

Corrections (as of August 24, 2006) for the first printing of
Data Analysis and Graphics Using R – An Example-Based Approach

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Readers who require corrections that are additional to the list dated March 19 2004 are advised to check the (very small) list of corrections for the second printing.

Note:

This document is designed to be printed in color, with replacement or new text in blue.

General

As a result of changes to R since this first edition was published:

- Code that uses `data()` to bring datasets in attached packages into the workspace can now, for packages used in this text, be omitted. (It may still be useful to use an explicit call to `data()` to overwrite a dataset, or in some cases multiple datasets, already present in the workspace.)
- The *date* package, described in Section 12.2.3, has been superseded by `as.Date()` and allied functions that are in *base* R.
- The description of the handling of missing values in subscripts, in Section 12.5 on page 318, is no longer accurate.
- While the code given in the text should all run, there are now more direct ways to handle some computations. This is especially relevant to the use of the *lattice* package.

See the web page <http://www.maths.anu.edu.au/~johnm/r-book.html> for additional details.

Preface

p.xviii: lines 9 & 10

Remove the two stray appearances of `ss`: responsibility `ss` and `ss` of

p.xviii, lines -6 to -5: Replace with a CRAN (Comprehensive R Archive Network) site; go to <http://cran.r-project.org> and click on [Mirrors](#).

Chapter 1

p.1, line 15: Replace pages <http://cbis.anu.edu.au/DAAG> and <http://www.stats.uwo.ca/DAAG> with page <http://www.stats.uwo.ca/DAAG>, or from <http://cran.r-project.org>.

p.5

line 4 of Section 1.1.6: Replace `working directory` by `workspace`

line 9 of Section 1.1.6: Replace `workshop` by `workspace`.

p.13, line -10

This line should read

```
> data(possum)      # Precede, if necessary, with library(DAAG)
```

p.14

p.14, line 5: Omit `, eda, ts` (time series)

line 19 and line 22: Replace `working directory` with `workspace`

p.16, lines -6 to -5

Omit the sentence: `We have already used ... graphs on a page.`

p.18, line 4

`left adjusted` would be better `left-justified`

p.19, line 16

Replace `default` by `current`

p.22, lines 12-13

Replace `grid.points()`, `grid.lines()`, `grid.text()`, etc. by `llines()`, `lpoints()`, `ltext()`, `lplot()`, `larrows()` and `lsegments()`.

p.23, fnote 3, line 2

Replace each of the 4 occurrences of ```` with `"`.

p.24, line 8

The sentence starting "Rounding ..." should start a new paragraph.

p.27, Exercise 4

In the final line of this exercise, replace ```` with `"`.

Chapter 2**p.33, fnote 7**

Add two further lines:

```
# See Section 4.5 for a description of stripplot()
# See Subsection 12.2.1 for a description of strsplit()
```

p.35, line 4

Omit (in the *modreg* package).

[The function `lowess()` is now in *stats*; in an out-of-the-box installation this is attached at startup.]

p.37

fnote 12: Replace lines 2 & 3 with

```
# Arguments 1 & 2 to matplot() can be vector or matrix or data frame
```

fnote 13: Add following line 2

```
# stack() concatenates selected data frame columns into a single
# column, & adds a factor that has the column names as levels
```

Add as the final two lines of fnote 13:

```
# The parameter relation="sliced" causes the length of the
# relevant scale(s) ('slice(s)') to be the same for all panels
```

p.40

lines 11-12: `panel.superpose` is illegally split across the two lines.

(Actually `panel=panel.superpose`, is not necessary and could be omitted. Note also the parameter setting `auto.key=TRUE` that might usefully appear.)

p.45, fnote 17

Add the further line

```
# Subsection 12.6.7 has information on split()
```

p.46, lines -16

A closing `)` should appear following `method="spearman"`

p.50, Section 2.6, Exercise 1

Replace the final line (`Comment ... present.`) by

Use `table(cut(possum$age, breaks=c(0,1.5,3,4.5,6,7.5,9)))` to obtain the table of counts. In which interval are possums with `age=3` included; in `(1.5,3]` or in `(3,4.5]`? List the values of age that are included in each successive interval. Explain why setting `breaks=c(0,1.5,3,4.5,6,7.5,9)` leads to a histogram that is misleading.

Chapter 3**p.52, line 11**

Replace `natural` by `physical`

p.57, lines 3 and 7

Replace `}` by `)`

p.59, line -4

Replace `1.645` by `1.28`

p.69, Exercise 5

Replace `mfrow` by [the parameter mfrow to par\(\)](#)

Replace `rows` by `panels`, in the three places where it appears.

Chapter 4**p.74, fnote 2**

Modify the final line to read

```
wren.boot <- boot(data = wren, statistic = median.fun, R = 999)
# R = number of resamples
wren.boot          # NB: wren.boot will be used again later, on p.99
```

p.77, Figure 4.4

Replace `pnorm(0.975)` by `qnorm(0.975)`, and replace `pt(0.975, 8)` by `qt(0.975, 8)`

p.83, line-10: Omit `in the ctest package`

line-2 to -1: Replace `This methodology is not, at the time of writing, implemented in R.` with `The function cor.test() implements this methodology.`

p.87, line 10: Replace `somewhat` with `substantially`

p.89, line -9: Replace `default).` with `default, before fitting the model).`

p.92, line1-4 of Subsection 4.5.3:

fnote 22: The code should read

```
trtchar <- as.character(rice$trt)
fac1 <- factor(sapply(strsplit(trtchar, "\\+"), function(x)x[1]))
variety <- sapply(strsplit(trtchar, "\\+"),
                 function(x)c("wt", "ANU843")[length(x)])
variety <- factor(variety, levels=c("wt", "ANU843"))
attach(rice)
interaction.plot(fac1, variety, ShootDryMass)
detach(rice)
```

(The first argument to `strsplit()` must be a character string. Hence we replace `rice$trt`, in lines 1 and 3, by `as.character(rice$trt)`. In the second to final line, replace `anu843` by `variety`.)

p.92, lines 12-13

Replace `In this instance it turns out that there is no detectable block effect, which is why we could ignore it.` by `In this instance it turns out that the block effect is small, and does not much affect the standard error estimates.`

p.98

line -3: Replace `standard errors` by `confidence intervals`.

fnote 24, line6: Replace `z <- array(, 2000)` by `z <- numeric(2000)`

p.99

fnote 25: Replace fnote 25 by

```
## Use boot.wren, calculated on p.74, as a starting point
boot.ci(wren.boot, type="perc")
```

fnote 26, line 1: Replace `poss o m` by `poss u m`

p.102, Further reading

The author of the *boot* package, whom we inadvertently failed to acknowledge, is Angelo Canty. See Canty (2002) for a readable and helpful overview of this package.

lines -13 to -11: Omit the sentence `Gigerenzer (2002) has helpful insights on ... violent behaviour.` (It is scrambled and is anyway redundant.)

p.103, References for Further reading

Add the reference:

Canty, A.J. 2002. Resampling methods in R: the boot package. *R News* 2/3: 2-7.

p.104

p.104, line4: Omit `library(ts)`

exercise 7, line2: Omit `that is in the ctest package`

Exercise 3: Add

Use `qqplot()`, with the parameter setting `x = qunif(ppoints(50))`, to compare the distribution of the *p*-values with that of a uniform random variable, on the interval [0, 1]. Comment on the plot. **Exercise**

7: This should be asterisked.

Chapter 5**page 112**

Figure 5.4: Note that Exercise 6 on page 133 has R code for panels B and D.)

p.112, line 10: Replace `a strong indication` with `an indication`

line -9: Replace `Figure 5.5 shows the fitted loess curve` with `Figure 5.5 shows the plot of residuals from the loess fit versus the predictor`

page 113, Figure 5.5

Add to the caption

Note that Exercise 7 on page 133 has the R code.

page 114, fnote 8

Insert as the first line

```
data(softbacks)
```

p.116, line 6: Replace `in the lqs package` with `(also in MASS)`

page 122, fnote 14, line 3

Replace the semicolon by a comma, i.e.

```
cv.lm(houseprices, houseprices.lm$call)
```

p.132, Section 5.11, Exercises

Exercise 2: Replace the final three lines with:

Use the robust regression function `rlm()` from the *MASS* package to fit lines to the data in `elastic1` and `elastic2`. Compare the results with those from use of `lm()`. Compare regression coefficients, standard errors of coefficients, and plots of residuals against fitted values.

Exercise 4, line 3: Replace the final three lines with:

[The relevant theory is that associated with the Clausius-Clapeyron equation, by which the logarithm of the vapor pressure is approximately inversely proportional to the absolute temperature. For further details of the Clausius-Clapeyron equation, search on the internet, or look in a suitable reference text.]

p.133, line-9: Omit `library(modreg)`, i.e., omit this line.

Chapter 6**p.136, line 16**

The 95% confidence interval is `for the coefficient of volume`.

p.136, line 18

The confidence interval is `for the coefficient of volume`.

p. 144, fnote 13

Move line -4, i.e. `par(mfrow = c(1,1))`, to be the final line of the footnote.

p. 145, lines 6-7

The split between lines 6 & 7 is at the wrong place. Replace with

```
leverage.plots(allbacks.lm, term.name="volume",
               identify.points=FALSE)
```

p.166, line 15

Omit the final `1`.

p.173, Section 6.10, Exercise 6

Reword thus:

Section 6.1 used `lm()` to analyze the `allbacks` data that are presented in Figure 6.1. Repeat the analysis using (1) the function `r1m()` in the *MASS* package, and (2) the function `lqs()` in the *lqs* package. Compare the two sets of results with the results in Section 6.1.

p.173, line-12 to -11: Replace `in the lqs package` with *(MASS)*

p.174, Exercise 9

Remove the asterisk. Omit `linear` in line 3 and `non-linear` in line 5. Omit from `Are there any advantages ...` to the end of the question.

Chapter 7**p.179**

line 19: Replace `three` by `four`.

p.183

line -10 (final line under “Model 3”): Replace “($z_2 = 1$ and $z_3 = 0$)” by ($z_2 = 0$ and $z_3 = 1$)

line -6 (final line under “Model 4”): Replace “($z_2 = 1$ and $z_3 = 0$)” by ($z_2 = 0$ and $z_3 = 1$)

p.191, line 4: Omit `,` implemented in the *modreg* package,

p.194, lines 4-5: Omit `and references on the help pages for the modreg and mgcv packages` with `references on the help pages for the mgcv package, and for the smoothing functions used in this chapter`

pp.194-196, Section 7.7, Exercises Exercise 1, Section 7.7: Replace “using `the log(weight)`” by `using log(weight)`, i.e., omit `the`.

Exercise 2: Replace “Section `6.7`” by “Section `7.3`”.

Exercise 3(c), line -2 on page: Replace `Minimizing` by `Maximizing`.

Exercises 9 & 10: Replace “Exercise `6`” by “Exercise `7`”.

Exercise 11, lines 3-4: The web page is now <http://www.antarctica.ac.uk/met/jds/ozone/>

Chapter 8**p.202**

line 4: Replace `axes=FALSE` by `axes=FALSE`

line -6: Replace `meanmin` by `meanmax`

*p.214-215**p. 214, lines 14-15*

Replace

In our example, any comparisons with `Bank`, which is the default reference level, will be inaccurate, as it has only one by

In the data as they stand, the initial level of `habitat`, which is `Bank`, will by default be used as the reference level. No moths of the first species (A) were found in this habitat. This creates problems for the calculation of standard errors, as will shortly become apparent.

p. 215, line 10

Replace “have large standard errors.” with “have large and meaningless standard errors. The standard generalized linear model approximation to the standard error breaks down when, as here, the fitted value for the reference level is zero.”

Here is some further commentary. The following results are obtained from version 2.0.1 of R.

```
> A1.glm <- glm(A ~ log(meters) + habitat, family=quasipoisson, data=moths)
> A2.glm <- glm(A ~ log(meters) + habitat, family=quasipoisson, data=moths,
+ subset=habitat!="Bank")
> b1 <- coef(A1.glm)
> b1
```

```
      (Intercept)      log(meters) habitatDisturbed habitatLowerside
      -15.696         0.129         15.622         16.906
habitatNEsoak    habitatNWsoak    habitatSEsoak    habitatSWsoak
      16.084         18.468         16.968         17.137
habitatUpperside
      16.743
```

```
> ## Notice that the above differ from the coefficients given on p.214.
> ## The reason is that, since the analysis reported in the book was done,
> ## glm()'s convergence criteria have been tightened
> ## Instead of the former exp(-6.696) on p.214 as an approximation to zero,
> ## there is now, with the tighter convergence criterion, exp(-15.67) as
> ## an approximation to zero.
> ##
```

```
> b2 <- coef(A2.glm)
> options(digits=3)
> b1[1]+b1[3:9]
habitatDisturbed habitatLowerside    habitatNEsoak    habitatNWsoak
      -0.0734         1.2098         0.3881         2.7722
      habitatSEsoak    habitatSWsoak habitatUpperside
      1.2719         1.4412         1.0475
```

```
> b1[1]+b1[4:9]
habitatLowerside    habitatNEsoak    habitatNWsoak    habitatSEsoak
      1.210         0.388         2.772         1.272
      habitatSWsoak habitatUpperside
      1.441         1.047
```

```
> b2[1]+b2[3:8]
habitatLowerside    habitatNEsoak    habitatNWsoak    habitatSEsoak
      1.210         0.388         2.772         1.272
      habitatSWsoak habitatUpperside
      1.441         1.047
```

Notice that `b1[1]+b1[4:9]` and `b1[1]+b1[3:8]` are, essentially, identical, i.e., the fitted values from the two models are the same. The same fitted values would be obtained from the coefficients in the book.

One set of nonsensical SEs has been replaced by another (as it happens, even less believable). As noted above, the standard GLM approximations have broken down.

p.221, line -5

Replace `probit` by `logit`

p.223, Section 8.9, Exercise 2

Replace the final sentence by:

Patients whose risk is sufficiently high will be sent for CT (computed tomography). Using a risk threshold of 0.025 (2.5%), turn the result into a decision rule for use of CT.

Chapter 9

p.227

line 12: Following `These values can be gleaned from VarCorr(science.lme)`, add `, or alternatively by squaring output from intervals(science.lme, which="var-cov")`

Thus the sentence now reads

“These values can be gleaned from `VarCorr(science.lme)`, or alternatively by squaring output from `intervals(science.lme, which="var-cov")`”

lines -10 & -9: In line -10, omit

which we give in the form that we obtain from the output,

line -9: Omit `very`. Following the full stop, insert

In the code given in footnote 4, the values have been squared, and are variances, not SDs.

fnote 3, line 2: Indent the code to align following the round bracket on the previous line

fnote 3, final line: Omit

fnote 4: Replace `intervals.lme()` by `intervals()`

[`intervals()` is the generic function, which calls `intervals.lme()`. It is not now possible to call `intervals.lme()` directly.]

p.238

line 1 (first line below the graphs): (near end of line): Replace `level=0` by `level=2`

line 3, near end of line: Replace `level=2` by `level=0`

line 4: Replace

“fitted values at level `2` and fitted values at level `1`”
by “fitted values at level `1` and fitted values at level `0`”

line 5: Replace

“fitted values at level `1` and fitted values at level `0`”
by “fitted values at level `2` and fitted values at level `1`”

(The text (but not the code) has, effectively, interchanged the labels 0 and 2.)

fnote 12: Replace the final line (`# i.e., the highest ...`) by `# i.e., they are adjusted for plot and block effects.`

p.240, final three lines

Replace the final `The` at the end of line -3 by
[Examination of the table of coefficients that we give below shows that the](#)

Replace `agegpsenior`, in the two places where it appears, by `agegpOlder`

With version 0.84 of *DAAG* or later, this labeling of output can be reproduced by preceding the use of the code on page 240 with:

```
tinting$agegp <- capstring(tinting$agegp)
```

p.242, line 12: Omit `,` in the *ts* package,

footnote 15, line 1: Omit this line (starting `library(ts)`)

p.245, fnote 19

Following line 4, insert the line

```
LH.yw$ar          # autocorrelation estimate of alpha
```

Following line 7, insert the line

```
LH.mle$ar        # maximum likelihood estimate of alpha
```

p.246, line -12 (third bullet point)

With $b_1 = b_2 = 0$, $b_3 = 0.5$, $b_4 = 0$, $b_5 = 0.5$ ($q = 5$) there are spikes at lags 2, 3 and 5.

p.246, final line Omit this line.

p.252, line 12

Add `normality` at the end of the line (also one `#` is enough, here and elsewhere on this page), i.e.

```
qqnorm(resid(soi.lme, type="normalized")) # Examine normality
```

p.258, Section 9.10, Exercise 3

In the final sentence, prior to “would it be too narrow or too wide?”, insert
[with \$\sigma\$ is defined as in Section 9.5.3,](#)

Chapter 10**p.262, fnote 2**

The code that follows `library(rpart)` should start a new line.

p.268, line 9

Omit `from the R modreg package`. The function `lowess()` is now in the *stats* package.

p.275, line 4

Replace `nsplit = 12` by `nsplit = 16`

p.277

In the output on the final three lines of p.277, replace `320` by `321`, and replace `240` by `239`.

Note: The final five lines of page 277 continue the output from line -2 on page 276, i.e., from `> print(mifemb.rpart)`.

p.280, Exercise 3

Replace `nsw74pre d1` by `nsw74psid1`

Chapter 11

p.284, line 20: Omit this line (starting `library(mva)`)

p.293, fnote 7, line 1

Replace MASS by DAAG.

lines 16-17: Replace `Both are males` by `Both are females`.

Omit the next sentence, i.e., omit

Examination of the graph where different levels of employment are identified makes it clear that both rely on parent

p.294, fnote 10, lines 2-4

These require correction, to read

```
plot(BDI[not.na] ~ ss.pr$scores[,1], col=as.numeric(gender[not.na]),
     pch=as.numeric(gender[not.na]), xlab="1st principal component",
     ylab="BDI")
topleft <- par()$usr[c(1,4)]
```

(A consequence of the failure of the code on p.294 to subset `gender` is that the assignment of symbols to points in Figure 11.5 is wrong.)

p.298, Section 11.6, Exercises

Exercise 1: Replace the second sentence (`Compare ...`) by

For each of the first and second principal components, plot the loadings for females against the loadings for all data combined, and similarly for males. Are there any striking differences?

Exercise 2: Replace `principal component`, in each of the three places where it appears, by `discriminant function`.

In line 3, replace the second occurrence of `second` by `first`

Exercise 4: Sentences after the first should be replaced by

The variable `altitude` has the same value for all observations within a `site`. What are the implications for any attempt to use `altitude` as an explanatory variable in the linear discriminant function calculations of Subsection 11.2.1?

Chapter 12**p.303, line 6**

Replace `per` by `par`

p.305, line -3: Replace `String functions` by `Character string functions`

line -2: Replace `text strings` by `character strings`.

p.307, line 9

Delete `> attach(cabbages)`. As the final line of the computer output, insert `> detach(cabbages)`

p.309, line 20

Following `sapply(elastic1, mean)`, add
`# elastic1 is from DAAG`

p.310, line 5: Replace `These functions are suitable only for the simplest applications.` by `See however help(as.Date) for alternatives to the use of the date package.`

p.314

lines -12 and -2: Replace `elasticband` by `elastic1`

line -11: Omit `#`, and move `stretch` and `distance` to be above the columns for which they are headings.

p.315, Section 12.4: Factors

line -19: To extract the codes 1, 2, ..., specify `unclass(country)`.

lines -12 and -11 (consequent on changes to R): If the `labels` argument to `text()` is a factor, as of 2.0.0 it is the levels that are plotted.

p.318

line -14: Omit `(but not in S-PLUS)`

line -12: Immediately prior to this line of computer code, insert
`y <- c(NA, 2, 4, 1, 7)`

line -12 (end of line): Replace `see below` by `see page 341`

p.321, line 20

Replace `y.names` by `y.names`

p.323, lines 8-9

To avoid ambiguity, this sentence should read
 Because `a data frame has the structure of a list` of columns, `sapply()` and `lapply()` can be used to apply a function to `each of its columns in turn`.

p.327, lines 1

Replace `rep(1:5, 6)` by `rep(1:6,5)`

p.330, line 21: [The names and contents of the base packages changed in R-1.9.0, and again in R-2.2.0. Partly as a result, the names of the packages that are attached at startup are now different.]

Replace `that methods, ctest and several other packages are` by `that a number of packages were`

p.335, Exercise 8

Modify this question to read

Save the objects in your workspace, into an image (`.RData`) file with the name `archive.RData`. Then remove all objects from the workspace. Demonstrate how, without loading the image file, it is possible to list the objects that were included in `archive.RData` and to recover a deleted object that is again required.

pp.336-337, Exercise 11

Reword this question thus

Try the following, for a range of values of `n` between, e.g., 2×10^5 and 10^7 . (On systems that are unable to cope with such large numbers of values, adjust the range of values of `n` as necessary.)

```
n <- 10000; system.time(sd(rnorm(n)))
```

The first output number is the user cpu time, while the third output number is the elapsed time. Plot each of these numbers, separately, against `n`. Comment on the graphs. Is the elapsed time roughly linear with `n`? Try the computations both for an otherwise empty workspace, and with large data objects (e.g., with 10^7 or more elements) in the workspace.

Epilogue**p.339, lines 22**

Replace `90%` by `10%`

p.340, lines 1-2

Between the first and second line, insert the words `the motivation`.

References**pp.346-349**

There are more up to date versions of some monographs that are noted in the references:

Chatfield, C. 2002. Confessions of a statistician. *The Statistician* 51: 1–20.

Chatfield, C. 2003. *The Analysis of Time Series: an Introduction*, 6th edn. Chapman and Hall.

Chatfield, C. 2003. *Problem Solving. A Statistician's Guide*, 2nd edn. Chapman and Hall/CRC.

Cleveland, W.S. 1994. *The Elements of Graphing Data*, revised edn. Hobart Press.

Collett, D. 2003. *Modelling Survival Data in Medical Research*, 2nd edn. Chapman and Hall.

Diggle, P. 1990. *Time Series: a Biostatistical Introduction*. Clarendon Press.

Krzanowski, W.J. 2000. *Principles of Multivariate Analysis. A User's Perspective*, revised edn. Clarendon Press.

R Core Development Team, updated regularly. *An Introduction to R*. Available from CRAN sites (for a list of CRAN sites, go to <http://cran.r-project.org>).

R Core Development Team, updated regularly. *R Language Definition*. Available from CRAN sites.

Steel R.G.D., Torrie J.H. and Dickie, D.A. 1993. *Principles and Procedures of Statistics. A Biometrical Approach*, 3rd edn. McGraw-Hill, New York.

Williams, E.R., Matheson, A.C. and Harwood, C.E. 2002. *Experimental Design and Analysis for Use in Tree Improvement*, revised edn. CSIRO Information Services.

See p.194 for the Eubank reference.

Note also that Venables and Ripley's *Modern Applied Statistics with S-PLUS*, 4th edn. should be [Modern Applied Statistics with S](#), 4th edn.

p.351, Web sites

line 6: Data set ozone Change the url to <http://www.antarctica.ac.uk/met/jds/ozone/>

Indices

pp.352-355, Index of R Symbols & Functions

Under additions (in text) replace 333 by 332

Under assign the only page number that should appear is 345.

Replace I ... by I ([wrapper function](#)) ...

Under library, omit 343.3

Under log, omit 343.3

Under plot, 342.1 should be 342

Under text, replace 342.1, 342.4 by 342.

pp.356-360, Index of Terms

Under AIC, the page numbers should be 150-151, 152-153, 240, 245, 251, 278, *see also* BIC

Add the main item and subitem (p.357, column 2)
[dates](#)

[calculations with](#), 310

Under function, add the subitem
[issues for writing and use](#), 308

Under histograms, run the lines on.

Under plots, add the subitem
[component plus residual](#), 143, 144, 145

Add the main item (p.359, column 2)
[random numbers](#), 60-62, *see also* *Index of R symbols and Functions*, under [rbinom](#),

`rchisq`, `rexp`, `rnorm`, `rpois`, `runif` and `sample`

Under regression, influence, the page numbers should be:

66, 114, 115, 116, 139, 146, 194, 195

Under regression, add the subitems

Cook's distance, 115, 139, 143, 146

ordinal logistic (POLR), 216-220

outliers, 41, 48, 49, 66, 115, 143, 146, 148, 149, 152, 157, 171, 189, 216, 262, 292, 293, 298

propensity scores, 161, 295, 296, 297

variance inflation factor (VIF), 167, 168

Under residuals add the subitem

from two-way table, 87

Under variance, add the subitem

heterogeneity, 112, 169, 170

Add the main items

working directory, 5, 7, 331

workspace, 5,7, 25, 330, 331, 335, 343

p.361, Index of Names

Add Eubank, R.L., 194.

Add Williams, E.R., 256

Figures

Figures 2.10, 2.11, 8.8, 11.1, 11.2 and 12.2 should be in color.