ERRATA

For the book ñA farewell to Entropy , Statistical Thermodynamics Based on Informationò

Chapter 1:

Page 2, lines 4-6 of paragraph 2 should be revised to:

ñThis definition is valid without any reference to the atomic constituency of matterò, i.e., delete ñbut also if matter were not atomistic at all, i.e., if matter were continuousò.

Page 4, Figure 1.2: Title should be Charlesô rather than Charleôs; replace figure (figure attached).

Page 5, equation, Equation (1.1.8): delete ñNò, the equation should be:

$$k_B T = \frac{2}{3}\frac{m\langle v^2 \rangle}{2} \qquad (1.1.8)$$

Chapter 2:

Page 40, 1st line, final paragraph: should be ñgreater than or equal toò, i.e., delete ñthanò.

Page 46, five lines from the end: should be ñrests on ourò, i.e., delete ñtheò.

Page 48, 4th & 5th lines from the bottom: replace the sentence ñEach of theseé are indistinguishableò with a new sentence, i.e., ñIf the particles are indistinguishable then each configuration in Figure 2.3 is counted twiceò.

Page 52, 8 lines from the top: Revise the exercise as follows: ñMrs. A has two children. It is known that she has at least one boy. What is the probability that she has two boys?ò

Page 52, 11 lines from the bottom: Revise the two sentences as follows: ñMrs. A has three children. It is known that she has at least one boy. Calculateé ò.

Page 80, Equation (2.7.9): Revise the second line of equation. The equation should be:

$$I_A(w) = \begin{cases} 1 & if \quad \omega \in A \\ 0 & if \quad \omega \notin A \end{cases} \qquad (2.7.9)$$

Page 83, Equation (2.7.23): fourth term on the 1st line should be:

$$E\left[\left(X - E(X)\right)^2\right]$$

Page 97, line above Equation (2.9.15), line below Equations (2.9.16) & (2.9.17), 4th line below Equation (2.9.19) and 2nd & 3rd lines above Equation (2.9.20):

It should be ñ*r*ò, i.e., the letters ñ*r*ò and ñò (a small letter ñ*r*ò and a regular, small letter ñò) instead of a Greek ñ ò.

Page 98, 1st line of the page, 1st line below Equation (2.9.22), last two lines at the bottom of the page:

It should be ñ*r*ò, i.e., the letters ñ*r*ò and ñò (a small letter ñ*r*ò and a regular, small letter ñò) instead of a Greek ñ ò.

Page 99, line below Equation (2.9.26): It should be ñ*rv*ò, i.e., the letters ñ*r*ò and ñ*v*ò (a small letter ñ*r*ò and a regular, small letter ñ*v*ò) instead of a Greek ñν ò.

Page 100, delete the $< p$: Revised equation should be:

$$-\varepsilon N_T < n(A) - pN_T < \varepsilon N_T \qquad (2.10.4)$$

Page 102, Equation (2.10.8): the 2nd of the two terms on the last line should be:

$$-erf\left[\frac{-\varepsilon N_T}{\sqrt{N_T pq}}\right]$$

i.e., a minus sign is required in the function argument. Last line of equation (2.10.8) should be:

$$= erf\left[\frac{\varepsilon N_T}{\sqrt{N_T pq}}\right] - erf\left[\frac{-\varepsilon N_T}{\sqrt{N_T pq}}\right] = 2\ erf\left[\varepsilon\sqrt{\frac{N_T}{pq}}\right] = 1$$

Chapter 3|

Page 106, Figure 3.1: the ordinal numbering in (b) is wrong, i.e., it should read 7th, 6th, 5th, 4th, 3rd (figure attached).

Page 110, last paragraph: Revise Shannonôs quotation to: ñé or of how uncertain we areé ò, delete ñmuchò.

Page 123, Equation (3.2.84): Replace on the left hand side ñ$I(X_1;\cdots;X_N)$ò with ñ$P(x_1,\cdots,x_N)$ò

Page 131, line before Equation (3.2.53): It should be ñWe defineé ò instead of ñWe definedò.

Page 137, Equation (3.2.84): Revise equation to:

$$-1 - \log f(x) + \lambda_1 + \lambda_2 x \qquad (3.2.84)$$

Page 144, 7th line from the bottom: It should be ñThere are an infiniteé ò instead of ñThere are a infiniteé ò.

Page 147, Equation (3.4.6) revise to: Replace subscript ñp_i'ò with ñp_iò or replace ñ$-\log(p_i)$ò with ñ$-\log(p_i')$ò; add the line ñfor all iò after the 0 in ñé $\lambda_2 i = 0$;

Page 147, line below Equation (3.4.6) should be revised to ñor equivalentlyò;

Page 147, on the right-hand side of Equation (3.4.8), replace ñ$\sum i \exp$é ò with ñ$\sum \exp$é ò The whole term on the rhs should be

$$= \exp[-1-\lambda_1]\sum \exp[-\lambda_2 i] \qquad (3.4.8)$$

Page 147, on the right hand side of Equation (3.4.9) revise to: $\frac{\sum ix^i}{\sum x^i}$ (i.e. delete the ñiò) in the denominator.

Page 156, Equation (3.5.20). Replace: $< \left(\frac{1}{7}, \frac{6}{7}\right) <$

with $< H\left(\frac{1}{7}, \frac{6}{7}\right) <$

i.e., add an ñHò before the parenthesis.

Page 160, 5th line from the top. Replace: $P(G_{N-3} / N_1 \ldots N_{N-2})$

With: $P(G_{N-1} / N_1 \ldots N_{N-2})$

Page 160, on the left hand side of Equation (3.5.31). Replace: $\sum_{i=1}^{N-1} i$

With: $\sum_{i=1}^{N-2} i$

Page 166, line after Equation (3.5.50). Replace ñgaining at the third stepò with ñgaining the information at the third stepò.

Page 167, 1st line. Replaceò $P(G_2 / N_2)$

With: $P(G_2 / N_1)$

Page 171, first line of equation (3.6.15). Replace: $\log P(+C)$

With: $\log P(+ / C)$

i.e., add slash.

<u>Chapter 4:</u>

Page 180, 4th line from the bottom. Replace ñsite, $i(i \neq j)$ò with ñ $i\ (i \neq j)$ò, (i.e., insert two spaces).

Page 184, Equation (4.1.15). Replace: $P_{i_1 i_1 \cdots i_N}$

With: $P_{i_1 i_2 \cdots i_N}$

Page 184, line after Equation (4.1.17) should be ñ However, for *N*ò rather than ñHowever, for an *N*ò, i.e., delete ñanò.

Page 185, first line of equation (4.120). Replace: $\sum_{i=1}^{n} H(1)$

With: $\sum_{i=1}^{N} H(1)$ (i.e., replace ñnò by ñNò.)

Page 185, Equation (4.1.20). Replace: $\log \frac{M!M^{N}}{N!(M-N)!}$

With: $\log \frac{M!M^{-N}}{N!(M-N)!}$

i.e., instead of M^{N}, it should be M^{-N}.

Page 185, Equation (4.1.22), 2nd line, delete $\xrightarrow{M>>N} \log \frac{1}{N!}$. Second line of Equation (4.1.22) should be:

$$= \log \binom{M}{N} - \log \frac{M!}{(M-N)!} = -\log N! \qquad (4.1.22)$$

Page 187, line after Equation (4.2.3): It should be ñfrom (4.2.1) instead of ñfrom (4.1.2)ò.

Page 189, 1st line above (4.2.12). In the *denominator* replace

$$\left(2-\frac{N}{M}+\frac{1}{M}\right)\left(2-\frac{N}{M}+\frac{2}{M}\right)\cdots 1$$

with

$$\left(1-\frac{N}{M}+\frac{1}{M}\right)\left(1-\frac{N}{M}+\frac{2}{M}\right)\cdots 1$$

Page 191, 1st line above (4.2.14). In the *denominator* of the *second* term, replace

$$\left(1-\frac{N}{2}+\frac{1}{M}\right)\cdots\left(1-\frac{N}{2M}\right)$$

with

$$\left(1-\frac{N}{M}+\frac{1}{M}\right)\cdots\left(1-\frac{N}{2M}\right)$$

Page 191, Equation (4.2.15), replace ñΔSò with ñΔHò.

Page 192, 11th line above the footnote 11: It should be ñligandò and not ñligandsò, delete the ñsò.

Page 194, 2nd line from the top: It should be ñamount of missing informationò, i.e., insert ñmissingò.

Page 198, on the rhs of Equation (4.2.30). Replace: $-N\log\left[x_1 \log x_1 + x_2 \log x_2\right]$

With: $-N\left[x_1 \log x_1 + x_2 \log x_2\right]$

Page 205, line after Equation (4.3.10): It should be ñv_1ò instead of ñv_Iò, i.e., the subscript should be the number one and not a big letter ñ*I*ò. The revised line should be:

ñwhere $v^N = v_1, \cdots, v_N$ò. All lower case ñvôsò should be in bold rendition.

Page 209, left hand side of both equations (4.4.2) ans (4.4.3) add minus sign, i.e.,

$$-\beta\mu = \left(\frac{\partial s}{\partial N}\right)_{E,M} \qquad (4.4.2)$$

$$-\beta\mu = ... \qquad (4.4.3)$$

Chapter 5:

Page 215, 9th line, 2nd paragraph: It should be ñcalculatedò instead of ñcalculatingò, i.e., ñé average quantities calculated fromé ò

Page 228, three lines after Equation (5.3.1); Insert ñfunctionò after ñpartitionò, i.e., ñé quantum mechanical partition function replacingé ò

Page 249, Equations (5.8.28) & (5.8.29): It should be ñexpò instead of ñ*exp*ò, i.e., no italics.

Chapter 6:

Page 270, 7th line above Equation (6.6.1): Delete one of the ñintoò; there appears two of them, i.e., revised line should read: ñé same kind are assimilated into each otheré ò

Page 274, 2nd line from above the footnote: It should be ñ2N particles initiallyé ò, i.e., add the number 2 to N in the beginning of the sentence.

Page 275, 2nd line below the last line of Figure caption 6.10: Enclose the word ñreverseò in quotation marks, i.e., ñreverseò and put a footnote number after VIIb. Corresponding footnote copy should be:

ñ VIIb is not the reverse of VIIa. Here, we use the term ñreverseò in the sense of going back from a square to a circle, rather than from a circle to a square as in VIIaò.

Page 278, last & 2nd lines from the bottom: It should be ñN_A, *A*-particlesò and N_B, *B*-particlesò, i.e., put a comma after N_A, and add a letter ñ*A*ò and a hyphen before the word ñparticlesò as it appears above; and then add a hyphen after the letter ñ*B*ò before the word ñparticlesò, also as it appears above.

Page 290, Equation (6.10.1): in the second ñ$g(R_1, R_2)$òa comma is missing; add a comma.

Page 291, 6th line above the footnote: It should be ñ$2N(N-1)/2$ pairsò instead of $N(N-1)/2$ pairsò. The line should read: ñ$2N(N-1)/2$ pairs to ñ$2N(2N-1)/2$ pairsé ò

Page 294, 3rd line after Equation (6.11.2): It should be (6.11.1) instead of (6.10.1).

Page 304, 1st line after Equation (6.12.12): Instead of ñ$erf\left(\sqrt{2\delta N}\right)$ò it should be $erf\left(\delta\sqrt{2N}\right)$.

Page 311, point (iii), 4th line: It should be ñchangeò instead of ñchangesò, i.e., ñé distribution of momenta might also changeé ò

Page 313, 4th line, 3rd paragraph: It should be ñHowever, the MI is not equal toò, i.e., insert ñnotò.

Page 313, 4 lines before (6.12.29): It should be ñevolve towardsò instead of ñevolve forwardsò.

Page 316, final sentence before the quotation: replace ñthenò with ñthanò, i.e., ñI cannot do any better thané ò

Appendices:

Page 329, 3rd line: It should be ñé all of equalé ò, i.e., delete ñtheò

Page 333, Equation (G.11) should be:

$$\frac{\partial F}{\partial x} = y + 2\lambda x = 0\,, \qquad \frac{\partial F}{\partial y} = x + 2\lambda y = 0$$

Equation (G.12) should be:

$$\lambda = \frac{-y}{2x}\,, \qquad \lambda = \frac{-x}{2y}$$

Page 334, Figure H.1: The title should be ñA concave downward functionò instead of ñA convex downward functionò.

Page 337, 1st line last paragraph: In ñ $f'(x)$ isò there should be more space between $f'(x)$ and the word ñisò;

Page 339, line below (H.25), leave more spaces in between ñ j $(j = 1, 2\cdots)$ò ; applies to both.

Page 343, 6th & 7th lines above the footnote: It should be ñé we cannot find a label that distinguishes between the twoò. i.e., delete ñyet does not affect their being identicalò.

Page 348, Equation (J.3): All lower limits of the integrals of the integrals are zero, i.e.,

$$\int_0^L \cdots \int_0^{X_N} \cdots \int_0^{X_2}$$

Page 358, three lines after (N.3): It should read ñparticlesò, i.e., insert ñsò, i.e., ñé generic event ñ*n* particles in *R*é ò

Page 359, 3rd line from the end: It should be ñdecreasesò rather than ñdecreaseò, i.e., ñé probability decreases with *N*é ò

Page 373, add reference (after Bridgman):

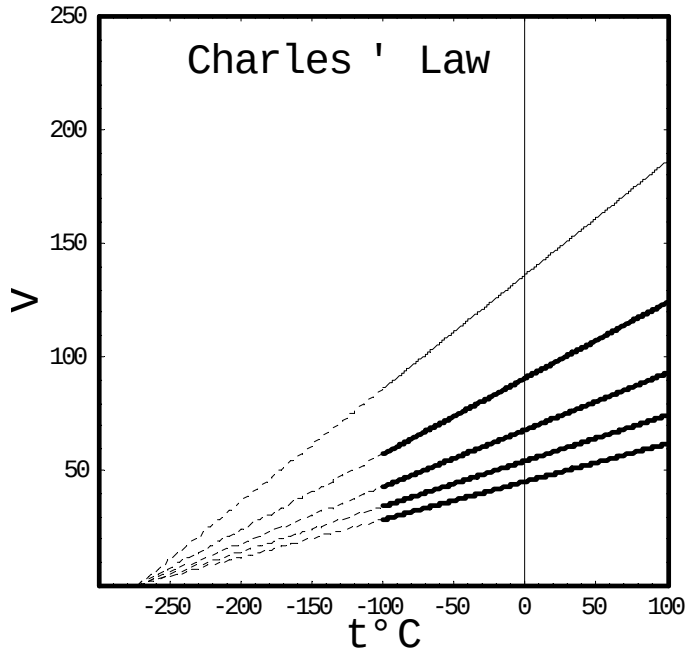
Callen, H.B. (1985), Thermodynamics and an Introduction to Thermostatistics, 2nd edition, John Wiley, New York

Page 379, add reference (in between Carnot and Denbigh):

David, F.N. (1962), Games, God and Gambling, A History of Probability and Statistical Ideas, Dover Publ., New York

Acknowledgement:

Add to the acknowledgement in the Preface: ñThanks to John Chiasson, Steven von Enk , Swami Iyer, Max Moroz and Paul Kingò.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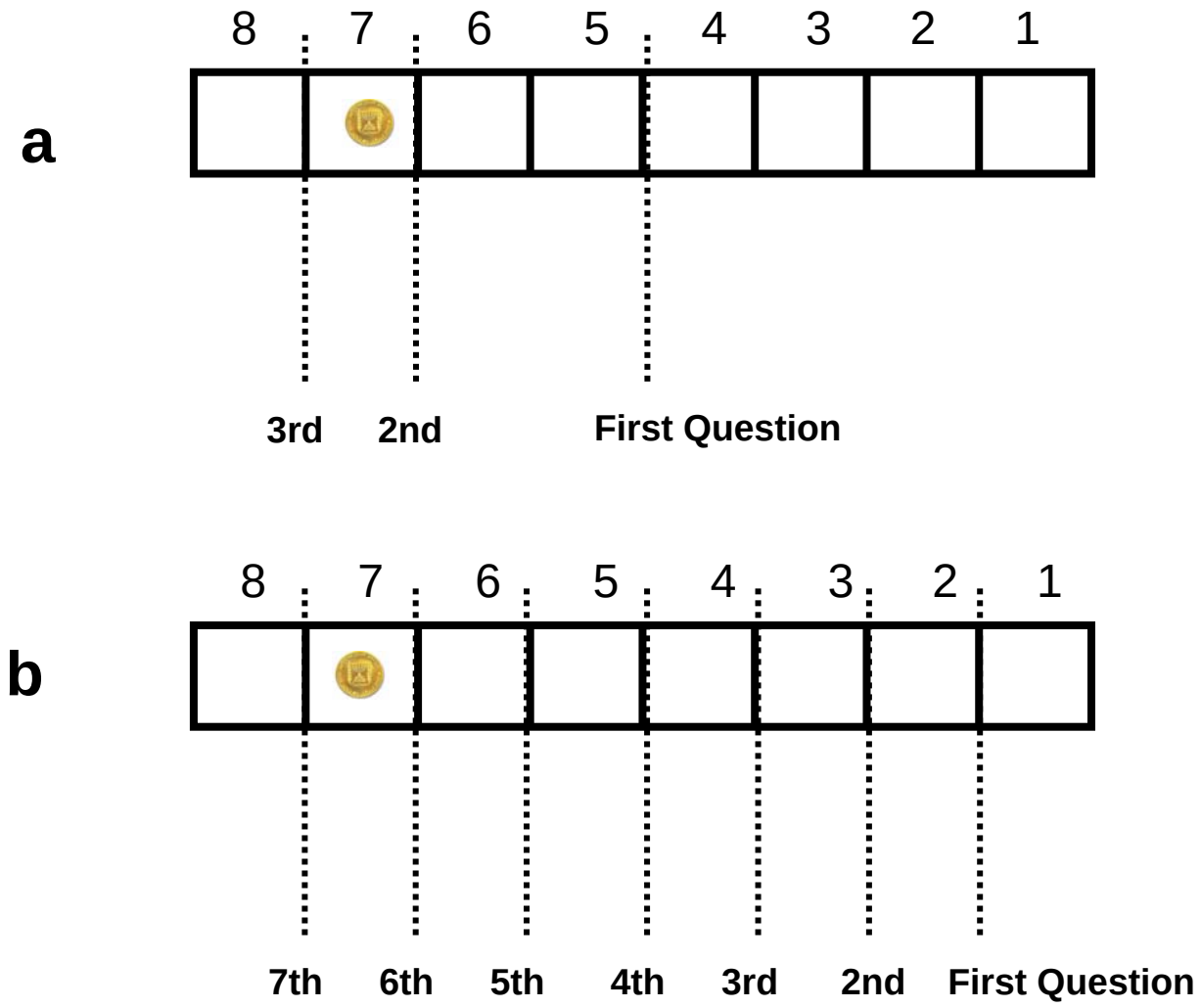
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Figure 3.1