

Geschichte und Theorie der Kybernetik

Vorlesung WS 2006/07
Ästhetik 2 | 29. November 2006



Hat Mondrian den ganzen Mondrian gemalt, den er hätte malen können?

Noll beauftragte einen Computer, sich an einem Bild von Mondrian zu inspirieren, und lieferte ihm dazu als Daten: Art der Elemente (Quadrate oder mehr oder weniger längliche Stäbe), Einordnung in eine Gesamtfigur (Kreis) und mittlere Dichte an jedem Punkt des Bildes. Er erhielt das rechte Bild und zeigte es zusammen mit dem Original von Mondrian (links) einer Anzahl Testpersonen, die er ohne jede Andeutung fragte, welches sie bevorzugten. Die Testpersonen zogen das Computer-Remake vor, und zwar in einem aufschlußreichen Verhältnis: 55 zu 45%. Dieses paradoxe Resultat erklärt sich aus der kulturellen Soziodynamik, und zwar aus der Tatsache, daß die Mondrian-Konzeption, die seit etwa 20 Jahren im Handel mit Vervielfältigungen existiert, banal und dem Auge des Betrachters gewohnt geworden ist; so findet dieser in der hier angebotenen Version etwas zusätzlich Neues.


a


b

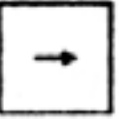

c


d





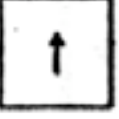
1


2

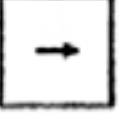

4


3


s2


s1


s3


s4

a₁ a₂

a₄ a₃

a'₁ a'₂

a'₄ a'₃

c₁ c₂

c₄ c₃

c'₁ c'₂

c'₄ c'₃

sa₂ sa₁

sa₃ sa₄

sa'₂ sa'₁

sa'₃ sa'₄

sc₂ sc₁

sc₃ sc₄

sc'₂ sc'₁

sc'₃ sc'₄

b₁ b₂

b₄ b₃

b'₁ b'₂

b'₄ b'₃

d₁ d₂

d₄ d₃

d'₁ d'₂

d'₄ d'₃

sb₂ sb₁

sb₃ sb₄

sb'₂ sb'₁

sb'₃ sb'₄

sd₂ sd₁

sd₃ sd₄

sd'₂ sd'₁

sd'₃ sd'₄



d' ₂	c' ₂	sd' ₃	sc' ₃	c ₁	b ₂	a' ₃	d' ₃
a' ₂	b' ₃	sb' ₃	sb' ₃	d ₁	a ₁	b ₄	c' ₃
b ₁	a ₄	sa ₄	sb' ₁	sd ₃	sa ₃	sb' ₂	sd' ₂
c ₄	d ₄	sd ₄	sc ₄	sc ₃	sb ₄	sb' ₂	sc' ₁
sc' ₃	sb' ₂	sb ₂	sc ₁	sc ₂	sd ₂	d ₂	c ₂
sd' ₄	sb' ₄	sa ₁	sd ₁	sb ₃	sa ₂	a ₂	b ₃
c' ₁	b' ₁	a ₃	d ₃	sb' ₁	sb' ₁	b' ₁	a' ₄
d' ₁	a' ₁	b ₄	c ₃	sc' ₄	sd' ₁	c' ₄	d' ₄

Der vorliegende Text, der eine Stichprobe aus der unendlichen (fiktiven) Grundgesamtheit aller Texte seiner Textsorte ist, besteht aus w Elementen (token). Von den insgesamt K Elementensorten (types) hat die Sorte k w_k Elemente, so daß für die Grundgesamtheit, falls $w_k \gtrsim 10$, näherungsweise gilt: $p_k = w_k/w$.

Die Sorten k und k' , deren Zuordnungsbeziehung bestimmt werden soll, werden zunächst zu k^* zusammengefaßt, so daß $p_{k^*} = \frac{1}{w} \cdot (w_k + w_{k'})$.

Der Text besteht dann aus einer Folge von k^* - und $\neg k^*$ -Elementen. (Letztere wurden im Beispiel des Textausschnitts mit 0 gekennzeichnet). Unter der Voraussetzung der Nullhypothese, daß die k^* - und die $\neg k^*$ -Elemente regellos über den Text verteilt sind, wird nach der Wahrscheinlichkeit gefragt, daß von einer mit einem k^* -Element besetzten Textstelle ab ein nächstes k^* -Element im Abstand j erscheint.

Sie ist gegeben durch:

$$P(j) = (1 - p_{k^*})^{j-1} \cdot p_{k^*}.$$

Diese Verteilung ist normiert; denn es gilt:

$$\sum_{j=1}^{\infty} P(j) = p_{k^*} \cdot \sum_{j=1}^{\infty} (1 - p_{k^*})^{j-1} = p_{k^*} \cdot \frac{1}{p_{k^*}} = 1.$$

Die Wahrscheinlichkeit, daß der Abstand j größer als j' ist, ist dann:

$$\begin{aligned} P(j > j') &= 1 - \sum_{j=1}^{j'} P(j) = 1 - p_{k^*} \cdot \sum_{j=1}^{j'} (1 - p_{k^*})^{j-1} = \\ &= 1 - p_{k^*} \cdot \frac{1 - (1 - p_{k^*})^{j'}}{1 - (1 - p_{k^*})} = 1 - p_{k^*}^{j'}. \end{aligned}$$

$$\left(\text{Wegen allg.: } \sum_{m=0}^{m'-1} a \cdot r^m = a \cdot \frac{1 - r^{m'}}{1 - r} \quad \text{mit} \quad 0 < r < 1. \right)$$

Wird nun eine Zahl $0 < \alpha < 1$, die formal der Irrtumswahrscheinlichkeit in einem Testverfahren entspricht, vorgegeben, so läßt sich ein j_s derart bestimmen, daß

$$P(j > j_s) = \alpha,$$

also

$$(1 - p_{k^*})^{j_s} = \alpha,$$

und daraus

$$j_s = \frac{\log \alpha}{\log (1 - p_{k^*})} .^3$$

3 Da rechts vom Gleichheitszeichen ein Bruch steht, ist für j_s die nächst größere ganze Zahl einzusetzen.

„purpurn“ bei Trakl

Es ist Schnee gefallen. Nach Mitternacht verlässt du betrunken von purpurnem Wein den dunklen Bezirk der Menschen, P	128,2
da des Träumers Herz/Überfließt von purpurner Abendröte,	132,8
Nachhallen die purpurnen Flüche/Des Hungers im dämmernden Grund/Mahlt die Mühle; im Hasellaub wölbt sich ein purpurner Mund,	133,31
So leise schließt ein mondener Strahl/Die purpurnen Male der Schwermut.	138,7
Purpurner Nachttau und es erlöschen rings die Sterne.	140,37
Die purpurnen Martern, Klage eines grossen Geschlechts,	141,4
Mit purpurner Stirne ging er ins Moor P	144,15
	147,27

148 Belegstellen gibt es
dafür in Trakls Werk. Der
obige Ausschnitt stammt
aus dem Belegwörterbuch

Heinz Wetzel
Konkordanz zu den
Dichtungen Georg Trakls
818 S., Ln., DM 98,—

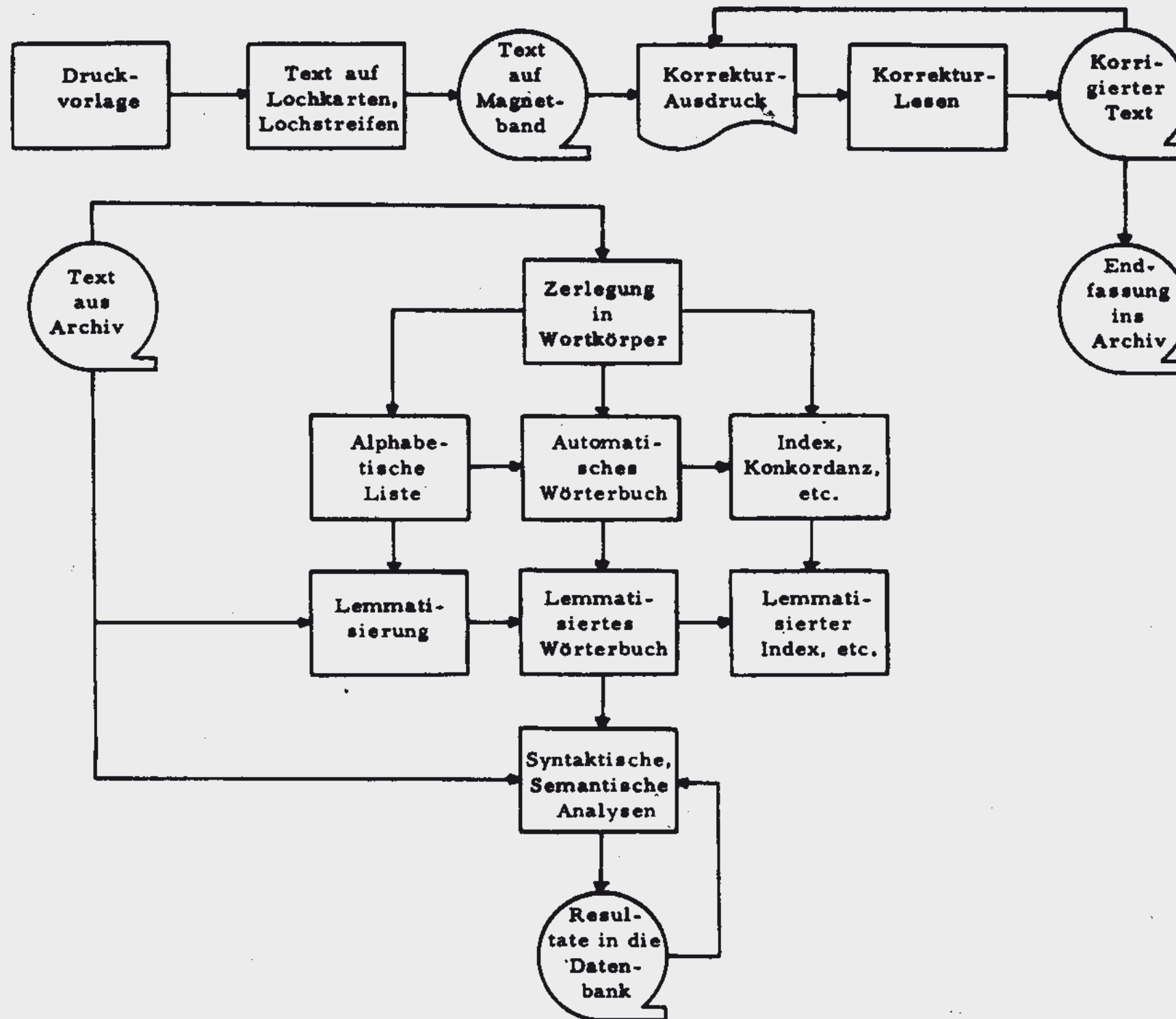
»Das Besondere an diesem
Textstellenwörterbuch ist,
daß es mit dem Computer
erstellt wurde. Das Hilfs-
mittel der elektronischen
Datenverarbeitung zur
Erschließung und Systema-
tisierung der Texte von

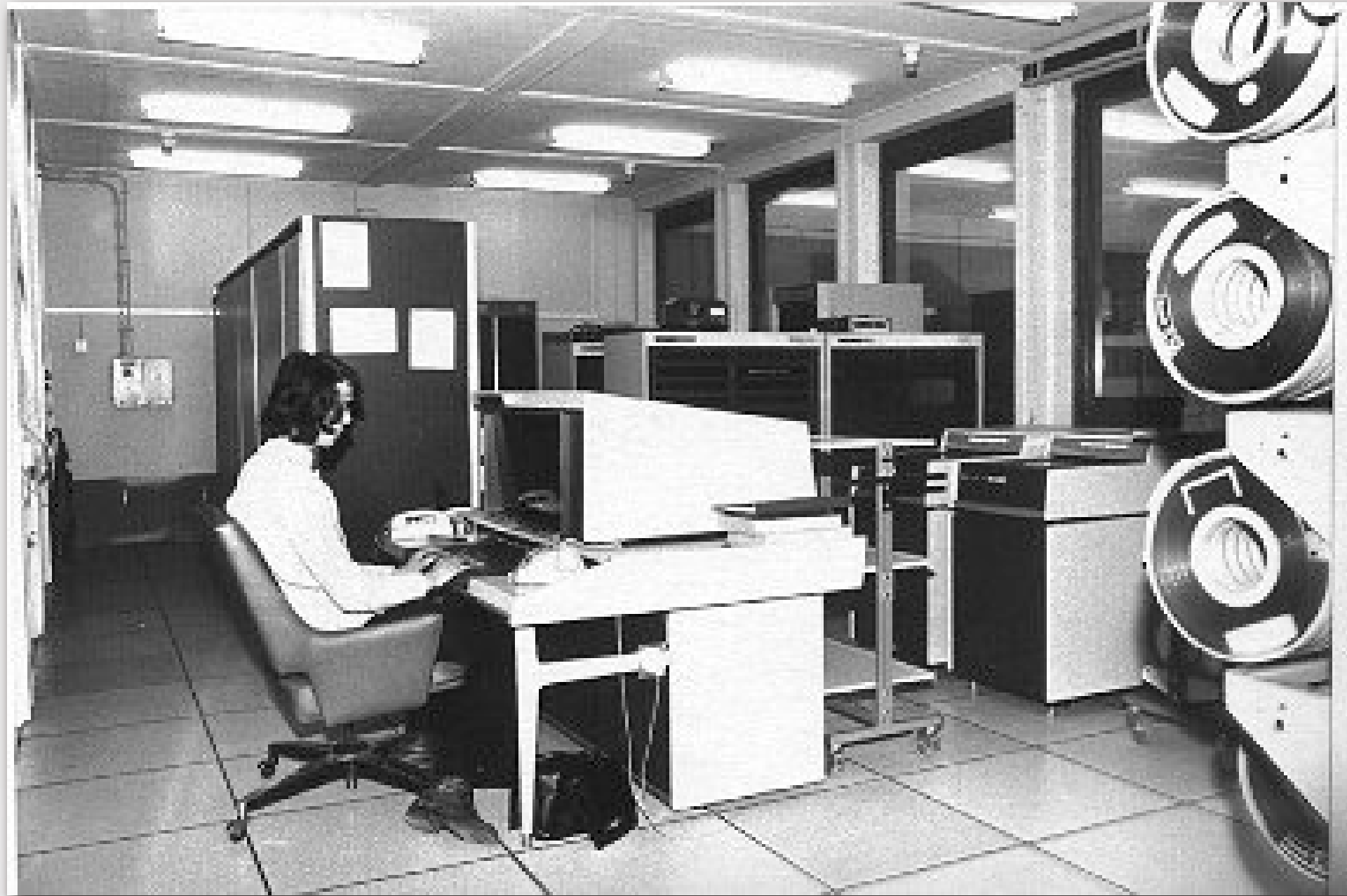
Trakls Dichtungen ist
vielleicht ungewöhnlich
und könnte Freunden des
romantisch-sentimentalen
Aspekts der Trakl'schen
Texte gefühlsmäßig »gegen
den Strich« gehen. Aber
gerade bei Trakl, der noch
an seinen gedruckten
Gedichten korrigiert,
verbessert, neue Worte
ausprobiert hat, ist eine
Zusammenstellung der von
ihm verwendeten Worte
und Wendungen überaus
aufschlußreich.«
Deutschlandfunk, Köln

»Die Herausgabe der
Konkordanz wird gerecht-
fertigt durch die Notwen-
digkeit, die schwierige und
aus dem Einzelbeleg heraus
kaum erschließbare Meta-
phorik Trakls durch Ver-
gleiche zu erhellen und
damit das Verständnis
dieser Dichtungen zu
fördern. «

Mitteilungen
des Deutschen
Germanisten-Verbandes,
Frankfurt

Otto Müller Verlag
Salzburg





Display Code Characters der CD 6400

Druck- zeichen	Display Code (oktal)	Lochung (IBM 026)	Druck- zeichen	Display Code (oktal)	Lochung (IBM 026)
A	01	12-1	+	45	12
B	02	12-2	—	46	11
C	03	12-3	*	47	11-8-4
D	04	12-4	/	50	0-1
E	05	12-5	(	51	0-8-4
F	06	12-6	)	52	12-8-4
G	07	12-7	\$	53	11-8-3
H	10	12-8	=	54	8-3

Control Data 6400

Magnetspeicher und Festplattenschrank



24 *SCHON DER *LIEBSTE HEIMGEKEHRT.+
25 *WELCHE *WONNE, WELCH *ENTZUCKEN.1+
26 *ACH ZU RUHN AN SEINER *BRUST.1+
27 *SCHON JA IST DAS TREUE *WESEN+
28 *SICH DER *LEIDEN NICHT BEWUSST.+
29 (. *ENDLICH, ENDLICH *REISEMUND.1+
30 *FINDEST *DU *DICH WIEDER EIN.++
31 *BIST *DU ENDLICH, O *GELIERTER.1+
32 *ENDLICH, ENDLICH WIEDER MEIN.2).+
33 *AUCH DIE *MUTTER, FAST GESTORBEN.+
34 *WIE SIE IHN, DEN *SOHN, ERRLICHT.+
35 *ACH.1 SIE HAT IHN JA NICHT MINDER+
36 *HERZLICH AN DIE *BRUST GEDRUCKT.+
37 *AHEN NACH DEM ERSTEN *FREUDE.+
38 *DASV SIE WIEDER IHN ERSCHAUT,+
39 *RUFT SIE AUS. (. ICH FREIE MORGEN+
40 *DIR, O *SOHN.1 DIE REICHSTE *BRAUT.).+
41 *O *MARTE.1 LASV ES BRECHEN.+
42 *BRECHEN LASV DAS TREUE *HERZ.++
43 *IN DER *FERNE WAND DER *LIERSTE+
44 *HAYTER, ALS DAS HARTE *ERZ.+
45 *LASV ES BRECHEN, SIEM ER KNUVPFET+
46 *MIT DER ANDERN JENEN *BUND.+
47 *WELCHEN *DIR DEREINST VERSPROCHEN+
48 *SEIN VERRATHEMISCHER *MUND.++

GEDICHT NR. 14

1 *NACHT ENTSTAND DEM HOHEN *HIMMEL.+
2 *RINGS FRELINT DER *STERNE *MEER+
3 *UEBER *NORDENS *FELSENKUVSTE.+
4 *UEBERS WEITE *WUVST *MEER.+
5 *RINGS FHSCHLEIT DAS *LAND GEKLEIDET+
6 *IN *GEWANNEN HLITZFND WEISV.++
7 *DOCH DIE *WILDE *MEERESWOG+
8 *DECKET DUNKELGRAUES *EIS.++
9 *DICH *MARTE, *DICH VERHUVLLET+
10 *LANGE SCHON DAS WEISVE *KLEID.++
11 *HEUTE ABER HAULT DIE *SCHOLLE+
12 *IHN ZU DECKEN SICH REBEIT.+
13 *NACHTIG TREILT DER *UNGETREUE+
14 *AUF DEM *EISESMEERE *ERN.++
15 *UND ERZUVREL VON DEM *HIMMEL+
16 *BLICKT HERAB DES *NORDENS *STERN.+
17 *PLOTZLICH KRACHT DIE STARKE *FICHTE+
18 *WELCHE IHN, DEN *FALSCHEN, DANG.+
19 *WILDER DHAUNT DIE *TODTESSCHOLLE.+
20 *UND DIE *HAKKE WIND EIN *SARG.+
21 *HA.1 WIE STEHT ER DA BETROFFEN.+
22 *HA.1 WIE HAT ER DA GEREST.1+
23 *WIE GESCHAUDERT.1 ALS DAZWISCHEN+
24 *EINE *STIMME SICH ERHEBT.++
25 (. *HABEN *IN UNS NICHT GESCHWORE.1.++
26 *RUFEN WOLLTEN WIR UNS AB.++
27 *WENN DER EINE ODER ANDER+
28 *SAVNKE IN DIE *GRUFT HINAB.).+
29 (. *MEINEN *WORTEN SO IM *TONE+
30 *WIE IM *LERNEN IMMER TREU.+
31 *KOMM ICH HEUTE, *DICH ZU RUFEN.+
32 *AUS DEM *GRABE FEHN HERBEI.).+
33 *DUMPF ERDROHNEND STUVRZT DIE *FAVHRE+
34 *NIEDER IN DAS *TODESTHOR.+
35 *WIEDER KUNIG DANN UND STILLE+
36 *WIRU DIE *FLAVCHE WIE ZUVOR.+
37 *SCHEIDEND ABER TANZEN, SCHWEBEN+
38 *DUVSTRE *SCHATTEN UM DEN *SCHLUND.++

24 *SCHON DER *LIEBSTE HEIMGEKEHRT.+
25 *WELCHE *WONNE, WELCH *ENTZUCKEN.1+
26 *ACH ZU RUHN AN SEINER *BRUST.1+
27 *SCHON JA IST DAS TR EUE *WESEN+
28 *SICH DER *LEIDEN NI ECHT BEWUSV+
29 (. *ENDLICH E, ENDLICH *REISEMUND+
30 *FINDEST *DU *DICH W WIEDER EIN. E.+
31 *BIST *DU ENDLICH, O E *BELIEBTE ER.1+
32 *ENDLICH, ENDLICH WI EDER MEIN. E2).+
33 *AUCH DIE *MUTTER, F EAST GESTOR EGEN.+
34 *WIE SIE I EHN, DEN *S SOHN, ERBLI ECKT.+
35 *ACH.1 SIE EAT IHN U EA NICHT MI ENDER+
36 *HERZLICH EAN DIE *HR EUST GEORUV ECKT.+
37 *ABER NACH E DER ERSTE EN *FREUDE, E+
38 *DASV SIE EWIEDER IHN E ERSCHAUT, E+
39 *RUFT SIE EHAUS. (. ICH E FREIE MOR EGEN+
40 *DIR, O *S EOHN.1 DIE EREICHSTE *BRAUT.).+
41 *O *MARTE. E1 LASV ES EBRECHEN,+
42 *BRECHEN L EASV DAS TR EUE *HERZ. E.++
43 *IN DER *F EERNE WARD EDER *LIEBS ETE+
44 *HAYTER, EALS DAS HA ERTE *ERZ.+ E+
45 *LASV ES B ERECHEN, SI EEM ER KNUV EPFET+
46 *MIT DER A EENDERN JEVE EN *BUND.+ E+
47 *WELCHEN *EDIR DEREIN EST VERSPRO ECHEN+
48 *SEIN VERR EAVTHERISCH EER *MUND.++ E+

1 *NACHT ENT ESENT KNT DEM EHOHEN *HIM EMEL.+
2 *RINGS FRB ELINKT DER ESTERNE *H EER+
3 *UEBER *NO ERDENS *FFL ESENKUVSTE, E+
4 *UEBERS WE EITE, WUVST EE *MEER.+ E+
5 *RINGS FR EICHEINT DAS E *LAND GOK ELEIDET+
6 *IN *GEWAV EENDER BLITZ EEND WEISV, E+
7 *DOCH DIE EWILDE *WFE ERESWOG+ E+
8 *DECKET DU ENKELGRAUES E *EIS.++ E+
9 *DICH *MAR EIE, *DICH EVERHUVLLET E+
10 *LANGE SCH EON DAS WEI ESVE *KLEID E.++
11 *HEUTE ABE ER HAULT RI EE *SCHOLLE E+
12 *IHN ZU DE ECKEN SICH EBEREIT. E+
13 *NACHTIG ETREIBT DER E *UNGETREU EE+
14 *AUF DEM * EISESMEERE E FERN. E+
15 *UND ERZUV EERNET VON O EEM *HIMMEL E+
16 *BLICKT HE ERAB DES *N EORDENS *ST EERN.+
17 *PLOTZLIC EH KRACHT D EIE STARKE EEFICHTE+
18 *WELCHE IN EN, DEN *FA ELSCHEN, BA EHO.+
19 *WILDER DR EAVNGT DIE E *TODTESSCH EOLLE.+
20 *UND DIE * EBARKE WIND E EIN *SARG E.+
21 *HA.1 WIE ESTEHT ER D EA BETROFFE EN.+
22 *HA.1 WIE EHAT ER DA EGEEST.1 E EHEN+
23 *WIE GESCH EAUDERT.1 A ELS-DAZWISC E EHEN+
24 *EINE *STI EEMME SICH E ERHEBT.++ E+
25 (. *HABEN W EIR UNS NIC EHT GESCHWO EREN.++ E+
26 *RUFEN VOL ELTEN WIR U ENS AB. E+
27 *WENN DER Eeine ODE+ EANDRE+ E+
28 *SAVNKE IN E DIE *GRUF EET HINAB.). E+
29 (. *MEINEN EWORTEN SO E IM *TODE+ E+
30 *WIE IM *L EEBEN IMMER E TREU. E+
31 *KOMM ICH EHEUTE, *DU EICH ZU RUF EEN.+
32 *AUS DEM * EGRABE FEHN E HERBEI.). E+
33 *DUMPF ERO EROVHNEND S ETUVRZT DIE E *FAVHRE+
34 *NIEDER IN E DAS *TOJE ESTHOR. E+
35 *WIEDER RU EHG DANN U END STILLE+ E+
36 *WIRD DIE EFLAVCHE W EIE ZUVOR. E+
37 *SCHEIDEND E ABER TANZ EEN, SCHWEB EEN+
38 *DUVSTRE * ESCHATTEN U EM DEN *SCH E LUND.++ E+

- | | |
|------------------------------------|-------------------------------|
| 1. Substantiv | 10. Adverb |
| 2. Finite Verbform | 11. Verbzusatz |
| 3. Infinite Verbform | 12. Präposition |
| 4. Hilfsverb | 13. Konjunktion |
| 5. Flektiertes Adjektiv | 14. Name |
| 6. Artikel | 16. Satzschluß |
| 7. Alleinstehendes Pronomen | 17. Unflektiertes Adjektiv |
| 8. Attributiv gebrauchtes Pronomen | 18. Substantiviertes Verb |
| 9. Numerale | 19. Substantiviertes Adjektiv |

Tab. 2 : Ausgewählte Übergänge

1- 2	1- 3	1- 4	1- 6	1- 7	1- 8	1-10	1-11	1-12	1-13
1-16	1-17	2- 2	2- 6	2- 7	2- 8	2-10	2-12	2-13	2-14
2-16	2-17	3- 1	3- 2	3- 4	3-12	3-13	3-16	4- 7	5- 1
5- 5	6- 1	6- 3	6- 5	6-19	7- 2	7- 3	7- 4	7- 6	7- 7
7- 8	7-10	7-11	7-12	7-13	7-16	7-17	8- 1	8- 5	10- 2
10- 3	10- 6	10- 7	10-10	10-12	10-13	10-17	11-13	11-16	12- 1
12- 5	12- 6	12- 7	12- 8	13- 1	13- 2	13- 6	13- 7	13- 8	13-10
13-12	13-13	13-17	14- 2	16- 2	16- 6	16- 7	16-10	16-12	16-13
16-14	17- 2	17- 3	17-12	17-13					

In gleicher Anordnung finden sich die relativen Häufigkeiten der ausgewählten WAÜ der vier Texte in den folgenden Tabellen (3 - 6); die Zahlen sind mit 1000 multipliziert:

Tab. 3: Nachtwachen

26,6	17,9	2,0	13,9	12,8	3,1	13,8	4,1	25,6	24,5
8,6	4,7	2,2	10,6	28,0	1,9	9,2	6,7	16,5	0,3
12,7	3,5	8,7	10,5	6,1	2,7	14,8	8,7	3,6	34,1
3,0	63,8	4,1	21,0	2,2	24,1	7,7	2,6	9,4	20,2
2,7	20,9	2,3	14,2	9,2	1,1	5,0	21,9	5,1	7,4
14,3	6,4	4,9	13,6	12,5	7,6	8,6	4,9	2,1	14,7
4,9	34,0	10,6	10,5	6,5	14,0	18,1	24,4	4,6	9,0
7,3	6,1	3,4	1,4	2,3	5,3	10,3	7,1	2,6	5,5
0,9	3,5	4,6	5,8	5,9					

Tab. 4: Romano

30,2	10,0	4,4	10,1	9,5	4,6	8,6	5,1	18,9	19,8
13,9	3,4	4,3	14,1	41,4	4,6	10,4	9,9	11,0	1,5
9,4	6,7	3,4	5,9	4,1	2,9	12,2	12,6	5,1	35,4
3,5	55,8	2,2	24,6	3,9	40,2	9,6	3,1	9,4	25,0
3,2	20,2	5,3	14,8	8,0	3,0	7,8	28,6	6,6	6,9
13,0	5,7	4,3	10,6	8,7	5,3	6,5	6,7	5,1	7,4
3,2	27,2	16,8	12,6	2,4	18,3	12,8	24,7	5,0	6,1
4,7	5,3	3,6	3,5	2,1	9,2	18,7	5,0	3,2	5,9
3,5	3,0	3,7	6,2	8,0					

Tab. 5: Ruinen

37,1	11,7	3,6	15,2	10,7	5,5	11,0	5,1	20,1	17,7
25,1	2,6	3,3	16,4	41,3	5,0	13,0	12,8	5,8	3,2
8,3	6,5	4,4	4,3	2,5	1,5	7,7	15,1	2,2	34,6
2,6	62,9	2,6	21,9	2,3	32,7	5,7	2,1	8,3	14,4
3,7	14,9	2,9	15,9	5,7	6,2	5,0	33,4	6,4	8,4
12,1	4,8	4,4	8,6	7,2	5,5	8,0	4,3	5,2	15,6
3,3	26,4	10,3	12,9	4,7	18,5	6,3	12,2	3,3	4,3
2,3	2,7	2,3	7,0	3,0	11,9	17,9	10,8	4,2	4,1
5,6	5,6	2,8	5,7	4,8					

			P (Ξ) [%]
1	BRE: Godwi	— WE: Fi. Reise, Kleon	1
2	Fi. Reise	— Kleon, Godwi	98
3	Kleon	— Fi. Reise, Godwi	99
1	WE: Kleon	— JP: Flegeljahre, Titan, Klagelied	0,02
2	Flegeljahre	— Titan, Klagelied, Kleon	99,8
3	Titan	— Flegeljahre, Klagelied, Kleon	18
4	Klagelied	— Flegeljahre, Titan, Kleon	78
1	JP: Flegeljahre	— BRE: Godwi, Sänger, Chronika	0,1
2	Godwi	— Sänger, Chronika, Flegeljahre	99,2
3	Sänger	— Godwi, Chronika, Flegeljahre	98
4	Chronika	— Godwi, Sänger, Flegeljahre	14
1	HO: Goldener Topf	— JP: Flegeljahre, Titan, Klagelied	0,1
2	Flegeljahre	— Titan, Klagelied, Goldener Topf	99,9
3	Titan	— Flegeljahre, Klagelied, goldener Topf	75
4	Klagelied	— Flegeljahre, Titan, goldener Topf	63

In der Tabelle handelt es sich um folgende Werke:

Cl. Brentano (BRE): *Godwi/ Der Sänger/Chronika des fahrenden Schülers*
(Urfassung)

F. G. Wetzel (WE): *Fischers Reise von Leipzig nach Heidelberg/Kleon der letzte Grieche*

Jean Paul (JP): *Flegeljahre/Titan/Das heimliche Klagelied der jetzigen Männer*

E. T. A. Hoffmann (HO): *Der goldene Topf*

			Ξ	$P(u > \Xi)$
Nachtwachen	—	Ru, Ro, Al	4,61	0,0002 %
Ruinen	—	Ro, Al, Nw	- 1,03	84,8 %
Romano	—	Ru, Al, Nw	- 1,96	97,5 %
Albano	—	Ru, Ro, Nw	- 1,88	97,0 %

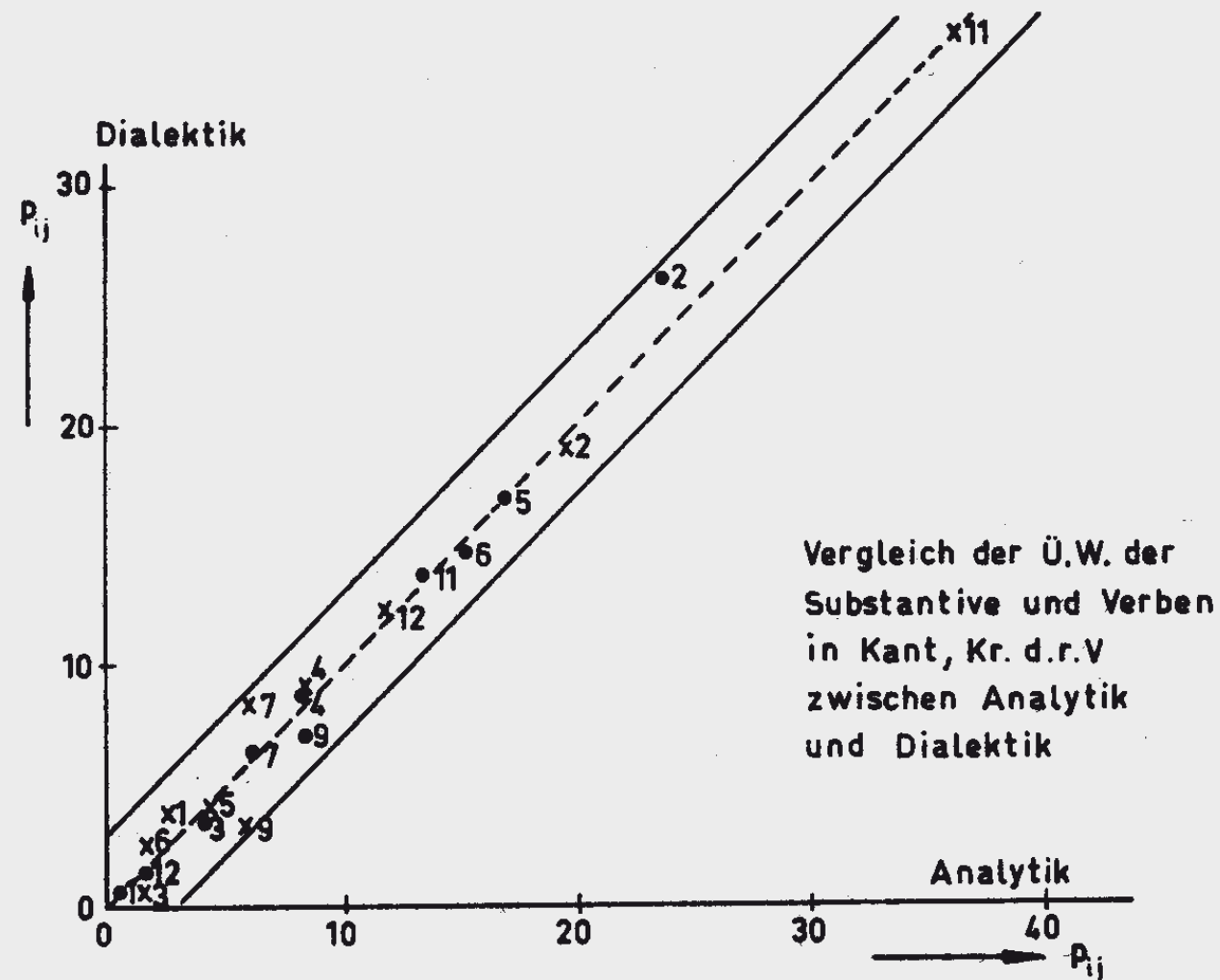


Abb. 4: Vergleich der relativen Übergangshäufigkeiten von Substantiven und Verben zu den übrigen Wortklassen in KANTS *Kritik der reinen Vernunft*, Analytik und Dialektik

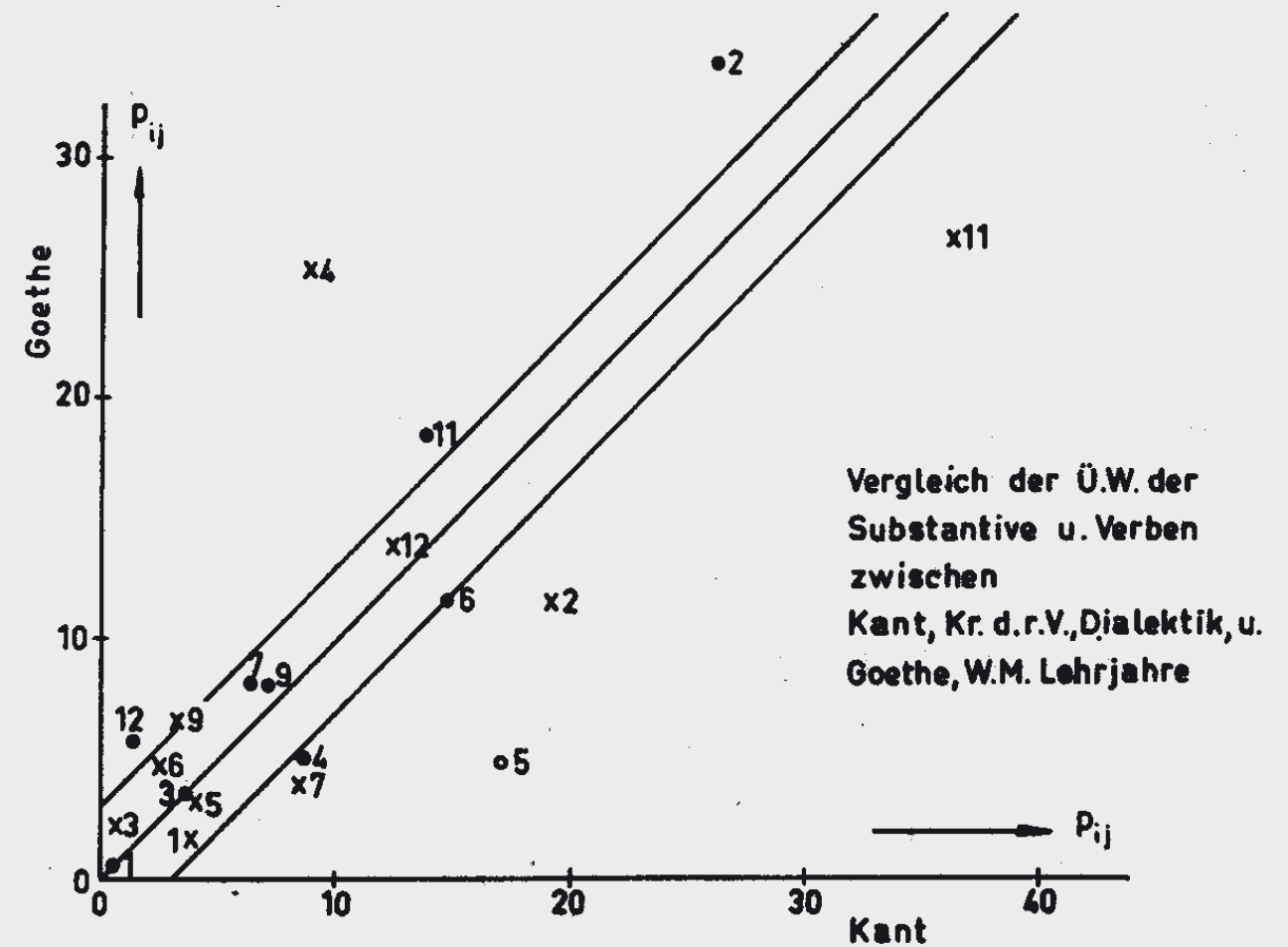
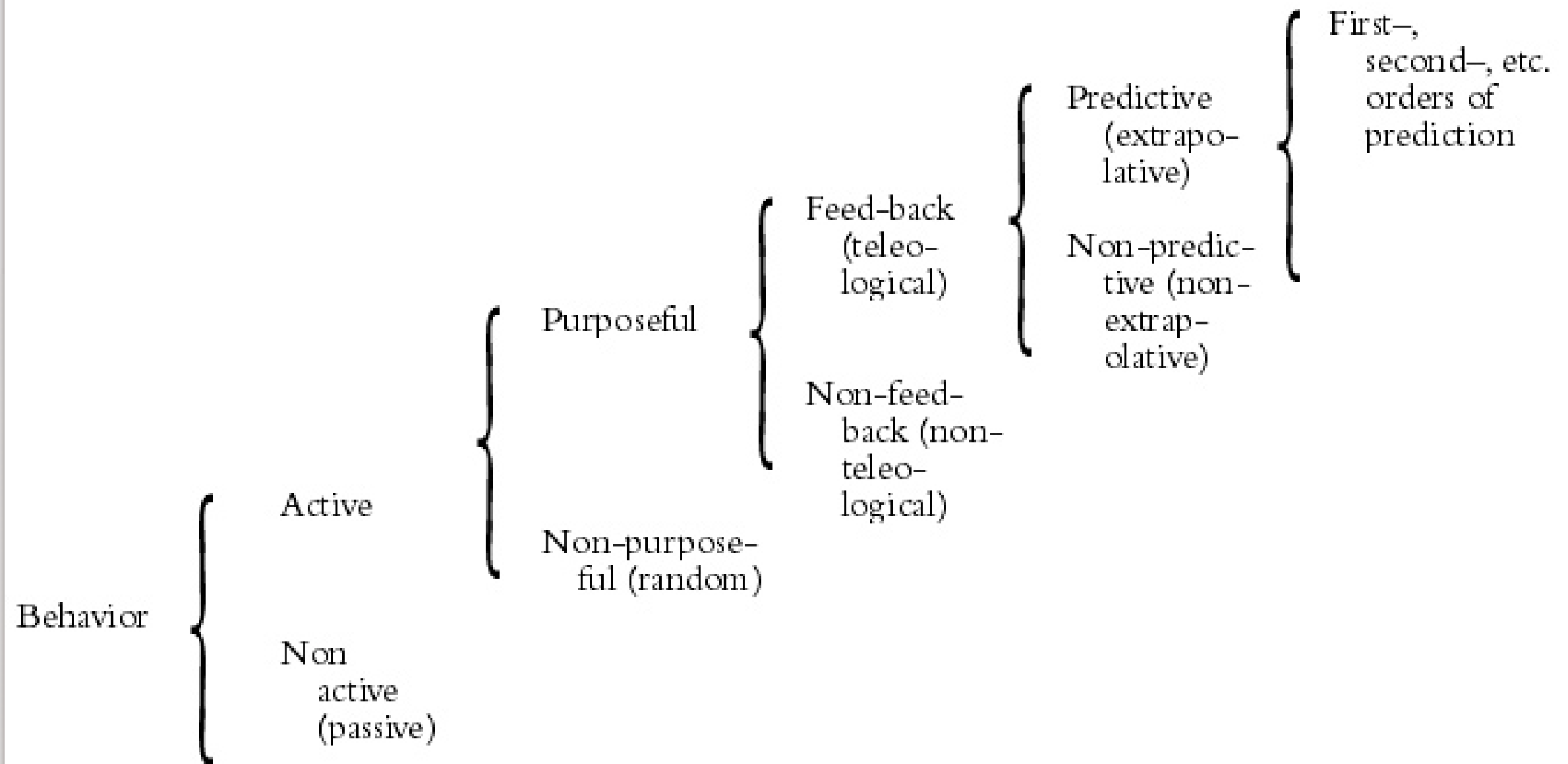


Abb. 5: Vergleich der relativen Übergangshäufigkeiten von Substantiven und Verben zu den übrigen Wortklassen zwischen KANT und GOETHE.

The classification of behavior suggested so far is tabulated here:



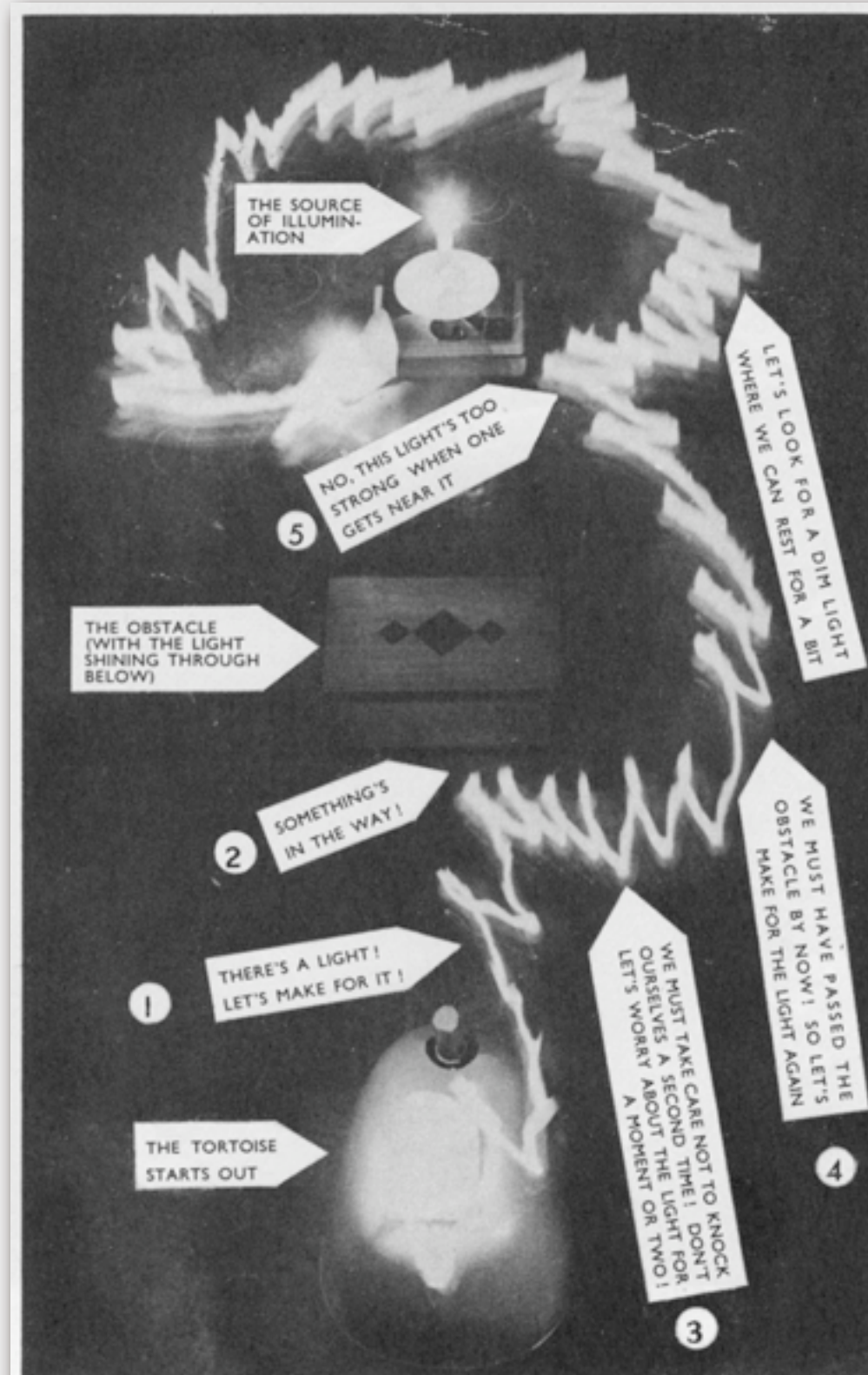
Das Glas als Feind

Illustration zum Thema Feedback aus einer Einführung der frühen 70er Jahre



Elsie's Weg zum Licht

Bewegungsstudie des Roboters von Grey-Walter

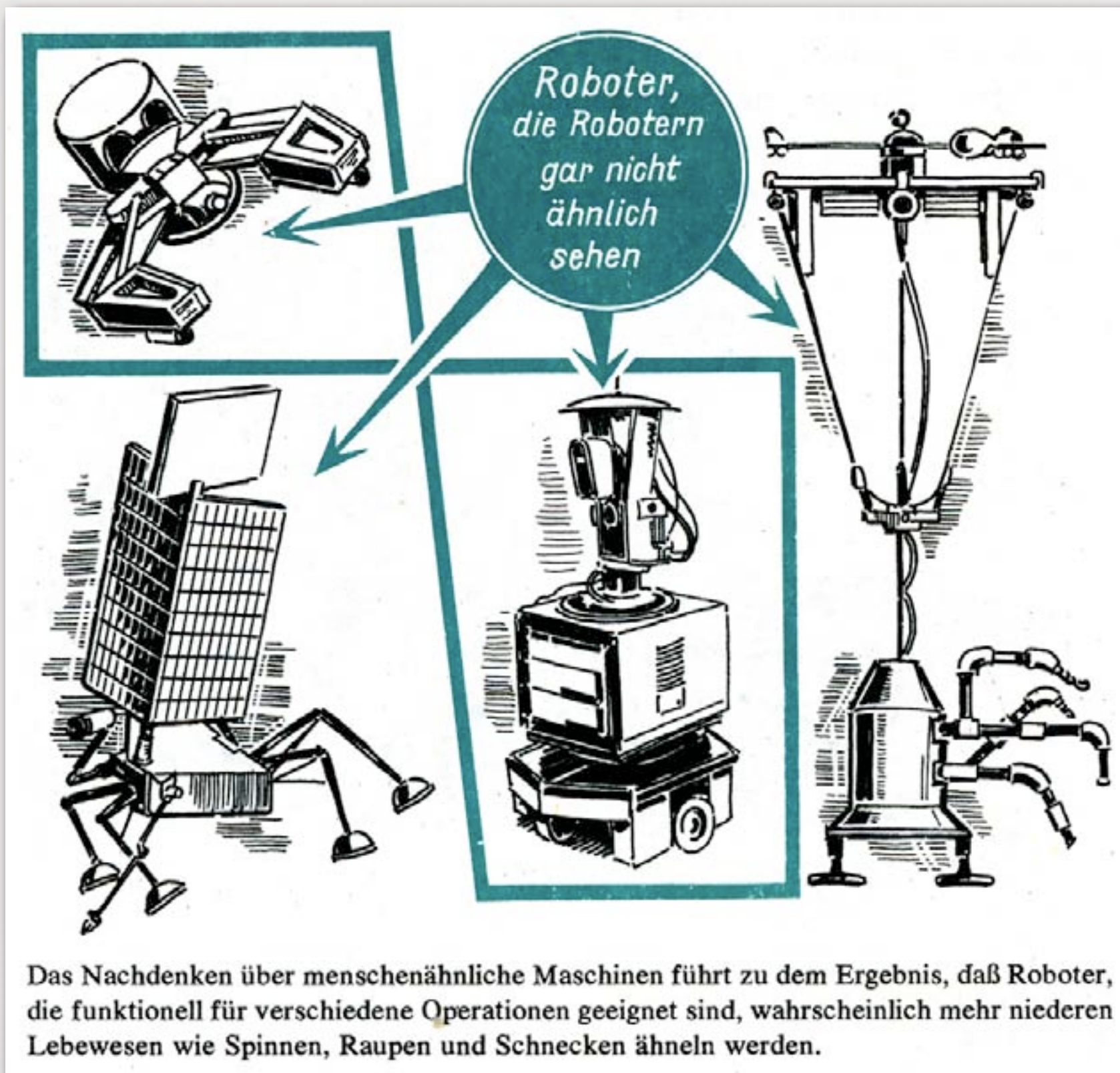


TWO MINUTES OF ELSIE'S LIFE

The photograph records the comings and goings of the electronic tortoise Elsie during a period of two minutes. Elsie had a lighted candle attached to her which produced a luminous trail. She is seeking out the source of illumination of another lighted candle. (Photo "Time-Life".)

Unähnlichkeit bei ähnlichem Verhalten

Illustration aus der »Kleinen Enzyklopädie der großen Kybernetik«



Cybernetic Serendipity

London, Institute of Contemporary Arts, 1968



Cybernetic Serendipity

London, Institute of Contemporary Arts, 1968



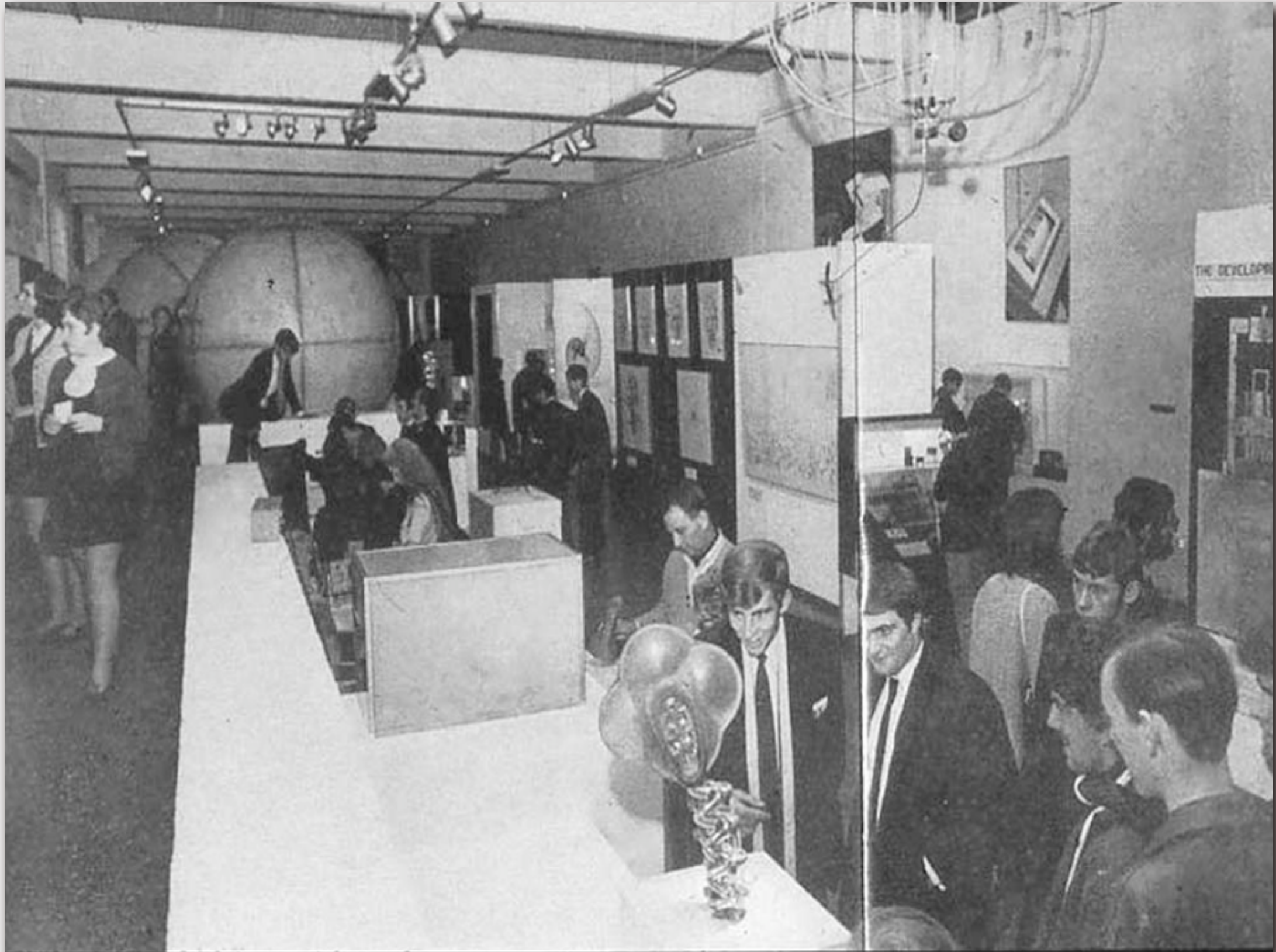
Cybernetic Serendipity

London, Institute of Contemporary Arts, 1968

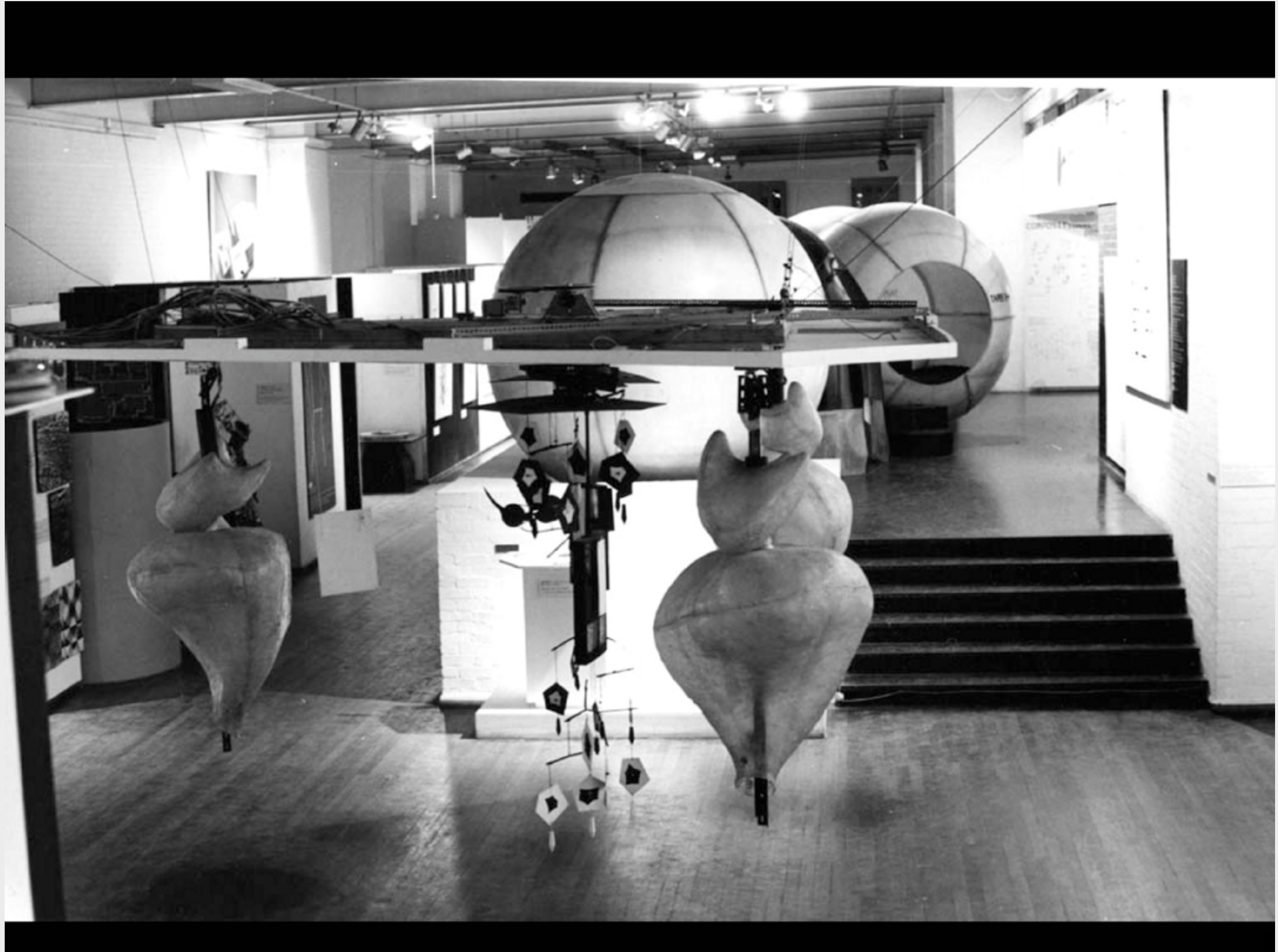


Cybernetic Serendipity

London, Institute of Contemporary Arts, 1968



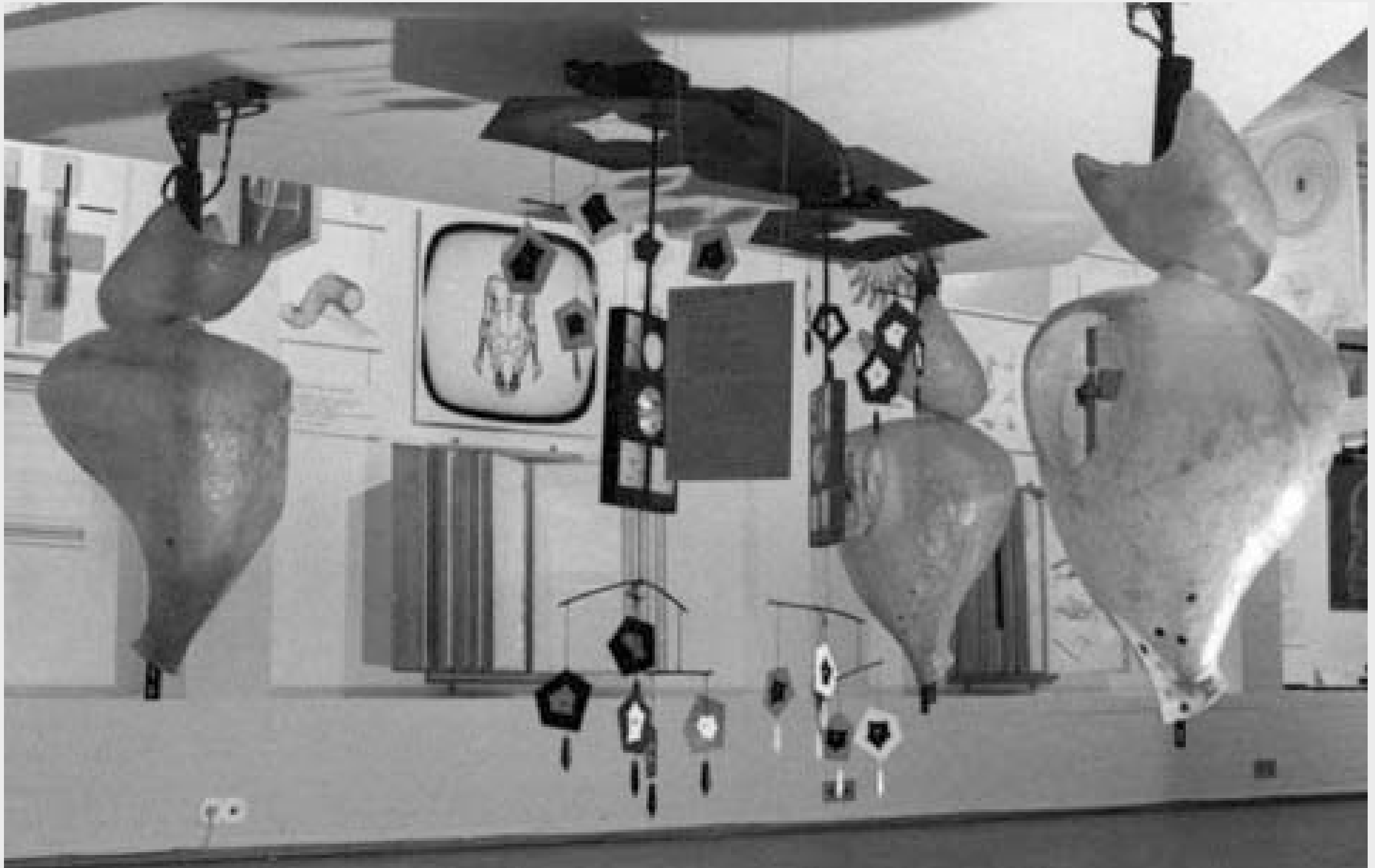
Gordon Pask: The Colloquy of Mobiles
Cybernetik Serendipity, London, 1968



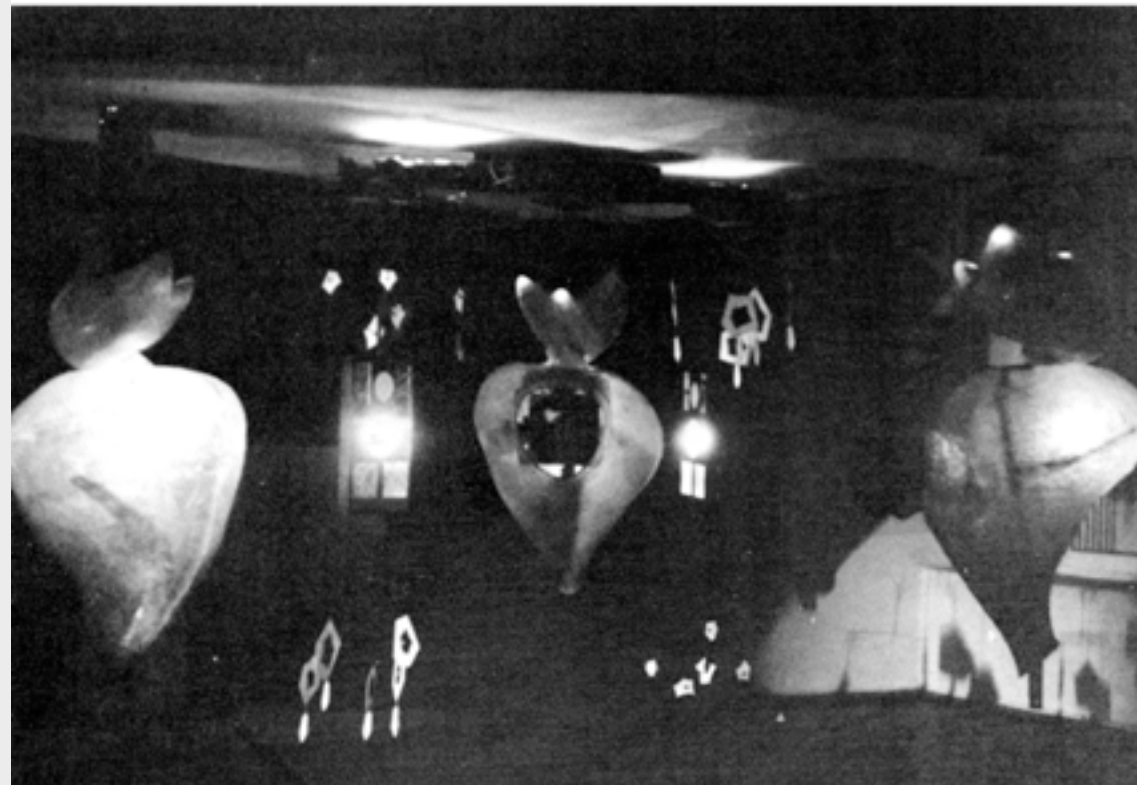
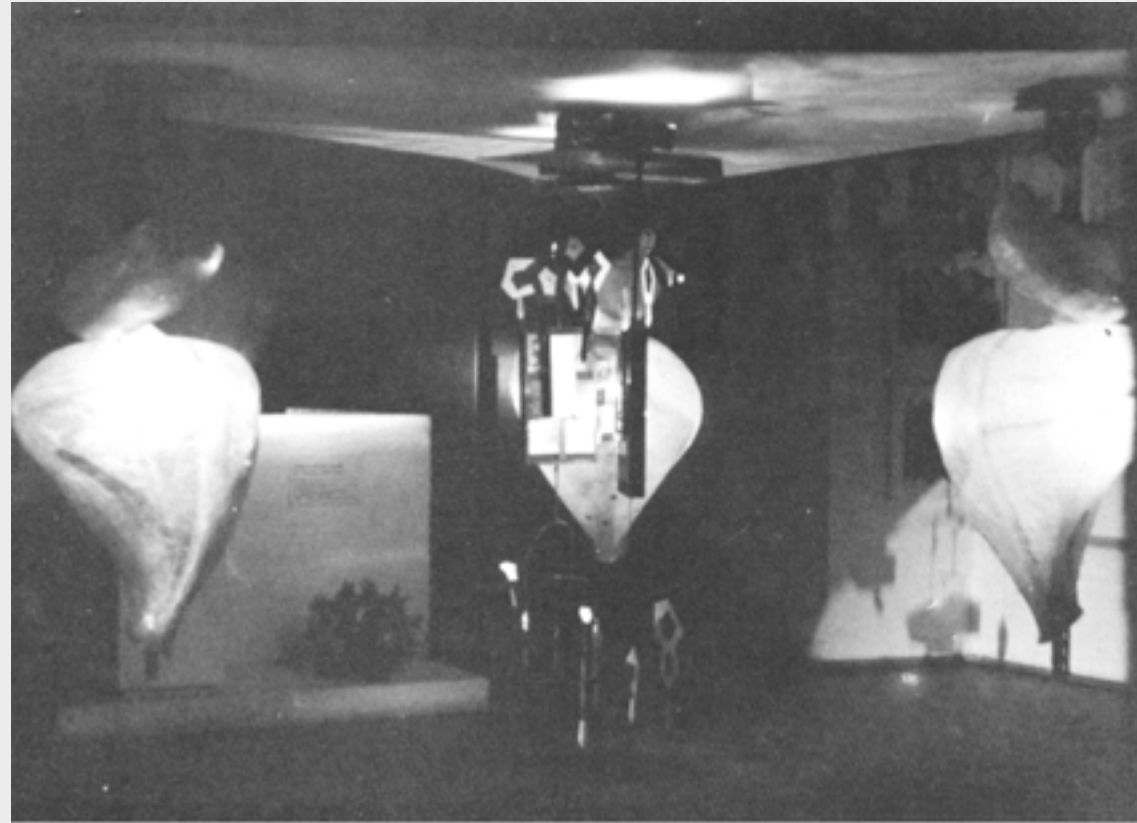
Gordon Pask: The Colloquy of Mobiles
Cybernetik Serendipity, London, 1968



Gordon Pask: The Colloquy of Mobiles
Cybernetik Serendipity, London, 1968



Gordon Pask: The Colloquy of Mobiles
Cybernetik Serendipity, London, 1968



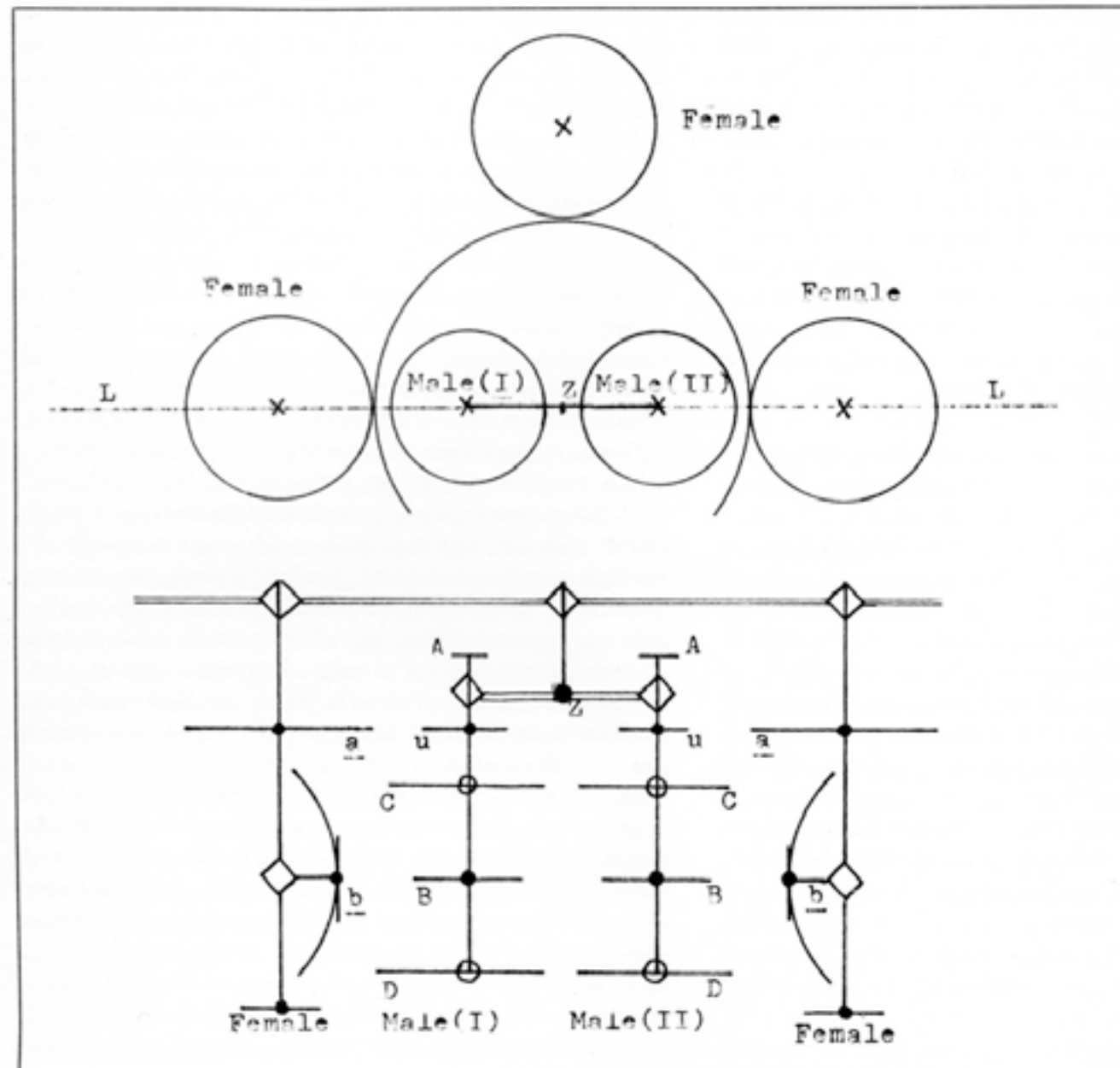


Fig. 34 A rough sketch of powered mobiles.

a Horizontal plan

b Vertical section taken through line *L* in horizontal plan.

A = drive state display for male

B = main body of male, bearing 'energetic' light projectors *O* and *P*

C = upper 'energetic' receptors

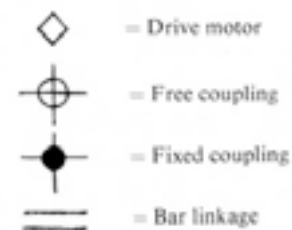
D = lower 'energetic' receptors

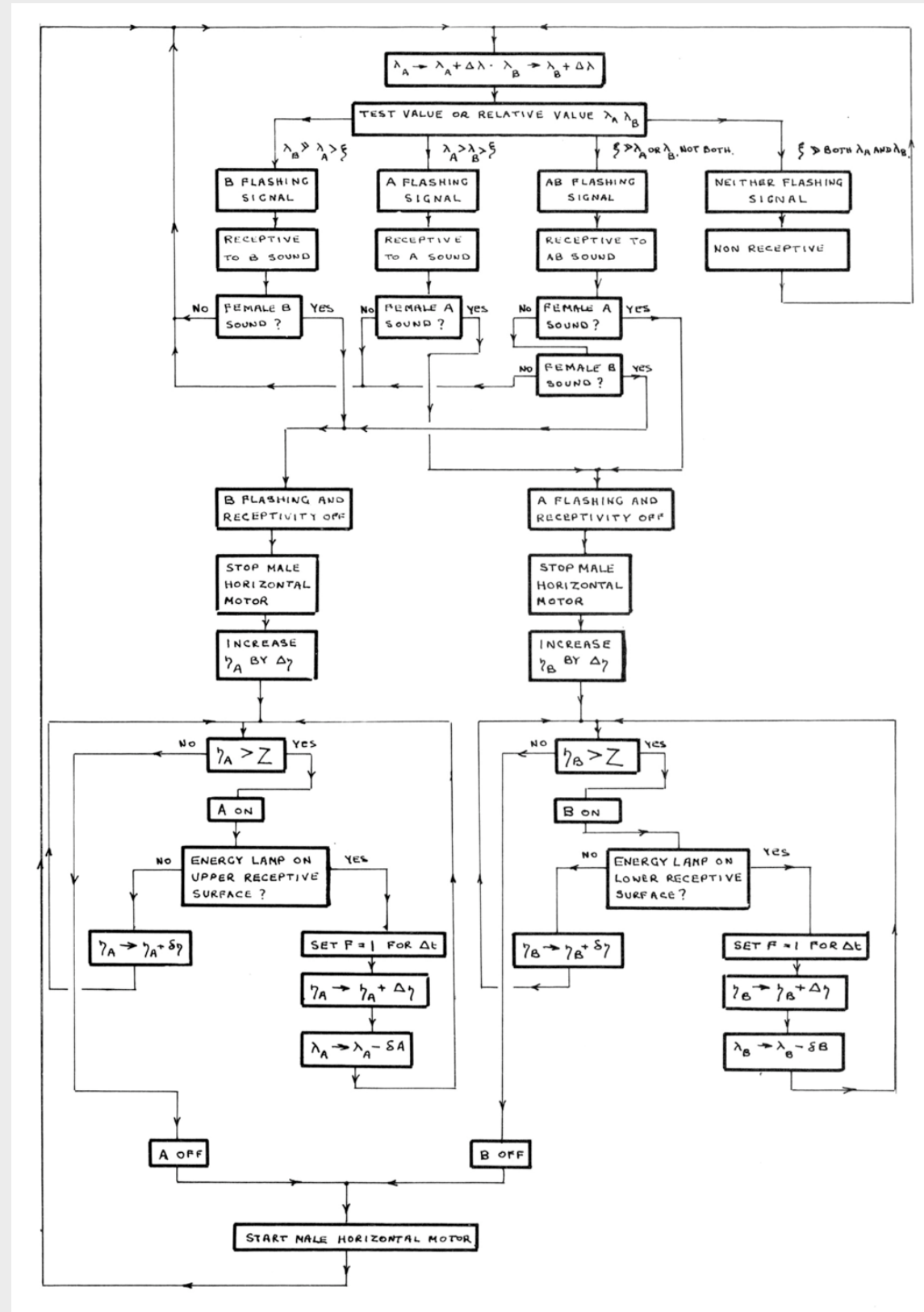
U = non-'energetic', intermittent signal lamp

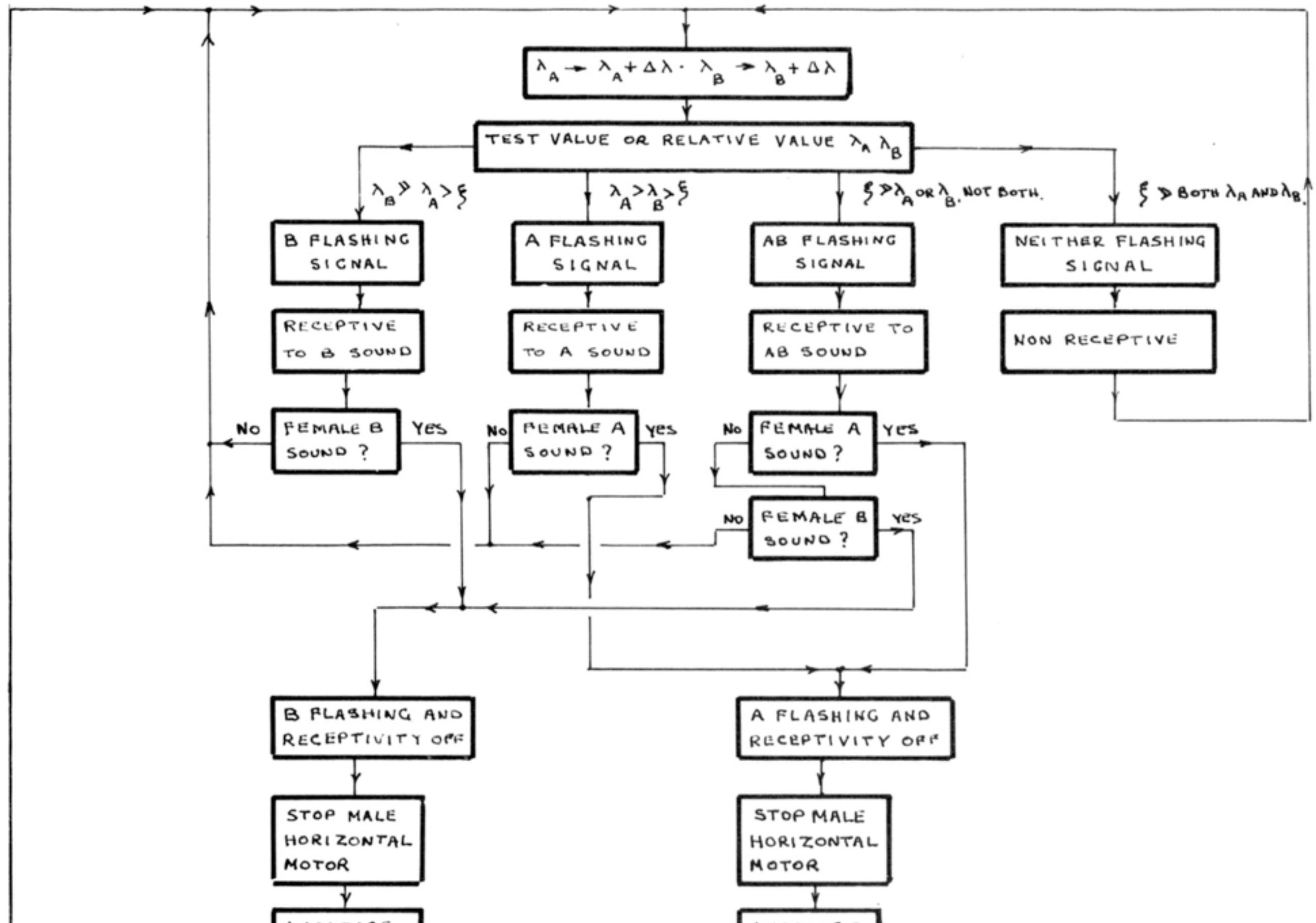
a = female receptor for intermittent positional signal

b = vertically movable reflector of female

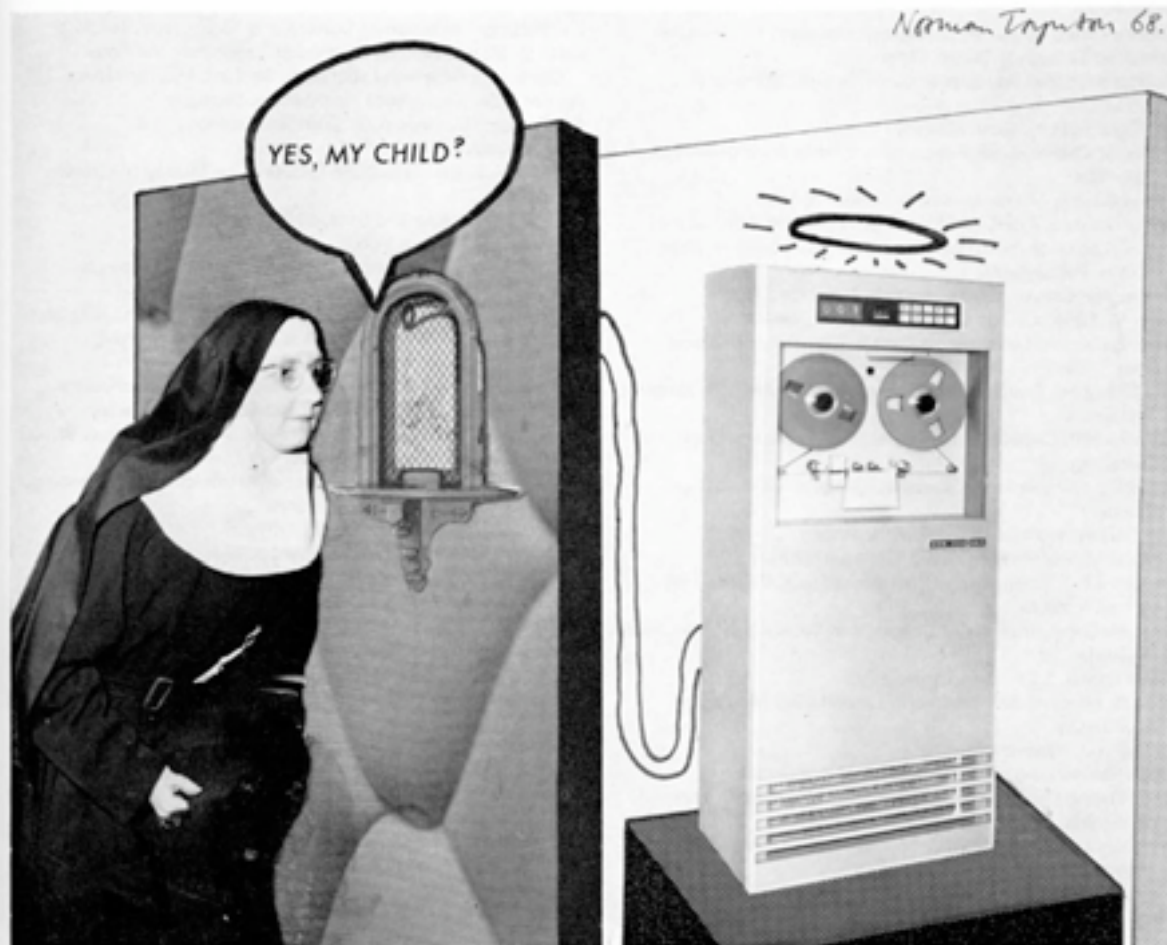
Z = bar linkage bearing male I and male II











Cartoon by Norman Toynton

Norbert Wiener on cybernetics

The best-known definition of cybernetics is Norbert Wiener's sub-title for his book *Cybernetics*: 'Or control and communication in the animal and the machine'.

He described it further in 1950 as the study of messages as a means of controlling machinery and society.

His first book on this subject was a technical one, and Wiener in order to make his ideas acceptable to the lay public wrote another volume *The human use of human beings*, subtitled *Cybernetics and society*. In the second edition of this book, in 1954, Wiener elaborated further the new context in which cybernetics had become relevant:

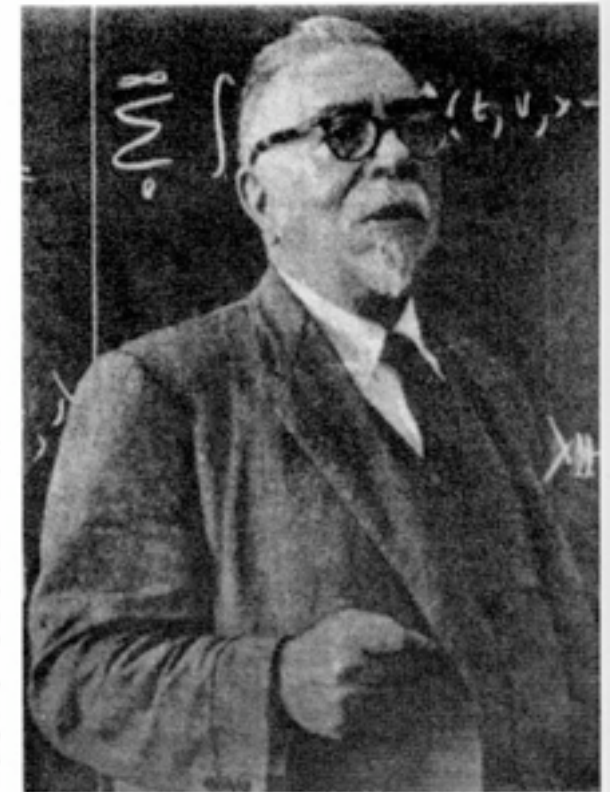
'In giving the definition of Cybernetics in the original book, I classed communication and control together. Why did I do this? When I communicate with another person, I impart a message to him, and when he communicates back with me he returns a related message which contains information primarily accessible to him and not to me. When I control the actions of another person, I communicate a message to him, and although this message is in the imperative mood, the technique of communication does not differ from that of a message of fact. Furthermore, if my control is to be effective I must take cognizance of any messages from him which may indicate that the order is understood and has been obeyed.

'It is the thesis of this book that society can only be understood through a study of the messages and the communication facilities which belong to it; and that in the future development of these messages and communication facilities, messages between man and machines, between machines and man, and between machine and machine, are destined to play an ever-increasing part.

'When I give an order to a machine, the situation is not essentially different from that which arises when I give an order to a person. In other words, as far as my consciousness goes I am aware of the order that has gone out and of the signal of compliance that has come back. To me, personally, the fact that the signal in its intermediate stages has gone through a machine rather than through a person is irrelevant and does not in any case greatly change my relation to the signal. Thus the theory of control in engineering, whether human or animal or mechanical, is a chapter in the theory of messages.

'Naturally there are detailed differences in messages and in problems of control not only between a living organism and a machine, but within each narrower class of beings. It is the purpose of *Cybernetics* to develop a language and techniques that will enable us indeed to attack the problem of control and communication in general, but also to find the proper repertory of ideas and techniques to classify their particular manifestations under certain concepts.'

(From *The human use of human beings* by Norbert Wiener, Doubleday, 1964.)



This digital Norbert Wiener is the work of H. Philip Peterson of the Control Data Corporation Digigraphics Laboratories, Burlington, Mass. The picture is composed entirely of numbers. Each two-digit number represents the density of colour in the area it occupies, based on a 'grey scale' of 100 increments. Philip Peterson designed the numerical character font so that the higher the number, the darker it appears to the eye. A Control Data Model 280 Digigraphic Scanner was used with a Model 160 computer to scan a 35 mm. black and white slide of Wiener, averaging the density in each of 100,000 'cells'. A Calcomp Model 564 plotter, driven on-line by a Control Data Model 3200 computer, was then used to plot the digits within the cells, which are 115 in. squares in the original plot. Scanning and processing time is about 4 minutes on the CDC 160, and plotting time on the Calcomp 564 is about 16 hours.



Cyberated Art is very important, but art for cyberated life is more important [...]

Cybernetics, the science of pure relations, or relationship itself, has its origin in karma. [...]

As the Happening is the fusion of various arts, so cybernetics is the exploration of boundary regions between and across various existing sciences. [...]

It might be a Buddhistic »third way« [...]

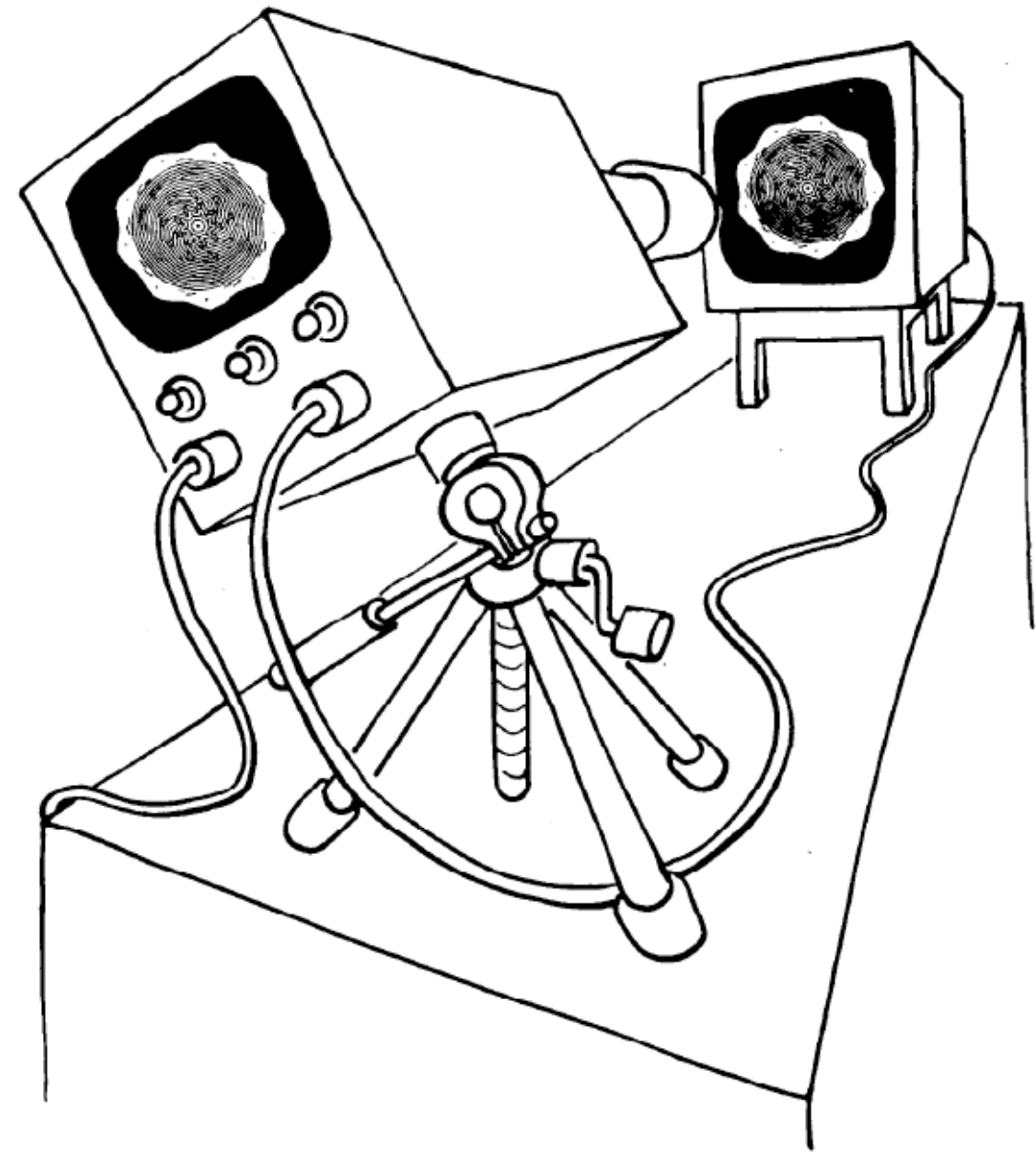


Fig. 1. Single video feedback. Information flows counter-clockwise through the electronic and optical pathways.



*Video Wedding at the Freex
Curtis and Cy*

photo: Ann Arden



Meta-Manual

New technologies begin life by being mistaken for the ones they replaced. The car was first called "horseless carriage." Another name for radio was "wireless." And some people still see broadcast TV as "a radio with a screen."

There is a similar bias against portable video generated by people who are mired in old media. Film freaks question the potential of videotape as if it were merely "Polaroid movies" and are more concerned about what it can't do in imitation of film, rather than what it can do uniquely. Media instructors tend to be unimpressed by the Porta-Pak because for their money it's just expensive "Super-8." Even those who understand that the grammar of television is different from film, nonetheless mistake portables for a less sophisticated version of the old TV studio.

Portable video is a new, major medium. It is a high access form of our culture's dominant communications mode and precisely the opposite of product television which can accept only artificial behavior because it is based on a scarcity of time and equipment access.

The economics of portable video are subversive to anyone whose authority and security are based on controlling information flow. Thus the usual argument against portable video is that it has inferior "technical standards" which is a hype promoted by unions whose jobs are based on scarcity, owners who can't afford both their overhead and "equal time," and educators who build a mystique of expertise and certification.

Unlike product television, the Porta-Pak embodies technological evolution towards decentralization: reduced size and cost, increased ease-of-operation. As a totally self-contained system it gives control of information to whoever is being processed. Film, on the other hand, goes off to central processing and is usually programmed by people who weren't there when the information was compiled.

The bias of self-contained record, storage, and instant playback punctures the estranging mythology of technology as something to be operated and therefore controlled by an elite.

Not only are portables simple enough for even kids to use, but they can take a system home and live with it. It's a high access technology. Most of America's media structures are the opposite: centralized and one-way.

Biological systems with those characteristics

are usually unstable and non-adaptive. Because the way information flows through a system determines its structure, we can't expect our culture to embody ecological sanity unless our media are restructured to reflect that bias.

A media ecology demands decentralized, two-way information structures; just as survival pressure is now on to decentralize schools and governments to give control back to the people.

Our experience at Raindance is that the Porta-Pak works best in its own context:

Don't demand that portable video imitate another, product-oriented medium. Treat it instead as a general purpose technology which has many uses indigenous to many different and unique behaviors. It's like the difference between an electric can opener, which is hardwired into one use, and a computer or the human brain, which have many uses independent of predetermined criteria of what is or isn't information.

Use portable video to process your own life, not to produce products which imitate life, or Johnny Carson and Walter Cronkite. Also avoid making superstars out of "alternate culture" heroes because that's the same old "leader" and "lead" bullshit. It's best to be intimate with video, not estranged by plastic modes of behavior put over on product TV.

So don't worry about initial inadequacies of technique. Everyone we know who's picked up a Porta-Pak for the first time used it to feedback on their own lives and environment because that seemed natural. Some of the strongest tapes we've seen are technically the crudest. It's a medium without experts. Not everyone writes novels, but everyone has writing as a tool.

And most important: structure your system to maximize access. Like guerrilla warfare, your heavy, centralized units should help support your most flexible one (the Porta-Pak), not vice-versa. If you want heavy hardware, (e.g. mixers, slick editing), design it as a technological support system in service to the portable. High flexibility is an optimum survival mode.

We are Raindance, 10 East 24th St., New York, N.Y. 10010. Other groups with whom we work are: Public Media Bank, c/o St. Vincent, 10 Prince Street, New York, N.Y. 10013; People's Video Theater, 1st Avenue at the Courthouse, N.Y. N.Y.; and Media Service Center, 1101 Broadway, 10th Floor, New York, N.Y. 10019. But there are also many, many other good people who've gotten it together, especially in New York, along with groups who are getting it together. So this is a pretty comprehensive list.



Manual

There are three standards of videotape and a fourth one coming: two-inch, one-inch, half-inch, and quarter-inch.

Two-inch or "high band" tape systems are indigenous to broadcasting and are exclusively low access systems. They are temperamental, complex to operate, and stationary.

Generally, the wider the tape the more information it can hold. Two-inch systems, also called "quadruplex," lay the scanning signal perpendicular to the edge of the tape. All one and half-inch systems incorporate helical scan which lays the signal at an angle to the tape edge.

Typically, clean editing was once an exclusive function of two-inch machines. One-inch was first used as a cheaper version as their size and price range (\$3,000 to \$10,000) make them ideal for institutions with closed-circuit TV systems which imitate broadcast. Like two-inch, its editing capability is perfect.

There are no one-inch portables. However, all of the half-inch portables listed below can be interfaced with one-inch to provide perfectly edited one-inch masters.

The major technical problem with half-inch systems had been an unstable signal which precluded clean edits and even intra-system compatibility, in some cases. But most of the "technical" objections came from people who had a vested interest in limiting access to TV. Some of the best video we've ever seen was made on early, relatively crude Porta-Paks which were nonetheless flexible enough to go where people had something to record. Process versus product.

Moreover, many of the technical problems have been eliminated since the Porta-Paks were first introduced in 1968. There is now a Japanese standard of inter-system compatibility between manufacturers (although not all the portables share it) which has a stable enough signal to be perfectly edited on relatively inexpensive (approx. \$950) half-inch editing decks (e.g. the Sony AV2050).

Most of the information in this report is grounded in our experience with Sony. The system has many faults, but nonetheless has been the easiest to get and get serviced because of Sony's marketing acumen. Thus, the charts below give more space to Sony than the three other available half-inch systems, two of which are manufactured for two brand names.

The far right column of "coming" machines has more space than Sony because the system listed there incorporate distinct advantages over the current Sony.

The charts are divided into four different scans: **Speed** (for specifications). They're generally the same for signal-to-noise ratio (the strength of the signal in relation to inherent noise); audio range (VTR's have a separate, synched, magnetic sound track); tape speed (the faster it is the more information stored, but the less recording time); and resolution (most cameras transmit more lines than the tape actually stores, so deck resolution is more important than camera capacity).

The second generation systems all incorporate 2:1 interface which essentially means that the synch-pulse is continuous and therefore the signal is stable.

System variables to look for are battery life and recharging time; standard microphones and lenses; and playback capability. Some Porta-Paks are record only and the signal won't playback through any TV set. Of course, a playback motor means a heavier unit which you may not need.

Design Intelligence. Even the best of the systems is an imitation of film technology. Rather than exploit the potentials inherent in electronics, Porta-Paks still have a small TV screen eyepiece between your eye and the lens. They could be separate. A lens in your hand, for example, and a monitor on your wrist. They're also still configured as guns, with triggers. And are thought of as packs, i.e. something you carry but which isn't part of you.

Other **Design Intelligence** criteria are how accessible is the tape path for monitoring and threading, can you get to the guts for repairs, and configuration of cable jacks and inputs and outputs.

Experience. This tells you what has screwed-up both electronically and mechanically from our own experience. Where we have none it's been left blank for others to feedback and fill in our ignorance.

Support. Some Porta-Paks are less flexible than others first, because they have few inherent options, second, because other units in the manufacturer's line aren't too good, and third, because they're less than a total system in their inability to interface with support technologies like one-inch and cable television.

This section also evaluates the quality and accessibility of dealer service.

PORTABLE VIDEO

A RADICAL SOFTWARE STATE-OF-THE-ART REPORT

BIO-FEEDBACK (cont.)

By this time some yogis and zen monks have actually had the opportunity to try feedback training, and to listen to themselves as they meditate. They have tended to agree with westerners' speculations that such devices might be useful in teaching people the elementaries of meditation. In other words, westerners could overcome handicaps of cross-cultural translations and busy schedules in imitating the physiological patterns of expert meditators, thereby perhaps learning the basic state of mind for at least the beginning stages of meditation. Subjects can learn to control their EEG to a measurable extent after only a brief period of practice (Nowlis & Kamiya, 1969; Nowlis & Macdonald, 1969). EMG control, depending on the muscle used, is also not difficult to achieve. Thus a student with either a portable feedback device similar to that designed by Macdonald, or with a central

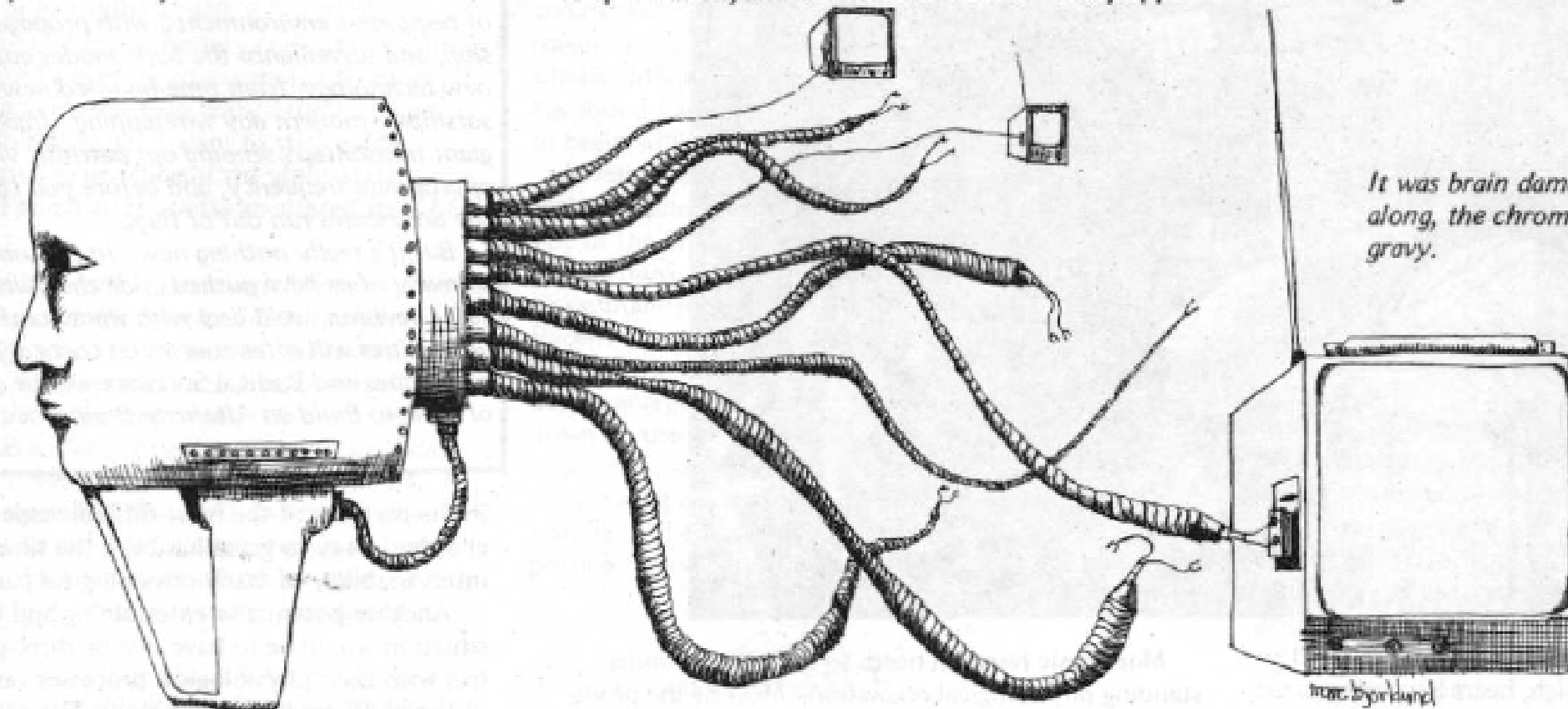
training facility available, for example at his college health service, could learn to meditate in a state of mind similar to that of a zen monk or a yogi.

Thus feedback devices and feedback training may be helpful in providing people with a chance to explore the internal, and in a socially constructive way. Perhaps because western society and western education are so oriented to discrimination and control of external events, the opposite abilities, perhaps providing some relief from practice of the others, are highly prized among the younger generation. Certainly feedback training is less dangerous and more constructive than drug use, or "dropping out", alternatives which attract large numbers of bright and potentially highly valuable young members of our society (H. H. Nowlis, 1968)

Concluding Remarks

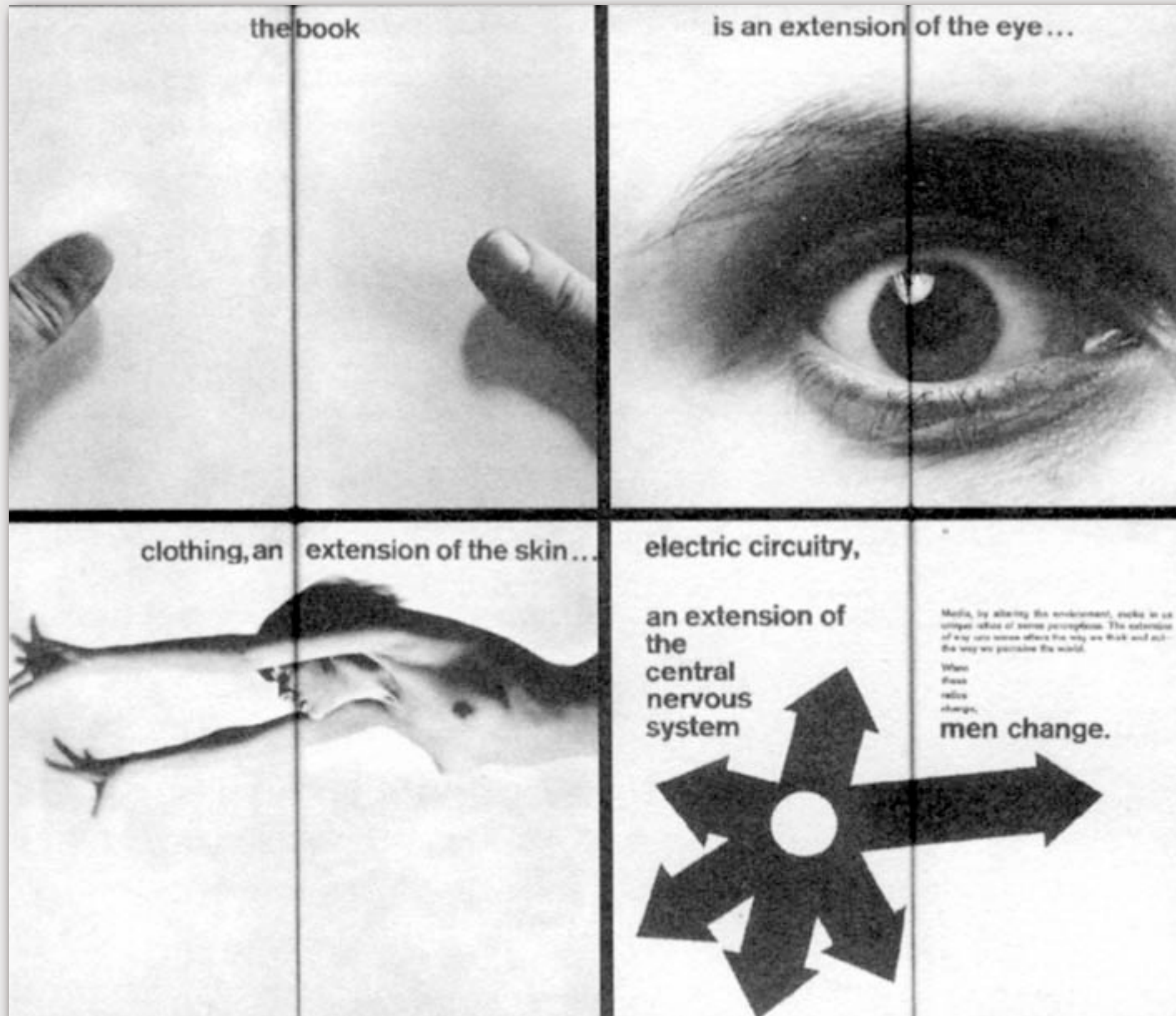
The feedback training technique lends itself easily to speculation, and we are sure there are many appli-

cations beyond what we have mentioned here. When inexpensive portable feedback devices are commercially available, for example, we are sure people will think of many more creative uses. We have only mentioned our more straight forward and practical ideas. Much more speculative thinking has gone along the lines of (1) could a feedback device be built to cue a woman as to her time of ovulation, (2) could feedback devices be used to get two or more people into very similar states, thus allowing demonstration of mental telepathy and other phenomena of parapsychology, (3) could feedback devices be helpful in the training of creative artists, training the artists to bring out internal states appropriate to various types of aesthetic productions, (4) could such devices be used in controlling artificial limbs, so that voluntary physiological changes would change the position of the limb, (5) could awareness of various muscle activities through EMG feedback be useful to athletes, etc. It is hard to stop thinking of uses once you begin trying it.



It was brain damage that we had in mind all along, the chromosome damage was just gravy.

—SB



By Merrill Paskal

Imagine

You can have a videotaperecorder at home. You can record sound and image and play them back right away. You can even monitor as you are recording. What do you do?

Strip.

Make Love.

Masturbate.

Wave your cock.

Grin happily and idiotically at all the taboos you are so joviously flaunting.

We are not supposed to dwell on our own bodies. And yet we all, for the extent of our sojourns on earth, live in a body, mostly our own, sometimes fused with another. We are interested in our bodies. We have had enough of undressing in the dark. In this culture we are starved for soma-feedback.

"Tape is a tender way of getting in touch with oneself. In privacy, with control over the process, one can learn to accept the extension out there on tape as part of self. There is the possibility of taking the extending back in

and reprocessing it over and over again on one's personal time warp," Paul Ryan

When we begin to relate nude to ourselves on tape, we imitate porno movies. Most couples set the camera on the tripod and point it at the bed. They press the record trigger, hop on the bed and screw. They do not watch themselves as they are screwing but they get off on the fact that they are making a dirty movie. Then they play it back later and if they have the energy they start again. Same movie. It is an elementary form of delayed feedback but it is after all our only model for nude behavior in front of a recording device.

But we have developed new modes of behavior and we can discover ways to feedback on that behavior and reinforce it. How ironic that we reprocess our love in their package.

"Narcissus gazes stupefied, paralyzed, at his image in the pool. His image is cut off from him and the amputation produces a numbness and closure that make it impossible for him to recognize his extended self. As long as we accept the Narcissus attitude of regarding the extensions of our bodies as really out there, really independent of us, we will meet all technological challenge with the same sort of banana skin pirouette and collapse."

Paul Ryan



photon: λ_{photon}



1999

Editor and Co-Editors:

2. **Challenges for Change**
 based on the OTCF hypothesis
 2. Culture is Embedded by Time
 Pushed
 a. what is happening, not
 happening in Culture Across
 3. Interventions for 20th-Century
 Community Change
 4. Social Networks for Economic
 Mobility: New Models

Quicker Free

- A. Tamas, Munkácsi György**
B. Tamas, Munkácsi György
Isabella Lőrincz

88. *Subsynchronous by Public
Output/Calculation by State
Management*

Young's Innovation Index

- *A. Arnold and G. Giffels by
Steve Niles.

1000

16. **TV Ads**
 Free Food
 A More Positive Social
 Reality
 Sending Taxes Across
 the Border
 Antique 45-280
17. **Advertising Newsletters**
 Distribution
 Section 2
 Use of TV in Children's
 Personality Disorders
 The Impact of Industrial
 Change

Keywords:

- 16. **Carroll 1988**
 Beyond Paper Video
 Workshop
- 17. **James Ray Project**
 Activism and Education
 Video, Examples
 Endpapers
 Notebook
 Manual
- 18. **VideoGraphic**
 Video, Examples
 Notes
- 19. **Power on the Side by Mike
 Galsworthy**
 1/1/79
- 20. **Cops 4**
 Photo Studio Project
 Screen
- 21. **Fire video**
 "Fire" University of
 Georgia
 1/1/80
- 22. **Video Graphic**
 Video, Examples
 Endpapers
 Notebook
 Manual
- 23. **Teaching Propaganda for
 Sexual Attraction**
 Playpost Institute
 Campaign for Change

Editor: Marjory Parker
Designer: David Bartholomew
Contributing Editors: Tom
Meadow, Jonathan Rasmusen,
Lorenza

Abstract

CYBERNETIC GUERRILLA WARFARE

by Paul Ryan

*To fight a hundred times and win a hundred times
is not the blessing of blessings. The blessing of
blessings is to beat the other man's army without
getting into the fight yourself.*

The Art of War Sun Tzu

Part I GUERRILLA STRATEGY AND CYBERNETIC THEORY

Traditional guerrilla activity such as bombings, snipings, and kidnappings complete with printed manifestos seems like so many ecologically risky short change feedback devices compared with the real possibilities of portable video, maverick data banks, acid metaprogramming, Cable TV, satellites, cybernetic craft industries, and alternate life styles. Yet the guerrilla tradition is highly relevant in the current information environment. Guerrilla warfare is by nature irregular and non-repetitive. Like information theory it recognizes that redundancy can easily become reactionary and result in entropy and defeat. The juxtaposition of cybernetics and guerrilla strategy suggests a way of moving that is a genuine alternative to the film scenario of NYC urban guerrilla warfare "Ice". Using machine guns to round up people in an apartment house for a revolutionary teach-in is not what the information environment is about. All power does not proceed from the end of a gun.

We suffer the violence of the entropy of old forms—nuclear family, educational institutions, supermarketing, cities, the oil slick complex, etc., etc. They are running us down, running down on us and with us. How do we get out of the way? How do we develop new ways? This ship of state continues to oscillate into runaway from its people and its planetary responsibilities, while efforts continue to seduce us onto boarding this sinking ship—educational loans, fellowships, lowering the voting age. Where did Nixon come from anyway? How did that leftover from the days of Elvis get to be Captain of our ship, Master of our fate?

How many Americans once horrified by thermonuclear war are now thinking the unthinkable in ecological terms with a certain spiteful glee of relief at the prospect of a white hell for all?



Illustrations by Claude Ponsot



Experimental set-up showing stage 3, taken at *The Nova Scotia College of Art and Design*, Halifax, 1971.



The 'Nude Version' (1974) was first performed in 1974 at *The Nova Scotia College of Art and Design*, Halifax. Collection: *Anton Herbert*, Gent.

