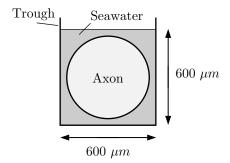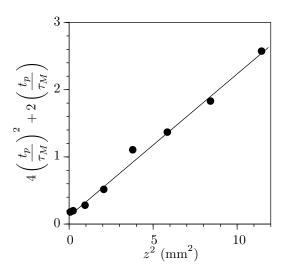# Changes and Errata to
Cellular Biophysics, Volume 2: Electrical Properties
by Thomas F. Weiss
December 29, 1998

- Page *xxv*, Seventh line, replace "133.3×10^5 N $\cdot$ m^{-2}" with "133.3 N $\cdot$ m^{-2}"

- Page *xxv*, Insert as first entry in 'Physical Contents' table [Name] "Acceleration of gravity" [Symbol] "g" [Value] " 9.807 m $\cdot$ s^{-2}"

- Page *xxvi*, Second entry in table (for Dielectric constant), third column, remove "cm$^2 \cdot$ s^{-1}"

- Page 56, Line 12 from bottom of page, replace "if there is an" with "an"

- Page 56, Line 10 from bottom of page, replace "cell, that must" with "cell, must"

- Page 60, Equation 2.31, in the third numerator replace "$\partial^2 V_m$" with "$\partial^2 V_m(z,t)$"
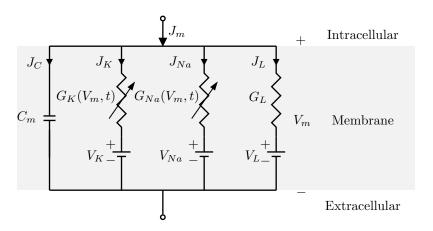
- Page 83, Replace Figure 2.33 with

- Page 117, Line 3, replace "the the" with "the"

- Page 140, replace item 'b.' of Problem 3.10 with "Explain why the internal potential, $\hat{v}_i(\lambda)$ approaches zero as r_i/r_o goes to zero."
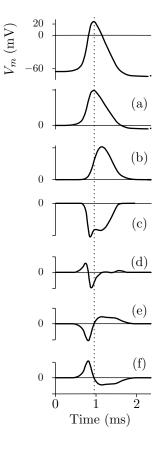
- Page 149, Replace Figure 3.49 with

- Page 156, In the equation in Problem 3.19, replace "$\frac{\partial v_o(z)}{\partial z}$" with "$\frac{dv_o(z)}{dz}$"

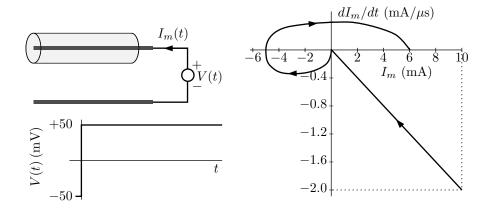- Page 170, Replace Figure 4.6 with

- Page 171, In the unnumbered equations after Eq. 4.3, replace both instances of "log" with "ln"

- Page 214, In equation 4.28, in the second numerator replace "(V_m)" with "(V_m)"

- Page 224, Last paragraph, line 7, replace "We also" with "We have also"

- Page 229, First paragraph, fifth line from bottom, replace "parameters the system of" with "parameters, the"

- Page 229, First paragraph, fourth line from bottom, replace "is unstable" with "are unstable"

- Page 233, Line 6, replace "all" with "each of" and replace "in Taylor's" with "in a Taylor's"

- Page 239, Line 7, replace "their" with "there"

- Page 271, Last line on page, replace "of membrane current" with "of current"

- Page 272, Lines 3 and 4, delete "The vertical scales for waveforms b through f are identical, but the scale for waveform a is different."
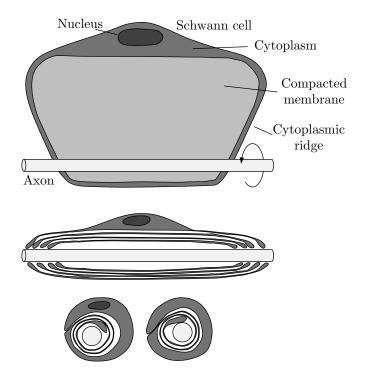
- Page 273, replace Figure 4.94 with

- Page 276, Second line from bottom of page, change "that indicates" to "to indicate"
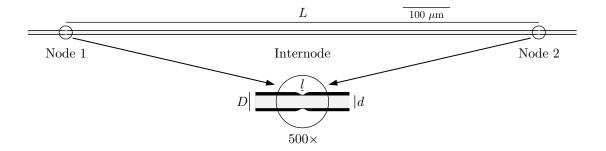
- Page 281, Replace Figure 4.102 with

- Page 283, Line 1, replace "the the membrane" with "the membrane"

- Page 295, Lines 8 and 9, replace "cells, either one unmyelinated fiber in one supporting cell" with "cell. A supporting cell may ensheath one"

- Page 295, Lines 9 and 10, remove "in a single supporting cell, as seen in cross section"
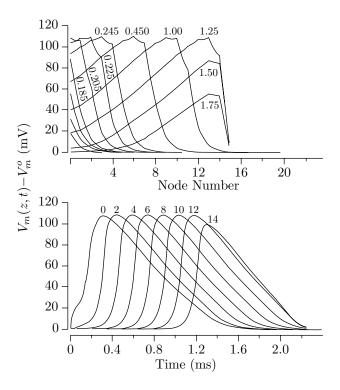
- Page 298, replace Figure 5.5 with
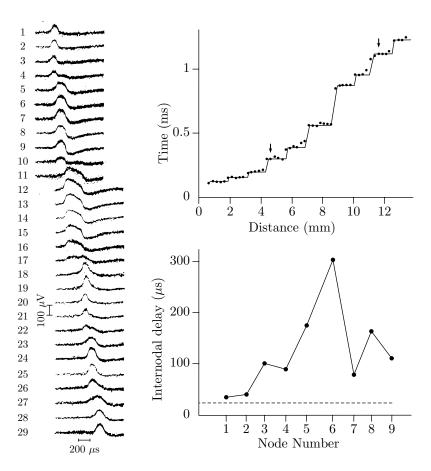
- Page 301, Replace Figure 5.8 with

$$L \qquad \overline{100 \ \mu\text{m}}$$

Node 1 $\qquad$ Internode $\qquad$ Node 2

l

$D|$ $\qquad$ $|d$

$500\times$

- Page 301, Figure 5.8 caption, Line 3, add after "and $l = 1\mu$m." the following sentence "The inset shows the region around a node scale by $500\times$."

- Page 302, Figure 5.9 caption, line 6, add after "for these fibers." the sentence "The average $\pm$ SD was: 0.731 ± 0.056 for the vagus nerve; 0.742 ± 0.065 for the sciatic nerve."

- Page 302, Figure 5.10 caption, line 8, add after "in μm." the sentence "The correlation coefficient is 0.80."

- Page 303, Figure 5.11 caption, line 4, add after "of lamellae." the sentence "The correlation coefficient is 0.89."

- Page 305, Second paragraph, sixth line, replace "suggests" with "suggest"

- Page 310, Last line on page, replace "(as" with "as" and replace "potential)" with "potential (Figure 4.32)" [NB — Use symbolic reference to Figure 4.32]

- Page 311, Last line of Figure 5.19 caption, add after "each record was obtained." the sentence "The external longitudinal current is plotted in a direction opposite to the direction of propagation."

- Page 315, Line 3, replace "reject" with "rule out"

- Page 315, Line 7 from bottom of page, replace "The pattern of maxima and minima occurred" with "The maxima and minima occur"

- Page 319, Figure 5.28 caption, line 3, replace "potential" with "potentials"

- Page 319, Last line on page, replace "values are" with "values of electrical and geometric properties of frog myelinated fibers are"

- Page 322, Line 6, replace the reference "(Figures 5.21)" with "(Figure 5.21)"
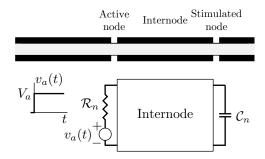
- Page 323, Replace Figure 5.31 with

- Page 325, Line 7 of Figure 5.33 caption, replace "$v = 2.0D$ (left panel)" with "$v = 2.0D$ with a correlation coefficient of 0.67 (left panel)"

- Page 325, Line 8 of Figure 5.33 caption, replace "$v = 2.6D$ (right panel)" with "$v = 2.6D$ with a correlation coefficient of 0.88 (right panel)"

- Page 325, Figure 5.34 caption, third line from bottom, replace "$v = 5.7D$" with "$v = 5.7D$ with a correlation coefficient of 0.97"

- Page 326, Equation 5.11, replace "$\left(\frac{d}{L}\right)$" with "$\left(\frac{d}{L}\right)^2$"

- Page 327, Equation 5.14, in the third numerator replace "$\partial V(z,t)$" with "$\partial V_m(z,t)$"
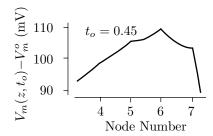
- Page 331, Replace Figure 5.37 with

- Page 331, Line 9 of Figure 5.37 caption, replace "those in Figure 5.25. The" with "those in Figure 5.25. The arrows in the upper right panel delineate the first and last record shown on the left. The"

- Page 331, Line 11 of Figure 5.37 caption, replace "time in" with "time"

- Page 331, Line 12 of Figure 5.37 caption, replace "successive internodes." with "versus distance (same scale as above); successive nodes are indicated."

- Page 331, Line 13 of Figure 5.37 caption, replace "The dotted line" with "The dashed line"

- Page 332, Line 4, replace "capacitance" with "membrane capacitance" and "resistance" with "membrane resistance"

- Page 338, In Problem 5.3, Item 'b'., replace "$V_m(z,t) = V_m(t - z/\nu)$" with "$V_m(z,t) = f(t - z/\nu)$"
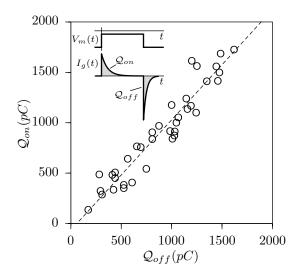
- Page 339, Replace Figure 5.43 with
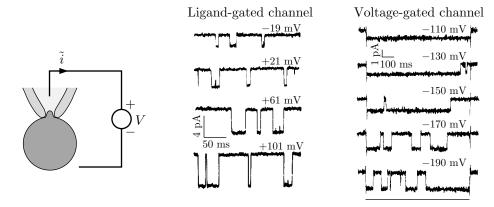

- Page 344, Replace Figure 5.49 with

- Page 344, Problem 5.10, Item 'a.', Line 3, add after "0.45 ms." the sentence "Assume that $r_i = 140$ MΩ/cm $\gg r_o$."

- Page 344, Problem 5.10, last line of item 'b.', replace "t" with "t_o"

- Page 351, First paragraph, third line from the bottom, replace "singe-channel" with "single-channel"

- Page 352, In the eighth and ninth lines of the first paragraph, remove "However, as with all important work, this" and replace with "This"

- Page 353, Second line from bottom of page, replace "voltage clamps" with "changes in membrane potential"

- Page 354, Line 5, replace "for very large cells only." with "only for very large cells."

- Page 354, Line 13, replace "wide" with "wider"

- Page 354, Line 17, replace the entire line with "in the cytoplasm, the antibiotic Nyastatin can be placed"

- Page 354, Line 18, replace "the pipette," with "the patch pipette,"

- Page 354, Last line on page, replace "We call these currents" with "We call currents measured this way"

- Page 358, Line 2, replace "and one that normally" with "and normally"

- Page 362, Paragraph 3, replace lines 3 and 4 with "to cell membranes and to membrane fractions that contain the appropriate channels. These blockers"

- Page 362, Paragraph 3, Line 6, replace "that result" with "which result"

- Page 363, Third line of first paragraph, replace "interpreted" with "explained"

- Page 363, Line 5, replace "which are permeable" with "which is permeable" and replace "If one channel predominates" with "If one channel is most prevalent"

- Page 367, Line 5, replace "variety of cells than" with "variety of cell parts than"

- Page 375, Paragraph 3, Line 2, replace "and are inward" with "and have inward"

- Page 375, Paragraph 3, Line 3, replace "of calcium" with "of free (unbound) calcium"

- Page 380, Third line from bottom of page, replace "Gauss's law" with "Gauss's integral theorem"

- Page 390, Replace Figure 6.24 with

- Page 390, Figure 6.24 caption, last line, add after "current through the membrane." the sentence "The dashed regression line has the equation $\mathcal{Q}_{on} = 1.07\mathcal{Q}_{off} - 47$ with a correlation coefficient of 0.95."

- Page 393, Last paragraph on page, line 3, replace "voltage-gated sodium" with "voltage-gated"

- Page 393, Last paragraph on page, line 4, replace "opening immediately after a depolarization" with "opening"

- Page 393, Last paragraph on page, line 5, replace "open immediately after a depolarization" with "open for $V = -190$ mV than for $V = -110$ mV"

- Page 394, Replace Figure 6.28 with

- Page 395, Lines 1 and 2, replace "magnitude of the membrane potential is increased." with "potential V is made more negative."

- Page 396, Last line on page, replace "channel open" with "channel-open"

- Page 399, fifth line from bottom of page, replace "gate that opens" with "gate that tends to open"

- Page 404, In the second equation, replace both instances of "$\tilde{g}(t)$" with "$\tilde{g}_k(t)$"

- Page 409, Line 10, replace "$E_C - E_O \ll kT$," with "$|E_C - E_O| \ll kT$,"

- Page 412, Second line following Equation 6.31, remove "Note that x_∞ is independant of ζ"

- Page 412, Tenth line from bottom of page, replace "Thus," with "That is,"

- Page 414, In the first equation, replace "V_m" with "$(V_m - V_O)$"

- Page 414, In the second equation, replace "V_m" with "$(V_m - V_C)$"

- Page 415, in the sixth line of the last paragraph, remove "$i(V_m, t)$,"

- Page 423, Second part of Equation 6.48, replace "$\tau_C p_O(\tau_C)$" with "$\tau_C p_C(\tau_C)$"

- Page 427, in the last line of the first paragraph, replace "the the" with "the"

- Page 441, Seventh line from bottom of page, replace "decided" with "decidedly"

- Page 453, (FIGURE 6.71 GRAY SCALES ARE NOT DISTINCT)

- Page 468, Example 6.10, replace "water channels" with "water channels (Weiss, 1996)" [NB — use symbolic citation]

- Page 472, Problem 6.6, Line 1, replace "through the a cell" with "through a cell"

- Page 487, Line 4, replace "Figure 6.89" with "Figure 6.89 (Weiss, 1996)" [NB — use symbolic citation]

- Page 495, Line 6, replace "Is so," with "If so,"