elements of Fluid Mechanics by D. C. Wilcox

These are all of the known typographical errors as of July 21, 2010.

1. Page 2, paragraph 2, last sentence: Replace "X-1 was determine" with "X-1 was to determine".
2. Page 7, Table 1.3: Change "deka" to "deca".
3. Page 9, last paragraph, first line: Replace "cancelation" with "cancellation".
4. Page 18, Equation (1.24): Change "1 torr" to "760 torr".
5. Page 20, Equation (1.28): Change "8310" to "8314".
6. Page 28, Just below Equation (1.49): Change "Appendix A.8" to "Table A.8 of Appendix A".
7. Page 30, Example 1.13: Change "Consider tape whose width" to "Consider tape whose width (out of the page)".
8. Page 38, Problem 1.48: Replace "1100 psi" with "1100 atm".
9. Page 42, Problems 1.78 and 1.79, line 4: Change "rate of descent" to "acceleration".
10. Page 126, Problem 3.82, first line: Replace "$h = \frac{1}{5}h$" with "$h = \frac{1}{5}H$".
11. Page 128, Problem 3.91, first line: Replace "copper" with "bismuth".
12. Page 131, Problem 3.107, first line: Replace "of width $2L$" with "of width L".
13. Page 153, Equation (4.63), upper limit of the integral: Replace "u_2^{cv}" with "u_2". The correct equation is

$$\lim_{\Delta t \to 0} \frac{A}{\Delta t} \int_{x_2 + u_2^{cv} \Delta t}^{x_2 + u_2 \Delta t} \rho(x, t + \Delta t) \beta(x, t + \Delta t) dx = A \left[\rho (u - u^{cv}) \beta \right]_2$$

14. Page 163, Problem 4.37, first line: Replace "zero" with "nonzero".
15. Page 174, second paragraph, first line: Replace "normal" with "normals".
16. Page 184, first line below Equation (5.30): Replace "area of the cylinder" with "cross-sectional area of the cylinder".
17. Page 220, Problem 5.67, next to last line: Replace "rection" with "reaction".
18. Page 231, Problem 5.109, first line: Replace "Klingons" with "Romulans".
19. Page 231, Problems 5.109 and 5.110, first line below equation: Replace "Assuming fuel density, ρ_e, velocity, u_e, and exit area, A_e, are constant at the rocket exit plane, and that pressure at the rocket exit plane is negligibly small, determine" with "Fuel density, ρ_e, and velocity, u_e, are uniform at the rocket exit plane, which has area A_e. Also, pressure at the rocket exit plane is negligible. Determine".
20. Page 239, Equation (6.16), between first and second equal signs: Replace "$d(1/\rho)$" with "$pd(1/\rho)$". The correct equation is

$$T ds = c_v dT + p d\left(\frac{1}{\rho}\right) = c_v dT - \frac{p}{\rho^2} d\rho$$

21. Page 244, fifth line below Equation (6.37): Replace "unaffected the motion" with "unaffected by the motion".
22. Page 250, Figure 6.6, caption: Replace "Fiction" with "Friction".

23. Page 264, just above Equation (6.80): Replace "substitute Equations (6.77) and (6.78) into Equation (6.73)" with "combine Equations (6.73), (6.75) and (6.77), and let $d_2/d_1 = \sqrt{2}$". Also, the correct Equation (6.80) for h_L is

$$h_L = \left[\hat{R}_1 + \hat{R}_2 \left(\frac{d_1}{d_2}\right)^4\right] \overline{u}_1^2 = \left[\hat{R}_1 + \frac{1}{4}\hat{R}_2\right] U^2$$

24. Page 277, Example 6.14: The dimensions of y are m, not m/sec. The correct equation for $\overline{u}$ is

$$\overline{u} = \frac{Q}{y^2} = \frac{5 \text{ m}^3/\text{sec}}{(2.61 \text{ m})^2} = 0.734 \frac{\text{m}}{\text{sec}}$$

25. Page 290, Problem 6.44, third line: Replace "in terms of $\rho, \dot{m}$," with "in terms of $\rho, \dot{V}$,".

26. Page 293, Problem 6.59, third line and figure: Replace "$\mathcal{R} = 0.06D$" with "$\mathcal{R} = 4D$". Also, add $L/D = 100$.

27. Page 295, Problem 6.67, figure: Replace "$p_0 + \Delta p$" with "$p_a + \Delta p$".

28. Page 322, second paragraph, first line: Replace "The purpose of a turbine is extract" with "The purpose of a turbine is to extract".

29. Page 323, Equation (7.71): The velocity "$\mathbf{u}-$" should be replaced by "$\mathbf{u}$". The correct equation is

$$\textbf{Deflected Jet:} \quad \mathbf{r} = r\mathbf{e}_r, \quad \mathbf{u} = \tilde{V}_j \mathbf{n}, \quad \mathbf{w} = \tilde{V}_j \mathbf{n} - \Omega r \, \mathbf{e}_\theta, \quad \mathbf{n} = \mathbf{e}_\theta \cos\phi + \mathbf{e}_r \sin\phi$$

30. Page 324, Equation (7.79): The quantity "r" should not appear in the equation to the right. The correct equation is

$$\frac{d\Omega\tau}{dU} = 2\rho Q \left(V_j - 2U\right)$$

31. Page 331, Problem 7.44, third line: Replace "$\Omega\tau$" with "τ".

32. Page 372, Problem 8.26(c): The gas is air.

33. Page 374, Problem 8.41, next to last line: Replace "T_{t1}" with "T_t".

34. Page 386, just above Equation (9.10): Replace "Reynolds Transport" with "Reynolds Transport Theorem".

35. Page 388, Footnote: Replace "Equation (9.1)" with "Equation (9.9)".

36. Page 389, just above Equation (9.33): Replace "Equation (9.33)" with "Equation (9.32)".

37. Page 402, Equation (9.90): Replace "a" with "a^2". The correct equation is

$$\frac{dh}{dp} = \frac{1}{\rho}, \qquad \frac{d^2h}{dp^2} = -\frac{1}{\rho a^2}\frac{dh}{dp}$$

38. Page 464, Problem 10.66: Replace "point source" with "potential vortex".

39. Page 509, Problem 11.21, last line: Replace "m^2/sec^2" with "m^2/sec".

40. Page 509, Problem 11.22, next to last line: Replace "that sailboat" with "that the sailboat".

41. Page 509, Problem 11.22, last line: Replace "ft^2/sec^2" with "ft^2/sec".

42. Page 512, Problem 11.37, second line: Replace "ft^2/sec^2" with "ft^2/sec".

43. Page 512, Problem 11.38, third line (twice): Replace "m^2/sec^2" with "m^2/sec".

44. Page 519, Equation (A.2): Change "1 torr" to "760 torr".

45. Page 547, Problem 1.25: Replace "519 J/(kg·K)", which is the value appropriate for $\mathcal{R}$ = 8310 J/(kg-mole·K), with "519.6 J/(kg·K)," which is appropriate for $\mathcal{R} = 8314$ J/(kg-mole·K).

46. Page 549, Problem 3.35, Part (b): Replace "Glycerin" with "SAE 10W Oil".

47. Page 549, Problem 3.45(b): Replace "0.225 atm" with "0.223 atm".

48. Page 549, Problem 3.87(a): Replace "$\mathbf{F} = -\rho g \ell^3 [3\mathbf{i} + (4+\pi)\mathbf{k}]$" with "$\mathbf{F} = -\rho g \ell^3 [6\mathbf{i} + (4+\pi)\mathbf{k}]$".

49. Page 549, Problem 4.5(a): Replace "U" with "U_o". The correct solution is $\mathbf{a} = (2U_o^2/x_o)(1 - x/x_o)^{-5}\mathbf{i}$.

50. Page 549, Problem 4.33: The exponential term's argument should be squared. The correct solution is

$$\boldsymbol{\omega} = (U/\sqrt{\pi\nu t}) \exp\left[-y^2/(4\nu t)\right]\mathbf{k}$$

51. Page 550, Problem 5.27: Replace "$u = U/6$" with "$A_{cs} = A/8$".

52. Page 550, Problem 5.39: Replace "$B = \frac{1}{2}A$" with "$B = \frac{1}{4}A$".

53. Page 550, Problem 5.67: The correct answer for R_y/R_x is $R_y/R_x = 5/(2 + 5\cos\phi)$.

54. Page 550, Problem 5.85: The correct answer for $\mathbf{F}$ is $\mathbf{F} = \frac{1}{32}\pi\rho V^2 D^2(-3\,\mathbf{i} + 2\,\mathbf{j})$.

55. Page 550, Problem 5.93(b): Replace "0.464 kN" with "0.467 kN".

56. Page 550, Problem 5.101: The correct answer for F_y is $F_y = -\frac{1}{72}\left(16 - 3\sin\alpha\right)\rho\, U^2 h$.

57. Page 550, Problem 5.105: The correct answer for C_p is $C_p = -\frac{5}{9}$.

58. Page 551, Problem 6.39: Add "$\overline{u}_2 = \overline{u}_1/4$".

59. Page 551, Problem 6.81: Replace "$\overline{u}_{up} = 0.96$" with "$\overline{u} = 1.02$".

60. Page 552, Problem 8.21: Delete "$M_A = 0.3$" and "$M_A = 0.6$". The first two of the three parts of the answer are $p_A/p_B = 1.198$ and $T_A/T_B = 1.053$.

61. Page 552, Problem 8.31: Replace "$T_2 = 279$ K" with "$T_2 = 292$ K".

62. Page 552, Problem 8.49: Replace "$T_t = 563^{\circ}$ R" with "$T_t = 563^{\circ}$ F".

63. Page 552, Problem 8.69(a): Replace "$p_1 = 13.51$ psi" with "$p_1 = 13.52$ psi".

64. Page 553, Problem 10.49(b): Replace "$UQ/(2\pi)$" with "$UQ/(\pi x)$". The correct solution is

$$p = p_\infty + \frac{1}{2}\rho\left[UQ/(\pi x) - Q^2/(2\pi x)^2\right]$$

65. Page 553, Problem 10.71: Replace "D" with "$\mathcal{D}$".

66. Page 557, Lighthill and Whitham reference: Replace "317{345" with "317-345".