Chapter 1

Floodings at Venice over Centuries

1.1 Solution for Venice's Flooding Problems

1.1.1 Can Venice be Saved?

Water and Venice have always a complicated relationship. The world's most famously wet city is also one of its most famously endangered ones, forever being flooded by its signature canals. Even since the 14th century, Italian engineers have dreamed of ways to control the water. Now a solution may be at hand: the Moses project, a vast series of sea gates that may finally the sodden city dry.

The need for Venetian water control has never been greater. Especially high tides have caused major floods 10 times in the past 67 years alone, most diastrously in 1966 when the water in parts of the city climbed to more than 1.83 m. Compression of sediment under the city, along with rising sea levels, often causes smaller floods, shutting down businesses and making sidewalks and squares impossible.

The source of the problem is geography. Venice is primarily a small cluster of interlocked islands set in the northern end of a 536-sq.-km lagoon. A long ridge of land seperates the lagoon from the far larger Gulf of Venice except at three major inlets. These openings allow high gulf tides to become high Venetian tides, with the water sometimes climbing far enough to swamp the city's seawalls.

In 1984 a commission composed of Italy's 50 largest engeneering and construction firms was formed to find a way to control the water flow through the inlets, and Moses is it. Moses, an acronym for the plan's technical name as well as a lyrical reference to the parting of the Red Sea, calls for 78 hollow sea gates—each up to 5 m thick, 20 m wide and 27.5 m long—to be hinged to foundations, or caissons, in the seabed and to lie flat there. The gates would usually be filled with water, but when tides rises to a height of 1 m or more,

compressse air would pump the water out. The free end of the gates would then float upwards, breaking the surface after about 30 minutes and sealing off the inlets. Sea locks would permit permit ships to pass while the gates are up.

The project—which would take as long as ten years and cost at least $2.7 billion—could still run into obstacles, especially given the fickle nature of Italian politics. Concerned that gates would be raised so frequently and remain there so long that they would cause water in the lagoon to grow stagnant, Greens are making that argument in an environmental-impact review that could delay or even scuttle construction. Even so, this is the closest Venice has come to a permanent solution to its water problems in 700 years. By local bureaucratic standards, that's not too bad.

1.1.2 Additional Information to the Gates

The gates are made of steel covered with a resistant coating to prevent building of algae and crustaceans. Every five years they're are scheduled for removal and cleaning.

The 78 hollow sea gates are filled with water most of the time and remain out of sight in a foundation or cassion. During especially high tides, compressed air flushes out the seawater. Within 30 min. the gates rise to the surface and block the inlets. When the danger passes, water is admitted back into the gates, causing them to sink within 15 min.

Chapter 2

Preface to the LaTeX-Guide

2.1 General Remarks

A new edition to "A Guide to LaTeX" begs the fundamental question: Has LaTeX changed so much since the appearance of the third edition in 1999 that a new release of this manual is justified?

The simple answer to that question is 'Well ....' In 1994, the LaTeX world was in upheaval with the issue of the new version LaTeX 2_ε, and the second edition of the 'Guide' came out just then to act as the bridge between the old and new versions. By 1998, the initial teething problems had been worked out and corrected through semi-annual releases, and the third edition could describe an established, working system. However, homage was still paid to the older 2.09 version since many users still employed its familiar syntax, although they were most likely to be using it in a LaTeX 2_ε environment. LaTeX has now reached a degree of stability that since 2000 the regular updates have been reduced to annual events, which often appear months after the nominal date, something that does not worry anyone. The old version 2.09 is obsolete and should no longer play any role in such a manual. In this fourth edition, it is reduced to an appendix just to document its syntax and usage.

But if LaTeX itself has not changed substantially since 1999, many of its peripherals have. The rise of programs like 'pdfTeX' and 'dvipdfm' for PDF output adds new possibilities, which are realized, not in LaTeX directly, but by means of more modern 'packages' to extend the basic features. The distribution of TeX/LaTeX installations has changed, such that most users are given a complete, ready-to-run setup, with all the 'extras' that one used to have to obtain oneself. Those extras include user-contributed packages, many of which are now considered indispensable. Today 'the LaTeX system' includes much more than the basic kernel by Leslie Lamport, encompassing the contributions of hundreds of other people. This edition reflects this increase in breadth.

2.2 The Changes in Detail

The changes to the fourth edition are mainly those of emphasis.

1. The material has been reorganized into 'Basics' and 'Beyond the Basics' ('advanced' sounds too intimidating) while the appendices contain topics that really can be skipped by most everyday users. Exception: Appendix H is an alphabetized command summary that many people find extremely useful (including ourselves).

This reorganizing is meant to stress certain aspects over others. For example, the section on graphics inclusion and color was originally treated as an exotic freak, relegated to an appendix on extensions; in the third edition, it moved up to be included in a front chapter along with the picture environment and floats; now it dominates Chapter 6 all on its own, the floats come in the following Chapter 7, and 'picture' is banished to the later Chapter 13. This is not to say that the picture features are no good, but only that they are very specialized. We add descriptions of additional drawing possibilities there too.

2. It is stressed as much as possible that LaTeX is a markup language, with separation of content and form. Typographical settings should be placed in the preamble, while the body contains only logical markup. This is in keeping with the modern ideas of XML, where form and content are radically segregated.

3. Throughout this edition, contributed packages are explained at that point in the text where they are most relevant. The 'fancyhdr' package comes in the section on page styles, 'natbib' where literature citations are explained. This stresses that these 'extensions' are part of the LaTeX system as a whole. However, to remind the user that they must still be explicitly loaded, a marginal note is placed at the start of their descriptions.

4. PDF output is taken for granted throughout the book, in addition to the classical DVI format. This means that the added possibilities of 'pdfTeX' and 'dvipdfm' are explained where they are relevant. A separate Chapter 10 on PostScript and PDF is still necessary, and the best interface to PDF output, the 'hyperref' package by Sebastian Rahtz, is explained in detail. PDF is also included in Chapter 15 on presentation material

On the other hand, the other Web output formats, HTML and XML, are only dealt with briefly in Appendix E, since these are large topics treated in other books, most noticeably the 'LaTeX Web Companion'.

5. This book is being distributed with the TeXLive CD, with the kind permission of Sebastian Rahtz who maintains it for the TeX Users Group. It contains a full TeX and LaTeX installation for Windows, Macintosh, and Linux, plus many of the myriad extensions that exist.

We once again express our hope that this *Guide* will prove more than useful to all those who wish to find their way through the intricate world of LaTeX. And with the addition of the TeXLive CD, that world is brought even closer to their doorsteps.

2.3 Demonstration for running heads

One main reason for this exercise was the demonstration of running heads at the top of the pages execept for the first pages after the chapter sectioning commands. The running heads on even pages consist of the actual chapter number and the chapter title. For odd pages consist the running heads of actual section command for these pages as here demonstrated.