Changes and Errata to

*Cellular Biophysics, Volume 1: Transport*

by Thomas F. Weiss

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- Page *xxix*, Seventh line, replace “133.3 × 10^5 N \cdot m^{-2}” with “133.3 N \cdot m^{-2}”
- Page *xxix*, Insert as first entry in table [Name]“Acceleration of gravity”[Symbol] “g” [Value] “9.807 m \cdot s^{-2}”
- Page *xxx*, Second entry in table (for Dielectric constant), third column, remove “cm^2 \cdot s^{-1}”
- Page 8, Sixth line from bottom of the page, change “and disassembled” to “(and disassembled)”
- Page 84, Line 1, change “To study diffusion” to “For example, to study diffusion”
- Page 88, replace Figure 3.2 with

![Diagram 1](image1)

- Page 94, replace Figure 3.4 with

![Diagram 2](image2)
• Page 158, Exercise 3.10, Sentence 33, replace “The volume of bath 2 is \( V_2. \)” with “Bath 2 has volume \( V_2 \) and a concentration of solute \( n \) that is zero.”

• Page 166, replace Figure 3.59 with

\[ \text{Membrane} \]
\[ \begin{array}{c}
C_1 \\
D_1
\end{array} \quad \begin{array}{c}
\phi \\
\phi
\end{array} \quad \begin{array}{c}
P \\
C_2 \\
D_2
\end{array} \]
\[ \begin{array}{c}
d_1 \\
d_2
\end{array} \]

• Page 167, Line 3, replace “equilibration time of \( X \) in the” with “time for \( X \) to reach steady state in the”

• Page 171, Item ‘c.’, line 2, replace “membrane, i.e., does” with “membrane at each instant in time, i.e., does”

• Page 171, In the equation of Item ‘c.’, replace “\( \dot{\phi}_n = P_s(c_n^1 - c_n^2)? \)” with “\( \dot{\phi}_n(t) = P_s(c_n^1(t) - c_n^2(t))? \)”

• Page 171, Item ‘d.’, line 2, replace “membrane, i.e., does” with “membrane at each instant in time, i.e., does”

• Page 171, In the equation in Item ‘d.’, replace “\( \dot{\phi}_n = P_l(c_n^1 - c_n^2)? \)” with “\( \dot{\phi}_n(t) = P_l(c_n^1(t) - c_n^2(t))? \)”

• Page 188, replace Figure 4.1 with

\[ \text{Surface area } A \]
\[ p(x) \quad \begin{array}{c}
F(x) \\
p(x + \Delta x)
\end{array} \]
\[ x \quad x + \Delta x \]
Page 199, replace Figure 4.6 with

![Diagram](image)

• Page 204, In the first line of the section Water Diffusion, remove “by means of” and replace with “with water that contains”

• Page 204, In the second line of the section Water Diffusion, replace “water (e.g., deuterium, tritium, etc.)” with “hydrogen (tritium)”

• Page 235, Line 6 of Figure 4.28 caption, replace “(pm $\cdot$ s$^{-1} \cdot$ Pa)” with “(pm $\cdot$ s$^{-1} \cdot$ Pa$^{-1}$)”

• Page 255, Fifth line from bottom of page, replace “$V_c.$” with “$V_c$, and $V'_c \ll V_c.$”

• Page 255, Last line on page, replace “Are” with “Determine if” and change “volume, $d\nu(t)/dt$ at” to “volume ($d\nu(t)/dt$ at”

• Page 256, Line 1, replace “$t = 0+$, and $\nu(\infty)$” with “$t = 0+$) and the final value ($\nu(\infty)$) of the normalized volume are”

• Page 263, Line 1, replace “a.” with “1.” and replace “was” with “is”

• Page 263, Line 2, replace “stood” with “stands”

• Page 263, Line 3, replace “had” with “has”, replace “30.7” with “36.5”, and replace “could” with “can”

• Page 263, Line 4, replace “had” with “has” and “was” with “is”

• Page 263, Line 6, replace “b.” with “2.”
• Page 265, replace Figure 4.47 with

![Diagram showing a glass tube with a membrane and sucrose solution on one side and water on the other, with a height function h(t).](image)

• Page 268, In first line of item ‘a.’, replace “less” with “fewer”

• Page 270, Line 5, replace “$C_\Sigma^0(t) < C_\Sigma(t)$” with “$C_\Sigma^0(t) < C_\Sigma^i(t)$”

• Page 283, Line 9 in Figure 5.2 caption, change “test” to “tests”

• Page 288, replace Figure 5.3 with

![Graph showing normalized time vs. normalized time for impermeant solute and permeant solute with corresponding functions $\nu(t)$, $\hat{n}(t)$, and $c(t)$, and varying $\alpha$.](image)
• Page 293, Line 8 of Figure 5.6 caption, replace “(pm \cdot s^{-1} \cdot Pa)” with “(pm \cdot s^{-1} \cdot Pa^{-1})”

• Page 297, Line 5 of first paragraph, replace “water molecules, e.g., tritium.” with “water molecules, e.g., with tritium replacing hydrogen.” and replace “solvant and tritium” with “solvant and tritiated water”

• Page 318, replace Figure 5.16 with

![Graph](image-url)
• Page 319, replace Figure 5.17 with

\[ n(t) \quad c_A(t) \quad c_B(t) \]

\[ \nu(t) \]

-1 0 1 2 3 4 5 6

Normalized time, \( \alpha \nu t \)

• Page 323, Line 7, replace “are” with “is”

• Page 323, Line 8, replace “largest?” with “larger?”

• Page 324, Line 18, replace “by radioactive” with “with heavy”

• Page 347, Lines 9 and 10. Remove “Since we assume the enzyme is conserved,”

• Page 347, Line 20 replace “Michaelis-Menton” with “Michaelis-Menten”

• Page 348 Line 1 in Figure 6.8 caption, replace “Michaelis-Menton” with “Michaelis-Menten”
• Page 353, replace Figure 6.14 with

![Graph showing a contour plot with axes labeled $r_1$ and $r_2$ in Ångstroms.]

• Page 388, Line 16, replace “the the” with “the”

• Page 422, Second Line from bottom of page, replace “$\tau_e$” with “$\tau_{eq}$”

• Page 423, Line 1, replace “$\tau_e$” with “$\tau_{eq}$”

• Page 423, Line 3, replace “$\tau_d$,” with “$\tau_{ss}$,”

• Page 423, Line 5, replace “$\tau_d$” with “$\tau_{ss}$”

• Page 424, In the equation in Problem 6.4, replace “$c^i$” with “$c^i(t)$” in both instances

• Page 424, In the fourth line of Problem 6.4, replace “$c^i$” with “$c^i(t)$”

• Page 426, Line 7, replace “concentration” with “densities”

• Page 429, Problem 6.9, Add after “initial concentration is $C.$” the sentence “Assume that the change in intracellular osmolarity is negligible.”

• Page 456, Line 6, replace “Using” with “With”
- Page 457, replace Figure 7.5 with

- Page 463, Last line, replace sinh Ψ(x) with sinh Ψ(X)

- Page 464, Equation 7.27, replace with

\[ \Psi = \frac{i}{RT/(zF)} \]

- Page 473, Line 7 of Figure 7.11 caption, add “The electric field was 0.548 V/cm.”

- Page 491, Line 12, replace “−68” with “−60”

- Page 501, Fourth line from bottom of page, change “flux ion” to “flux of ion”

- Page 510, Third line from bottom of page, replace “low-sodium” with “sodium”

- Page 511, Line 7 of Figure 7.42 caption, replace “low-sodium” with “sodium”

- Page 512, Line 9, replace “effect” with “dependence”

- Page 514, Second paragraph, third line, replace “First, addition” with “Addition”

- Page 517, Line 10 of Figure 7.46 caption, remove “, obviating” and replace with “which interfered with”

- Page 530, third line from bottom of page, the two coefficients of \( V_m \) should be \( (z_n^2 \beta FP_n c_n^i) \) and \( (z_n^2 \beta FP_n c_n^o) \), respectively.

- Page 531, replace Figure 7.52 with
• Page 531, add to the end of the caption of figure 7.52 “The parameter is $c_n^o/c_i^o$.”
• Page 546, Third line from bottom of page, replace “0.2mol/L” with “0.2 mol/L”
• Page 555, replace Figure 7.68 with

![Diagram](image)

• Page 584, Line 14, replace “$c_p$” with “$c_i$”
• Page 584, Line 15, replace “$c_p(t) = n_p(t)/V(t)$” with “$c_i(t) = n_i(t)/V(t)$”
• Page 584, Line 16, replace “$c_p(t) = (n_p(t))$” with “$c_i(t) = (n_i(t))$”
• Page 628, Line 11, remove “for a $z_+ z_-$ electrolyte”
• Page 628, Line 14, remove “equilibrium”
• Page 630, Part a, Line 1, replace “$V_m$” with “$V_m^o$” and replace “the potential” with “the resting potential”
• Page 630, Part a, Line 2, replace “$V_m$” with “$V_m^o$”
• Page 630, Part a, Part v, Line 1, replace “Equilibrium” with “Quasi-equilibrium”
• Page 630, Part c, Line 1, replace “equilibrium” with “quasi-equilibrium”
• Page 630, Part c, Line 2, replace “equilibrium” with “quasi-equilibrium”

• Page 631, in the last line, the denominator of the righthand side of the equation should read “$x(t)(L - x(t))$”

• Page 632, Line 12, the denominator of the righthand side of the equation should read “$x(t)(L - x(t))$”

• Page 633, Third line from bottom of page, replace “$\phi^o$” with “$\phi^{co}$”

• Page 634, every instance of “equilibrium” should be preceded by “electrodiffusive”

• Page 635, every instance of “equilibrium” should be replaced with “quasi-equilibrium”

• Page 683, Column 3, Line 8, replace “Michaelis-Menton” with “Michaelis-Menten”