

# “Playing as Metaphor for Learning in the 21st Century”

Hamish McLeod

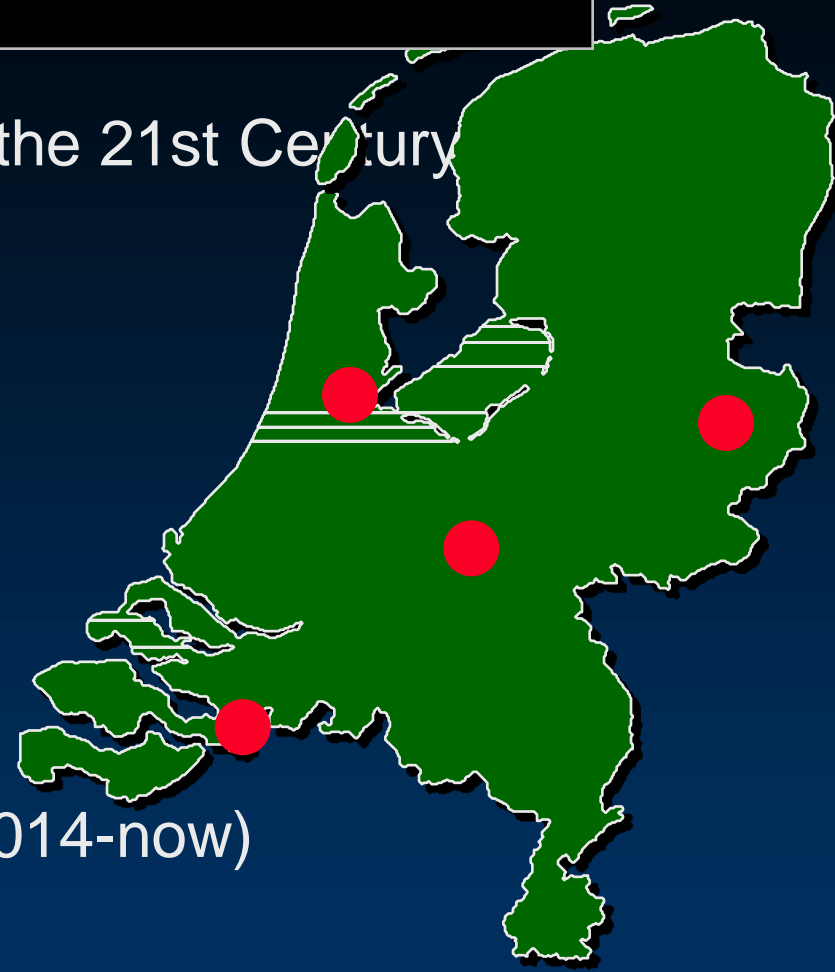
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1. Journal Editor IJWBC & IJCEELL

2. Co-Chair of IADIS Conferences

3. UNESCO professor of Learning Technologies







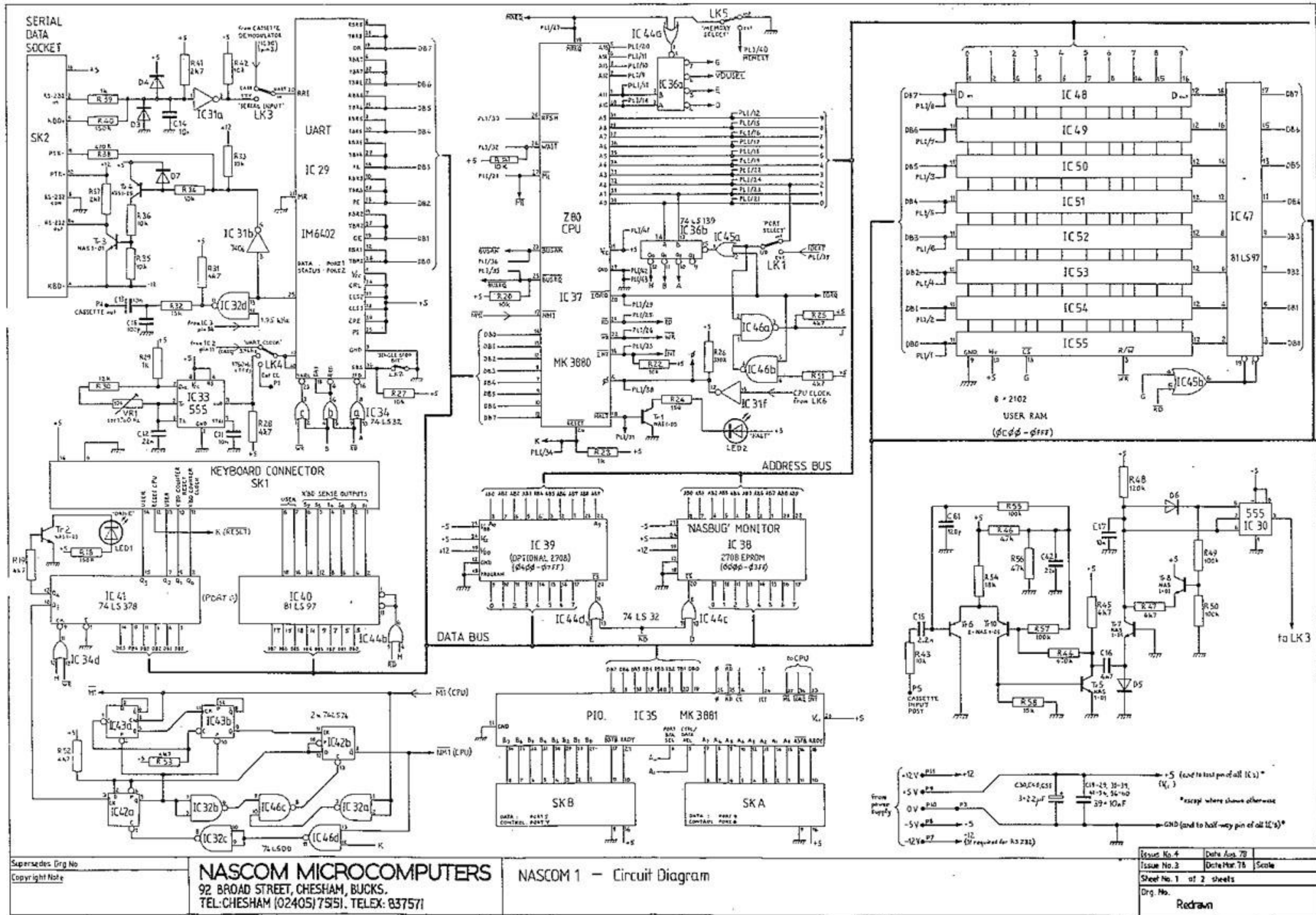
Learning

Playing

Working

# From Instrual via Extrual to Construal

- Nascom 1 and Nascom 2 (1977-1979)
- Machine Code, Forth, Lisp, Pascal, Prolog, SmallTalk.



Supersedes Drg No  
Copyright Note

**NASCOM MICROCOMPUTERS**  
92 BROAD STREET, CHESHAM, BUCKS.  
TEL: CHESHAM (02405) 7551. TELEX: 837571

NASCOM 1 - Circuit Diagram

Issue No. 4	Date Aug. 79
Issue No. 3	Date Mar. 78
Sheet No. 1 of 2 sheets	Scale
Drg. No.	
Redrawn	

NASCOM-1

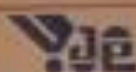
04110001

400-1000









```

C209 0A1803          JP Z, £031B          ; 0x1B
C20C 2178C5          LD HL, £C578        ; !x0
C20F 220BC0          LD (£C00B), HL      ; "↓e
C212 2A09C0          LD HL, (£C009)      ; *→e
C215 3E00            LD A, £00           ; >
C217 CDFAC2          K0001 CALL £C2FA    ; 0x2FA
C21A BE              CP (HL)             ; >
C21B 2809            JR Z, K0000         ; (→
C21D 3C              INC A               ; <
C21E 20F7            JR NZ, K0001        ; u
C220 2102C2          K0003 LD HL, L0002 ; !1B
C223 220BC0          LD (£C00B), HL      ; "↓e
C226 21A00B          K0000 LD HL, £0BA0 ; ! ↓
C229 CD6DC5          CALL £C56D          ; 0x56D

```



QM-1211



FREE

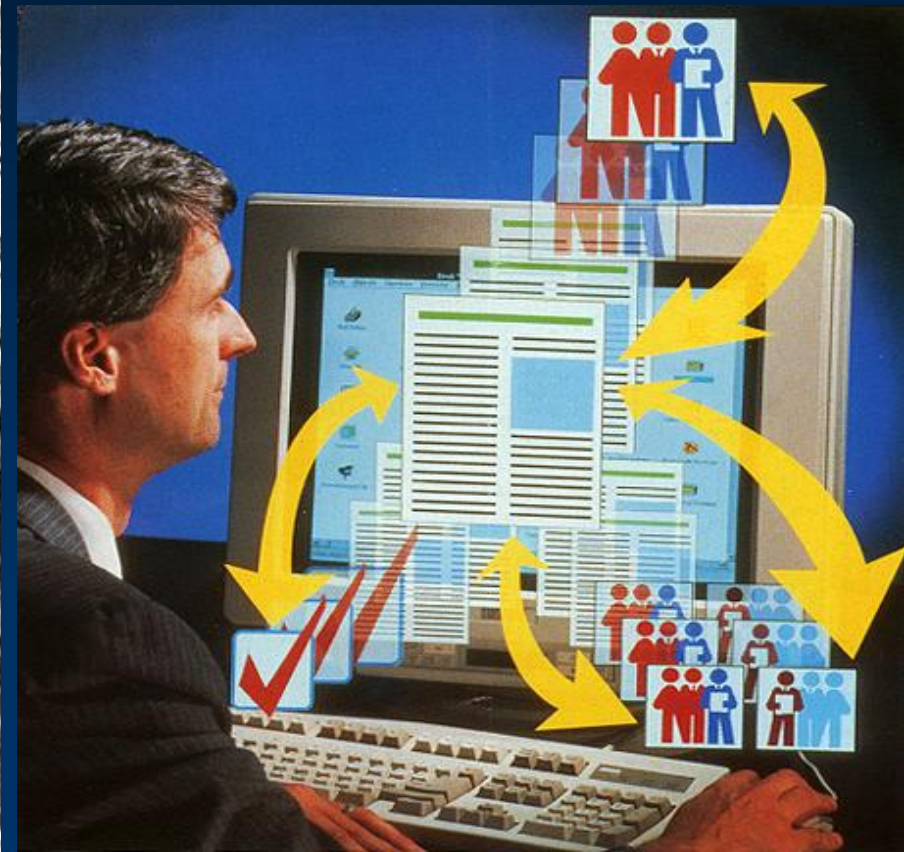
New York World Telegram  
The Princess to See C...  
At Canterbury's

Pay Results Justice 40  
to Poor Justice 2000

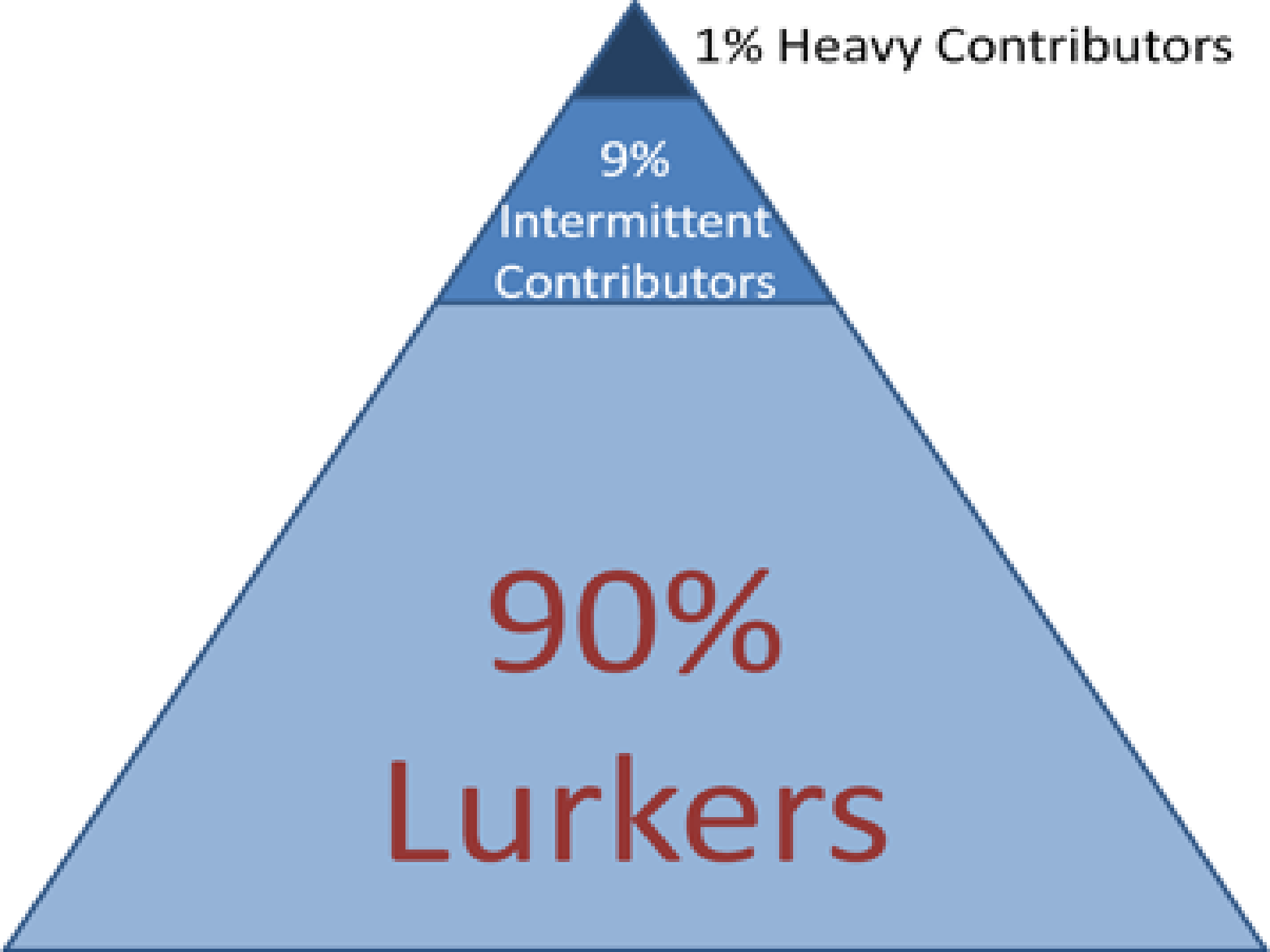
Special Court Will  
A Royal Marriage,  
Needs Big Money

By Edward Mackay  
Miss Commission

# From Hypermedia via Multimedia to VR







1% Heavy Contributors

9%  
Intermittent  
Contributors

90%  
Lurkers

# Conversation Theory

A cybernetic theory and methodology

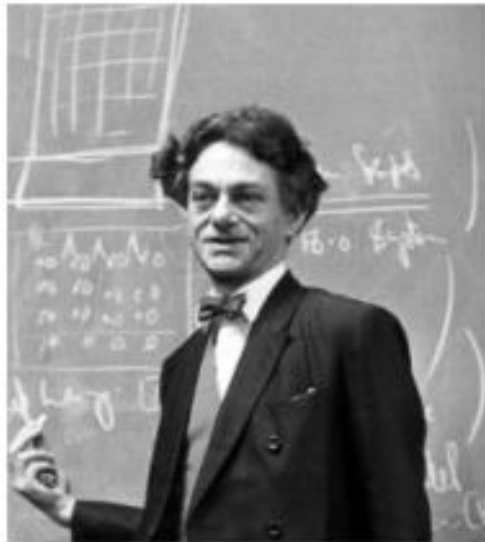


Fig. 4

*Gordon Pask was an English author, inventor, educational theorist, cybernetician and psychologist who made significant contributions to cybernetics, instructional psychology, experimental epistemology and educational technology. -- Wiki*

*“The theory itself applies to all conversations and, given the stricture that a conversation is the minimal unit for psychological observation, all of psychology including its extrapolation into related areas, such as architecture, as it deals with cities that are lived in...”<sup>3</sup>*

*---Conversation Theory, Conversation, Cognition and Learning, Reasons for developing a thoery of conversations, 1975*

# PORTAELVCIS

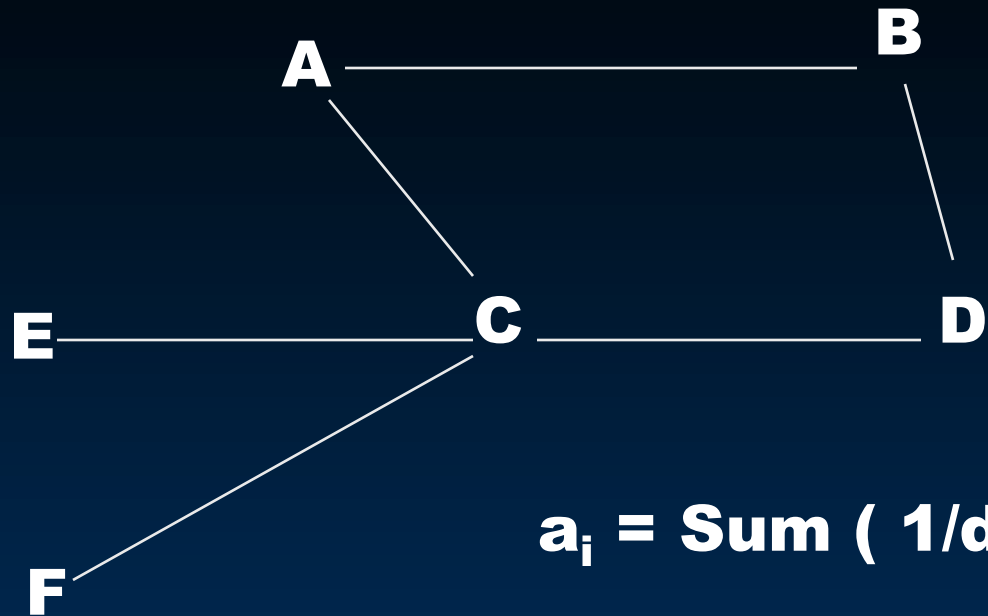
Hęc est porta Tetragramaton iusti intrabit per eam.

זו השערה ל'חזור יצ'ה לחיים לבאנו בו









$$a_i = \text{Sum} ( 1/d_j ) - 1$$

$$a_B = 1/d_A + 1/d_D - 1 = 0$$

$$a_A = - 1/4$$

$$a_C = + 2$$

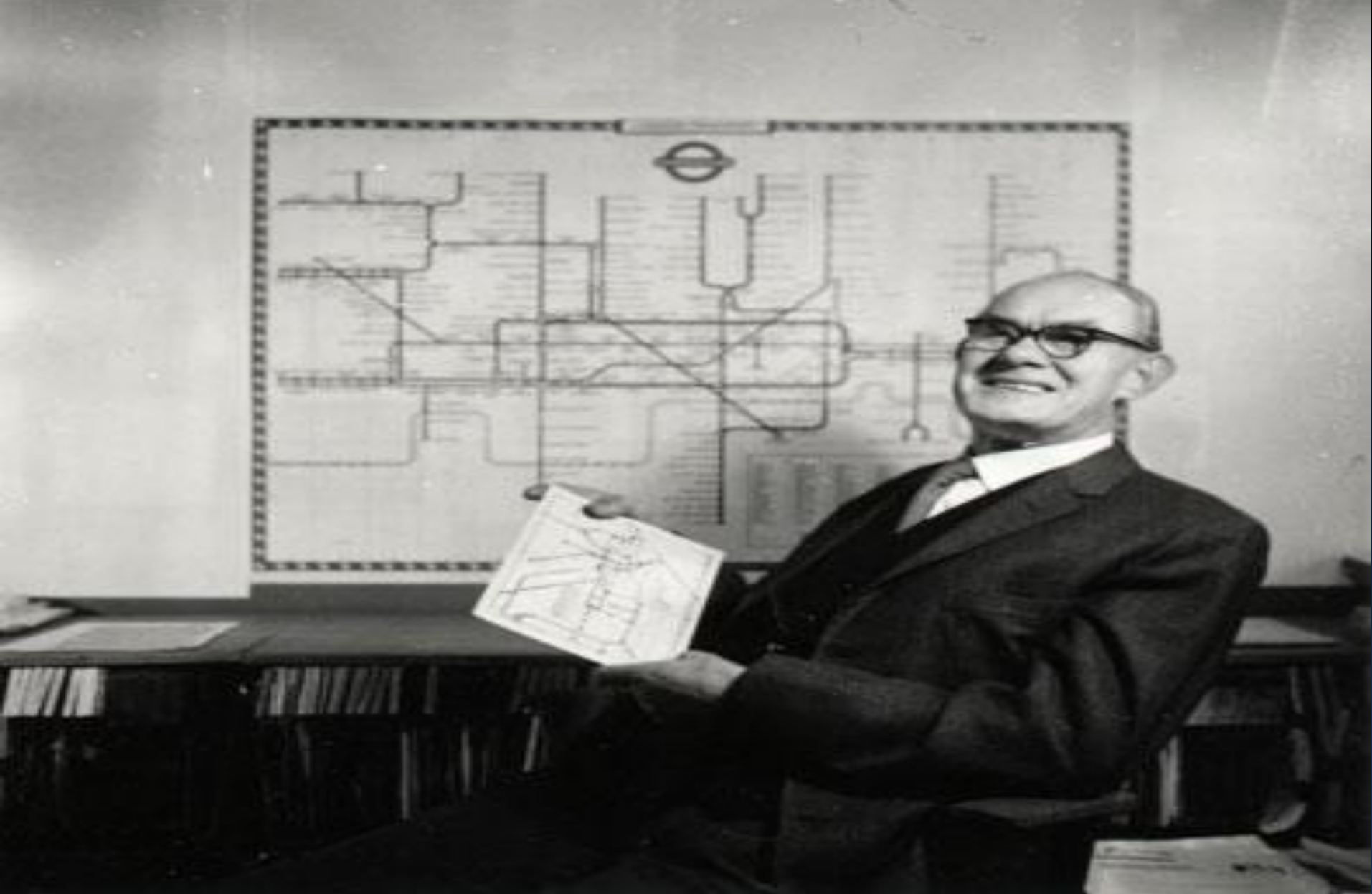
$$a_D = - 1/4$$

$$a_E = - 3/4$$

$$a_F = - 3/4$$

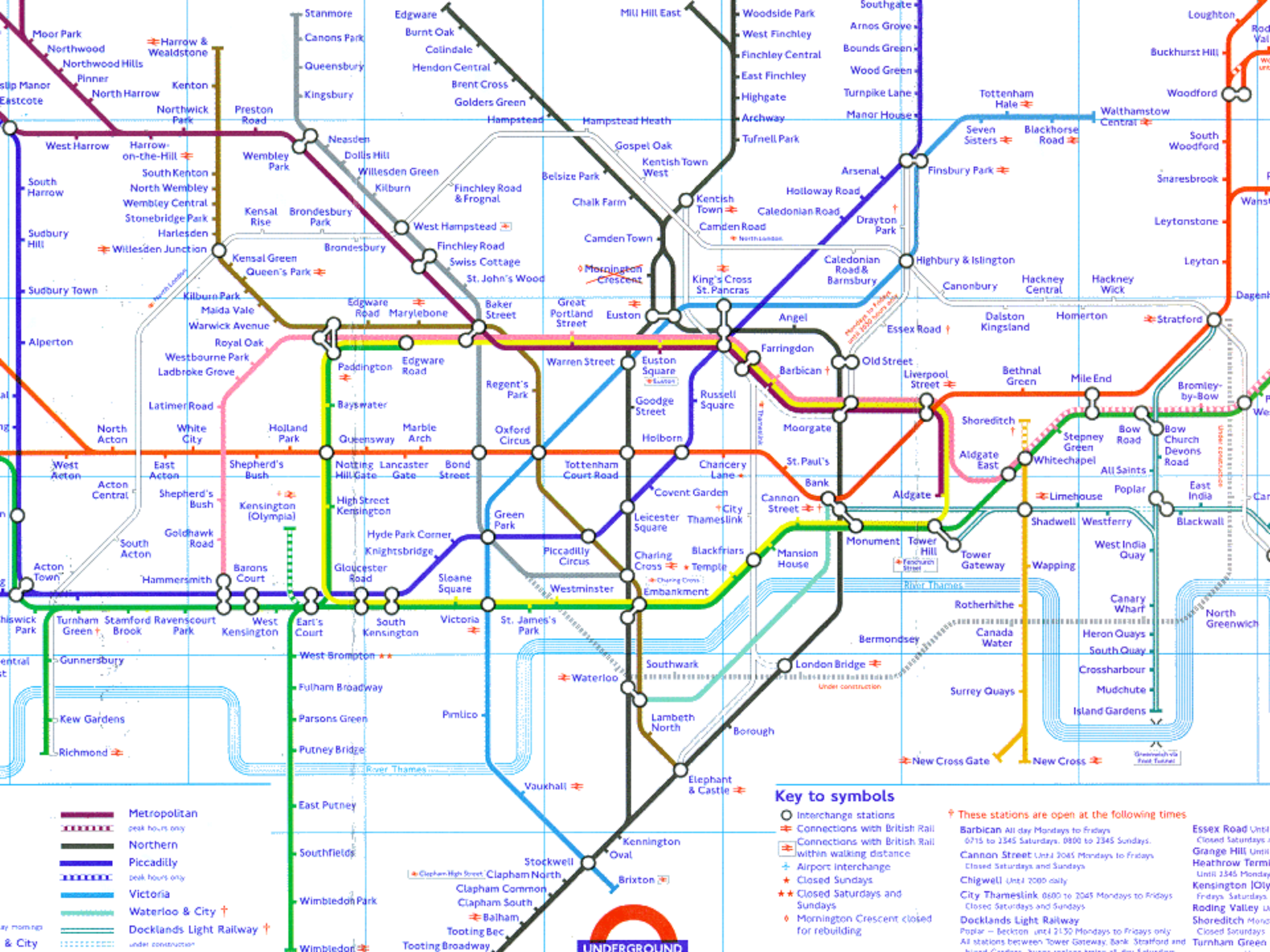






**Harry Beck, 1931**



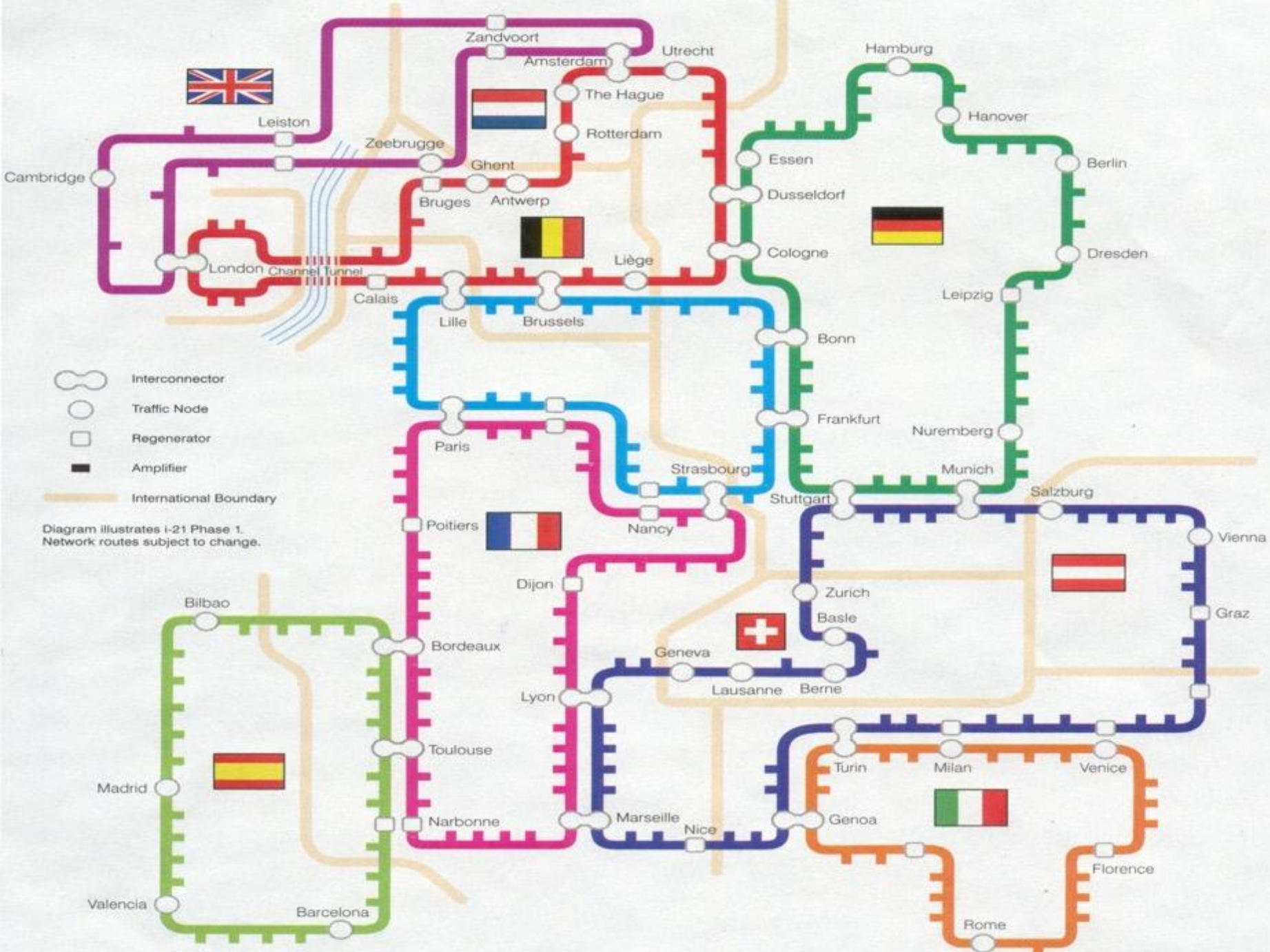


- Metropolitan
- - - - - peak hours only
- Northern
- Piccadilly
- - - - - peak hours only
- Victoria
- - - - - Waterloo & City †
- - - - - Docklands Light Railway †
- - - - - under construction

**Key to symbols**

- Interchange stations
- ⊕ Connections with British Rail
- ⊕ Connections with British Rail within walking distance
- ✈ Airports interchange
- ★ Closed Sundays
- ★★ Closed Saturdays and Sundays
- ◇ Mornington Crescent closed for rebuilding
- † These stations are open at the following times
- Barbican** All day Mondays to Fridays 0715 to 2345 Saturdays 0800 to 2345 Sundays
- Cannon Street** Until 2045 Mondays to Fridays Closed Saturdays and Sundays
- Chigwell** Until 2000 daily
- City Thameslink** 0600 to 2045 Mondays to Fridays Closed Saturdays and Sundays
- Docklands Light Railway** Poplar – Beckton until 2130 Mondays to Fridays only All stations between Tower Gateway, Bank, Stratford and All Saints Green open until 01.00 Saturdays and Sundays
- Essex Road** Until 0715 Closed Saturdays
- Grange Hill** Until Heathrow Terminal 5
- Kensington (Olympic)** Until 2345 Mondays, Fridays, Saturdays
- Roding Valley** Until Shoreditch Monday
- Shoreditch** Monday Closed Saturdays
- Turnham Green** Until 2345 Mondays, Fridays, Saturdays





# SO FIA





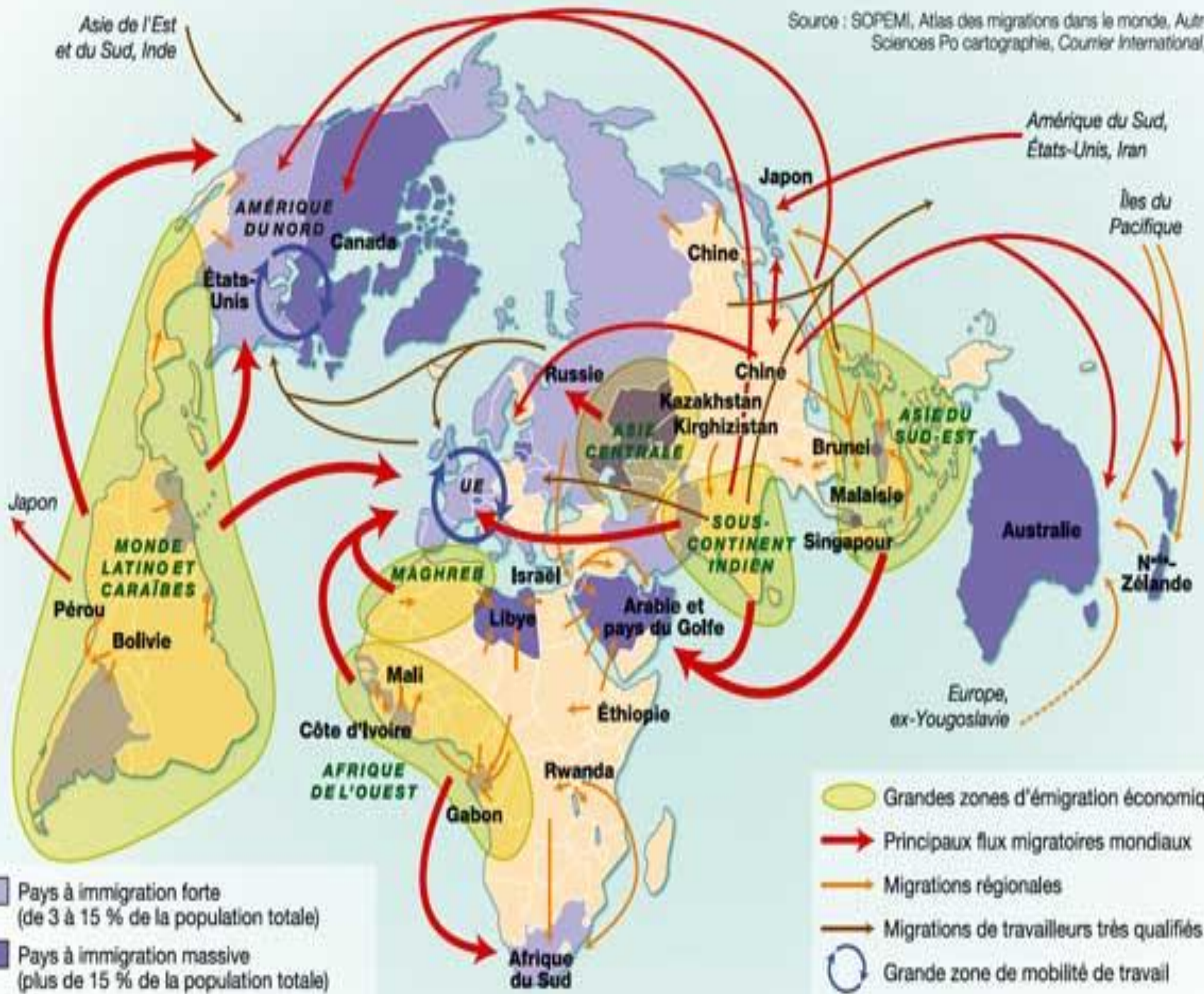
**Is ICT still a  
Game  
Changer?**



Asie de l'Est et du Sud, Inde

Amérique du Sud, États-Unis, Iran

Îles du Pacifique



- Pays à immigration forte (de 3 à 15 % de la population totale)
- Pays à immigration massive (plus de 15 % de la population totale)

- Grandes zones d'émigration économique
- Principaux flux migratoires mondiaux
- Migrations régionales
- Migrations de travailleurs très qualifiés
- Grande zone de mobilité de travail

## Conflicts in Contracts

**Axiom 1:** Opposite permissions conflict:  $\vdash \mathcal{P}_p(x) \bowtie !\mathcal{P}_p(x)$ .

**Axiom 2:** Obligation to perform mutually exclusive actions is a conflict:  $a \bowtie b \vdash \mathcal{O}_p(a) \bowtie \mathcal{O}_p(b)$ .

**Axiom 3:** Conflicts are closed under symmetry:  $C \bowtie C' \vdash C' \bowtie C$ .

**Axiom 4:** Conflicts are closed under increased strictness:

$C \bowtie C' \wedge C' \sqsubseteq C'' \vdash C \bowtie C''$ .

# My recent construal this morning

- $(a + b)^2 = a^2 + 2ab + b^2$

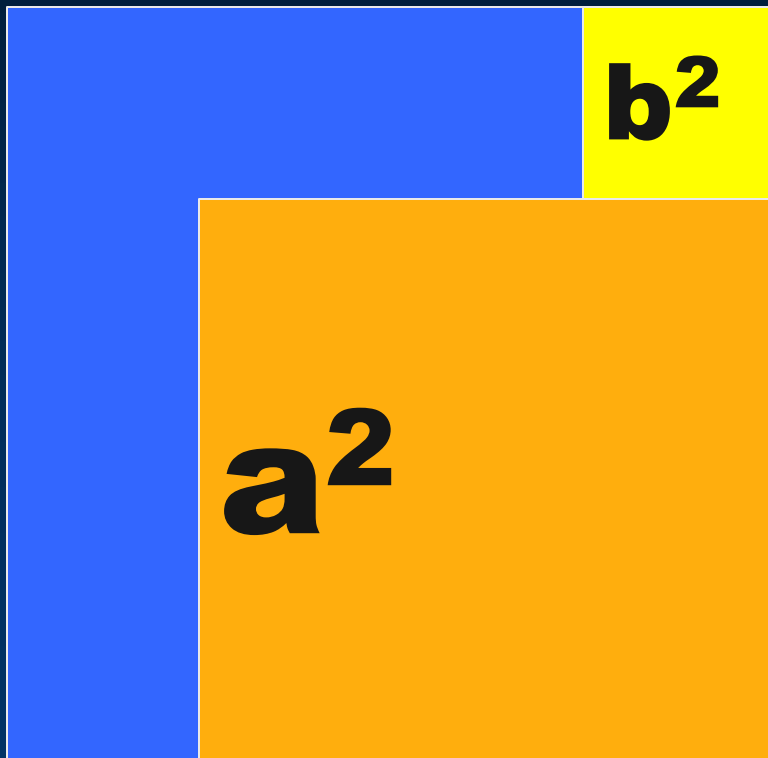
# My recent construal this morning

- $(a + b)^2 = a^2 + 2ab + b^2$



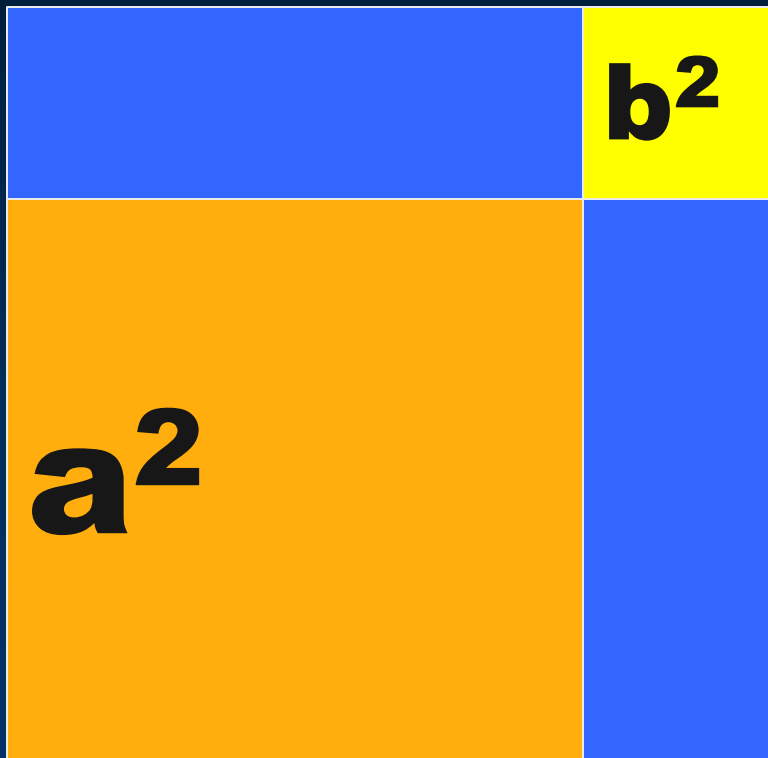
# My recent construal this morning

- $(a + b)^2 = a^2 + 2ab + b^2$



# My recent construal this morning

- $(a + b)^2 = a^2 + 2ab + b^2$



# Technological Fluency

Becoming fluent in thinking, expressing, communicating and constructing with technology





# Learning Environment

Construction

Time

Integration

Openness

Learner-Centered

Project-Based

Technology as pencil



# Kenneth Dunn

If students don't learn the way we teach them, let's teach them the way they learn.

# William Glasser: effectiveness of different modes of learning

What we read	10%
What we hear	20%
What we see	30%
What we see/hear	50%
What we discuss with others	70%
What we experience	90%



ドーナツ  
ドーナツ  
ドーナツ

**MENU**  
ドリンクセット  
(あまーいたやま5個入  
+お好きなドリンク)  
¥200

あまーいたやま  
5個入単品  
¥180

ドリンク ¥E  
ソーロシ  
オレシ  
ス

メニュー表  
品名 価格  
あまーいたやま 5個入 ¥180  
ソーロシ ¥E  
オレシ ¥E  
ス ¥E  
ドリンク ¥E  
ドリンクセット ¥200







The knowledge is  
*between*

rather than

*within*

the persons





# The Nature and Culture of Learning



# Cognitive Styles

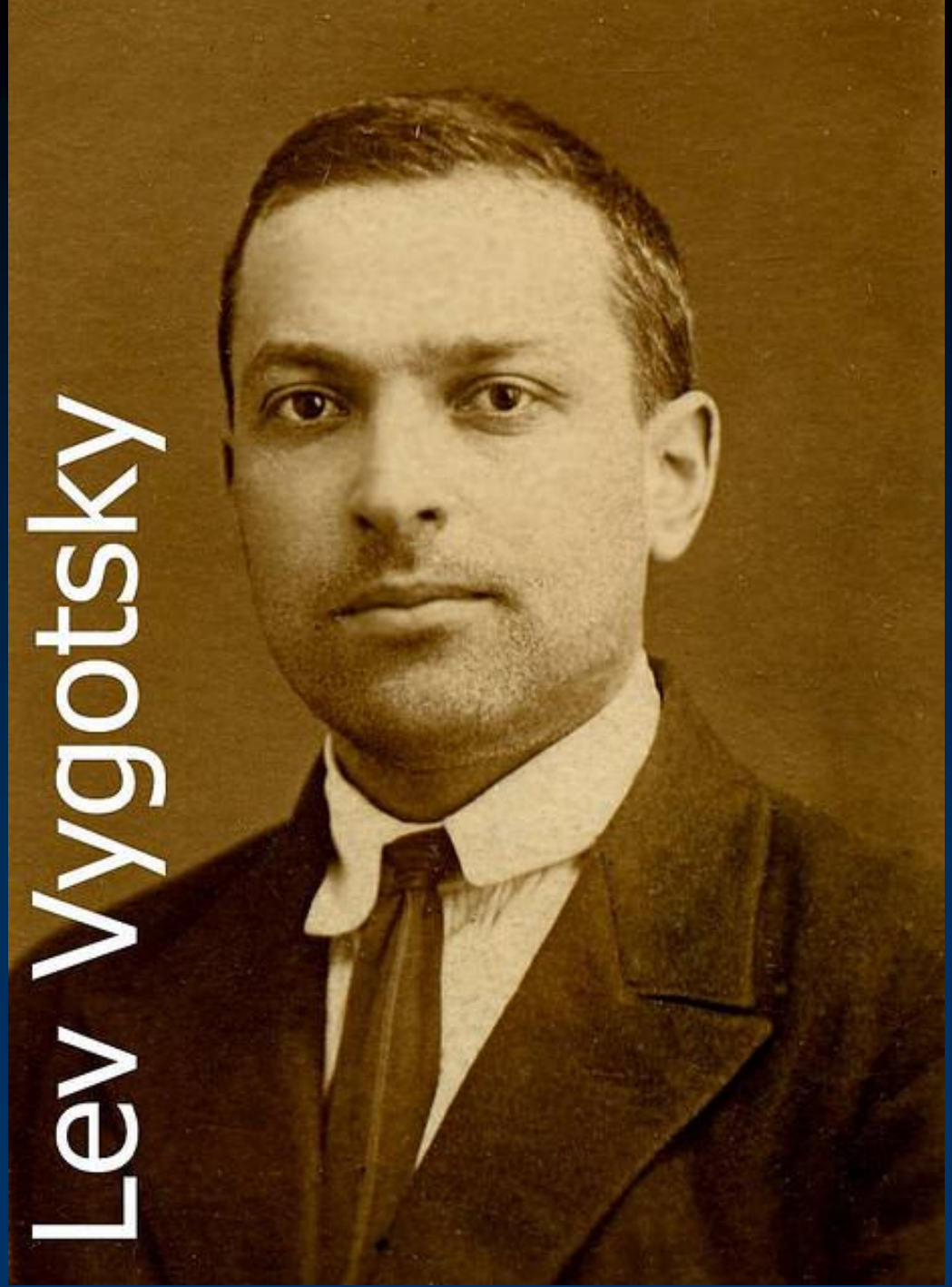
Serialist



Holist



Lev Vygotsky



Active  
Manipulative/  
Observant

Intentional  
Reflective/  
Regulatory

Constructive  
Articulate/  
Reflective

Authentic  
Complex/  
Contextualized

Cooperative  
Collaborative/  
Conversational

# ICT-Education Partnerships

Narrative

Explorative

Constructive

Creative

Emotional

**Concrete  
Experience**

(doing / having an  
experience)



**Reflective  
Observation**

(reviewing / reflecting  
on the experience)



**Abstract  
Conceptualisation**

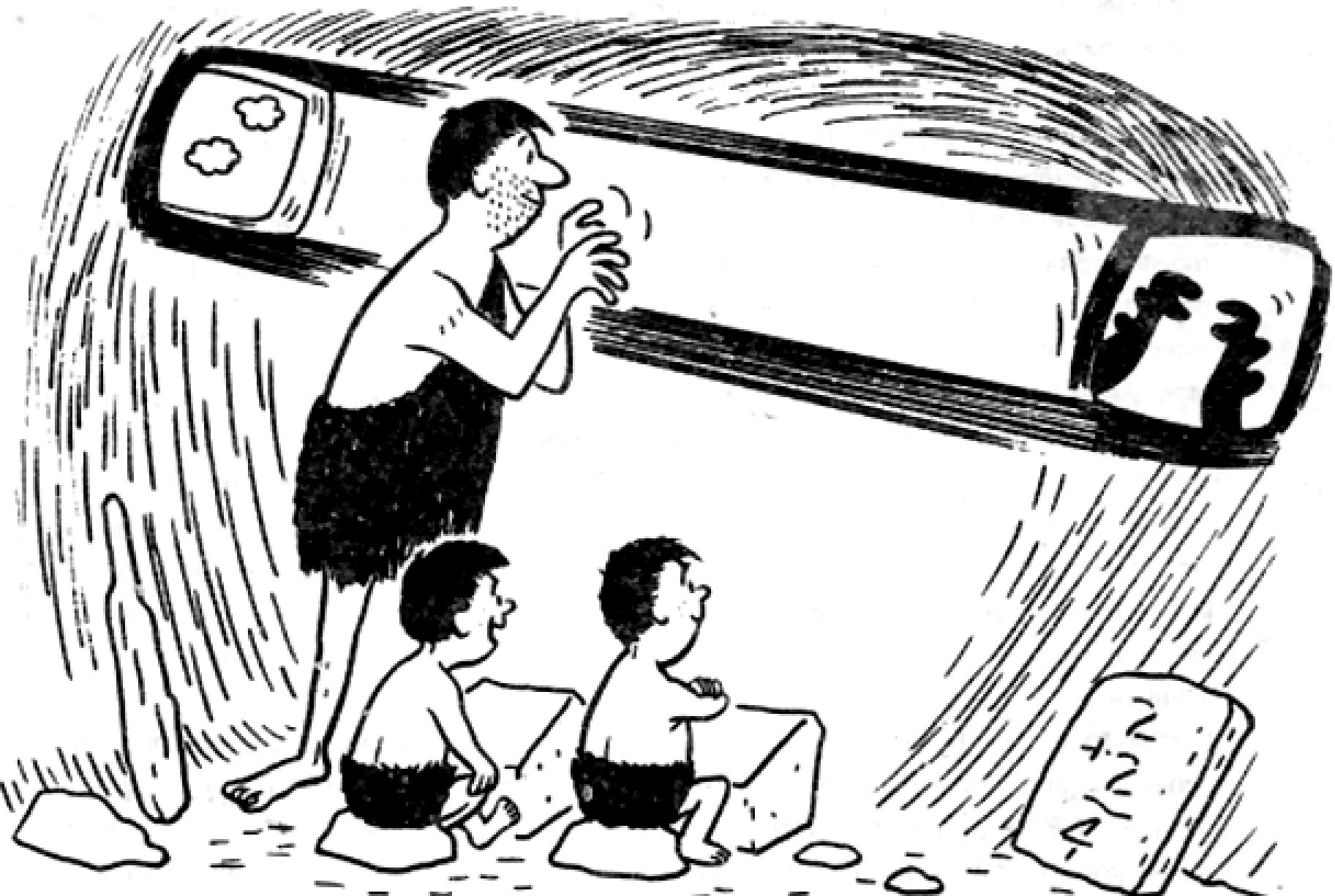
(concluding / learning  
from the experience)



**Active**

**Experimentation**

(planning / trying out  
what you have learned)



Bill Money

Top  
Managers

Conceptual  
Skills

Middle  
Managers

Human  
Skills

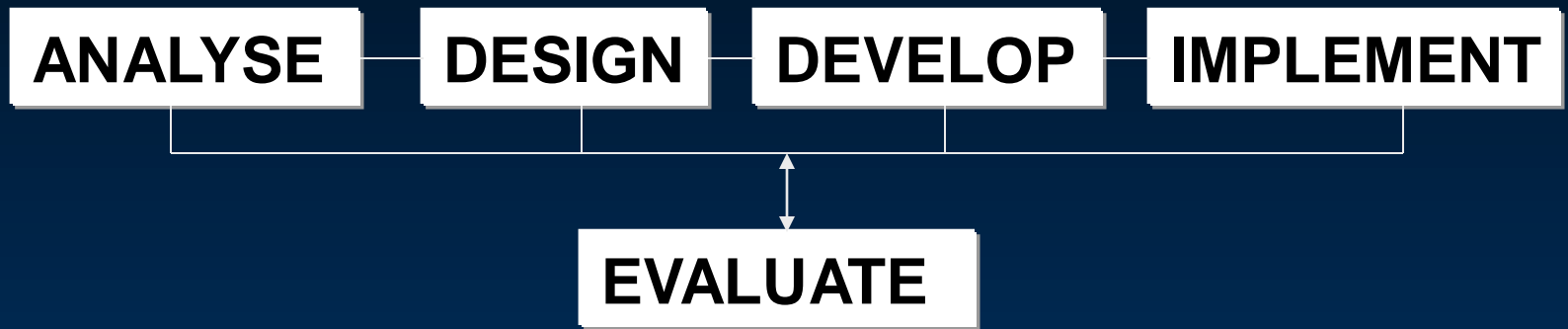
Lower-level  
Managers

Technical  
Skills

 Level of Importance



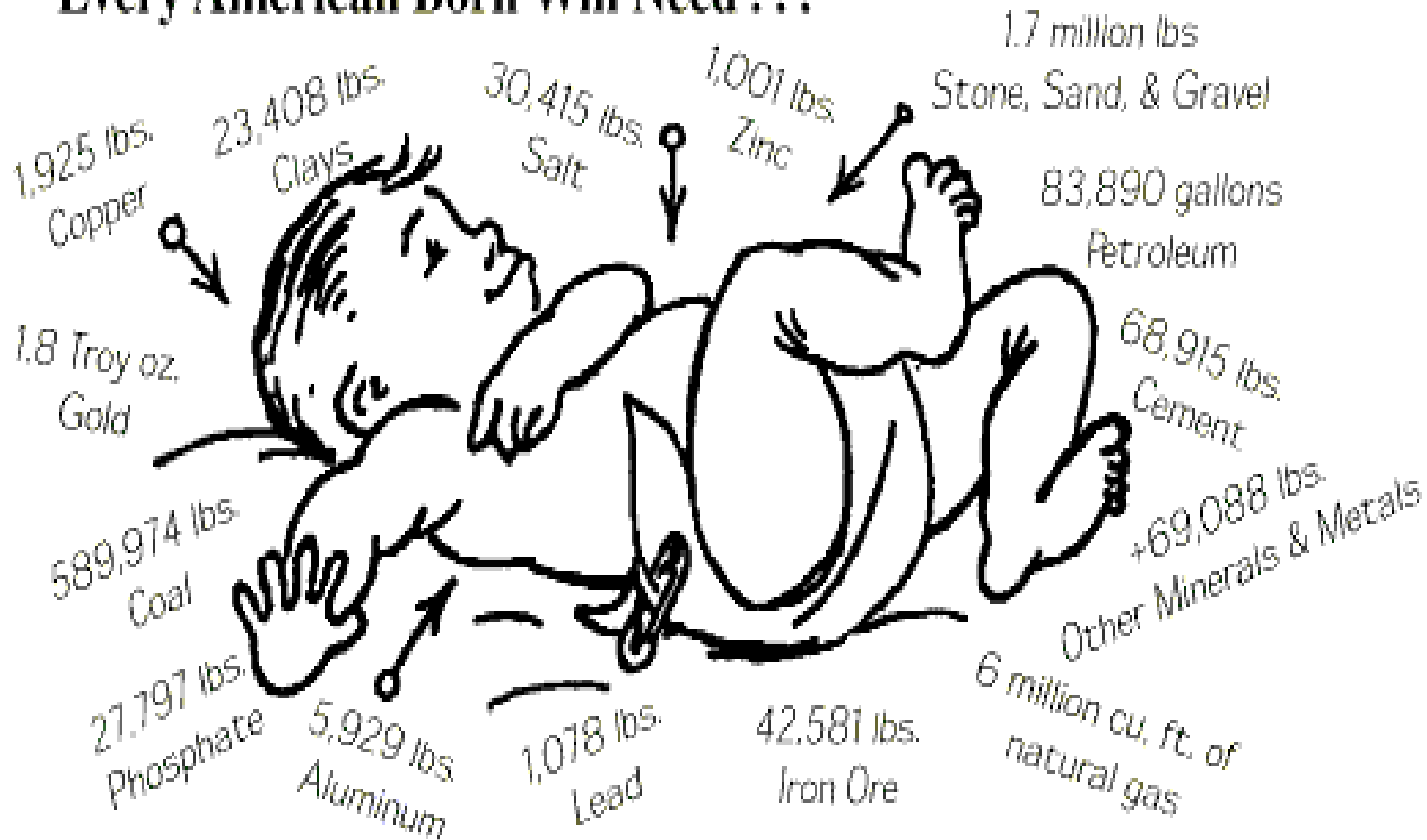
# Traditional Model for Design



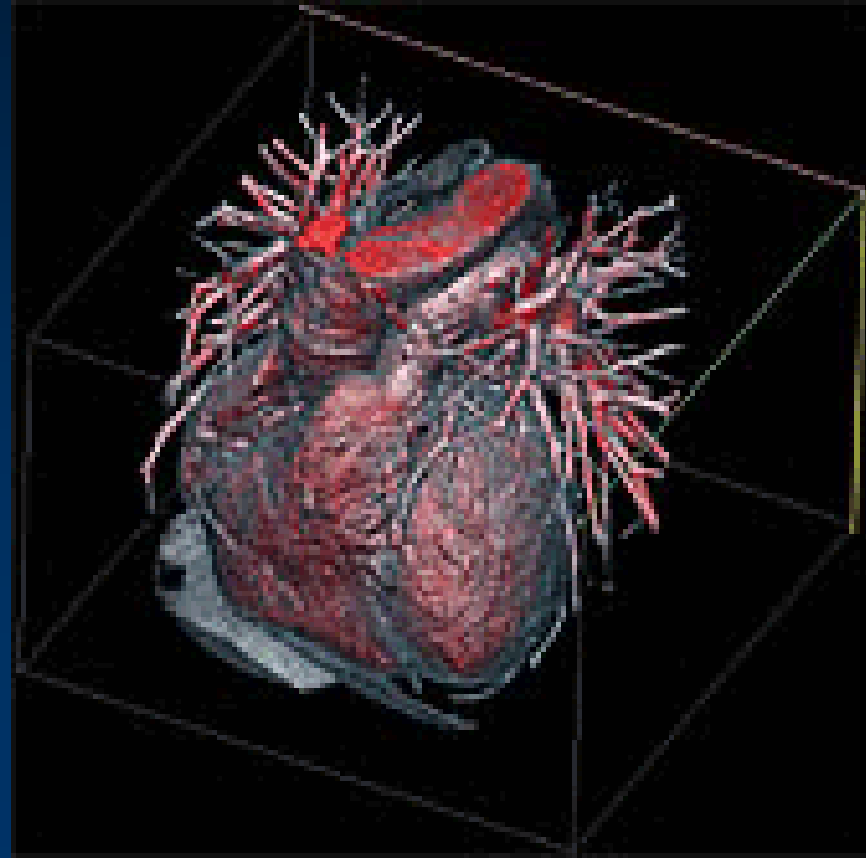
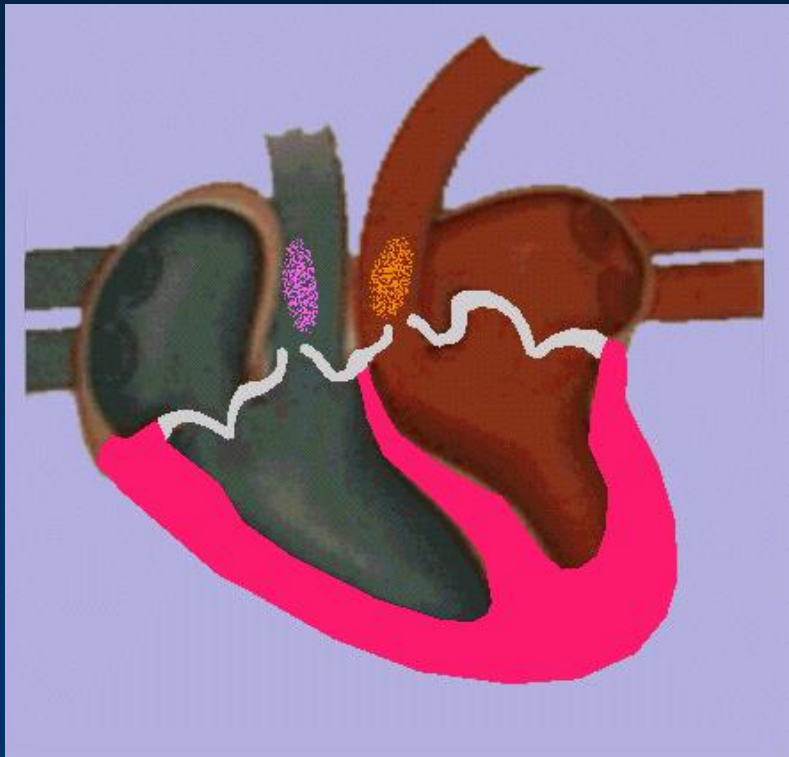
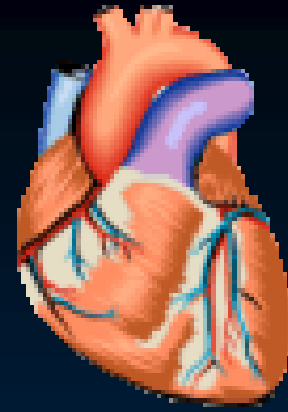
Onderhoud van de banden



# Every American Born Will Need . . .

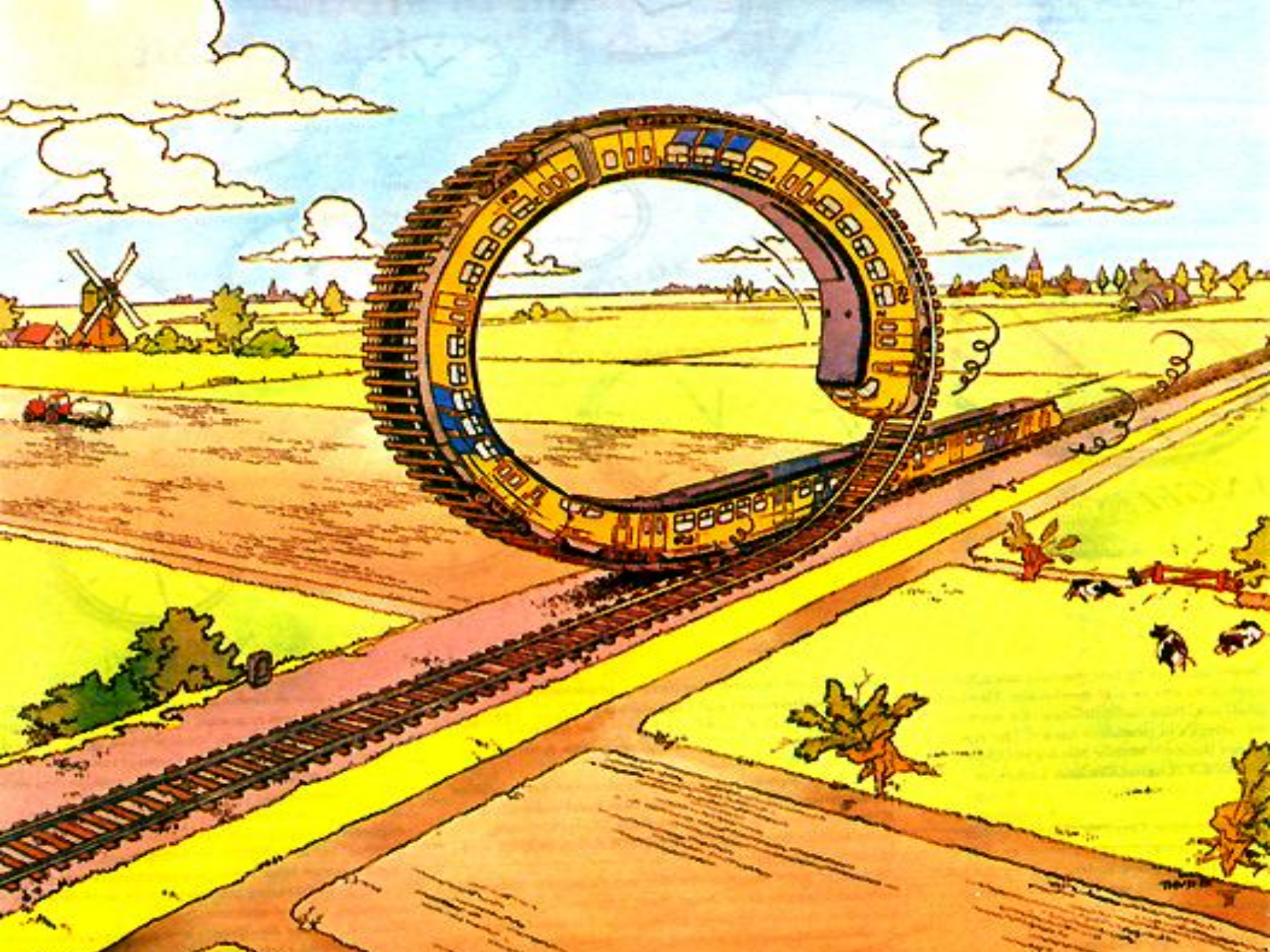


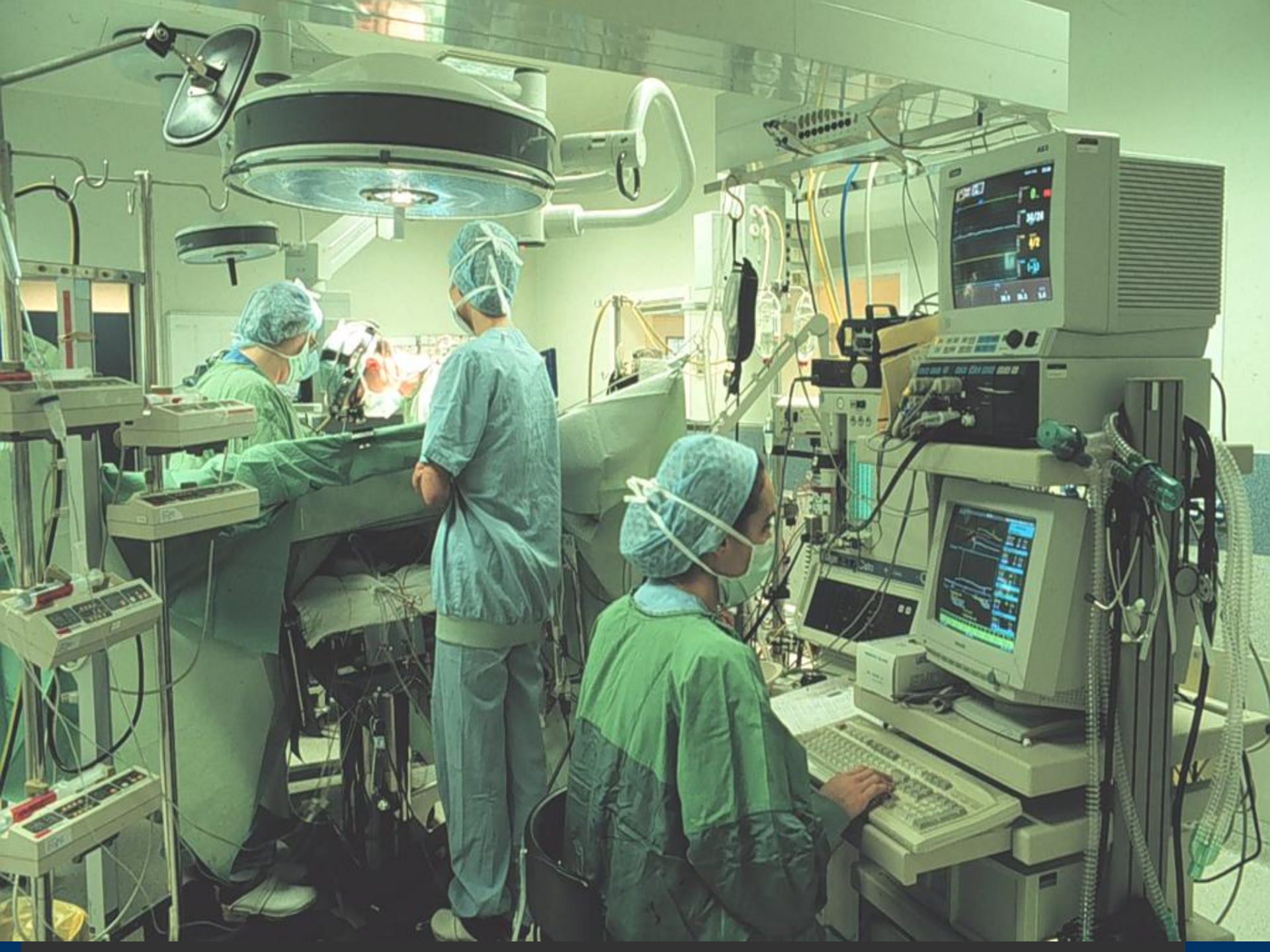
**$3\frac{3}{4}$  million pounds of minerals, metals, and fuels in a lifetime**



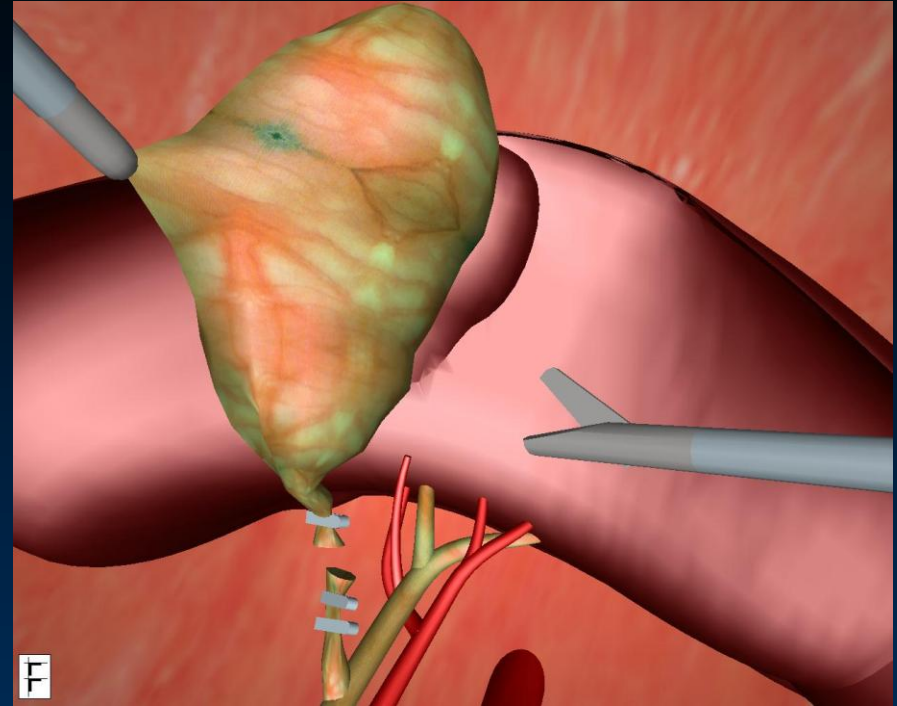












# The VREST Project

## Surgical Training with Haptic Devices







A Venn diagram consisting of three overlapping circles. The top circle is labeled 'Learning', the bottom-left circle is labeled 'Playing', and the bottom-right circle is labeled 'Working'. The circles overlap in the center and at the intersections between pairs of circles. The text is white and centered within each circle.

Learning

Playing

Working