Is the superfluous a (new) modality?

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(still under construction)

difficult to find a position those days, especially for an old woman;

mondialization is everywhere ... so I have taken an English name now

But you may *infer* my true name

Thea Arebee

↓

The A are B

↓

Les A sont B

↓

Léa Sombé !

... maybe an example of *accessibility* between *possible worlds*?
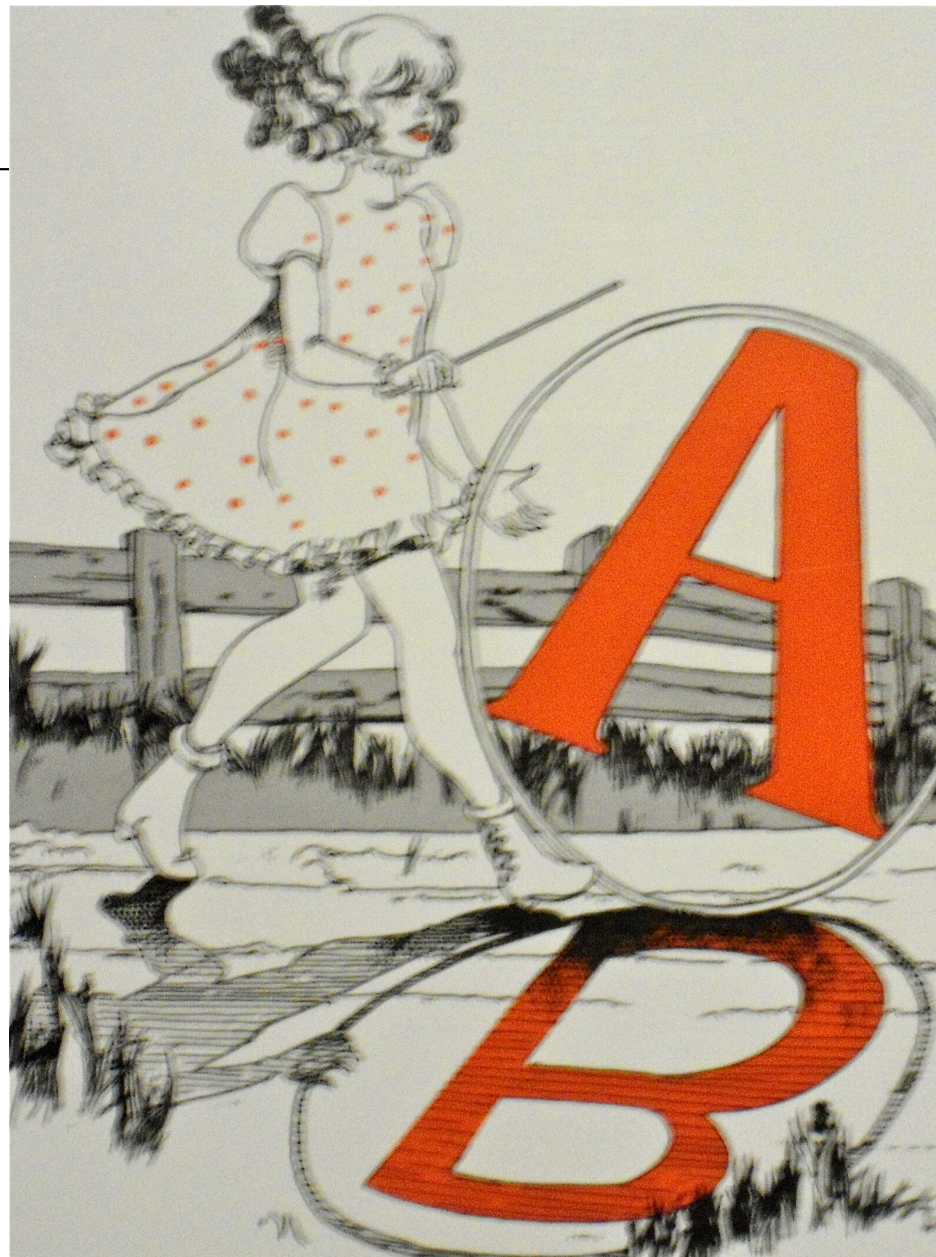
Figure 1: ... with already a stick!
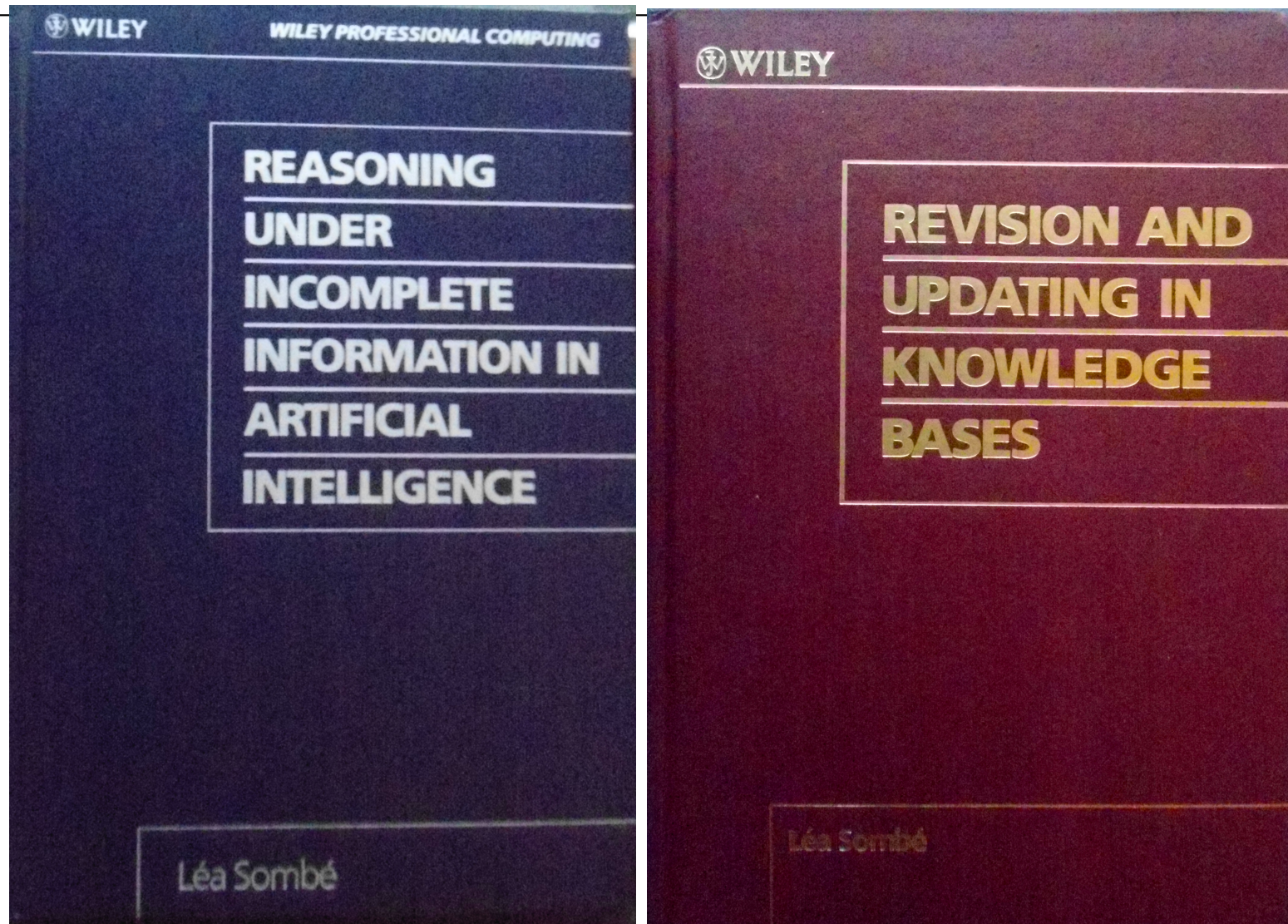
At that time, I published several books ...

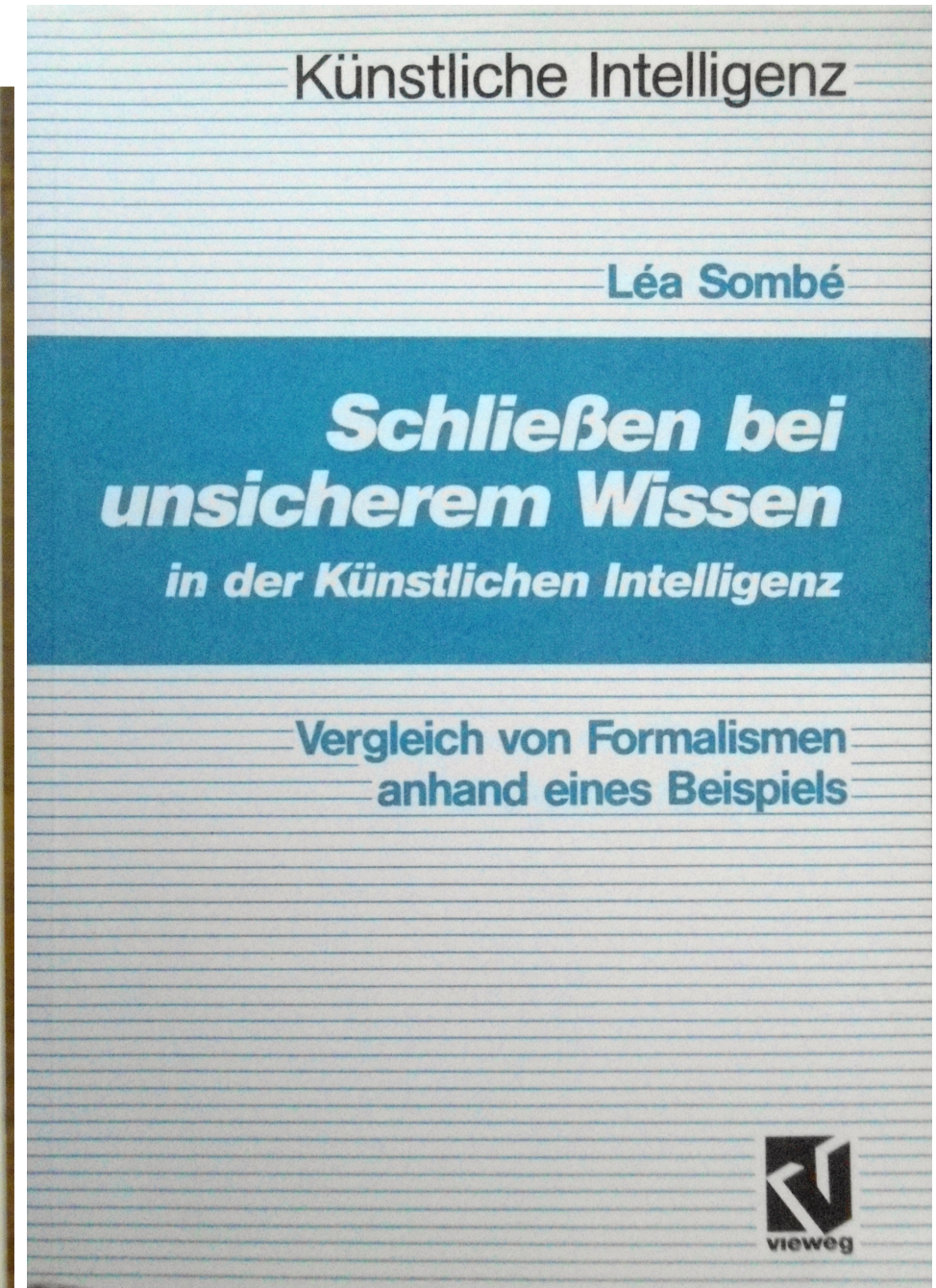Figure 2: 1990 & 1994

LÉA SOMBÉ

RAISONNEMENTS SUR
DES INFORMATIONS
INCOMPLÈTES
EN INTELLIGENCE ARTIFICIELLE

A
B

Künstliche Intelligenz

Léa Sombé

Schließen bei
unsicherem Wissen
in der Künstlichen Intelligenz

Vergleich von Formalismen
anhand eines Beispiels

vieweg

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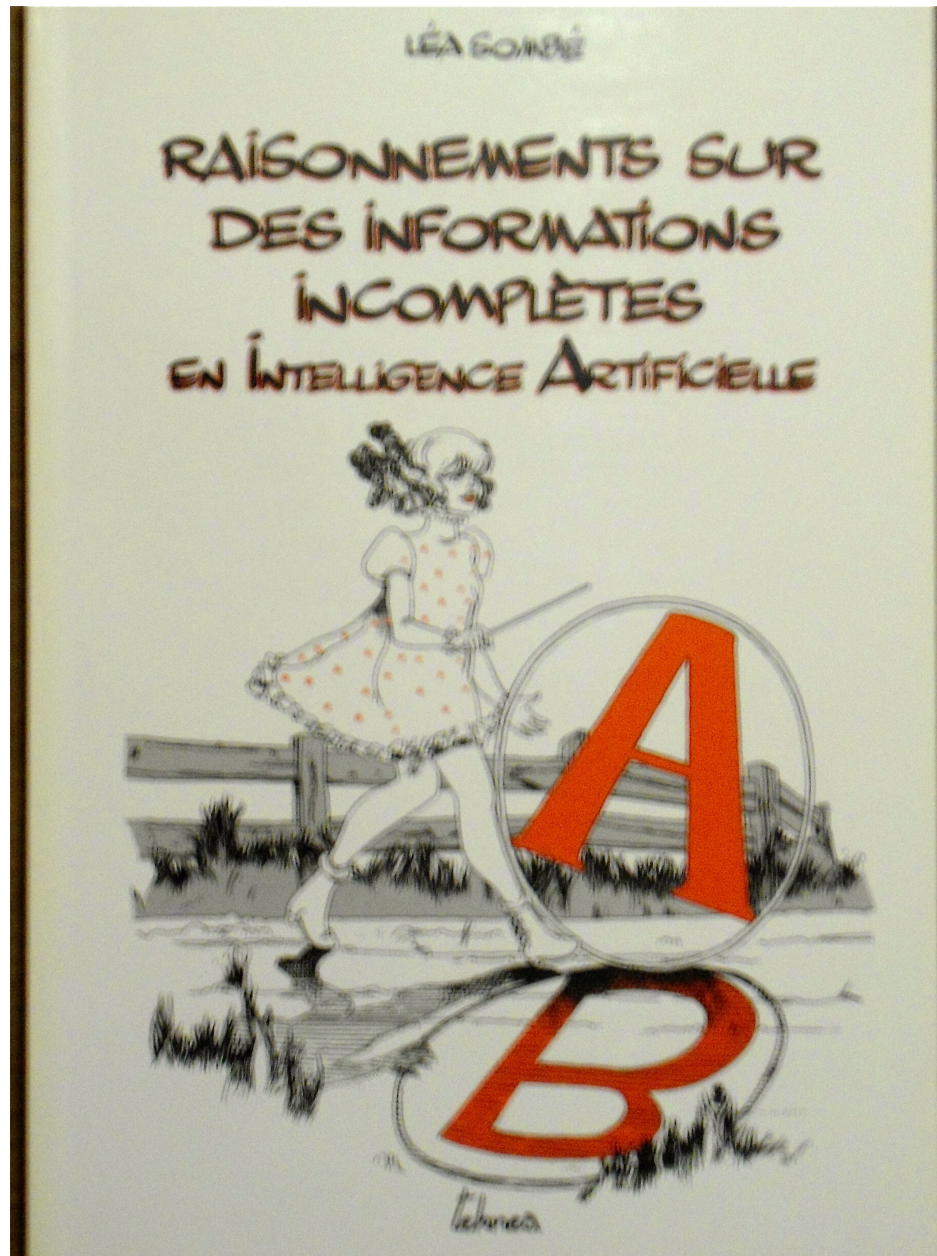
Figure 3:

My children

I was the *editor* of these volumes,

written by a bunch of young and talented researchers:

Camilla, Christine, Didier, François, Henri,

Laurence, **Luis**, Marie-Odile, Philippe, Pierre, Yves

I was like a mother for them. Happy days !

Luis: beginnings !

"Analyse de l'évolution des utilisations des sols
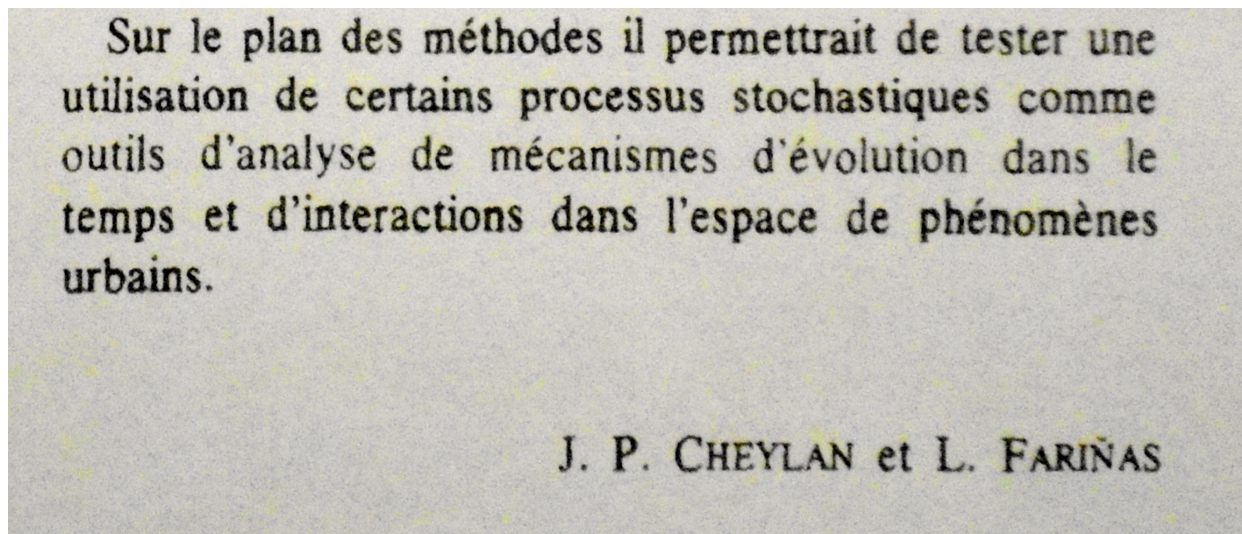(Construction de modèles explicatifs)"

> Sur le plan des méthodes il permettrait de tester une utilisation de certains processus stochastiques comme outils d'analyse de mécanismes d'évolution dans le temps et d'interactions dans l'espace de phénomènes urbains.
>
> J. P. CHEYLAN et L. FARIÑAS

Figure 4: Last paragraph *Computers & Graphics* **2** (4), 255, 1977

1982 : 1st journal paper by Luis on modal logic

"A simple deduction method for modal logic".
Information Processing Letters, **14** (2) 49-51.

And then, for more than 30 years, he has been playing with the necessary and the possible !

just the necessary □ and the possible ◇ !!

Not very innovative !

possibility theory, accessibility relation

To be fair, Luis was not the only one in the group to play with the necessary and the possible

there were at least two others, Didier and Henri, playing similar games with their *possibility theory*,

claiming that *they were not even needing an accessibility relation*! These little bastards !

Sure, **there are** accessibility relations between possible worlds, otherwise how could it be possible for me to be here with you?

More fun with ... colored logic

I am not a logician, but this does not prevent me to reason ...

and to offer you some suggestions to go beyond your usual business

- use colored modalities

  more beautiful: $(\neg p \vee \blacksquare q) \wedge \blacklozenge \blacksquare r$

- color can keep track of sources, identify agents

- light colors may indicate less strong modalities
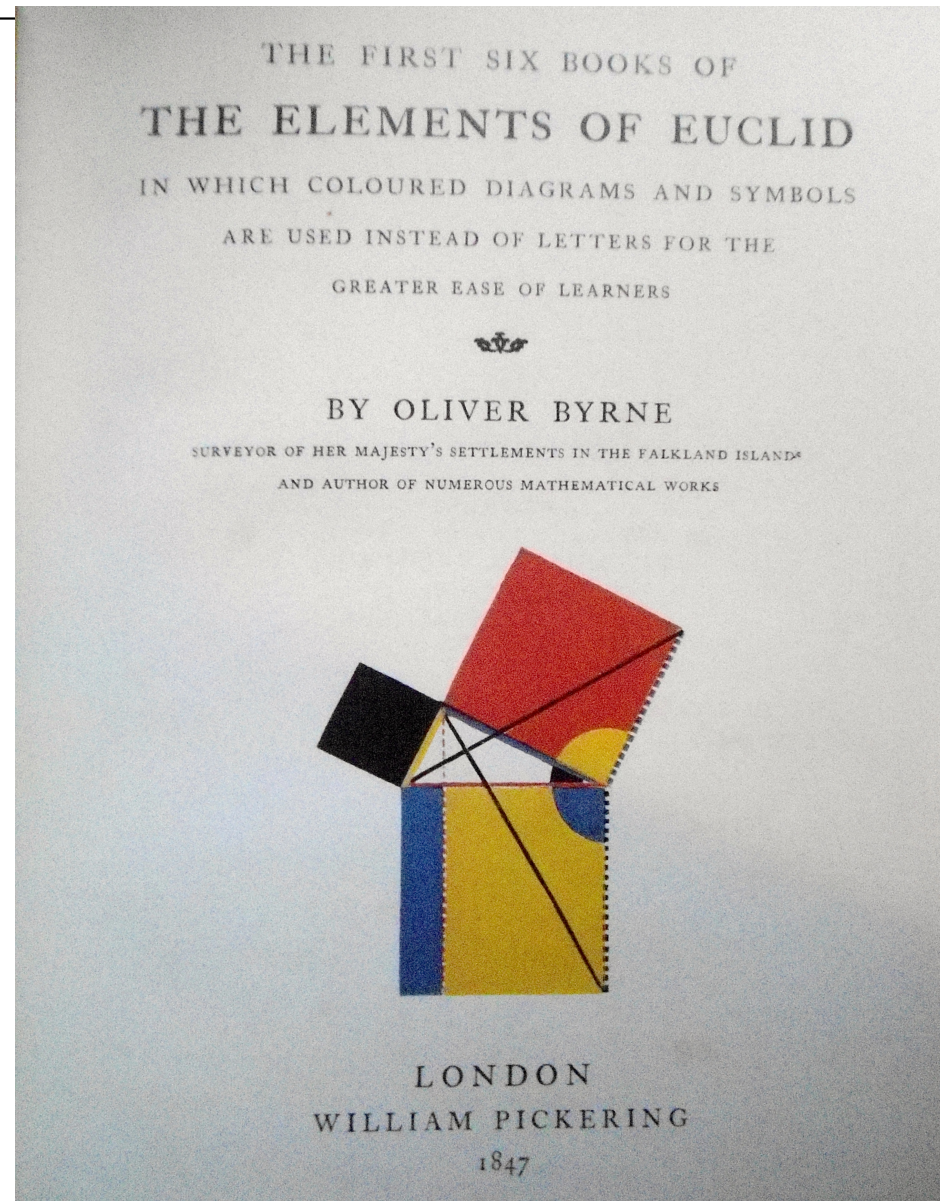
  $$\blacksquare p \rightarrow \blacksquare p \qquad \blacklozenge q \rightarrow \blacklozenge q$$

- uncompromized necessity $\boxtimes p \rightarrow \blacksquare p$

An ancestor of colored logic: Oliver Byrne (1810-1880)

IF magnitudes, taken *feparately*, be proportionals, they fhall alfo be proportionals when taken jointly: that is, if the firft be to the fecond as the third is to the fourth, the firft and fecond together fhall be to the fecond as the third and fourth together is to the fourth.

Let ♥ : ◡ :: ▨ : ◆,

then ♥ + ◡ : ◡ :: ▨ + ◆ : ◆ ;

for if not, let ♥ + ◡ : ◡ :: ▨ + ● : ● ,

fuppofing ● not = ◆ ;

∴ ♥ : ◡ :: ▨ : ● (B. 5. pr. 17) ;

but ♥ : ◡ :: ▨ : ◆ (hyp.) ;

∴ ▨ : ● :: ▨ : ◆ (B. 5. pr. 11) ;

∴ ● = ◆ (B. 5. pr. 9),

which is contrary to the fuppofition ;

∴ ● is not unequal to ◆ ;

that is ● = ◆ ;

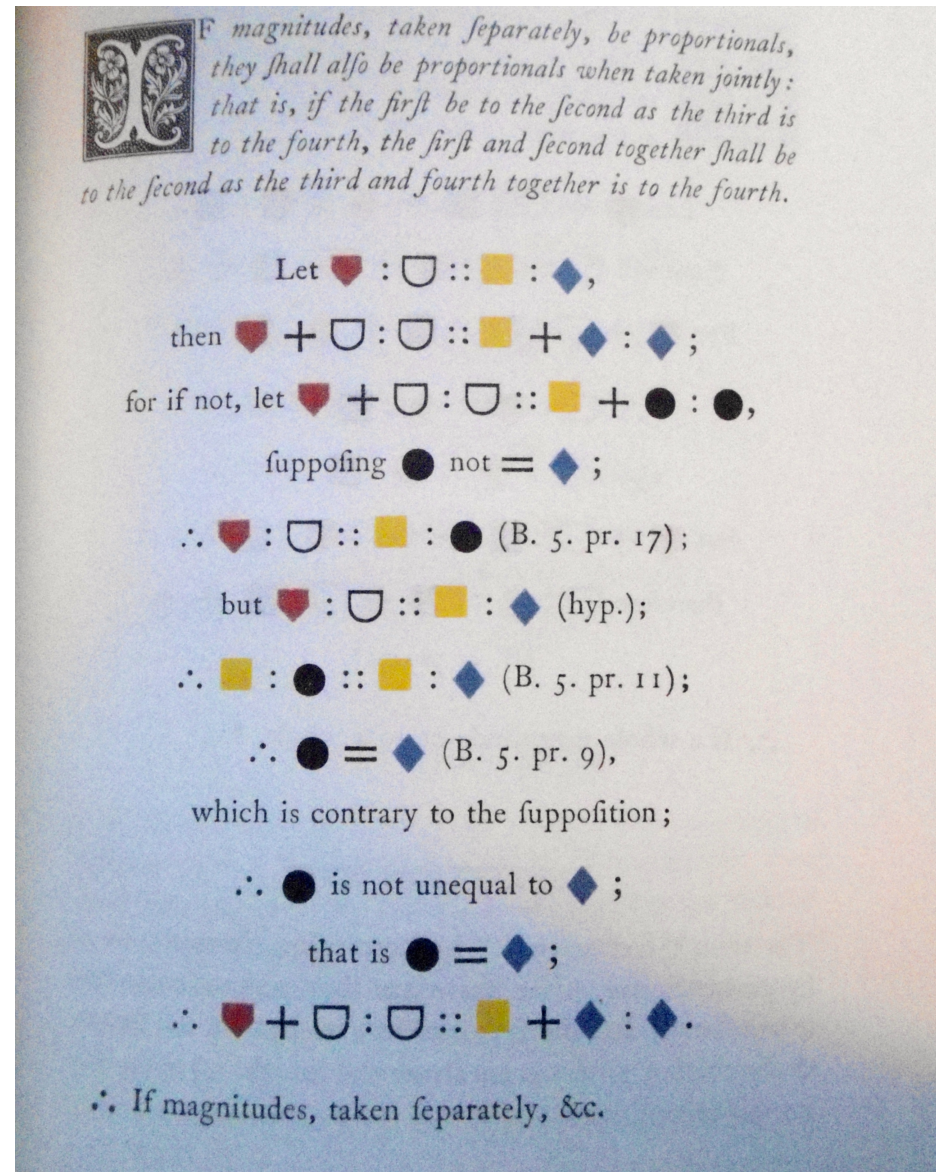∴ ♥ + ◡ : ◡ :: ▨ + ◆ : ◆.

∴ If magnitudes, taken *feparately*, &c.

Figure 5: But Augustus De Morgan remained skeptical ...

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The superfluous ! ...

Why always describing *what is known about the world* and its possible states ?

Try something more concrete, and more useful

tell the necessary from the superfluous

it is what we need in order to get rid of deficits !

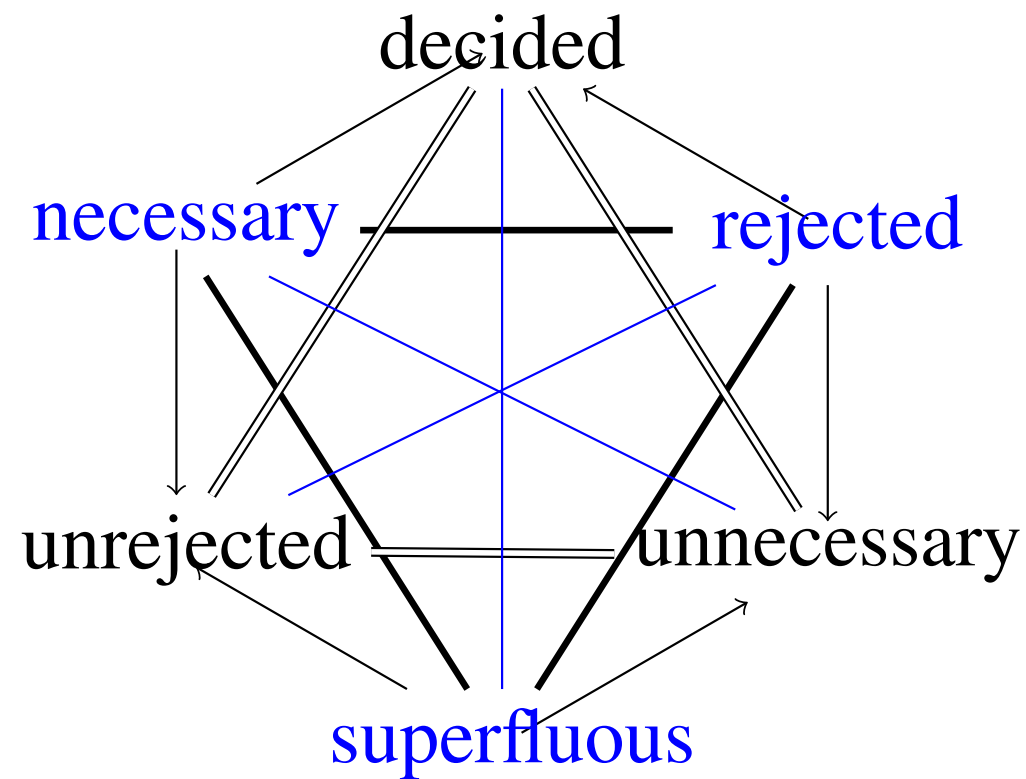superfluous: beyond what is needed, not necessary, exceeding what is necessary

Figure 6: Blanché 's hexagon of opposition

Logic of the superfluous

$\Box p$ having p true is needed

$\Box \neg p$ having p false is needed (p true is rejected)

$\Box p \rightarrow \neg \Box \neg p$

$\Box (p \wedge q) \equiv (\Box p \wedge \Box q)$

    having p true is superfluous

$$\blacktriangleright p =_{def} \neg(\Box p \vee \Box \neg p) = \neg \Box p \wedge \neg \Box \neg p$$

Discussing the superfluous is *time consuming*,

           hence its symbol!

Revising the needed

"The superfluous is sometime necessary"

(as every woman knows!)

Another direction of research ?

[La Reine] n'oublia pas non plus de faire sa cour à l'abbé Fouquet, en se moquant avec lui de la dépense que j'avois faite en ce voyage. Il est vrai qu'elle fut immense pour le peu de temps qu'elle dura. Je tenois sept tables servies en même temps, et j'y dépensois huit cents écus par jour. *Ce qui est nécessaire n'est jamais ridicule.*

Mémoires du Cardinal de Retz (t. III, liv. IV, [1652])

What is necessary is never ridiculous!

$$\Box p \rightarrow \neg \odot p$$

Viva la Sciencia !