INTRODUCTION TO
DIGITAL TYPOGRAPHY

Typography?

Typesetting?

Line Breaking?

Page Breaking?

WHAT IS
Typography?

타이포그래피: 활자를 사용한 인쇄술. 본래 활자로 조판하는 것, 활판(活版)인쇄술, 인쇄된 것의 체재(體裁) 등을 뜻하였다. 근대인쇄술 가운데 활판이 가장 일찍 발달, 보급된 것으로, 인쇄술 전반 및 그 표현을 가리키는 말이었다. 그러나 뒤에 인쇄술이 차츰 다양해지고, 그 용도도 넓어져 현대에 와서는 활자뿐 아니라 사진식자(寫眞植字)·전자기술에 의한 인자(印字) 등도 포함해 문자조성의 시각적인 처리를 말하는 경우도 많아지고 있으며, 문자를 살린 레이아웃이나 그래픽디자인과 동의어로 여겨지고 있다.

WHAT IS
Typography?

활자Type

조판Typesetting

인쇄Printing

WHAT IS

Typography?

활자(活字): 활판인쇄에 쓰이는 금속의 네모기둥 꼭지면에 글자를 볼록하게 새긴 것. 활자의 시초는 1041년에서 1048년 사이 중국 송(宋)나라에서 필승(畢昇)이 구운 찰흙으로 활자를 만들어 사용했다는 기록에서 찾는다. 원(元)나라의 왕정(王禎)은 세라믹활자의 단점을 극복하기 위해 목제활자를 만들어, 1313년 농서(農書)를 출판했다. 한국에는 고려 인종 1234년 상정고금예문(詳定古今禮文)을 활자를 이용해 만들었다는 기록이 있다.

此是十分真用意勇猛丈夫却須記切莫道

不須參古聖玄玄妙妙為指南

錐然舊閣閑田地一度贏來得也未要識坐禪不

動尊風行草偃悉皆論

而今四海清妖鏡頭頭物物皆吾聽長短方圓只

自知從來絲髮一不曾後若問坐禪成底事日出

東方夜落西

大珠禪師因僧問一切衆生皆有佛性如何師云作

佛用是佛性作賊用是賊性作衆生用是衆生

性無形相隨用立名故經云一切賢聖皆以無為法

而有差別文僧問無法可說是名說法禪師如何

體會師曰為般若體體畢竟清淨無有一物可得

是名無法可說是名說法

佛體和尚示來舉僧問趙州如何是不還義州以

手作流水勢其僧有省又僧問法眼云日出東

如如不動如何不取於相見不動去法眼云日出東

方夜落西其僧亦有省若也於此二和尚言句

見得方知道旋嵐偃岳本來常靜江河競注元

自不流此是如如不之義

羅山和尚曾問石霜起滅不停時如何霜云直須

寒灰枯木去一念萬年去全清絕點去山不契却
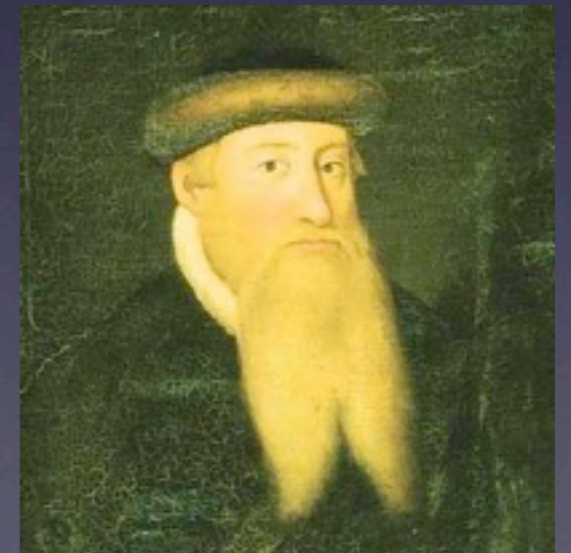
往巖頭勲如前問頭喝云是誰起滅山於言下獻

화약

나침반

종이

활판인쇄술

Gutenberg's Bible in British Library (1455)

WHAT IS Typesetting?
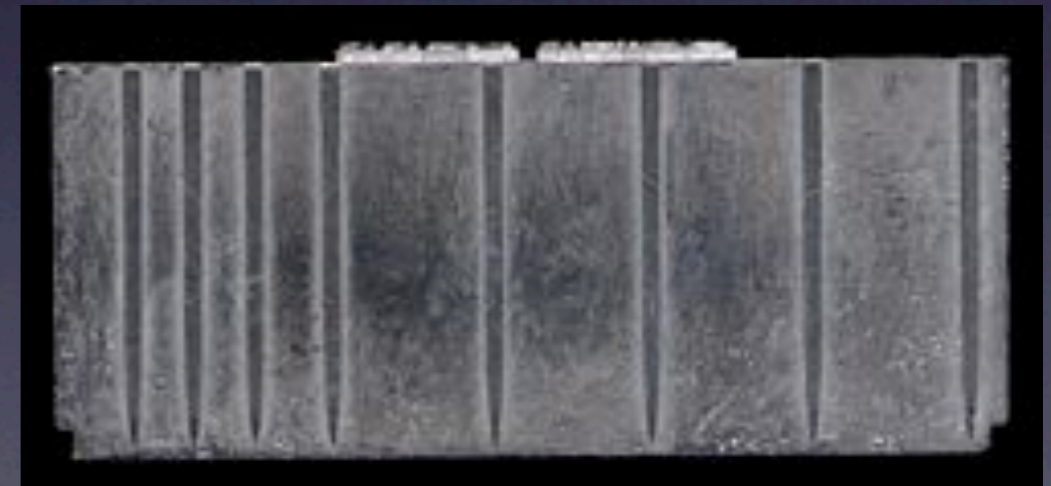
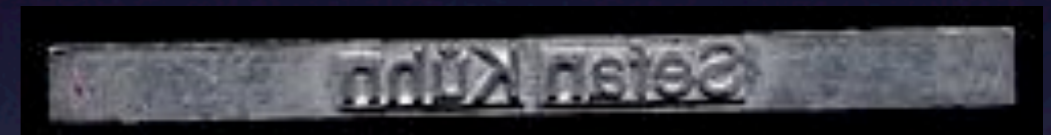조판(組版): 원고에 따라 문선한 활자로 인쇄판을 짜는 것.
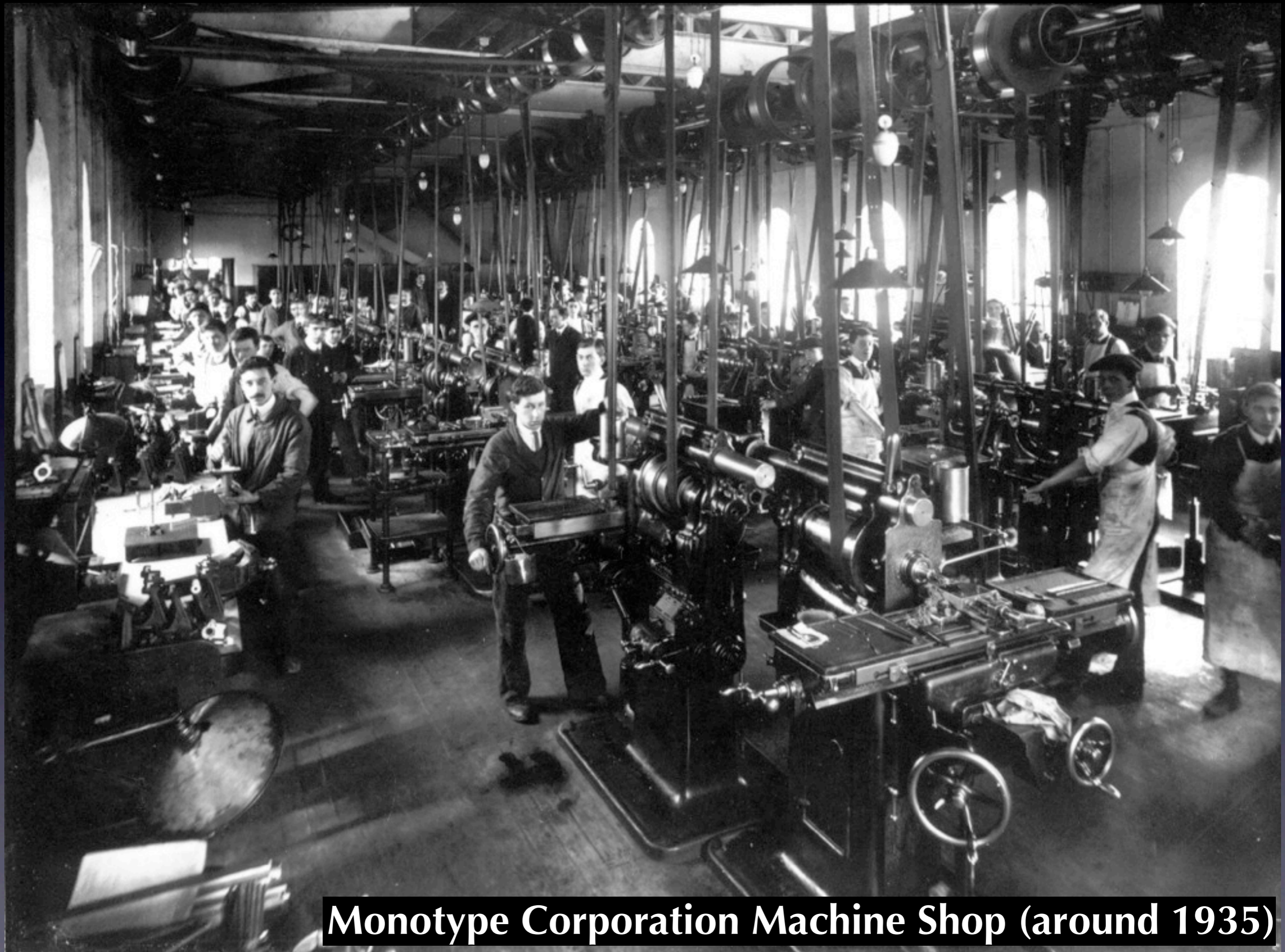
Der Name der Rose
- Umberto Eco

模寫
↓
植字

Ottmar Mergenthaler's
Linotype Machine (1886)

Monotype Corporation Machine Shop (around 1935)

Monotype Corporation Machine Shop (around 1935)
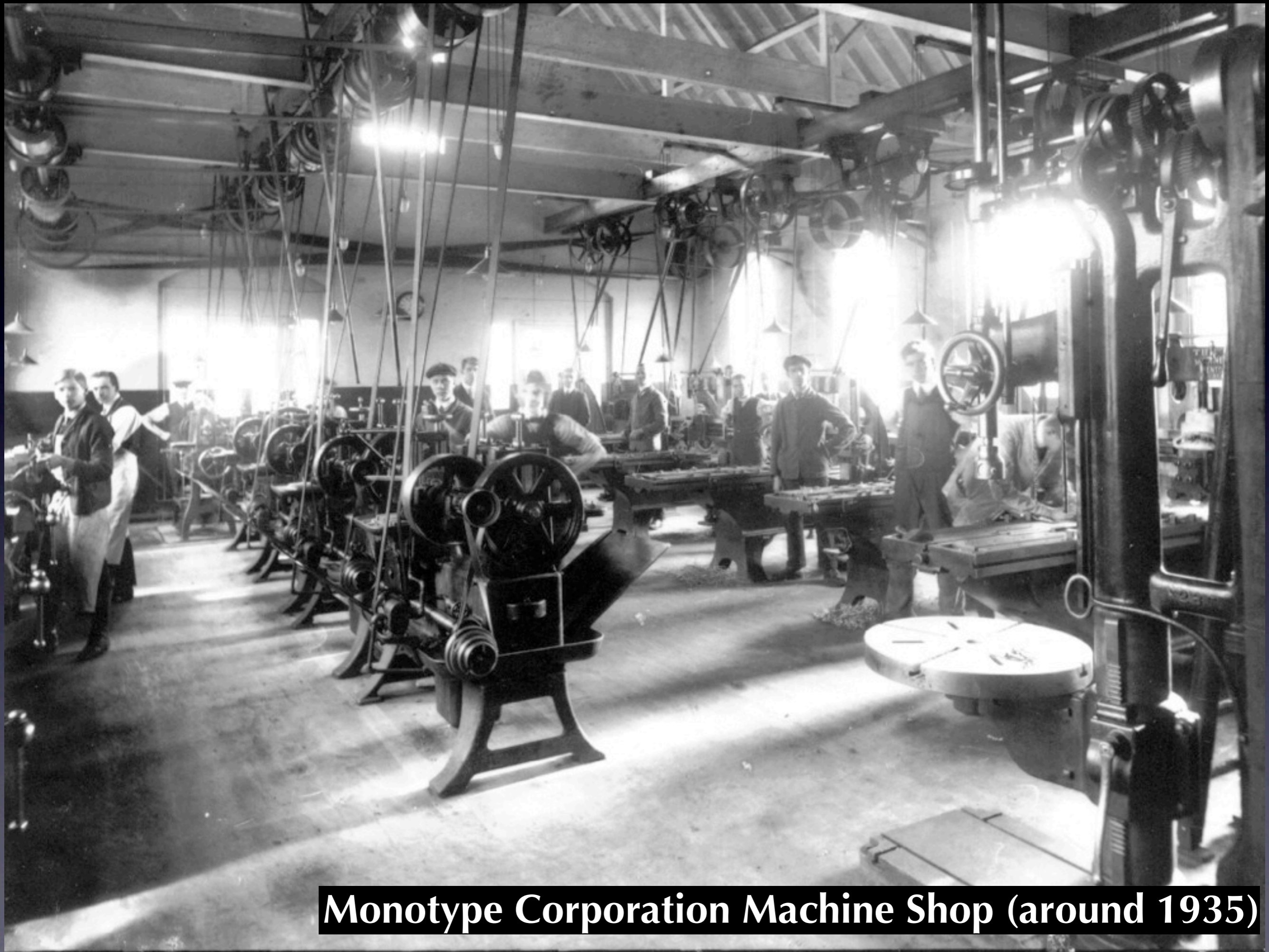
Monotype Corporation Machine Shop (around 1935)

WHAT IS

Typesetting?

아름다움: 디자인의 측면에서 조판은 레이아웃을 의미한다.

레이아웃(layout): 설정된 공간 속에 합목적적·효과적으로 사물을 배치하는 일, 또는 그 기술. 인쇄용어로서는 신문·잡지 등의 페이지 할당과 활자·기호·괘선의 배치, 배당 지면의 종합을 가리킨다. 특히 그래픽디자인에서는 전달을 위한 표현수단으로서, 사진·삽화·문자·기호·괘선 등의 여러 조형요소를 한정된 공간 안에서 시선의 옮김을 쉽게 하고, 미적으로 효과 있게 배치하는 일을 말한다.

Typesetting?

읽기쉬움(readability): 언어 또는 내용의 측면에서 글이 얼마나 읽기 쉽게 쓰여있는가를 의미한다.

읽기쉬움(legibility): 디자인 측면에서 글자 또는 글자들을 배치한 모양이 얼마나 읽기 쉬운가를 의미한다.

과부(widow)와 고아(orphan)

The next unpleasant business was putting on the iron shoes; that too was very hard at first. My master went with me to the smith's forge, to see that I was not hurt or got any fright at all.

The next unpleasant business was putting on the iron shoes; that too was very hard at first. My master went with me to the smith's forge, to see that I was not hurt or got any fright at all.

WHAT IS

Typesetting?

커닝(kerning): 어떤 글자 다음에 특정한 글자가 따라올 때 글자 사이의 간격을 자동으로 조정하는 것을 의미한다.

World World

World World

Typesetting?

합자(ligature): 어떤 글자 다음에 특정한 글자가 따라올 때 글자의 모양이 자동으로 변하는 것을 의미한다.

fi fl ff   fi fl ff

Zap Zapfin Zapfino

Typesetting?

$$(\sin x + \cos x)^2 = (\sin x)^2 + 2\sin x\cos x + (\cos x)^2 = 1 + 2\sin x\cos x$$

$$(\sin x + \cos x)^2 = (\sin x)^2 + 2\sin x \cos x + (\cos x)^2 = 1 + 2\sin x \cos x$$

$$(\sin x + \cos x)^2 = (\sin x)^2 + 2\sin x \cos x + (\cos x)^2 = 1 + 2\sin x \cos x$$

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$$(\sin x + \cos x)^2 = (\sin x)^2 + 2\sin x \cos x + (\cos x)^2 = 1 + 2\sin x \cos x$$

$$\TeX$$

Typesetting?

활자는 박스(box)의 예술인 반면, 조판은 공백(glue)의 예술이다!

The Korean TEX Society

WHAT IS
Line Breaking?

Hyphenation & Justification(양끝정렬)
What is Different from Line Breaking(줄나눔)?

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

THE FIRST-FIT METHOD FOR
Line Breaking [Michael P. Barnett,1965]

In olden times when wishing still helped one, .857
there lived a king whose daughters were all beauti- -.750
ful; and the youngest was so beautiful that the sun -.824
itself, which has seen so much, was astonished 1.087
whenever it shone in her face. Close by the king's -.235
castle lay a great dark forest, and under an old .607
lime-tree in the forest was a well, and when the .500
day was very warm, the king's child went out into -.500
the forest and sat down by the side of the cool .700
fountain; and when she was bored she took a 1.360
golden ball, and threw it up on high and caught it; -.650
and this ball was her favorite plaything. .001

THE BEST-FIT METHOD FOR
Line Breaking [Plass & Knuth,1981]

In olden times when wishing still helped one, **.857**
there lived a king whose daughters were all beau- **.000**
tiful; and the youngest was so beautiful that the **.280**
sun itself, which has seen so much, was astonished **-.235**
whenever it shone in her face. Close by the king's **-.235**
castle lay a great dark forest, and under an old **.607**
lime-tree in the forest was a well, and when the **.500**
day was very warm, the king's child went out into **-.500**
the forest and sat down by the side of the cool **.700**
fountain; and when she was bored she took a **1.360**
golden ball, and threw it up on high and caught **-.357**
it; and this ball was her favorite plaything. **.000**

THE FIRST-FIT METHOD   THE BEST-FIT METHOD

.857
-.750
-.824
1.087
-.235
.607
.500
-.500
.700
1.360
-.650
.001

In olden times when wishing still helped one, there lived a king whose daughters were all beauti-ful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

In olden times when wishing still helped one, there lived a king whose daughters were all beau-tiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

.857
.000
.280
-.235
-.235
.607
.500
-.500
.700
1.360
-.357
.000

THE TOTAL-FIT METHOD FOR
Line Breaking
[Plass & Knuth,1981]

In olden times when wishing still helped one,   .857

there lived a king whose daughters were all beau-   .000

tiful; and the youngest was so beautiful that the   .280

sun itself, which has seen so much, was aston-   1.000

ished whenever it shone in her face. Close by the   .067

king's castle lay a great dark forest, and under an   -.278

old lime-tree in the forest was a well, and when   .536

the day was very warm, the king's child went out   -.167

into the forest and sat down by the side of the   .700

cool fountain; and when she was bored she took a   -.176

golden ball, and threw it up on high and caught   -.357

it; and this ball was her favorite plaything.   .000

THE BEST-FIT METHOD   THE TOTAL-FIT METHOD

.857
.000
.280
-.235
-.235
.607
.500
-.500
.700
1.360
-.357
.000

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

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.857
.000
.280
1.000
.067
-.278
.536
-.167
.700
-.176
-.357
.000

THE TeX WAY OF
Line Breaking

[Knuth,1991]

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

THE FIRST-FIT METHOD

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

THE BEST-FIT METHOD

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

THE TOTAL-FIT METHOD

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.
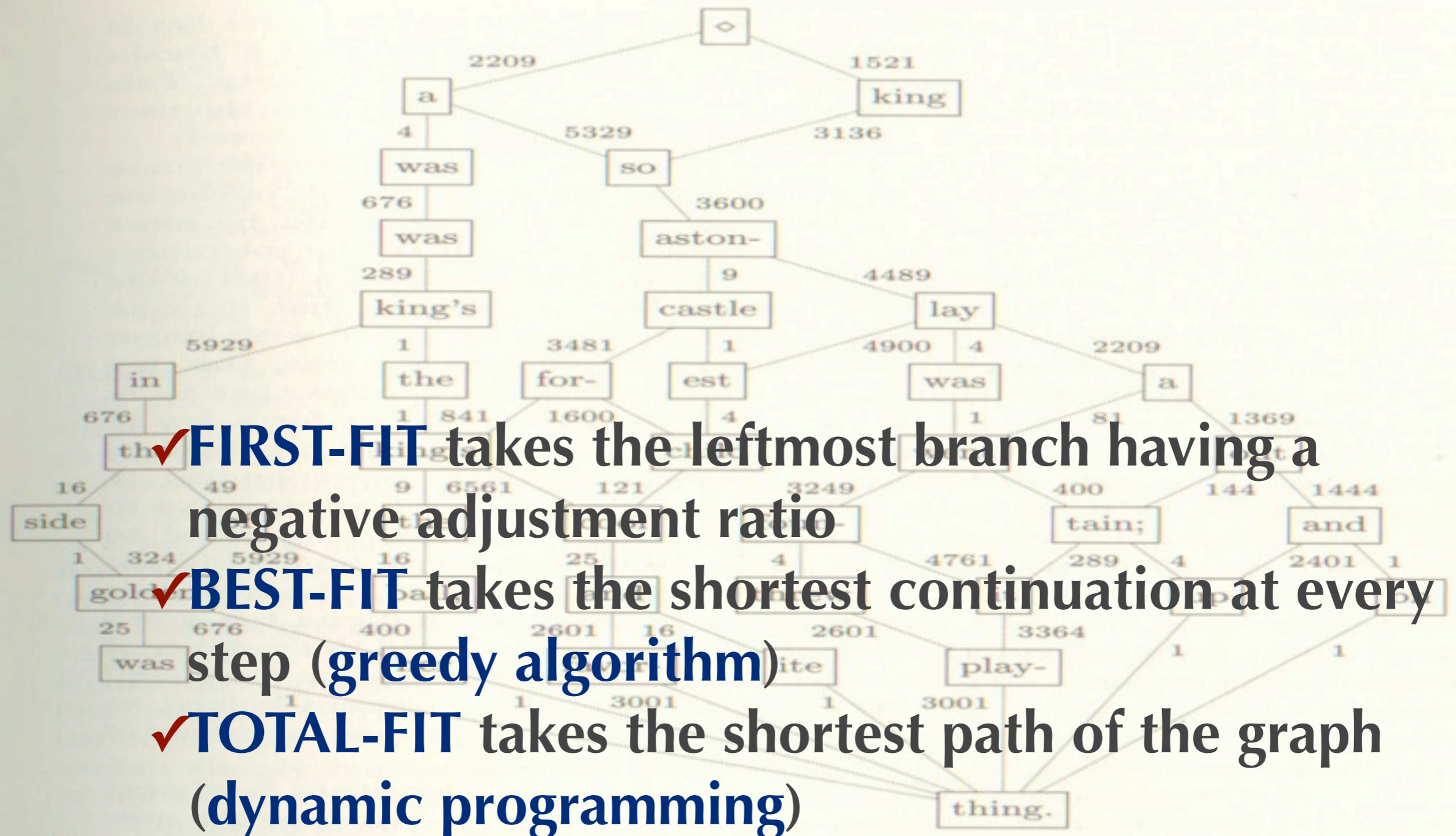
THE TeX WAY

In olden times when wishing still helped one, there lived a king whose daughters were all beautiful; and the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face. Close by the king's castle lay a great dark forest, and under an old lime-tree in the forest was a well, and when the day was very warm, the king's child went out into the forest and sat down by the side of the cool fountain; and when she was bored she took a golden ball, and threw it up on high and caught it; and this ball was her favorite plaything.

THE ALGORITHMS OF
Line Breaking

In olden times when wishing still helped one, there lived a   .774
king whose daughters were all beautiful; and the youngest was   .179
so beautiful that the sun itself, which has seen so much, was   .629
astonished whenever it shone in her face. Close by the king's   .545
castle lay a great dark forest, and under an old lime-tree in the   .000
forest was a well, and when the day was very warm, the king's   .079
child went out into the forest and sat down by the side of the   .282
cool fountain; and when she was bored she took a golden ball,   .294
and threw it up on high and caught it; and this ball was her   .575
favorite plaything.   .004

THE ALGORITHMS OF
Line Breaking

✓**FIRST-FIT** takes the leftmost branch having a negative adjustment ratio

✓**BEST-FIT** takes the shortest continuation at every step (**greedy algorithm**)

✓**TOTAL-FIT** takes the shortest path of the graph (**dynamic programming**)

METAPOST clip is not the same as a video clip, although we can use METAPOST to duce a video cl

Figure 1 A clipped buffer (text).

METAPOST clip is not the same as a video clip, although we can use METAPOST to duce a video cl

Figure 2 A clipped buffer (text).

As you may know, TEX's ambassador is a lion represented by a lioness. It is still unclea relationship, but if so, and if a baby is born, may it enjoy MetaFun.

As you may know, TEX's ambassador is a lion while METAPONT is represented by a lioness relationship, but if so, and if MetaFun.

As you may know, TEX's ambassador is represented by a lioness. It is s clea relationship, but if so, and if a ba is born, may i en M Fu

ConTEXt & MetaFun