

KNOW YOUR SHIT

A DESIGN READER

Volume Two

Computers

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Talia Cotton

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Hito Steyerl

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Akademie Schloss Solitude

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Karl Gerstner: Designing Programmes

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Alec Tiranti Ltd.
London W. 1.

Programme as Logic

Instead of solutions for problems, programmes for solutions – the subtitle can also be understood in these terms: for no problem (so to speak) is there an absolute solution. Reason: the possibilities cannot be delimited absolutely. There is always a group of solutions, one of which is the best under certain conditions.

To describe the problem is part of the solution. This implies: not to make creative decisions as prompted by feeling but by intellectual criteria. The more exact and complete these criteria are, the more creative the work becomes. The creative process is to be reduced to an act of selection. Designing means: to pick out determining elements and combine them. Seen in these terms, designing calls for method. The most suitable I know is the one Fritz Zwicky has developed, although actually his is intended for scientists rather than designers. (*Die morphologische Forschung*, 1953, Kommissionsverlag, Winterthur) I have produced the diagram below in accordance with his instructions and, following his terminology, I have called it the

morphological box of the typogram. It contains the criteria – the parameters on the left, the relative components on the right – following which marks and signs are to be designed from letters.

The criteria are rough. As the work proceeds, of course, they are to be refined as desired. The components are to be made into parameters and new components are to be specified, etc. Moreover, they are not only rough, they are also not self-contained. The component "something else" is the parcel in which the left-overs are packed if the parameter does not break down neatly. The designations are imprecise in some cases. There are many imperfections. But it is precisely in drawing up the scheme, in striving for perfection, that the work really lies. The work is not diminished; it is merely transferred to another plane.

The inadequacy of this box is my own and not inherent in the method. Even so: it contains thousands of solutions which – as could be shown by checking an example – are arrived at by the blind concatenation of components. It is a kind of designing automatic.

a Basis

21

1. Components	11. Word	12. Abbreviation	13. Word group	14. Combined	
2. Typeface	21. Sans-serif	22. Roman	23. German	24. Some other	25. Combined
3. Technique	31. Written	32. Drawn	33. Composed	34. Some other	35. Combined

b Colour

1. Shade	11. Light	12. Medium	13. Dark	14. Combined	
2. Value	21. Chromatic	22. Achromatic	23. Mixed	24. Combined	

c Appearance

1. Size	11. Small	12. Medium	13. Large	14. Combined	
2. Proportion	21. Narrow	22. Usual	23. Broad	24. Combined	
3. Boldness	31. Lean	32. Normal	33. Fat	34. Combined	
4. Inclination	41. Upright	42. Oblique	43. Combined		

d Expression

1. Reading direction	11. From left to right	12. From top to bottom	13. From bottom to top	14. Otherwise	15. Combined
2. Spacing	21. Narrow	22. Normal	23. Wide	24. Combined	
3. Form	31. Unmodified	32. Mutilated	33. Projected	34. Something else	35. Combined
4. Design	41. Unmodified	42. Something omitted	43. Something replaced	44. Something added	45. Combined

Solutions from the programme

(Not all the solutions were found with the aid of the morphological box. But all those found can be assigned to a place in it and analyzed.)

If all the components contained in the trademark *intermöbel* are added we obtain the following chain:

- a 11. (word) – 21. (sans-serif) – 33. (composed)
- b 14. (shades combined, viz. light and dark) – 12. (achromatic)
- c 12. (size immaterial, therefore medium) – 22. (proportion usual) – 33. (fat) – 41. (roman)
- d 11. (from left to right) – 22. (normal spacing) – 31. (form unmodified) – 43. (something replaced, viz. the face of the letter r by superimposition of the two parts of the word).

Not all the components are of equal importance; only two are actually decisive: b 14 + d 43.

The importance of "combined" is shown in example b 14: the components light-medium-dark are not very expressive in themselves because they do not represent an assessable value (apart from black always being dark). But if letters of varying degrees of darkness are combined (as here) the parameter of shade may be the point at which the solution crystallizes out.

Parameters as points of crystallization: I will illustrate all those in the section "Expression" by the following examples:

"Reading direction" determines the expression of the typograms *Krupp* and *National Zeitung*. In both instances the component d 15 (combined) forms the basis. In *Krupp* d 11 (from left to right) is combined with d 14 (otherwise, i. e. from right to left). In the case of *National Zeitung* the components are d 12 and 13. Incidentally, the typogram for Bech Electronic Centre belongs here, see page 44.

"Spacing", once again combined in the component, is determining in *Braun Electric* and *Autokredit A.G.*

22

intermöbel

23

KRUPP 1961

24

National Zeitung

25

Braun Electric International SA

26

AUTOKREDIT

Again: Solutions from the programme

"Form" is relevant in *Abfälle*, *Globotyper*, *wievoll?*. In *Abfälle* the component d 32 (mutilated, here fragmented); in *Globotyper* d 33 (projected, here on a sphere), in *wievoll?* d 34 (something else, the form is neither unmodified, nor is it mutilated or projected, but "something else": partly silhouetted).

The idea of "design" means something more than is conveyed by "form". To take an example: in *Auto AG*, the dropping of the crossbar of the A's cannot be called a mutilation nor a form operation either. If the form is mutilated, the components are preserved. That is not the case in this instance. The form as such is Berthold sans-serif but "something is omitted". The reverse applies to the case of *FH* (Fédération Horlogère Suisse): here "something is added": namely, the Swiss cross within the letters. In the case of *Rheinbrücke* there is "something replaced": the part of the word "brücke" (bridge) by the sign.

The reader will have noticed that there is a criterion running right through the examples below: the relationship between form and content.

Basically, every typogram can be produced in two ways: firstly, through the word sense (to interpret the meaning) and secondly, through the word picture (to take the formal data as the point of departure). It would need a second, a semantic box, to bring this within a system. Its components can be found in the examples given here.

Say: the solution for *National Zeitung* is the perception of a formal rotation, *Krupp* is a literary interpretation (Look back to the past, look forward to the future). In *Autokredit* the word credit (payment over a long term) is represented. In *Globotyper* the typeface suggests the typewriter and the projection suggests the sphere (it was originally a name for the IBM spherical head typewriter). "*Abfälle*" and "*wievoll?*" symbolize the idea, etc.

27

Abfälle

28

globotyper

29

wievoll?

30

AUTO AG

31

FH

32

RHEIN 

Programme from the Far Middle Ages

I pass the Cathedral every day on my way to work. The building contains some typical Gothic specialities. An example is provided by the pointed arches of the 15th century cloisters reproduced below: a perfect example of the joyful (and artful) way the Gothic designers went to work.

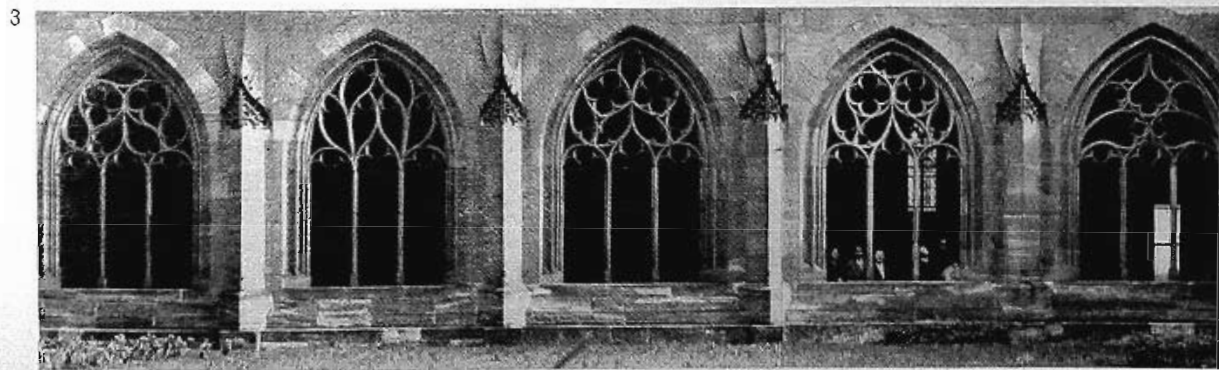
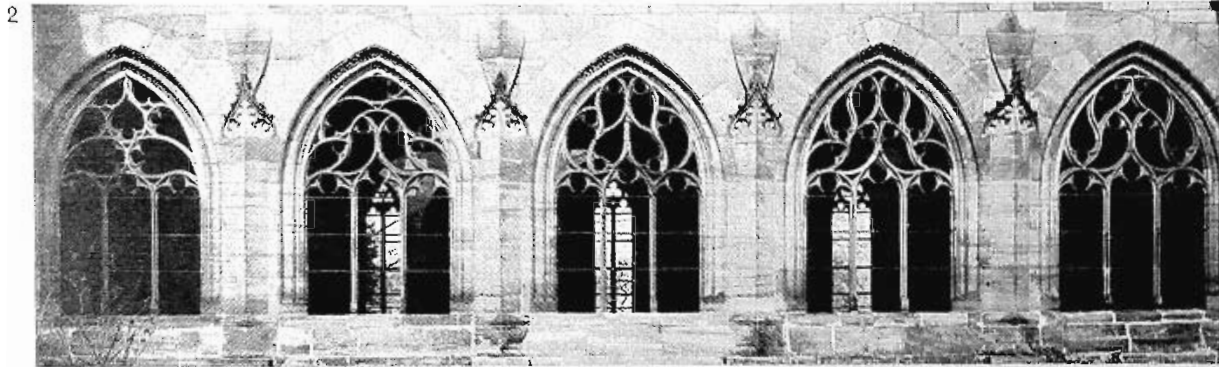
Joyful, because it gave them pleasure to create complicated patterns in profusion. Artful, because they tempered the complicity to the beholder and concealed the profusion. That is: none of the 16 windows (one is missing in the picture) is identical with another; simply because somebody wanted to have fun (a whim, perhaps, of the head artisan?) Each window is a design in itself based on an exact programme of constants and variants.

The Programme:

The material and execution are prescribed; the dimensions, outlines, including the vertical tripartition up to the springing line of the arch.

There are 16 different ornamental patterns to be designed in the triangle of the arch and they must be related from the following points of view:

the profiles of the lines and the joining together of the bundles of lines are in principle all alike – the tracing of the lines must be adapted organically to the outline and also to the vertical tripartition – the lines meet either at right angles to each other (or to the periphery) or run into each other at 0 degrees – there must be no residual forms; that is, each line must form a self-contained pattern on two sides.



Integral typography

A new label? The typographical aspect of a new *ism*? No, this is just what is not meant. The times of both, pioneers and *isms*, are over. After the adventurers of the 'teens and the twenties we are the settlers, the colonizers.

The continent of modern creation is not only discovered, but it already figures on various maps. *Isms* are the countries of the spiritual map, each one with a border separating it from the others as in a school geography – and like everything in school books right and wrong at the same time. For today the borderlines between *isms* are beginning to be obscured. And what interest us are not so much the surrounding constructions as the matter itself, the individual achievement which stands finally behind collective theories. In my opinion, for the sake of honesty, no new *ism* should be created¹.

Today it is time (at any rate so it seems to me) to gain distance from the theses of the "new" and "elementary" typography of the twenties and the "functional" typography of the early forties.

Let us recapitulate these theses once again. Max Bill writes in 1946: "We call elementary typography a typography entirely developed out of its own data; that is to say, which works in an elementary way with basic typographical elements, and if, at the same time, it aims at the sentence-picture in such a way that it becomes a living sentence-organism without any decorative addition and without any strain, we would call it functional or organic typography. Which is to say that all demands – technical, economic, functional and aesthetic – should be fulfilled and should determine together the sentence-picture²."

It is precisely in typography that the difficulty of setting theoretical boundaries is plain³. For example discussing Bill's functional claim, Jan Tschichold, the editor of "Elementary Typography"⁴ said even in 1928: "The New Typography is different from the earlier because it is the first to attempt the derivation of the appearance from the function of the text⁵." And Moholy Nagy even five years earlier: "This first of all: an unambiguous clarity in all typographical works. Legibility and communication should never suffer from a previously held aesthetic⁶."

Those were the theses which caused the typographical revolution and let loose discussion forty, twenty and even ten years ago. Today it can be said that they are no longer controversial; they are accepted – and thus they have lost their object, their currency. This is what is up to date in the situation of the new typography of 1959. After all a dream has been fulfilled, but the envisaged paradise has remained as far away as ever. In the twenties for instance it was claimed for the first time that the typographer should proceed from the data of his material, from the basic typographical elements; today it is hardly conceivable that he should not proceed from them.

If most of the pioneers' theses have become self-evident, the aesthetic criteria have been generally outlived. For example: Is sans serif or Roman type the type of the twentieth century (Tschichold 1928:

"Among all existing types the sans serif . . . is the only one which conforms spiritually to our time⁵¹)? is symmetrical or asymmetrical typography the genuine, contemporary way of expression? do flush left, ragged right or flush left, flush right correspond to present-day feelings? can a type be set vertically or not? and so on.

Such "either or" criteria have served their time and their purpose. Today typographers use both sans serif and Roman type, set books both symmetrically and asymmetrically, use both flush left, ragged right and flush left, flush right. Today everything is stylistically allowable, allowable from the point of view of up-to-dateness. "There remain only open doors to be unlocked", as the German saying has it. And we shall not be spared the necessity of rendering an account of the state of our spiritual inheritance. Nobody will relieve us of the task of searching for new criteria.

Typography is an art not in spite of its serving a purpose but for that very reason. The designer's freedom lies not at the margin of a task but at its very centre. Only then is the typographer free to perform as an artist when he understands and ponders his task in all its parts. And every solution he finds on this basis will be an integral one, will achieve a unity between language and type, between content and form.

Integral means: shaped into a whole. There the Aristotelian dictum that the whole is greater than the sum of its parts is assumed. And this vitally concerns typography. Typography is the art of making a whole out of predetermined parts. The typographer "sets". He sets individual letters into words, words into sentences.

Letters are the elementary particles of the written language – and thus of typography. They are figurative signs for sounds without content, parts which acquire a meaning and a value only if they are combined. This means that combinations of two, three and more letters show in any case a word-picture, but definite letters render a definite idea only in a certain sequence; literally they constitute a word. To clarify the example from the other angle let us take four letters which can be combined in four different ways. From this we can see that only one combination makes sense. The 23 remaining are indeed both legible and pronounceable, they contain the same elements and give the same total. But they do not constitute a linguistic whole. They remain meaningless.

¹

EFIW	FEIW	IEFW	WEFI
EFWI	FEWI	IEWF	WEIF
EIFW	FIEW	IFEW	WFEI
EIWF	FIWE	IFWE	WFIE
EWFI	FWEI	IWEF	WIEF
EWIF	FWIE	IWFE	WIFE

The importance of the whole, the integral in general, for language and typography, is obvious. If the proportion between the correct and the possible combinations in words of four letters is 1 : 24, in five-letter words it will be 1 : 120, in six-letter words 1 : 720, in seven-letter words 1 : 5040 and so on.

This means that what we can write and set with our letters in all languages – if it makes sense, it makes a whole – always remains a mere fraction of the mathematical possibilities of the alphabet.

Morgenstern, the Dadaists, Schwitters and others have tried the abstract language which stands for nothing outside itself, consisting of unconventional combinations of sounds and letters, of words which are not words because they have no meaning but their own acoustic and visual rhythm⁷. The poets explode what has become natural and meaningless for us in the language. And in so doing they give us back a feeling for the natural and elementary. Kurt Schwitters' "Sonata in Primeval Sounds" is especially illuminating with respect to the accord between elementary, linguistic and typographical form.

The author says: "The Sonata consists of four movements, an introduction, a coda and a cadenza in the fourth movement. The first movement is a rondo with four main elements which are especially marked in this text of the Sonata. It is rhythm in strong and weak, loud and soft, compressed and extended and so on."

Page 1 of the "Sonata in Primeval Sounds" published in Hannover in 1932. (Typography by Jan Tschichold):

In our contemporary reality abstract word-creations which seem at first sight the eccentric ideas of a poet, have developed into an everyday economic factor. Every day new words are created. Perhaps they grow out of abbreviations like UNO, are pieced together from foreign words like Ovomaltine, or are new inventions like Persil; in each case they are independent of their source. And now names for industrial products are found by means of electronic computers. This happens as follows: some three random vowels and four consonants are fed into the computer which registers in a few moments thousands of combinations (see above), replacing imagination by mechanical choice. These meaningless word-creations have become indispensable to publicity. The label departments of every firm of importance have dozens of them in stock; before the products exist the name is already registered and protected by law.

Elementary optics correspond to elementary speech sounds, the formal value of the type corresponds to the acoustic value of language. What Schwitters says about his "Sonata in Primeval Sounds", applies, if correspondingly modified, to the next example, an advertisement for the Delft Cable Works designed by Piet Zwart around 1928. It is a rhythm in black and white, large and small, compressed and extended.

2

Einleitung:

Fumms bö wo tää zää Uu, pögiß, kwir Ec

Ooooooooooooooooooooooooooooo,

dll rrrrr beeeee bö, (A)

dll rrrrr beeeee bö fumms bö, 5

rrrrr beeeee bö fumms bö wo,

beeeee bö fumms bö wo tää,

bö fumms bö wü zää zää,

fumms bö wo tää zää Uu

erster Teil:

Thema 1:

fumms bö wo tää zää Uu, pögiß, kwir Ec.

Thema 2:

Dedenn an rrrrr, li Ec,

mpiff rrrrr too, rrrrr,

Jüü Kaa' (gesungen)

Thema 3:

Rinnzeke bee bee nuz kee müü?

zuuu ennze, zuuu rinnzeke müü,

räkeee bee bee.

Thema 4:

Ruummpf rrrrr toooo?

157

3

NEDERLANDSCHE KADELFABRIEK • DELFT.

10-28-34 NV

LOOSBAHNINGSKABEUS MET PAPIERISOLATIE - NED. DELFT.

25'0

From the point of view of integral typography the illustration below is an interesting example of an influential experiment with fundamentals, though, as its author admits, an imperfect typographical achievement. It is a page of the first printing of Mallarmé's "Coup de dés", published in 1897 in the magazine *Cosmopolis*⁹.

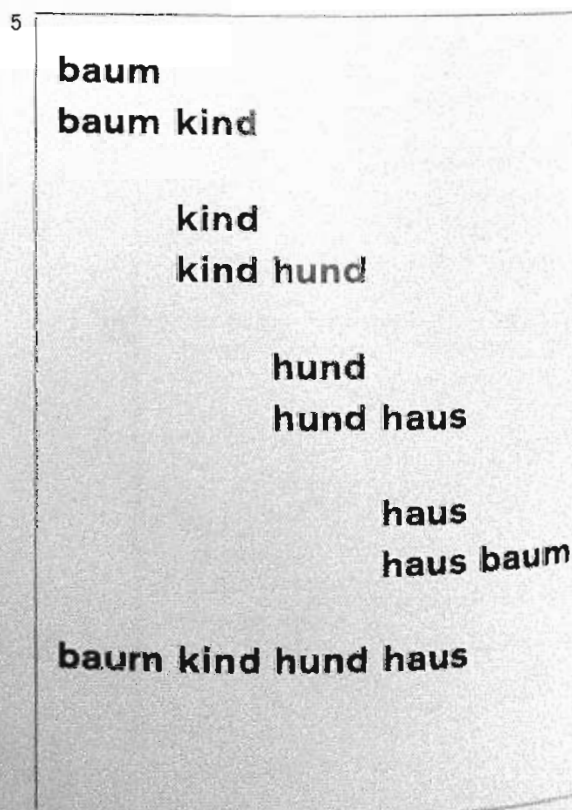
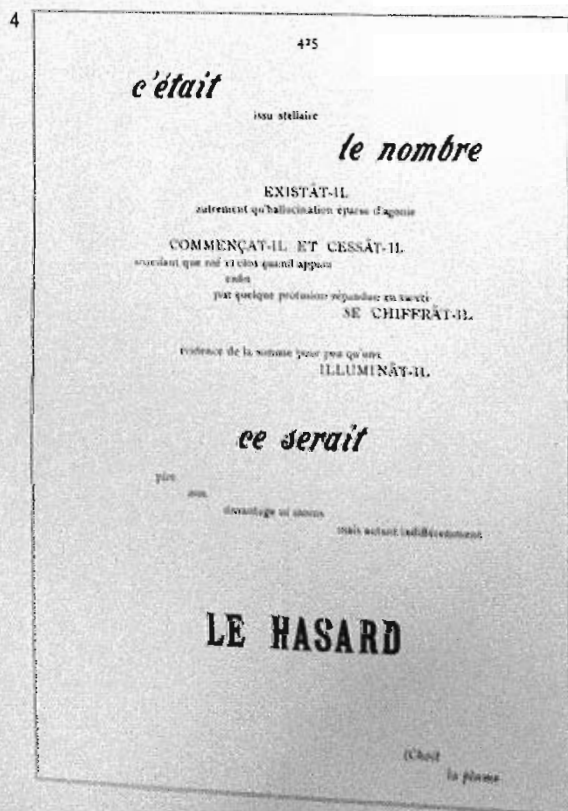
Paul Valéry writes on this⁹: "His (Mallarmé's) whole invention, derived from analyses performed for years on language, books and music, is based on the conception of the page as a visual unity. He had studied very carefully (even on posters and in newspapers) the effect resulting from the distribution of black and white and had compared the intensity of various types . . . He creates a surface reading which he combines with the lineal reading, thus enriching the domain of literature with a second dimension." And: "I believe the composition of the 'coup de dés' should not be considered as created in two distinct operations, the one consisting in writing a poem in the traditional way, independently of each visual form and the size of the spacing, the other in giving the text its appropriate setting. Mallarmé's attempt must necessarily have been more profound. It happens in the very moment of creation, it is itself a sort of creation."

Mallarmé himself writes in a letter to André Gide: "The poem has just been printed with my sentence-arrangement, in which the whole effect lies." It would not be possible to underline more clearly the relationship existing between the contents and the setting of the text.

If the Schwitters example is a composition of pure type-combinations, Mallarmé's is one of pure word-constellations¹⁰.

The author Eugen Gomringer says: "The constellation, the word-group, replaces the verse. Instead of syntax it is sufficient to allow two, three or more words to achieve their full effect. They seem on the surface without interrelation and sprinkled at random by a careless hand, but looked at more closely, they become the centre of a field of force and define a certain scope. In finding, selecting and putting down these words he creates 'thought-objects' and leaves the task of association to the reader, who becomes a collaborator and, in a sense, often the completer of the poem¹¹." Further: "Silence distinguishes the new poetry . . . in this its prop is the word¹²."

Gomringer calls himself the "play-leader, the one who invites others to play with him". The words he puts down are not words applied to some subject, but a reality, conceptual and rhythmical values in themselves. They are again and again points in relationship to one another in a vacuum in which the reader's imagination wanders, rapidly or leisurely, according to his mood. And the less numerous the points of reference, the more precise they are – which means, in application to typography, the more fixed the unity of word and word-picture, the more natural it is. Lissitzky, addressing the reader, says as early as 1925: "You should demand that the writer take pains over the presentation, because his ideas come to you through the eye and not through the ear. Therefore typographical sculpture, through its visual quality, should do what the speaker's voice does for his thoughts¹³."



Gomringer also tells us that the poet's distance from the so-called reality of everyday life is at best only apparent. If his constellations are artistically concentrated concentrates, they are often very close to slogans centred on a definite subject, such as: "Cyclists attention-attention cyclists". Or "Face oncoming traffic". Or like the classic among slogans: "Dubo-Dubon-Dubonnet". As publicity for a torch battery the Parisian writer Arman Salacrou conceived: la pile wonder ne s'use que si l'on s'en sert (la pile wonder – the name of the battery – is used up only when in use.)

The newspapers' headlines often become constellations of a particular force¹⁴. They shape and reduce to the briefest and most direct not only a poetic idea but daily events.

For instance how much is said and at the same time left unsaid in their contemporary context by the four words: Meg to wed court fotog: Princess marries photographer. A subject to excite the imagination of the reading millions. Sensation beyond the scope of normal print. Everyday speech is too elaborate for the headline, too space-consuming. A special solution, then. Abbreviate (fotog); draw upon the thesaurus (wed instead of marries); substitute nicknames (Meg for Margaret). We are interested by the fact that the effect here not only lies in the words, the content of their factual communication. Without any doubt the same words, if they, for example, stood somewhere in the middle pages, would have a completely different effect. Again content and presentation of the language result, cumulatively, in an entirely new unity.

The above examples do not follow any plan and are certainly not intended to be an anthology of pioneer work. I should prefer to look at the theme of integral typography- of the integration of language and type – from as many angles as possible. And there I cannot but mention questions we take for granted. I hope the reader will not consider this too much of a liberty.

We take for granted for instance that on the poster one does not read: "Allianz is organizing an exhibition in the Zurich Museum . . . and so on". The astonishing thing is: nothing is said of an exhibition! The text is reduced to the barest essentials, to names and dates scaled according to their significance – the rest is filled in by the onlooker. Or, in Gomringer's words: "The onlooker completes the poster". The information, though employing only type as its medium, is not as much read as "seen".

Here, using elementary means, the poster fulfils its function in an exemplary way, it conveys its message to the reader in the simplest possible manner, it literally puts him in the picture at the first glance – the information's content and form correspond to one another.

Poster by Max Bill, Zurich 1942:



8

"The gravy train
has stopped
running! Let's see
some
action!"

Another phase of integral typography is illustrated by the following examples. The reader must imagine what is not shown on the illustrations. Each one is part of one folder for the New York Times, designed in 1958 by Louis Silverstein.

9

"Our
advertising
has to
produce!"

10

"This is no
time for
**guess-
work!**"

11

"We've got
to get out
and
**sell
sell
sell!**"

The mailer receives the prospectus with the figure 8 on the front. He unfolds it, 9, and with each following unfolding, 10 and 11, the size becomes twice as big, the text more insistent and the type heavier. After the dramatic climax "sell sell sell!", - there comes in conclusion the propaganda message - "Put the New York Times Magazine on your magazine schedules . . . use it consistently all year long".

With the elements so far accepted a new one is integrated. The reading-time becomes important, its rhythm is intensified, and it is incorporated into the typographical structure. One can say that text and typography develop simultaneously, as the paper is unfolded. (What is true here for unfolding a sheet of paper can as well be said of turning the pages of a book.)

12

Put The
New York Times
Magazine
on your magazine
schedules...use it consistently
all year long

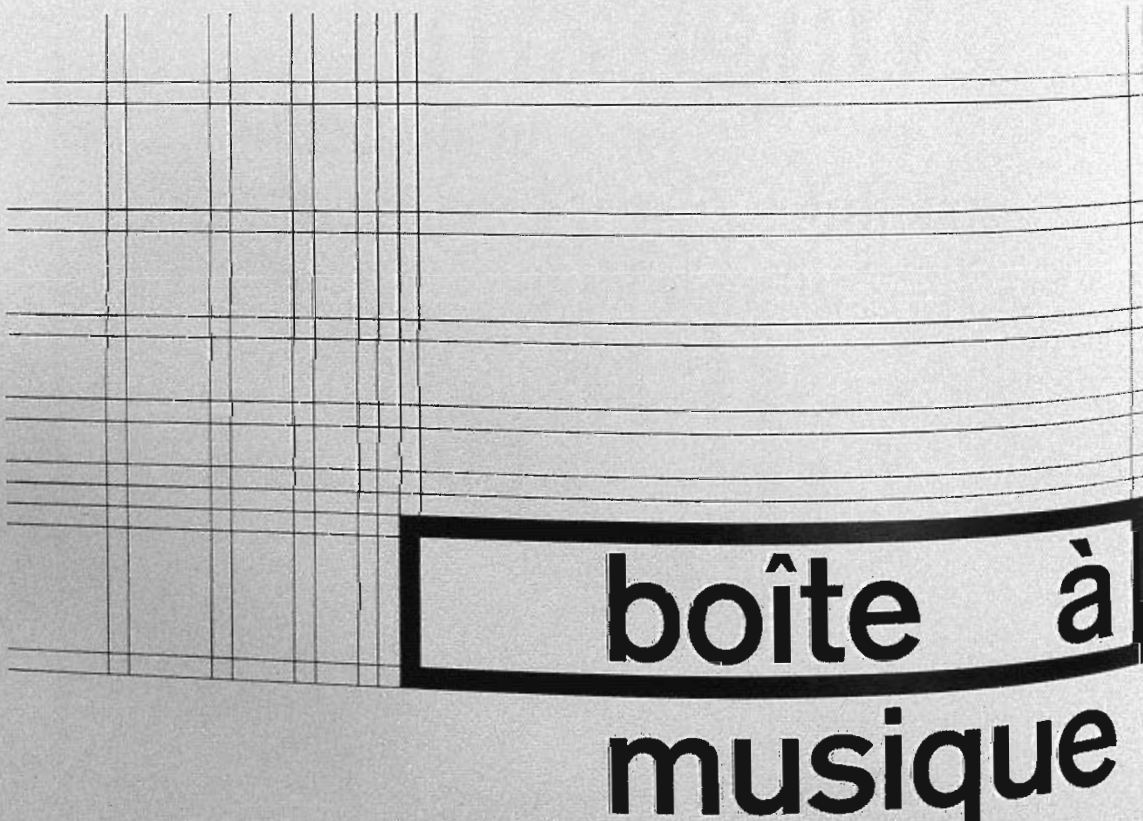
The New York Times folder shows the solution of a complex problem; it displays the integration of an idea, a text and typographical presentation through several phases. It would be a further task to integrate this type of folder with other advertising media or printed matter. Today more than ever, firms need not only a folder here, a poster or an advertisement there. Today something else is needed: a physiognomy, a public face.

The examples on these pages show the physiognomy of "Boîte à musique", a record shop in Basle. "Boîte à musique" has a signature and a style of its own – but not in the sense of an unchangeable mark or of a mere aesthetic principle. Rather do the elements, definitely established though adapted in every case to the functions and proportions, constitute the signature and style in one.

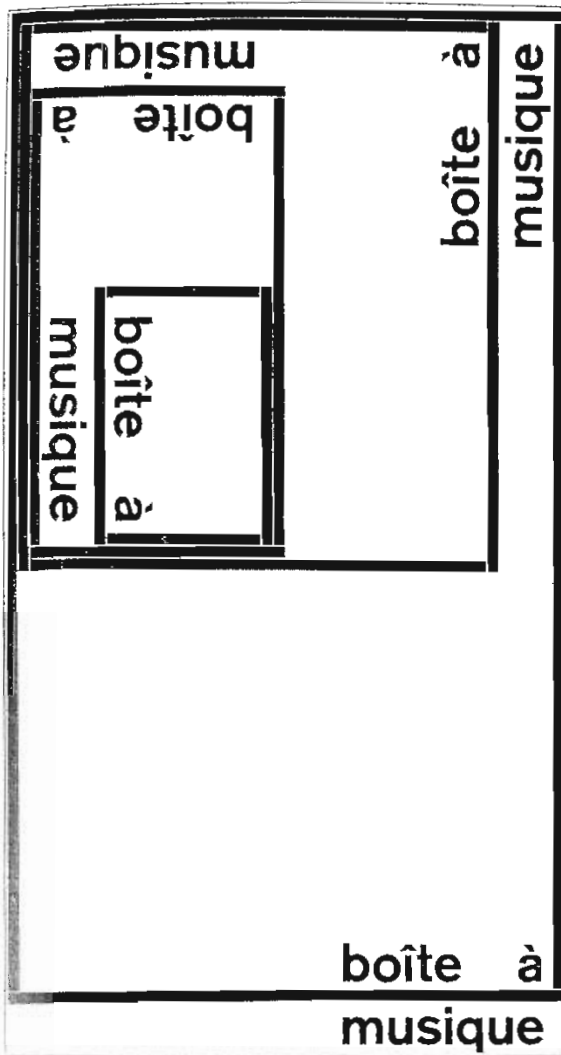
Fig. 13 shows the structure. The lettering and frame are fixed elements; so are the connection between them and the principle of variability. Starting from the bottom right corner, the frame can be increased upward or to the left by whole units at a time. There is no case which is pre-eminent for its proportions. There are only variants of equal value; and the variant is pre-eminent when it is best adapted to the particular problem awaiting solution.

Fig. 14 shows the New Year's card with variants embodying different proportions at one and the same time; 15 the notepaper, in which the insignia is adapted to the (given) DIN A 4 format; 16 and 17 advertisements tailored to fit the advertising space available; 18 a gift voucher.

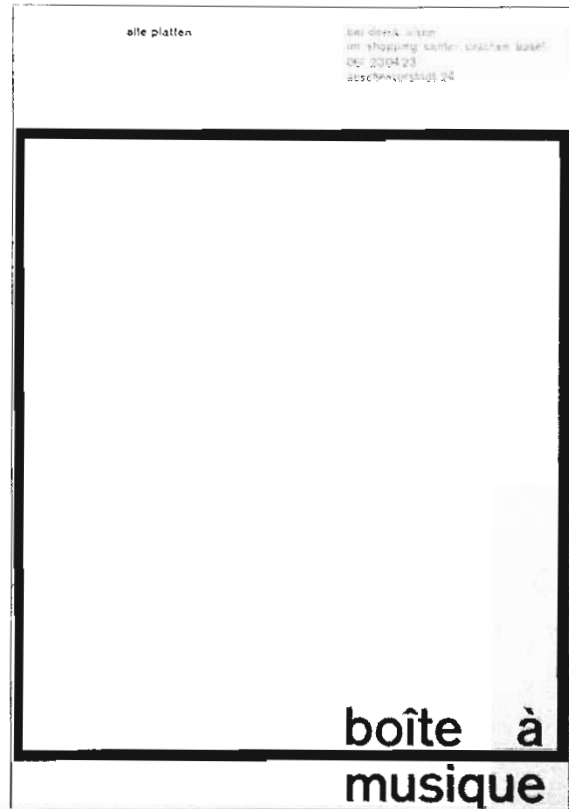
13



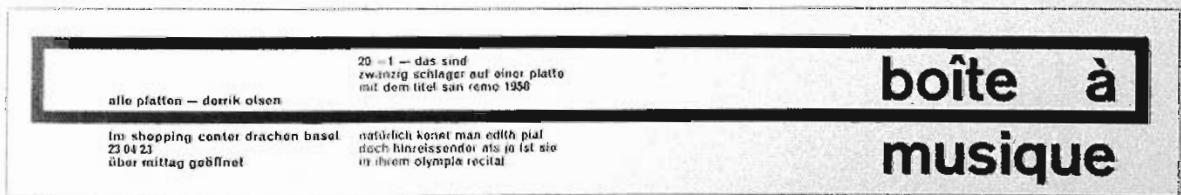
14



15



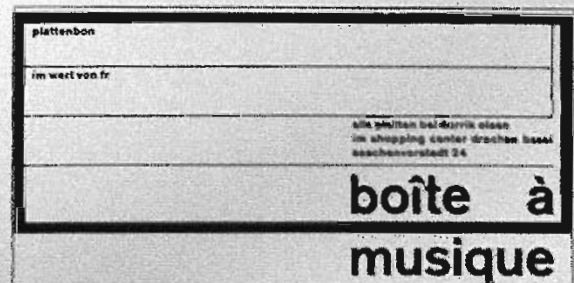
16



17



18



As an addition to Boîte à musique two other cases are quoted which may also be adduced as proof. What is to be shown is the ability of the principle to prove itself in practice; its general applicability first of all with various aids and secondly under various basic conditions.

In the case of Bech Electronic Centre the problem was different only in that the name involved quite different basic conditions. It answers the question Who? (Bech, the proprietor) What? (Electronics, the article) How? (Centre, the type of offer) A description, then, rather than a name; and under the disadvantage of comprising a great deal of text.

I must add that the name does not have this form, as many think, in order to oblige graphic artists. Just the opposite: the design is simply and solely a matter of discerning two characteristics of the name (basic conditions) which lend themselves to the system.

Firstly: the initial letters coincide in the manner of a crossword puzzle when the words are written together so as to read two ways. In other words: the name appears twice without actually being repeated. What appeared a handicap at first, is artificially intensified.

Secondly: the expanded form (horizontal and vertical) contains from the outset variants and combinations. Thus the sign, consisting solely of letters (and without additional aids like the frame in the case of Boîte à musique) can be adapted (within limits) to various proportional requirements. Moreover: through the combinatory variants, it suggests, although not actually interpreting, electronic technique.

Fig. 19 and 20 show the New Year's and also Introductory Card; 19 is the most condensed yet still identifiable form, 20 shows the full range of variability; 21 the firm's notepaper; 22 a repair slip with separable coupon.

19

**BECH
ELEC
CENT**

20.

**BECH
ELECTRONIC
CENTRE**

**BECH
ELECTRONIC
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**BECH
LE
EN
CT
TR
RE
O
N
I
C**

**BEC
ELE
CEN
HCT
TR
RE
O
N
I
C**

**BEC
ELE
CENTRE
HCT
TR
RE
O
N
I
C**

21

R.F. 2000
 Zürich
 Bergwegstrasse 88
 Telefon 01 26 00 71 28 3 00
 Fax 01 26 00 71 28 9 92

- Industriemaschinen- und Elektrobauteile
- Bauelemente
- Ersatzteile
- Druck- und Druckvervielfachung
- Reparaturservice

BECH ELECTRONIC CENTRE
HCT
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22

[illegible]

EC
ELECTRONIC
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FR
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**BECH
ELECTRONIC
CENTRE
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wünscht

von links bis rechts
von oben bis unten
und um sowohl als auch

ein gutes neues jahr

**BECH
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wünscht

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23

BECH
ELECTRONIC
CENTRE
HCT
TRE
ONIC

Fig. 23 shows the poster in four colours with a sequence from yellow through blue-violet to red, following the movement from horizontal to vortical; 24-26 disc sleeves; 27 an advertisement in the daily press.

24



25



26



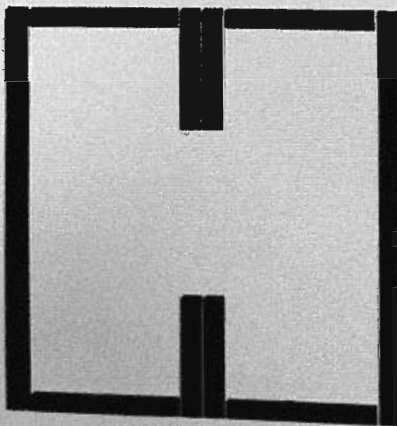
With both Boîte à musique and Bech the basic conditions are the same in the way they affect the problem: both are retail shops. In both cases the firm had to be characterized as such and given a physiognomy for the outside world.

In the case of Holzäpfel the structure had an additional task to perform: it had to characterize the products as well as the firm. In other words, a trademark had to be designed in the widest sense of the word.

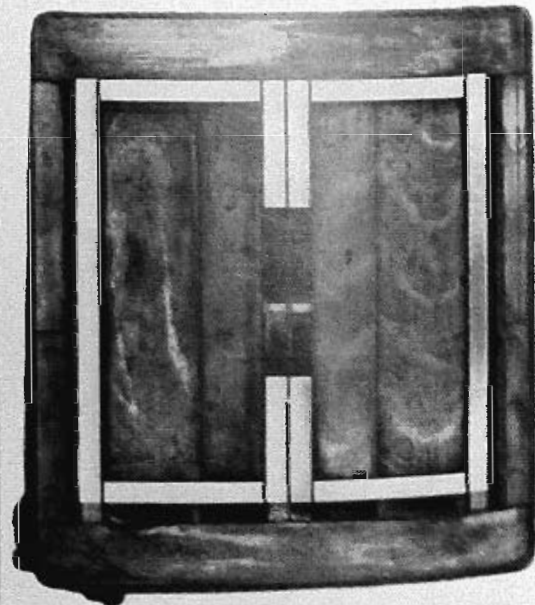
Vital question: can a mark be variable without at the same time forfeiting its mark-like character? Counter-question: what is typical about a mark, the proportion or the "configuration"? My answer is known: it is not and cannot be a question merely of proportions as such. Proportions can never be anything but good (or bad) relative to the task. But: in the structure of any sign, however great the number of variants, there is always one which must be declared to be the exemplar. The "configuration" must not suffer as a result of the variability; Fig. 28.

Fig. 29 shows the "printed frame". This characteristic is common to all examples: all consist of parts which are components of the case. There is an economic and also a disciplinary reason for this. Economic because otherwise originals would have to be drawn of every variant of the structure and blocks would have to be made of every size. Disciplinary because the typographical units simplify decisions as to proportion from the outset. Fig. 30 is a portion of the system. The thickness of line is the same in all the variants; the size, proportion and boldness are changed. Fig. 31 is a business form; 32 a dispatch label.

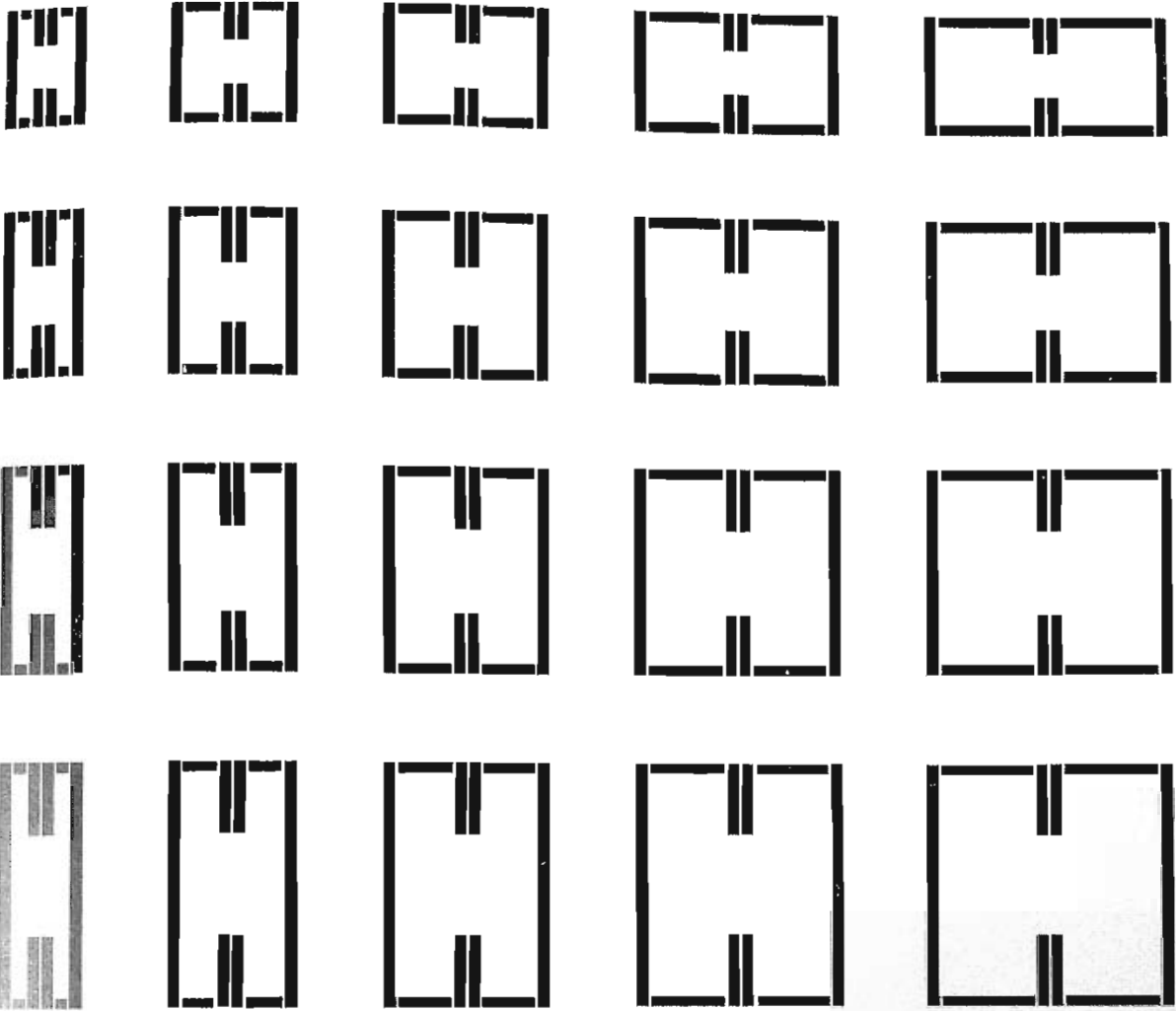
28



29



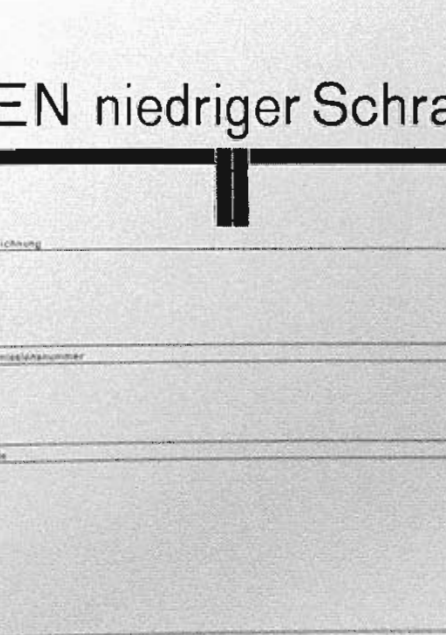
30



31

[illegible]

32



PEN niedriger Schrank

Bezeichnung

Kürzel/Abkürzung

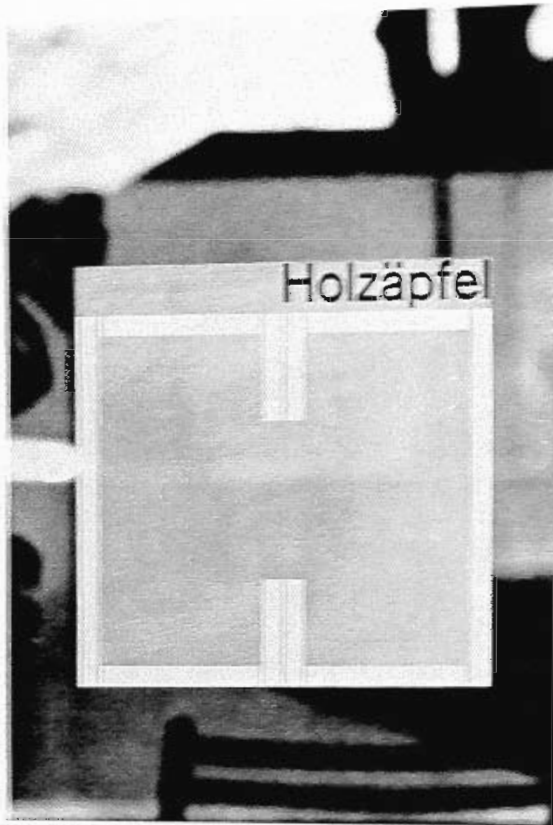
Kunde

Holzäpfel

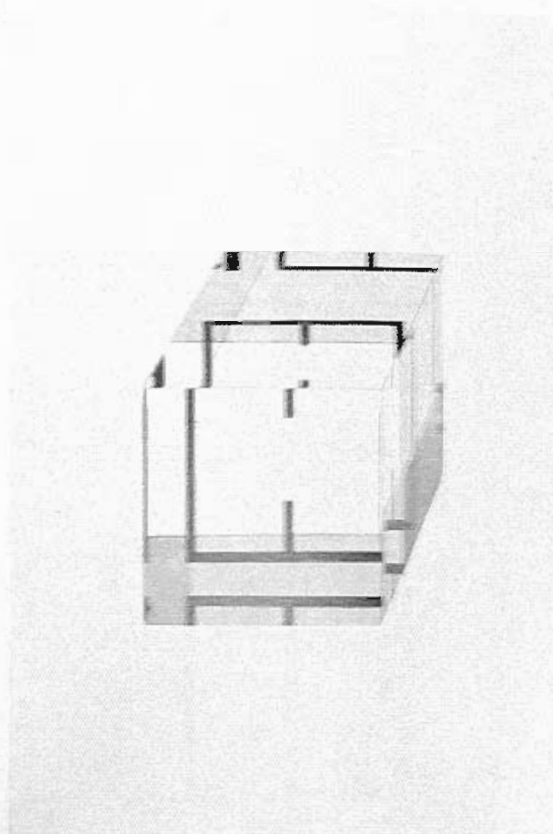
To pick a variant out of the system and declare it to be a trademark makes sense only where the mark is the sole centre of the item as in examples 33–35. 33 shows the window mark for retailers; 34 a customer giveaway (the sign cast in a perspex cube); 35 matchbook; 36 export mark.

In examples 37–39 the mark is a means to an end, 37 cover for a catalogue, 38 cover for the booklet of instructions for assembling INTERwall – a unit cabinet and partition wall; 39 shows the packing for LIP, an article of furniture for on-the-spot assembly.

33



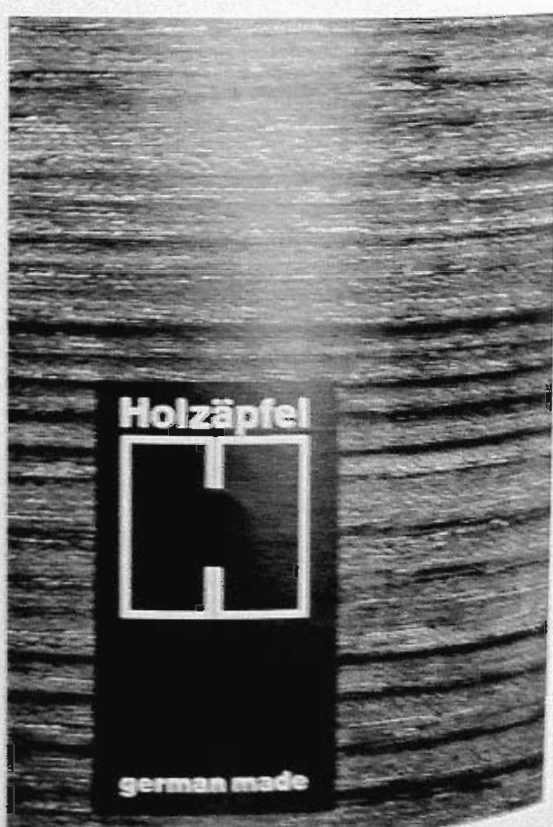
34



35

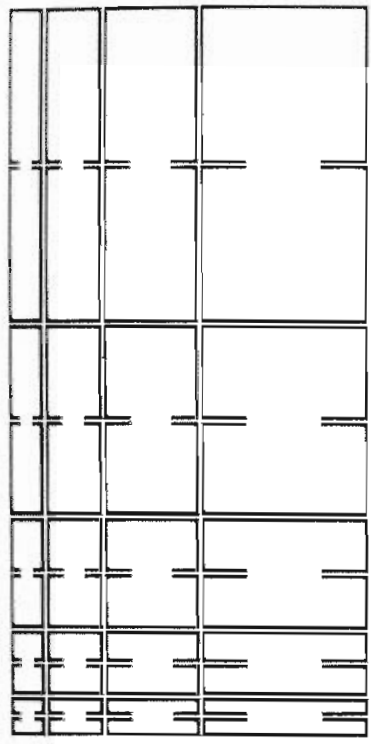


36



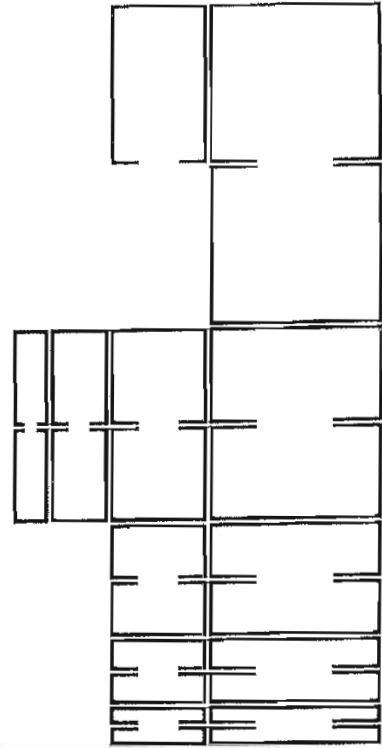
37

Holzäpfel INwand die inwendige Wand in Bau und Haus und Innenraum

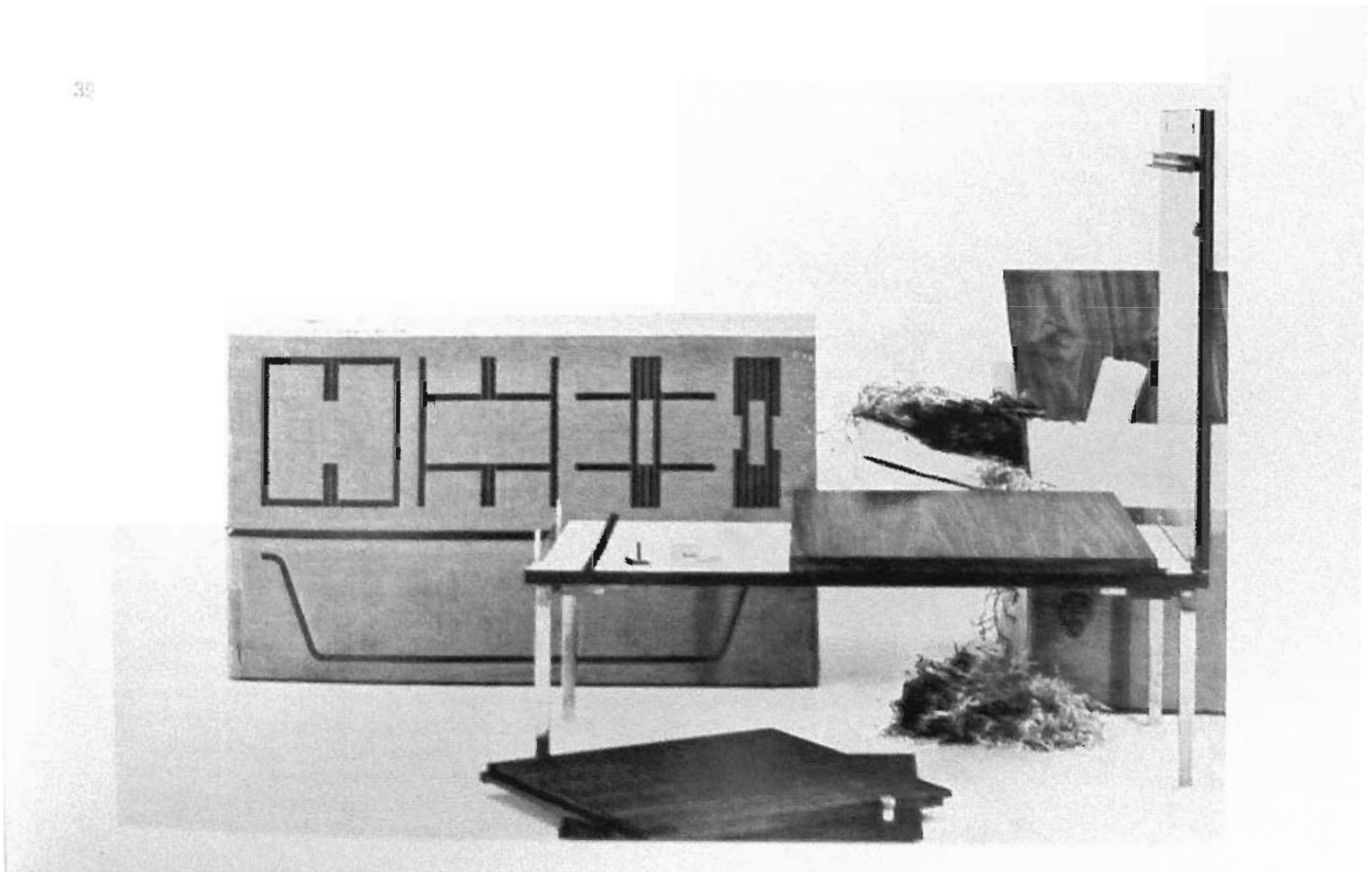


38

Montageanleitung INwand



39



Summarized:

1. Integral typography strives for the marriage of language and type resulting in a new unity, in a superior whole. Text and typography are not so much two consecutive processes on different levels as interpenetrating elements.
2. Unity is reached in different phases, each successor including its predecessor:
 - in the integration of different signs, different letters into the word. Examples 1 to 4
 - in the integration of different words into the sentence. Examples 5 to 8
 - in the integration of different sentences into the "reading-time" dimension. Examples 9 to 12
 - in the integration of independent problems and functions. Examples 13 to 39.

At the beginning I was rash enough to speak of "searching for new criteria". Has this article been productive of such? Some of the examples cited are old and have already become historic documents. The problems have already arisen and been solved. They have been solved in such a way that the results have remained fresh, living exemplars. Figure 7, the work of Max Bill, for example: If Allianz had to organize an exhibition again, today, twenty years later, the poster might be different but it could scarcely be more pertinent, better, more up to date.

As already said: In essentials these principles of "elementary" and "functional" typography are still valid and are observed to a very great extent. And new ones cannot be added where the solution of single problems is concerned.

However, today there are some changes: the production of printed matter has assumed unforeseen proportions. We are not only threatened by the danger of extravagance and superficiality where the individual creation, however excellent it may be, becomes lost, but also by the menace that the knowledge and experience of the pioneers, what has already been done and is generally recognized, will degenerate into mere formalism, become fashionable. The fulfilment of a dream threatens to become a nightmare. Here we are not allowed to resign. Here the designer must intervene, he must in a sense aim at a larger whole; he must not continue to carry out the single task so much as create structures from which single solutions can be derived.

This adds to the work of design a new dimension of planning, from the angle of both language and type.

The structure, once planned, always contains the elements of text and typography, always comprehends the whole and makes the single task possible. (Consider "Boite à musique": each task is always typical of the whole, bears the firm's image, and at the same time each is created in view of its special use, from the label to the poster). Thus work becomes more complex, and presupposes an intensified co-operation among all participants. But here design acquires meaning again. The greater effort and longer time dedicated to the development of the structure pays off in the end because it makes the detail work so much easier. And finally the new experience brings forth new impulses for the work on single tasks. In short: From the viewpoint of the whole structure, the integral design itself gains a new stability, a new up-to-dateness, a new significance in this age of short-lived production and corresponding waste of printed matter.

What I have tried to show on these pages cannot be a new typographical style. Because the "New Typography" was not an arbitrary fashion which has now served its purpose. It was the sweeping reform of our most important means of communication, the type face, in a period of sweeping changes. What we can and must do today is not change the inherited principles but extend them to new tasks. From the elementary, from the functional to the structural, the integral: this is the raw material for the new criteria.

Notes on the Essay "Integral Typography".

1

On the isms from 1914–1924 a book by Hans Arp and El Lissitzky appeared: "die Kunst-Ismen". Eugen Rentsch, Erlenbach 1925.

2

From an essay, "über typographie", in "Schweizer Graphische Mitteilungen", May 1946.

3

In other fields than typography the boundaries are more sharply drawn. Georg Schmidt, the apologist of functionalism, writes: "Dutch constructivism acted like a catalyst on architecture and on decorative arts and reduced house, furniture and utensil construction to the most elementary surface, body, space, and material tensions. The result was a much more direct relationship to material and construction in the field of house, furniture, and utensil construction, a complete renouncement of ornament and the discovery of the beauty of 'unornamented form' ". But: "Very soon one had to recognize that one had only slipped into a new formalism. Houses and furniture like this tried to be interesting constructivist sculptures and cared very little for actual use."

"Like every historical error this one was very salutary too. From it arose the further knowledge that house, furniture and utensils are not only conditioned by material and construction like a constructivist picture or a constructivist sculpture but even before this by the function." From an essay "Von der Beziehung zwischen Architektur und Malerei um 1920", in the magazine "Werk", July 1946.

4

"Elementare Typographie" was the title of a special issue of the magazine "Typographische Mitteilungen" edited by Jan Tschichold in Berlin, October 1920.

5

From "Die neue Typographie" by Jan Tschichold, Berlin 1928, Verlag des Bildungsverbandes der Deutschen Buchdrucker.

6

From an essay "Die neue Typographie" from the book "Staatliches Bauhaus in Weimar 1919–1923", Bauhausverlag, Weimar-München 1923.

7

"Die Galgenlieder" by Christian Morgenstern was first published in 1905 by Inselverlag. To the "Dada" creations in question belong above all Hugo Ball's "Lautgedichte", Hülsebeck's "Simultangedichte", Raoul Hausmann's phonetic poem "fmsba" which inspired Schwitters, following Hans Bolliger's "Dada-Lexikon", to write his "Sonata in Primeval Sounds". The reader can learn more from the "Dada-Monographie" published by Willy Verkauf, Arthur Niggli, Teufen 1957 and from the "Anthologie des Absseitigen" by Carola Giedion-Welcker, Benteli AG, Bern-Bümpliz 1946.

In a more restricted sense, i.e. rather as artificial than abstract poetry, mention should be made of the recent experimental texts of Max Bense. These texts are pro-

duced mechanically on a basis of aesthetic programming: "Bestandteile des Vorüber" and "Entwurf einer Rheinlandschaft"; both were published by Kiepenheuer and Witsch in Cologne. In 1962 the same publishers brought out Bense's "Theorie der Texte".

8

An excellent edition of the "Coup de dés" was published in accordance with the last directions of the poet, who died in 1897, at the "Librairie Gallimard in 'Editions de la Nouvelle Revue Française', Paris 1914. Also in 1897, another poet was giving thought to the typographical presentation of his work: Stefan George. At the "Verlag der Blätter für die Kunst" appeared "Das Jahr der Seele". The typographical design was by Melchior Lechner. In 1898 Arno Holz published the first "Phantasusheft". It contained fifty poems which were free of metrics, strophe, rhyme and were accentuated typographically by the fact that words which belong together rhythmically were always taken together in one line and the lines of most varying length were set on the central axis. A complete edition appeared at J. H. W. Dietz Nachfolger, Berlin 1925. In the following years the poets Apollinaire and Marinetti applied themselves intensely to typography. "Caligrammes" by Apollinaire was published by Gallimard, Paris 1925. Marinetti's principal work in this respect, "Les mots en liberté futuriste", appeared at the "Edizione futurista di poesia", Milan 1919. Besides Schwitters, Käthe Steinitz and Theo van Doesburg ("Die Scheuche", Apossverlag, Hanover 1925) belong to the typographical poet revolutionists. An equally important work is the poetry volume written by Majakowsky and typographically designed by Lissitzky, "Dlja Gôlossa" (to be read aloud), Russian State Edition, Moscow 1923. And so on. A more recent publication in this field is "Les Epiphanies" by Henri Pichette whose typography was designed by Pierre Lefauchaux and appeared 1948 at "k éditeur", Paris. And I may also mention in this ancestors' gallery the novel "Schiff nach Europa" by Markus Kutter, which I organized visually and which was published by Arthur Niggli, Teufen 1957.

9

From the essay on Stéphane Mallarmé in "Variété II", Gallimard, Paris 1930.

10

From "Konstellationen", poetry volume in four languages, Spiral Press, Berne 1953.

11

From an article in "Neue Zürcher Zeitung", September 1954, on the page "Young Swiss Authors answer".

12

From an essay "vom vers zur konstellation, zweck und form einer neuen dichtung", in the magazine "Spirale", No. 5, Spiral Press, Stadion Wankdorf, Berne 1955. "Spirale" publishes in each number authors spiritually related to Gomringer such as Augusto de Campos, Helmut Heissenbüttel, Décio Pignatari and so on. Furthermore Daniel Spoerri publishes a magazine in Darmstadt which counts among its collaborators the same authors as "Spirale". In 1959 there appeared in Sao Paulo at Editora Kos-

Hito Steyerl

In Defense of the Poor Image

01/09

The poor image is a copy in motion. Its quality is bad, its resolution substandard. As it accelerates, it deteriorates. It is a ghost of an image, a preview, a thumbnail, an errant idea, an itinerant image distributed for free, squeezed through slow digital connections, compressed, reproduced, ripped, remixed, as well as copied and pasted into other channels of distribution.

The poor image is a rag or a rip; an AVI or a JPEG, a lumpen proletarian in the class society of appearances, ranked and valued according to its resolution. The poor image has been uploaded, downloaded, shared, reformatted, and reedited. It transforms quality into accessibility, exhibition value into cult value, films into clips, contemplation into distraction. The image is liberated from the vaults of cinemas and archives and thrust into digital uncertainty, at the expense of its own substance. The poor image tends towards abstraction: it is a visual idea in its very becoming.

The poor image is an illicit fifth-generation bastard of an original image. Its genealogy is dubious. Its filenames are deliberately misspelled. It often defies patrimony, national culture, or indeed copyright. It is passed on as a lure, a decoy, an index, or as a reminder of its former visual self. It mocks the promises of digital technology. Not only is it often degraded to the point of being just a hurried blur, one even doubts whether it could be called an image at all. Only digital technology could produce such a dilapidated image in the first place.

Poor images are the contemporary Wretched of the Screen, the debris of audiovisual production, the trash that washes up on the digital economies' shores. They testify to the violent dislocation, transferrals, and displacement of images – their acceleration and circulation within the vicious cycles of audiovisual capitalism. Poor images are dragged around the globe as commodities or their effigies, as gifts or as bounty. They spread pleasure or death threats, conspiracy theories or bootlegs, resistance or stultification. Poor images show the rare, the obvious, and the unbelievable – that is, if we can still manage to decipher it.

1. Low Resolutions

In one of Woody Allen's films the main character is out of focus.¹ It's not a technical problem but some sort of disease that has befallen him: his image is consistently blurred. Since Allen's character is an actor, this becomes a major problem: he is unable to find work. His lack of definition turns into a material problem. Focus is identified as a class position, a position of ease and privilege, while being out of focus lowers one's value as an image.

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Shoveling pirated DVDs in Taiyuan, Shanxi province, China, April 20, 2008.

The contemporary hierarchy of images, however, is not only based on sharpness, but also and primarily on resolution. Just look at any electronics store and this system, described by Harun Farocki in a notable 2007 interview, becomes immediately apparent.² In the class society of images, cinema takes on the role of a flagship store. In flagship stores high-end products are marketed in an upscale environment. More affordable derivatives of the same images circulate as DVDs, on broadcast television or online, as poor images.

Obviously, a high-resolution image looks more brilliant and impressive, more mimetic and magic, more scary and seductive than a poor one. It is more rich, so to speak. Now, even consumer formats are increasingly adapting to the tastes of cineastes and esthetes, who insisted on 35 mm film as a guarantee of pristine visibility. The insistence upon analog film as the sole medium of visual importance resounded throughout discourses on cinema, almost regardless of their ideological inflection. It never mattered that these high-end economies of film production were (and still are) firmly anchored in systems of national culture, capitalist studio production, the cult of mostly male genius, and the original version, and thus are often

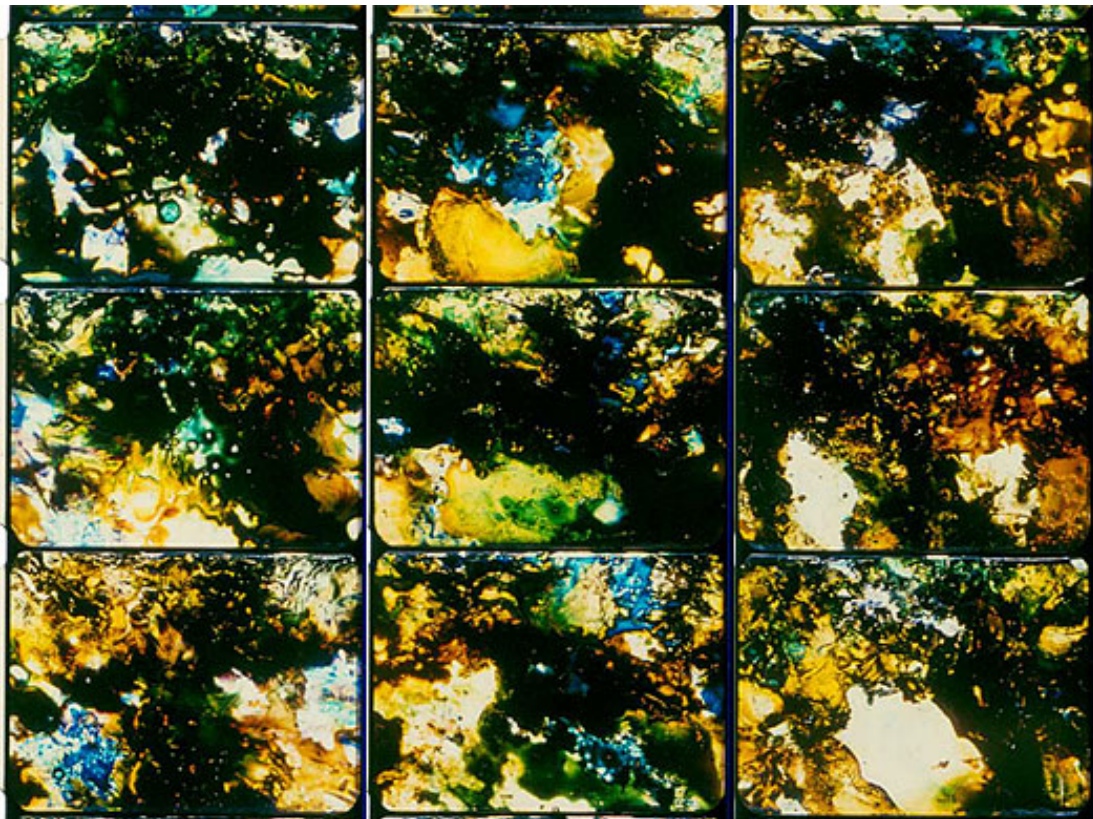
conservative in their very structure. Resolution was fetishized as if its lack amounted to castration of the author. The cult of film gauge dominated even independent film production. The rich image established its own set of hierarchies, with new technologies offering more and more possibilities to creatively degrade it.

2. Resurrection (as Poor Images)

But insisting on rich images also had more serious consequences. A speaker at a recent conference on the film essay refused to show clips from a piece by Humphrey Jennings because no proper film projection was available. Although there was at the speaker's disposal a perfectly standard DVD player and video projector, the audience was left to imagine what those images might have looked like.

In this case the invisibility of the image was more or less voluntary and based on aesthetic premises. But it has a much more general equivalent based on the consequences of neoliberal policies. Twenty or even thirty years ago, the neoliberal restructuring of media production began slowly obscuring non-commercial imagery, to the point where experimental and essayistic cinema became almost invisible. As it became prohibitively

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Nine 35mm film frames from Stan Brakhage's *Existence is Song*, 1987.

expensive to keep these works circulating in cinemas, so were they also deemed too marginal to be broadcast on television. Thus they slowly disappeared not just from cinemas, but from the public sphere as well. Video essays and experimental films remained for the most part unseen save for some rare screenings in metropolitan film museums or film clubs, projected in their original resolution before disappearing again into the darkness of the archive.

This development was of course connected to the neoliberal radicalization of the concept of culture as commodity, to the commercialization of cinema, its dispersion into multiplexes, and the marginalization of independent filmmaking. It was also connected to the restructuring of global media industries and the establishment of monopolies over the audiovisual in certain countries or territories. In this way, resistant or non-conformist visual matter disappeared from the surface into an underground of alternative archives and collections, kept alive only by a network of committed organizations and individuals, who would circulate bootlegged VHS copies amongst themselves. Sources for these were extremely rare – tapes moved from hand to hand, depending on word of mouth, within circles

of friends and colleagues. With the possibility to stream video online, this condition started to dramatically change. An increasing number of rare materials reappeared on publicly accessible platforms, some of them carefully curated (Ubuweb) and some just a pile of stuff (YouTube).

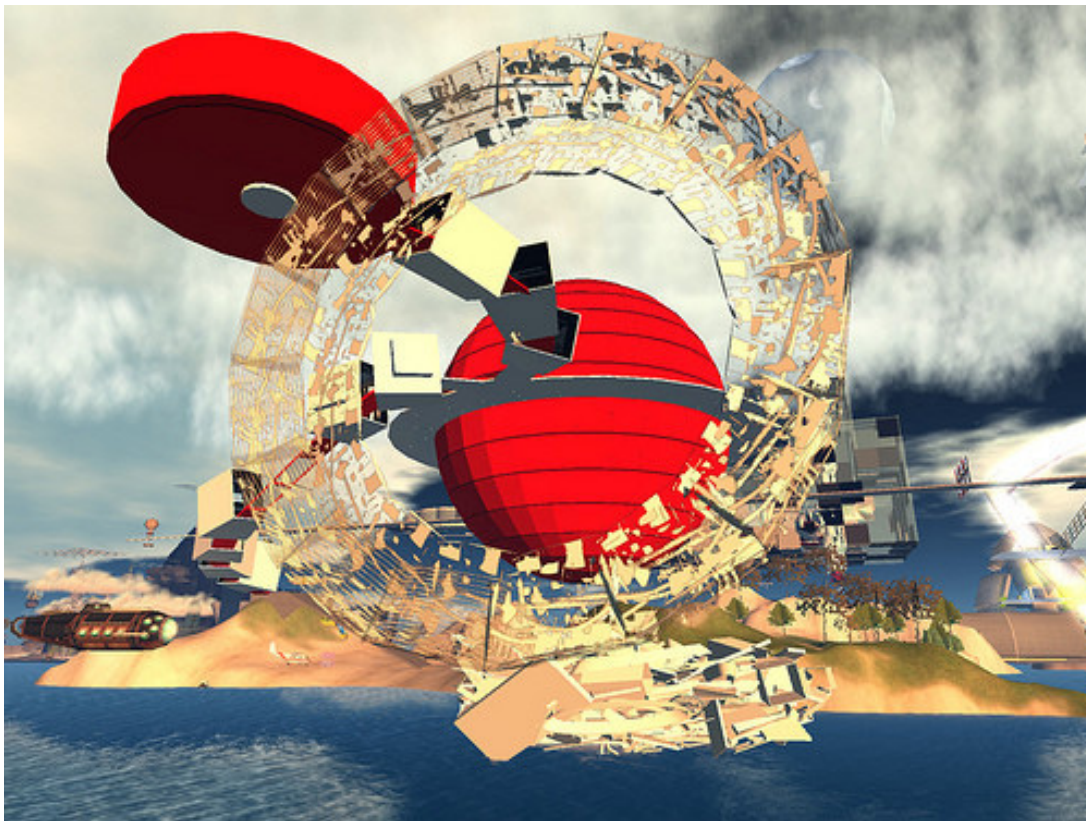
At present, there are at least twenty torrents of Chris Marker's film essays available online. If you want a retrospective, you can have it. But the economy of poor images is about more than just downloads: you can keep the files, watch them again, even reedit or improve them if you think it necessary. And the results circulate. Blurred AVI files of half-forgotten masterpieces are exchanged on semi-secret P2P platforms. Clandestine cell-phone videos smuggled out of museums are broadcast on YouTube. DVDs of artists' viewing copies are bartered.³ Many works of avant-garde, essayistic, and non-commercial cinema have been resurrected as poor images. Whether they like it or not.

3. Privatization and Piracy

That rare prints of militant, experimental, and classical works of cinema as well as video art reappear as poor images is significant on another level. Their situation reveals much more than the content or appearance of the images

04/09





Chris Marker's virtual home on Second Life, May 29, 2009.

themselves: it also reveals the conditions of their marginalization, the constellation of social forces leading to their online circulation as poor images.⁴ Poor images are poor because they are not assigned any value within the class society of images – their status as illicit or degraded grants them exemption from its criteria. Their lack of resolution attests to their appropriation and displacement.⁵

Obviously, this condition is not only connected to the neoliberal restructuring of media production and digital technology; it also has to do with the post-socialist and postcolonial restructuring of nation states, their cultures, and their archives. While some nation states are dismantled or fall apart, new cultures and traditions are invented and new histories created. This obviously also affects film archives – in many cases, a whole heritage of film prints is left without its supporting framework of national culture. As I once observed in the case of a film museum in Sarajevo, the national archive can find its next life in the form of a video-rental store.⁶ Pirate copies seep out of such archives through disorganized privatization. On the other hand, even the British Library sells off its contents online at astronomical prices.

As Kodwo Eshun has noted, poor images circulate partly in the void left by state-cinema organizations who find it too difficult to operate as a 16/35-mm archive or to maintain any kind of distribution infrastructure in the contemporary era.⁷ From this perspective, the poor image reveals the decline and degradation of the film essay, or indeed any experimental and non-commercial cinema, which in many places was made possible because the production of culture was considered a task of the state. Privatization of media production gradually grew more important than state controlled/sponsored media production. But, on the other hand, the rampant privatization of intellectual content, along with online marketing and commodification, also enable piracy and appropriation; it gives rise to the circulation of poor images.

4. Imperfect Cinema

The emergence of poor images reminds one of a classic Third Cinema manifesto, *For an Imperfect Cinema*, by Juan García Espinosa, written in Cuba in the late 1960s.⁸ Espinosa argues for an imperfect cinema because, in his words, “perfect cinema – technically and artistically masterful – is almost always reactionary cinema.” The imperfect cinema is one that strives to overcome the divisions of labor within class society. It merges art with life and science, blurring the distinction between consumer and producer, audience and author. It insists upon its own

imperfection, is popular but not consumerist, committed without becoming bureaucratic.

In his manifesto, Espinosa also reflects on the promises of new media. He clearly predicts that the development of video technology will jeopardize the elitist position of traditional filmmakers and enable some sort of mass film production: an art of the people. Like the economy of poor images, imperfect cinema diminishes the distinctions between author and audience and merges life and art. Most of all, its visuality is resolutely compromised: blurred, amateurish, and full of artifacts.

In some way, the economy of poor images corresponds to the description of imperfect cinema, while the description of perfect cinema represents rather the concept of cinema as a flagship store. But the real and contemporary imperfect cinema is also much more ambivalent and affective than Espinosa had anticipated. On the one hand, the economy of poor images, with its immediate possibility of worldwide distribution and its ethics of remix and appropriation, enables the participation of a much larger group of producers than ever before. But this does not mean that these opportunities are only used for progressive ends. Hate speech, spam, and other rubbish make their way through digital connections as well. Digital communication has also become one of the most contested markets – a zone that has long been subjected to an ongoing original accumulation and to massive (and, to a certain extent, successful) attempts at privatization.

The networks in which poor images circulate thus constitute both a platform for a fragile new common interest and a battleground for commercial and national agendas. They contain experimental and artistic material, but also incredible amounts of porn and paranoia. While the territory of poor images allows access to excluded imagery, it is also permeated by the most advanced commodification techniques. While it enables the users' active participation in the creation and distribution of content, it also drafts them into production. Users become the editors, critics, translators, and (co-)authors of poor images.

Poor images are thus popular images – images that can be made and seen by the many. They express all the contradictions of the contemporary crowd: its opportunism, narcissism, desire for autonomy and creation, its inability to focus or make up its mind, its constant readiness for transgression and simultaneous submission.⁹ Altogether, poor images present a snapshot of the affective condition of the crowd, its neurosis, paranoia, and fear, as well as its craving for intensity, fun, and distraction. The condition of the images

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speaks not only of countless transfers and reformattings, but also of the countless people who cared enough about them to convert them over and over again, to add subtitles, reedit, or upload them.

In this light, perhaps one has to redefine the value of the image, or, more precisely, to create a new perspective for it. Apart from resolution and exchange value, one might imagine another form of value defined by velocity, intensity, and spread. Poor images are poor because they are heavily compressed and travel quickly. They lose matter and gain speed. But they also express a condition of dematerialization, shared not only with the legacy of conceptual art but above all with contemporary modes of semiotic production.¹⁰ Capital's semiotic turn, as described by Felix Guattari,¹¹ plays in favor of the creation and dissemination of compressed and flexible data packages that can be integrated into ever-newer combinations and sequences.¹²

This flattening-out of visual content – the concept-in-becoming of the images – positions them within a general informational turn, within economies of knowledge that tear images and their captions out of context into the swirl of permanent capitalist deterritorialization.¹³ The history of conceptual art describes this

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dematerialization of the art object first as a resistant move against the fetish value of visibility. Then, however, the dematerialized art object turns out to be perfectly adapted to the semioticization of capital, and thus to the conceptual turn of capitalism.¹⁴ In a way, the poor image is subject to a similar tension. On the one hand, it operates against the fetish value of high resolution. On the other hand, this is precisely why it also ends up being perfectly integrated into an information capitalism thriving on compressed attention spans, on impression rather than immersion, on intensity rather than contemplation, on previews rather than screenings.

5. Comrade, what is your visual bond today?

But, simultaneously, a paradoxical reversal happens. The circulation of poor images creates a circuit, which fulfills the original ambitions of militant and (some) essayistic and experimental cinema – to create an alternative economy of images, an imperfect cinema existing inside as well as beyond and under commercial media streams. In the age of file-sharing, even marginalized content circulates again and reconnects dispersed worldwide audiences.



Thomas Ruff, *jpeg rl104*, 2007.

The poor image thus constructs anonymous global networks just as it creates a shared history. It builds alliances as it travels, provokes translation or mistranslation, and creates new publics and debates. By losing its visual substance it recovers some of its political punch and creates a new aura around it. This aura is no longer based on the permanence of the “original,” but on the transience of the copy. It is no longer anchored within a classical public sphere mediated and supported by the frame of the nation state or corporation, but floats on the surface of temporary and dubious data pools.¹⁵ By drifting away from the vaults of cinema, it is propelled onto new and ephemeral screens stitched together by the desires of dispersed spectators.

The circulation of poor images thus creates “visual bonds,” as Dziga Vertov once called them.¹⁶ This “visual bond” was, according to Vertov, supposed to link the workers of the world with each other.¹⁷ He imagined a sort of communist, visual, Adamic language that could not only inform or entertain, but also organize its viewers. In a sense, his dream has come true, if mostly under the rule of a global information capitalism whose audiences are linked almost in a physical sense by mutual excitement, affective attunement, and anxiety.

But there is also the circulation and production of poor images based on cell phone cameras, home computers, and unconventional forms of distribution. Its optical connections – collective editing, file sharing, or grassroots distribution circuits – reveal erratic and coincidental links between producers everywhere, which simultaneously constitute dispersed audiences.

The circulation of poor images feeds into both capitalist media assembly lines and alternative audiovisual economies. In addition to a lot of confusion and stupefaction, it also possibly creates disruptive movements of thought and affect. The circulation of poor images thus initiates another chapter in the historical genealogy of nonconformist information circuits: Vertov’s “visual bonds,” the internationalist workers pedagogies that Peter Weiss described in *The Aesthetics of Resistance*, the circuits of Third Cinema and Tricontinentalism, of non-aligned filmmaking and thinking. The poor image – ambivalent as its status may be – thus takes its place in the genealogy of carbon-copied pamphlets, cine-train agit-prop films, underground video magazines and other nonconformist materials, which aesthetically often used poor materials. Moreover, it reactualizes many of the historical ideas associated with these circuits, among others Vertov’s idea of the visual bond.

Imagine somebody from the past with a beret asking you, “Comrade, what is your visual bond today?”

You might answer: it is this link to the present.

6. Now!

The poor image embodies the afterlife of many former masterpieces of cinema and video art. It has been expelled from the sheltered paradise that cinema seems to have once been.¹⁸ After being kicked out of the protected and often protectionist arena of national culture, discarded from commercial circulation, these works have become travelers in a digital no-man’s land, constantly shifting their resolution and format, speed and media, sometimes even losing names and credits along the way.

Now many of these works are back – as poor images, I admit. One could of course argue that this is not the real thing, but then – please, anybody – show me this real thing.

The poor image is no longer about the real thing – the originary original. Instead, it is about its own real conditions of existence: about swarm circulation, digital dispersion, fractured and flexible temporalities. It is about defiance and appropriation just as it is about conformism and exploitation.

In short: it is about reality.

×

An earlier version of this text was improvised in a response at the “Essayfilm – Ästhetik und Aktualität” conference in Lüneburg, Germany, organized by Thomas Tode and Sven Kramer in 2007. The text benefitted tremendously from the remarks and comments of *Third Text* guest editor Kodwo Eshun, who commissioned a longer version for an issue of *Third Text* on Chris Marker and Third Cinema to appear in 2010 (co-edited by Ros Grey). Another substantial inspiration for this text was the exhibition “Dispersion” at the ICA in London (curated by Polly Staple in 2008), which included a brilliant reader edited by Staple and Richard Birkett. The text also benefitted greatly from Brian Kuan Wood’s editorial work.

08/09

e-flux journal #10 — november 2009 Hito Steyerl
In Defense of the Poor Image

Hito Steyerl is a filmmaker and writer. She teaches New Media Art at University of Arts Berlin and has recently participated in Documenta 12, Shanghai Biennial, and Rotterdam Film Festival.

09/09

1
Deconstructing Harry, directed by Woody Allen (1997).

2
"Wer Gemälde wirklich sehen will, geht ja schließlich auch ins Museum," *Frankfurter Allgemeine Zeitung*, June 14, 2007. Conversation between Harun Farocki and Alexander Horwath.

3
Sven Lütticken's excellent text "Viewing Copies: On the Mobility of Moving Images," in *e-flux journal*, no. 8 (May 2009), drew my attention to this aspect of poor images.

4
Thanks to Kodwo Eshun for pointing this out.

5
Of course in some cases images with low resolution also appear in mainstream media environments (mainly news), where they are associated with urgency, immediacy, and catastrophe – and are extremely valuable. See Hito Steyerl, "Documentary Uncertainty," *A Prior* 15 (2007), <http://magazines.documenta.de/frontend/article.php?idLanguage=1&NrArticle=584>.

6
Hito Steyerl, "Politics of the Archive: Translations in Film," *Transversal* (March 2008), <http://eipcp.net/transversal/0608/steyerl/en>.

7
From correspondence with the author via e-mail.

8
Julio García Espinosa, "For an Imperfect Cinema," □trans. Julianne Burton, *Jump Cut*, no. 20 (1979): 24–26.

9
See Paolo Virno, *A Grammar of the Multitude: For an Analysis of Contemporary Forms of Life* (Cambridge, MA: MIT Press, 2004).

10
See Alex Alberro, *Conceptual Art and the Politics of Publicity* (Cambridge, MA: MIT Press, 2003).

11
See Félix Guattari, "Capital as the Integral of Power Formations," in *Soft Subversions* (New York: Semiotext(e), 1996), 202.

12
All these developments are discussed in detail in an excellent text by Simon Sheikh, "Objects of Study or Commodification of Knowledge? Remarks on Artistic Research," *Art & Research* 2, no. 2 (Spring 2009), <http://www.artandresearch.org.uk/v2n2/sheikh.html>.

13
See also Alan Sekula, "Reading

an Archive: Photography between Labour and Capital," in *Visual Culture: The Reader*, ed. Stuart Hall and Jessica Evans (London/New York: Routledge 1999), 181–192.

14
See Alberro, *Conceptual Art and the Politics of Publicity*.

15
The Pirate Bay even seems to have tried acquiring the extraterritorial oil platform of Sealand in order to install its servers there. See Jan Libbenga, "The Pirate Bay plans to buy Sealand," *The Register*, January 12, 2007, http://www.theregister.co.uk/2007/01/12/pirate_bay_buys_island.

16
Dziga Vertov, "Kinopravda and Radiopravda," in *Kino-Eye: The Writings of Dziga Vertov*, ed. Annette Michelson (Berkeley: University of California Press, 1995), 52.

17
Vertov, "Kinopravda and Radiopravda," 52.

18
At least from the perspective of nostalgic delusion.

e-flux journal #10 — november 2009 Hito Steyerl
In Defense of the Poor Image

Once Again, The Doorknob

On Affordance, Forgiveness and Ambiguity in Human Computer and Human Robot Interaction
Keynote at Rethinking Affordance Symposium

Akademie Schloss Solitude, 8 June 2018¹

I think it is absolutely wonderful that there is an event about affordance and an idea that this concept could be rethought. I guess you invited me to talk as an artist who is critically reflecting on the medium she is working with. Indeed as a net artist I do my best to show the properties of the medium, and as a web archivist and Digital Folklore researcher I examine the way users deal with the world they're thrown into by developers. I suggest we talk about these aspects later, during the Q and A session because it would be good to start in the more applied context of HCI and interface design, since this is where the term lives now and where it is discussed and interpreted. These interpretations affect crucial matters.

The following might sound like an introduction or a lengthy side note, but in fact it is what I really want to tell you today. Interface design is a very powerful profession and occupation, a field where a lot of decisions are made, gently and silently. Not always with bad intentions, very often without any intention at all. But decisions are made, metaphors chosen, idioms learned, affordances introduced—and the fact that they were just somebody's impulsive picks doesn't make them less important. To say that design of user interfaces influences our daily life is a commonplace and an understatement. User interfaces influence people's understanding of processes, form relations with the companies that provide services. Interfaces define roles computer users get to play in computer culture.

I teach students who, if they don't change their mind, will become interface designers (or "front end developers," or "UX designers," there are many different terms and each of them could be a subject of investigation.) I strongly believe that interface designers should not start to study by trying to make their first prototype of something that looks the same or better or different from what already exists; they shouldn't learn functions and tricks in Sketch, master drop shadows and rounded corners. I know, that's easy to state, but what is the alternative? It would be strange to expect or demand that they study philosophy, cybernetics, Marxism, dramaturgy and arts (though all these would be very desirable)—and only afterwards make their first button or gesture.

The compromise I found is introducing them to key texts that reveal what power designers of user interfaces have and that there is no objective reality or reasoning, no nature of things, no laws, no commandments; only decisions that were and will be made consciously or unconsciously.

"It is important for designers and builders of computer applications to understand the history of transparency, so that they can understand that they have a choice."²

This quote is from the very beginning of the book *Windows and Mirrors*, written by Jay Bolter and Diana Gromala 15 years ago. Unfortunately the book—relatively well-known in new media theory since one of the authors coined the term Remediation³—is largely ignored in interface design circles. Unfortunately because it questions mainstream practices based on the postulate that the best interface is intuitive, transparent, or actually no interface.

The book very much corresponds to the conference call you published,⁴ because it is almost exclusively artists who chose reflectivity over transparency, and these are artists who are re-thinking, re-imagining, and some times manage to intervene and correct the course of events.

Ten years ago I invited my former student and artist Johannes Osterhoff to teach the basics (in our common understanding of what basics are) of interface design. You may know his witty year-long

performances Google,⁵ iPhone live,⁶ Dear Jeff Bezos,⁷ and other works that reflect on algorithmic and interactive regimes. For his artistic practice, Johannes calls himself “interface artist,” a quite unique self-identification.

He named his course after the book *Windows and Mirrors* and guided students to create projects that were all about looking at interfaces, reflecting upon metaphors, idioms, and affordances.

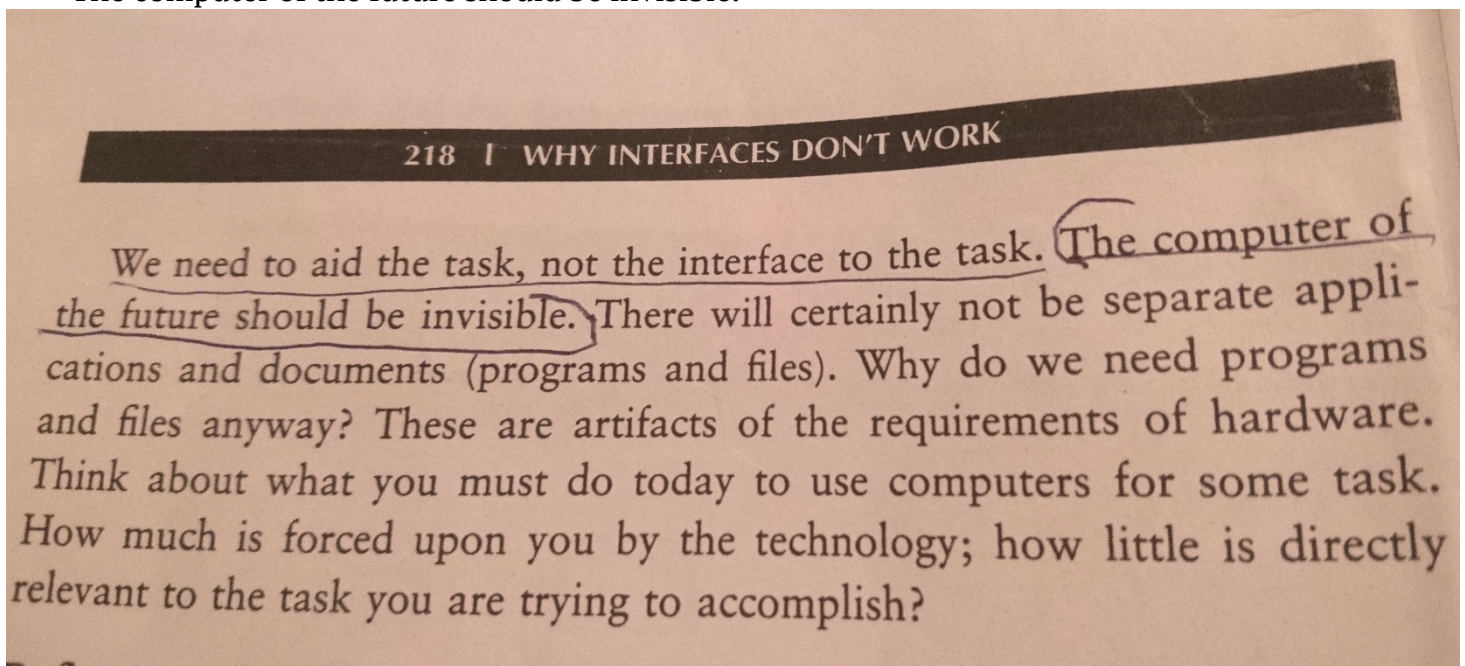
Soon after, Johannes took the position of Senior UX Designer at SAP, one of the world’s biggest enterprise software corporations (and it is also not a side note, I will come back to this fact later.) So I took over the course from him a few years ago.

Where do I start with interface design in 2018?

I begin with an essay published in 1991 in Brenda Laurel’s *The Art of Human Computer Interaction*,⁸ a book that I rediscover and rediscover for myself year after year. It contains articles by practitioners who now, almost three decades later, either have turned into pop stars—heroes of the electronic age—, people who were forgotten, or recently rediscovered. In 1990, five years after “the rest of us” had their first experience with graphical user interfaces, they convened to analyze what went wrong and what could be done about these mistakes.

The text I ask students to read is *Why Interfaces Don’t Work* by Don Norman. It contains statements quoted and referenced by already several generations of interface designers:

- The problem with the interface is that there is an interface.⁹
- What are computer for? The user, that’s why – making life easier for the user.¹⁰
- Make the task dominate, make the tools invisible.¹¹
- The computer of the future should be invisible.¹²



► transcription

Curiously, these particular points were not typographically emphasized by the author himself, but anyway became a manifesto and mainstream paradigm for thinking about computers.

In *Why Interfaces Don’t Work*, sentence after sentence, metaphor after metaphor, Norman claims that users of computers are interested in whatever but not the computers themselves; they want to spend the least time possible with a computer. As a theoretician and more important as a practitioner at Apple, Norman was indeed pushing the development of invisible or transparent interfaces. This is how the word “transparent” started to mean “invisible” or “simple” in interface design circles.

Sherry Turkle sums up this swift development in the 2004 introduction to her 1984 book *The Second Self*:

“In only a few years the ‘Macintosh meaning’ of the word Transparency had become a new lingua franca. By the mid-1990s, when people said that something was transparent, they meant that they could immediately make it work, not that they knew how it worked.”¹³

The idea that the users shouldn’t even notice that there is an interface was widely and totally accepted and seen as a blessing. Jef Raskin, initiator of the Macintosh project and author of many thoughtful and otherwise highly recommended texts writes in the very beginning of *The Humane Interface*:

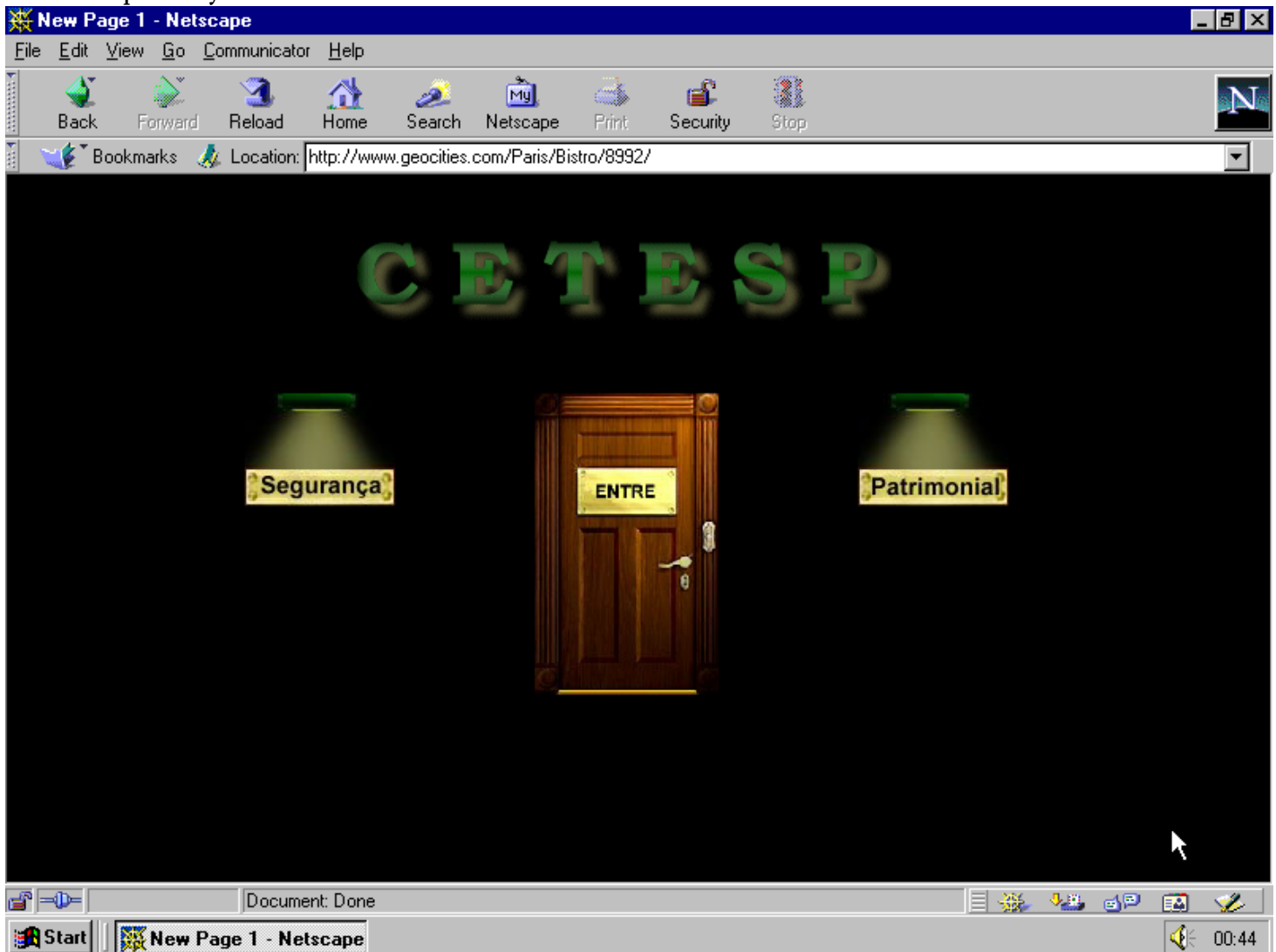
“Users do not care what is inside the box, as long as the box does what they need done. [...]

What users want is convenience and results.”¹⁴

Period. No manuals or papers that would contradict. Though in practice we could see alternatives: works of media artists, discussed in the aforementioned *Windows and Mirrors*, and of course the web of the 90’s.

The best counter example to users not wanting to think about interfaces is early web design where people were constantly busy with envisioning and developing interfaces.

Sorry, I can’t stop myself from showing some examples from my One Terabyte of Kilobyte Age archive to you. I hope you can sense the the people who created these pages developed against the invisibility and transparency of interfaces.



I have many more. But back to Norman: to support his intention of removing the interface from even the peripheral view of the user he quotes himself from *Psychology Of Everyday Things*¹⁵ and lifts the doorknob metaphor from industrial design to the world of HCI.

“A door has an interface – the doorknob and other hardware – but we should not have to think of ourselves using the interface to the door: we simply think about ourselves as going through the door or closing or opening the door.”¹⁶

I really don't know any mantra that has been quoted more often in interface design circles.

You can ask, if I am obviously sarcastic and disagreeing with any of the points Norman makes, why do I ask students to read exactly this text? The reason is the sentence right after the previous quote:

“The computer really is special: it is not just another mechanical device.”¹⁷

No one ever wants to refer to this moment of weakness; already in the next phrase Norman says that the metaphor applies anyway and the computer's purpose is to simplify lives.

But this “not just another mechanical device” is the most important thing I like to make students aware of: the complexity and beauty of general purpose computers. Their purpose is not to simplify life. It is maybe a side effect sometimes. The purpose was or could have been man computer symbiosis, “the question is not what is the answer the question is what is the question”¹⁸ Licklider quoted french philosopher Anry Puancare when he wrote his programmatic Man Computer Symbiosis, meaning that computers as colleagues should be a part of formulating questions.

The purpose could be Bootstrapping as in Engelbart¹⁹ or, as Vilém Flusser formulated 1991 in Digitaler Schein²⁰—the same year as the Norman's text was published!—: “Verwirklichen von Möglichkeiten,”²¹ realizing opportunities. All this is quite different from “making life easier.”

One can sense that Norman's colleagues and contemporaries were not that excited about the doorknob metaphor. In a short introductory article “What is Interface,” Brenda Laurel diplomatically notices that in fact door knobs and doors are beaming complexity, control and power, “who is doing what to whom.”²²

astronaut and the void. What gives these interfaces their shape? The shape of the interface reflects the physical qualities of the parties to the interaction (the interactors, if you will). A doorknob is hard and firmly mounted because of the weight and hardness of the door; it is round or handle-shaped because of the nature of the hand that will use it. The doorknob's physical qualities also reflect the physical aspects of its function. It is designed to be turned so that the latch is released and so that it is easier for the user to pull the door open.

A point that's often missed is that the shape of the interface also reflects who is doing what to whom. The doorknob extends toward the user and its qualities are biased toward the hand. The door will be opened; a human will open it—the human is the agent and the door is the patient of the action. In a high-security government office I visited the other day, there was no doorknob at all. I was screened by a hidden camera and the door opened for me when I passed muster. My sense of who was in control of the interaction was quite different from the way I feel when I enter a room in my house. In the office, the door—representing the institution to which it was a portal—was in control.

An interface is a contact surface. It reflects the physical properties of the interactors, the functions to be performed, and the balance of power and

► transcription

In 1992 French philosopher Bruno Latour, who according to his reference list was acquainted with Norman's writings, published *Where Are the Missing Masses? The Sociology of a few mundane artifacts*.²³ The text contains the mind blowing section "Description of the door" that canonizes the door as a "miracle of technology" which "maintains the wall hole in a reversible state." Word by word his investigation of a note pinned onto a door—"The groom is on Strike, For God's Sake, Keep the door Closed"—and with elaboration on every mechanical detail—knobs, hinges, grooves—he dismounts Norman's intention to perceive the doorknob as something simple, obvious, and intuitive.

* * *

Why Interfaces Don't Work is not mentioning the word affordance, but the door knob is a symbol of it, accompanying the term from one design manual to another. And more importantly it was again Don Norman who among other things—or should I say first and foremost—adapted and reinterpreted the term Affordance, originally coined by ecological psychologist Gibson, for the world of Human Computer Interaction.

A very good basic summary on the topic was written by Viktor Kapelinin with *Article on Affordances* in the 2nd edition of *Encyclopedia of HCI*, a highly recommended resource.

“Affordance is [...] considered a fundamental concept in HCI research and described as a basic design principle in HCI and interaction design.”²⁴

Affordance as in Norman, not in Gibson.

Gibson’s Affordances

- Offerings or action possibilities in the environment in relation to the action capabilities of an actor
- Independent of the actor’s experience, knowledge, culture, or ability to perceive
- Existence is binary – an affordance exists or it does not exist

Norman’s Affordances

- Perceived properties that may or may not actually exist
- Suggestions or clues as to how to use the properties
- Can be dependent on the experience, knowledge, or culture of the actor
- Can make an action difficult or easy

Table 1: Comparison of affordances as defined by Gibson and Norman.

► transcription

The difference is properly explained in a widely quoted table from *Affordances: Clarifying and Evolving a Concept* by Joanna McGrenere and Wayne Ho written in 2000.²⁵ The authors summarize the shift:

“Norman [...] is specifically interested in manipulating or designing the environment” so that utility can be perceived easily.”

...or vice versa...

“Unlike Norman’s inclusion of an object’s perceived properties, or rather, the information that specifies how the object can be used, a Gibsonian affordance is independent of the actor’s ability to perceive it.”²⁶

As we know, Don Norman later admitted²⁷ to misinterpreting the term, corrected it to “perceived affordances,” and excused for starting the mess and devaluation of the term.²⁸

“Far too often I hear graphic designers claim that they have added an affordance to the screen design when they have done nothing of the sort. Usually they mean that some graphical depiction suggests to the user that a certain action is possible. This is not affordance, either real or perceived. Honest, it isn’t. It is a symbolic communication, one that works only if it follows a convention understood by the user.”²⁹

Almost 20 years later, as the community has grown, claims become even more ridiculous, with the word affordance being used by UX designers in all possible meanings, as a synonym for whatever. When I started to work on this lecture Medium.com, which always knows what I am interested in at the moment, delivered to me a fresh 11 minutes read on uxplanet.org: *How to use affordances in UX*.³⁰ Already the title indicates confusion, but not to the author who obviously thinks that affordance is an element of an app and it can be used as a synonym for Menu, Button, Illustration, Logo, or Photo. The

article references a three years old text³¹ laying out six rather absurd types of affordances: explicit, hidden, pattern, metaphorical, false, and negative.

This terminological mess is nothing new for the design discipline; also the word affordance and its usage are not the biggest deal. There are other terms at stake and their usage is more troubling such as “transparency” or “experience.” Maybe this affordance clownery could be ignored or could be even seen positively as a commendable attempt to bring sense into a world of clicking, swiping and drag-and-dropping; a good intention to contextualize them to interpret them through psychology and philosophy.

But I’d also like to mention that this urge to talk about and define affordances is not so innocent, with affordance being a corner stone of the HCI paradigm User Centered Design—which was coined³² and conceptualized by (again!) Don Norman in the mid-1980’s—as well as the User Experience bubble that (again!!) Don Norman started.³³ Both blew up 1993 when he became head of research at Apple. User Experience or UX swallowed other possible ways to see what an interface is and how it could be.

In my essay Rich User Experience, UX and Desktopization of War³⁴ I wrote about the danger of scripting and orchestrating user experiences, in Turing Complete User³⁵ I mention that it is very difficult to criticize the concept, because it has developed a strong aura of doing the right thing, of “seeing more,” “seeing beyond,” etc.

I asked aforementioned Johannes Osterhoff about his interpretation of UX. Quoting from his direct message:³⁶



When I say UX I usually mean the processes that I set up so that a product meets customer‘ (i.e. users‘) needs. Processes because usually I deal with complicated tools that take a long time to develop and refine - much beyond an initial mock-up and a quick subsequent implementation. So when I say UX I mean the interplay of measures that have to be taken to enhance a special piece of software on the long run: this involves several disciplines such as user research, usability testing, interaction design, information visualization, prototyping, scientific and cultural research, and some visual design. In a big software company, strategy and psychology is part of this, too. And also streams of communication; which form and frequency is adequate, what works in cross-located teams and what does not.

Jun 3

► transcription

Another former student, Florian Dusch, principal of the software design and research company “zigzag” in Stuttgart, when answering my question also refers to UX as “many things,” “holistic,” and “not only pretty images.”³⁷



Not sure if that was clever enough to be quoted. :)

23h



We’re working hard with our clients to make them understand that UX is not only pretty images but a holistic user-centered approach to building products. There’s a nice video from Don Norman on that.

23h

► transcription

The next quote is from *The best Interface is no interface*,³⁸ a very expressive book brought to the world in 2015 by Golden Krishna who “currently works at Google on design strategy to shape the future of Android.”³⁹

This is UI:

Navigation, subnavigation, menus, drop-downs, buttons, links, windows, rounded corners, shadowing, error messages, alerts, updates, checkboxes, password fields, search fields, text inputs, radio selections, text areas, hover states, selection states, pressed states, tooltips, banner ads, embedded videos, swipe animations, scrolling, clicking, iconography, colors, lists, slideshows, alt text, badges, notifications, gradients, pop-ups, carousels, OK/Cancel, etc. etc. etc.

This is UX:

People, happiness, solving problems, understanding needs, love, efficiency, entertainment, pleasure, delight, smiles, soul, warmth, personality, joy, satisfaction, gratification, elation, exhilaration, bliss, euphoria, convenience, enchantment, magic, productivity, effectiveness, etc. etc. etc.

► transcription

The German academic Marc Hassenzahl also delivers a wonderful definition of UX by introducing himself on his website:

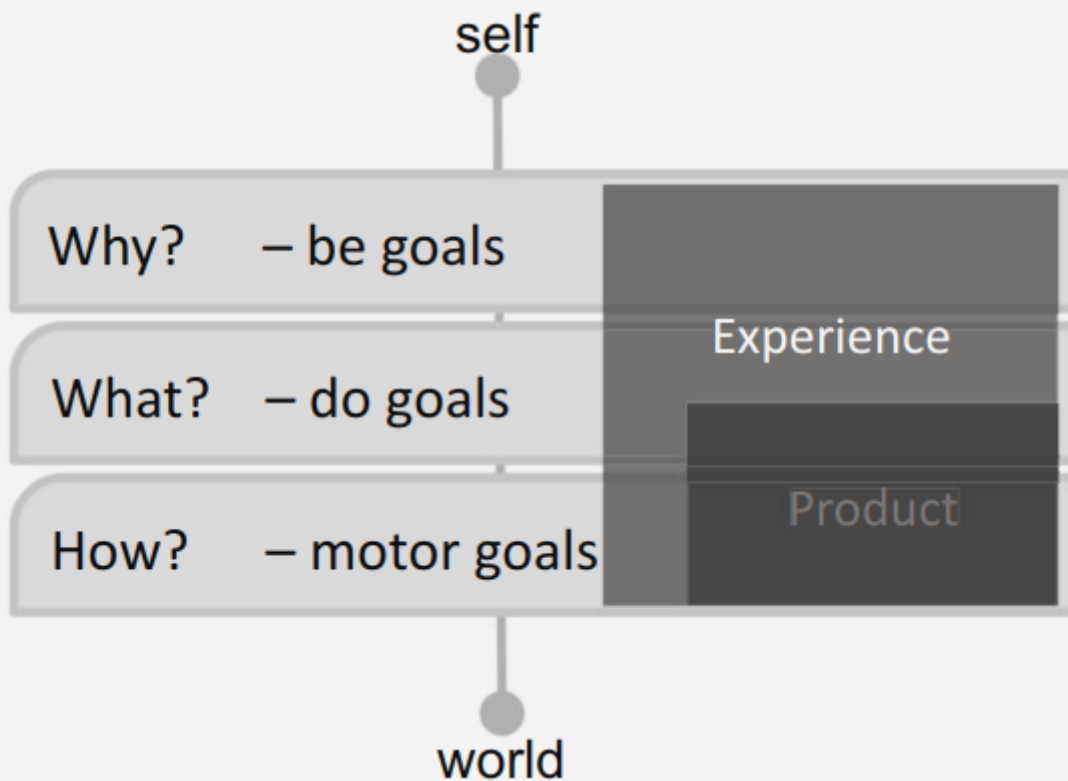
“He is interested in designing meaningful moments through interactive technologies – in short: Experience Design.”⁴⁰

Already from this small selection of quotes by people who are in the business for a long time and know what they do, you can sense that UX is big, big and good, bigger and better than... small-minded and petty things.

The paradox is that technically, when it comes to practice, products of User Experience Design are contradicting its image and aura. UX is about nailing things down, it has no place for ambiguity or open-ended processes.

Marc Hassenzahl is contributing to the scene not only by poetic statements and interviews. In fact in his 2010 book *Experience Design: Technology for all the right reasons* he proclaims “the algorithm for providing the experience”⁴¹ in which the “why” is a crucial component, a hallmark that justifies UX’s distinguished position.

12 2. CRUCIAL PROPERTIES OF EXPERIENCE



In a series of video interviews⁴² Hassenzahl recorded with the Interaction Design Foundation he states that people don't just want to make a phone call, there are different reasons behind each of them: business, goodnight kiss, checking if a kid is at home, ordering food. And all those "whys" need their own design on both the software and the hardware level. Again, an ideal UX phone is a different phone for each need or at least a different app for different type of calls.

The Why of UX is not a philosophical, but pragmatic question, that could be substituted with "what exactly?" and "who exactly?"

User Experience Design is a successful attempt to overcome the historic accident Don Norman makes responsible for difficult-to-use interfaces of the late 1980's:

"We have adapted a general purpose technology to very specialized tasks while still using general tools."⁴³

Here is a fresh insight from the studio "UX Collective" on how to train your UX skills:

"It's a good idea to limit yourself by imposing some assumptions, constraints, and a platform (mobile / desktop / tablet etc). If working in pairs, one person could pick a problem, and the partner could refine it. So choose one of the following, decide on a mobile or desktop solution, and then keep asking questions."⁴⁴

The list has 100 suggestions, here are a few:

20. Create an alarm clock.
21. Create an internal tool that allows a major TV network to tag and organise their content.
22. Create a time tracker.
23. Create a chat-bot for financial decisions.
24. Create a music player.
25. Create a smart mirror.
26. Prompt the user to engage in a daily act of kindness.
27. Track your health with some kind of wearable tech.
28. Locate your locked bike and be informed if it moves.
29. Prevent your parked car from being stolen while you go on holiday.
30. Build a smart fridge.

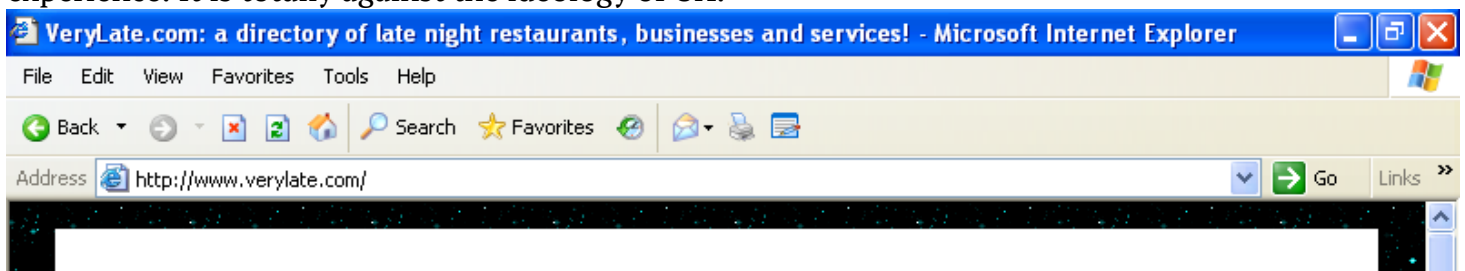
Top highlight

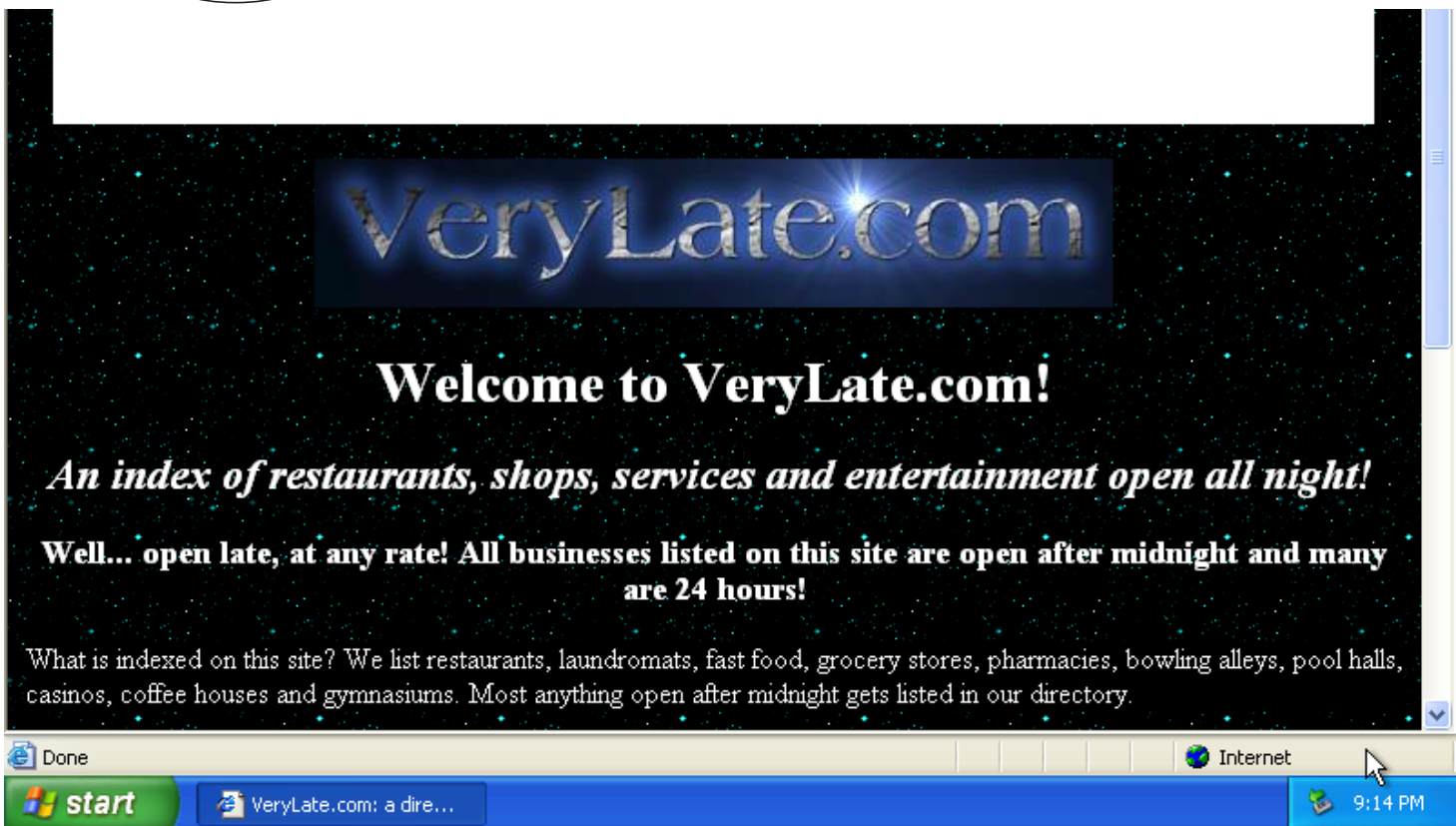
► transcription

“We can design in affordances of experiences”⁴⁵ said Norman in 2014. What a poetic expression if you forget that “affordance” in HCI means immediate unambiguous clue, and “experience” is an interface scripted for a very particular narrow scenario.

There are many such examples of tightly scoped scenarios around. To name one that gets public attention right at the moment—early May 2018 in the middle of the Cambridge Analytica scandal—, Facebook announces an app for long-term relationships:⁴⁶ Real long-term relationships—not just “hook-ups” to quote Mark Zuckerberg. If you are familiar my position on general purpose computers and general purpose users, you know that I believe there should be no dating apps at all; not because I am against dating, but because I think that people can date using general purpose software, they can date in email, in chats, you can date in Excel and Etherpad. But if the free market demands a dating software it should be made without asking “why?” or “what exactly?”, “hook-up or long term relationship?”, etc.

Please allow me again to show a screenshot or two of old web pages. I have a **before_** category in the One Terabyte of Kilobyte Age archive which I assign to pages which authors created with a certain purpose in mind which nowadays are taken over by industrialized, centralized tools and platforms. The first category is **before_flickr**, the next **before_googlemaps**. The last one reminds me of ratemyprofessors.com, so I tagged it **before_ratemyprofessor**. These pages are dead and none of them became successful, but they are examples of users finding their ways to do what they desire in an environment that is not exclusively designed for their goals: this is what I would call a true user experience. It is totally against the ideology of UX.





* * *

So, apart from contradicting Don Norman's call and saying that Computers of the Future should be visible, I'd like to suggest to finally disconnect the term affordance from Norman's interpretation, to disconnect affordance from experience, from the ability to perceive (as in Gibson), and from experience design needs; to see affordances as options for possibilities of action, and to insist on the General Purpose Computer's affordance to become anything if you are given the option to program it; to perceive opportunities and risks of a world that is not restrained to mechanical age laws and artifacts.

In the chapter on affordance, the authors of the influential interaction design manual *About Face*—which for many years was subtitled as “the essentials of interaction design,” in the latest edition changed to “classic of creating delightful user experiences”—observe:

“A knob can open a door because it is connected to a latch. However in a digital world, an object does what it does because a developer imbued it with the power to do something [...] On a computer screen though, we can see a raised three dimensional rectangle that clearly wants to be pushed like a button, but this doesn't necessarily mean that it should be pushed.

It could literally do almost anything.”⁴⁷

Throughout the chapter, designers are advised to resist this opportunity and to be consistent and follow conventions. Because indeed everything is possible in the world of zeroes and ones they introduce the notion of a “contract:”

“When we render a button on the screen we are making a contract with the user [...]”⁴⁸

If there is a button on screen it should be pressed, not dragged-and-dropped, and should respond accordingly. And they are absolutely right... but only when the interface is limited to knobs and buttons.

When Bruno Latour wanted his readers to think about a world without doors he wrote:

“[...] imagine people destroying walls and rebuilding them every time they wish to enter or leave the building... or the work that would have to be done to keep inside or outside all the things and people that left to themselves would go the wrong way.”⁴⁹

A beautiful thought experiment and indeed unimaginable—however, not in a computer generated world where we don't need doors really. You can go through walls, you can have no walls at all, you can introduce rules that would make walls obsolete. These rules and contracts—not behaviors of knobs—are the future of user interfaces, so we have to be very thoughtful about the education of interface designers.

* * *

There are two more concepts I promised in the title but didn't say a word about yet: Forgiveness and Human Robot Interaction (HRI).

My questions are: How does the preoccupation with strong clues and strictly bound experiences—affordance and UX—affect the beautiful concept of “forgiveness” that theoretically would have to be a part of every interactive system? And how do concepts of transparency, affordance, form follows function, form follows emotion,⁵⁰ user experience, and forgiveness refract in HRI?

I'll start with forgiveness. The following is a quote from Apple's 2006 Human Interface Guidelines, which I think gives a very good idea of what exactly is meant by forgiveness when it comes to user interfaces.⁵¹

Forgiveness

Encourage people to explore your application by building in forgiveness—that is, making most actions easily reversible. People need to feel that they can try things without damaging the system or jeopardizing their data. Create safety nets, such as the Undo and Revert to Saved commands, so that people will feel comfortable learning and using your product.

Warn users when they initiate a task that will cause irreversible loss of data. If alerts appear frequently, however, it may mean that the product has some design flaws. When options are presented clearly and feedback is timely, using an application should be relatively error-free.

Anticipate common problems and alert users to potential side effects. Provide extensive feedback and communication at every stage so users feel that they have enough information to make the right choices. For an overview of different types of feedback you can provide, see “Feedback and Communication” (page 42).

► transcription

Its essence is making actions reversible, offering users stable perceptual cues for a sense of “home,” and always allowing “Undo.”

In 2015 Bruce Tognazinni and Don Norman noticed that forgiveness as a principle vanished from Apple's guidelines for iOS and wrote the angry article *How Apple Is Giving Design A Bad Name*.⁵² Bruce Tognazinni himself has authored eight editions of Apple's Human Interface Design Guidelines, starting 1978,⁵³ and is known for conceptualizing interface design in the context of illusion and stage magic.

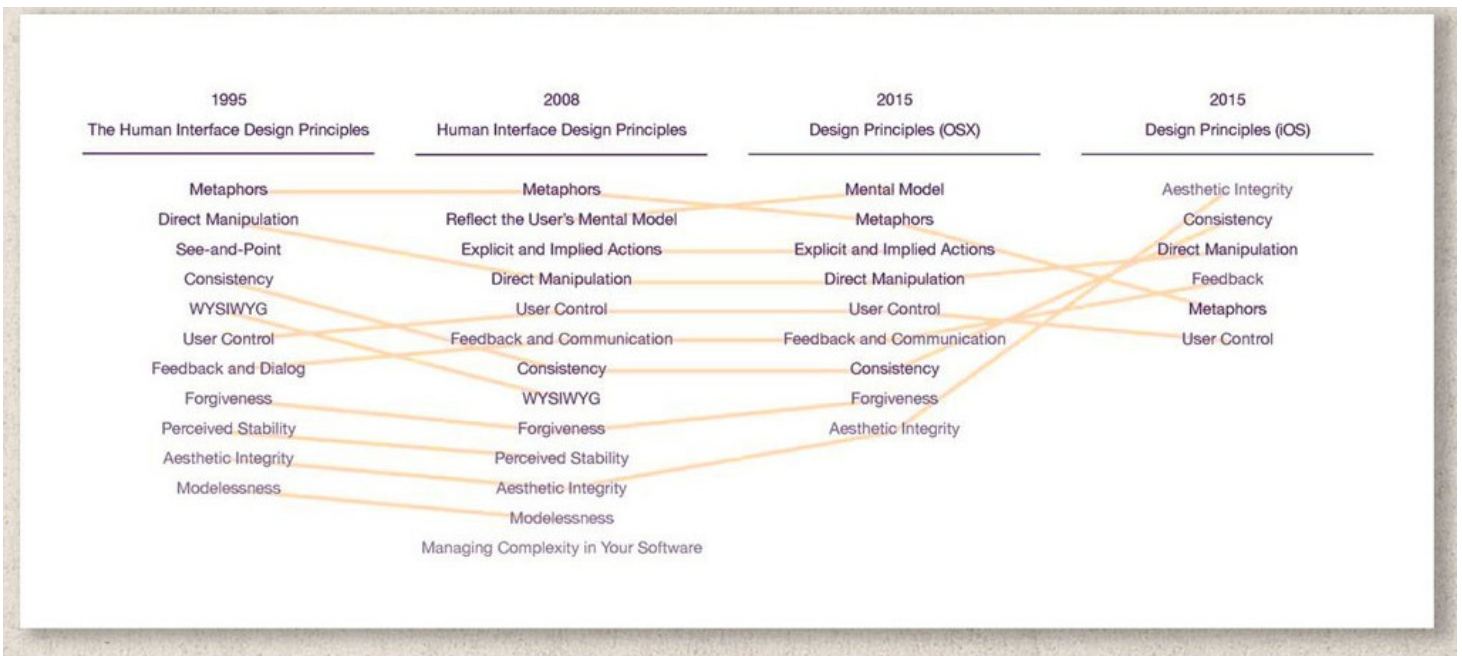


Diagram tracing the changes in core principles of Apple's guidelines over time, by Michael Meyer. Users of both Apple, Android, and all other mobile phones without keyboards noticed the disappearance of forgiveness even earlier, because there was no equivalent to ⌘-Z or Ctrl-Z on their devices. They noticed but didn't protest.



Mettez, Teja. “[External Undo Button](#).” Undo - Reloaded, 2015.

In my view of the world Undo should be a constitutional right. It is the top demand on my project User Rights.⁵⁴ In addition to the many things I said in support of Undo elsewhere, in the context of this talk I’d like to emphasize that all the hype around affordances and UX developed in parallel with the disappearance of Undo, it is not a coincidence. Single-purpose applications with one button per screen would guide through life without a need for Undo.

Though what users really need from operating system vendors is a global Undo function. It could have been the only contract, it could be a world where further discussions about affordances would be obsolete.

* * *

Being part of New Media dynamics the field of HCI is very vibrant and very “pluralistic.” Tasks for interface designers are to be found far beyond the screens of personal computers and submit buttons. There are new challenges like Virtual Reality and Augmented Reality, Conversation and Voice User Interfaces, even Brain Computer Interaction. All these fields are not new by themselves, they are contemporaries of GUI, and by calling them new I rather mean “trending right now” or “trending right now again” in HCI papers and in mass media.

The last few years were all about artificial intelligence, neural networks and anthropomorphic robots, in movies, literature, and consumer products. I adjusted my curriculum as well and introduced

rewriting an ELIZA⁵⁵ script to my interface design course, so that students prepare themselves for designing interfaces that talk to the users and pretend that they understand them. I personally have a bot,⁵⁶ and this talk will be fed to its algorithm and will become a part of the bot's performance. Some more years and this bot might be injected into a manufactured body looking something like me and will go to give lectures in my place.

Watching films and TV series where robots are main protagonists, following Sophia's⁵⁷ adventures in the news, regular people dive into issues that were exotic only some time ago: the difference in between symbolic and strong AI, ethics of robotics, trans-humanism.

The omnipresence of robots, even if just mediated, provoke delusions:

"We expect our intelligent machines to love us, to be unselfish. By the same measure we consider their rising against us to be the ultimate treason."⁵⁸ (Zarkadakis)

Delusions lead to paradoxes:

"Robots which enchant us into increasingly intense relationships with the inanimate, are here proposed as a cure for our too-intense immersion in digital connectivity. Robots will pull us back into a physical real and this each other."⁵⁹ (Turkle)

Paradoxes lead to more questions:

"Do we really want to be in the business of manufacturing friends that will never be friends?"⁶⁰ (Turkle)

Should Robot's have rights? Should robots and bots be required to reveal themselves as what they are?

The last question suddenly entered the discourse after Google's recent demo of Duplex,⁶¹ causing internet users to debate if Google's assistant should be allowed to say "hmmm," "oh," "errr," or to use interjections at all.



ITU Pictures. [Sofia, First Robot Citizen at the AI for Good Global Summit 2018](#). AI for Good Global Summit 2018. May 15, 2018. Photo.

Without even noticing, we, the general public, are discussing not only ethical but interface design questions and decisions. And I wish or hope it will stay like this for some time.

“Why Is Sophia’s (Robot) Head Transparent?”⁶² users ask the internet another design question: Is it just to look like Ex Machina, or is it for better maintenance? Or maybe it marks a comeback of transparency in the initial, pre-Macintosh meaning of the word?

Curiously, when scientists and interaction designers talk about transparency at the moment, they oscillate in between meaning exposing and explaining algorithms and the simplicity of the communication with a robot:

Designing and implementing transparency for real time inspection of autonomous robots⁶³

Robot Transparency: Improving Understanding of Intelligent Behaviour for Designers and Users⁶⁴

Improving robot transparency: real-time visualisation of robot AI substantially improves understanding in naive observers⁶⁵

The researcher Joanna J. Bryson—co-author the aforementioned papers—has a very clear position on ethics. “Should Robots have rights?” is not a question for her. Instead she asks why to design machines that raise such questions in the first place.⁶⁶

However, there are enough studies proving that humanoids (anthropomorphic robots) that perform morality are the right approach for situations where robots work with and not instead of people: the social robot scenario, where “social robot is a metaphor that allows human like communication patterns between humans and machines.”⁶⁷ This is quoted from Frank Hegel’s article Social Robots: Interface Design between Man and Machine, a text that truly impressed me some time ago, though it doesn’t announce anything revolutionary; on the opposite, it states quite obvious things like “human-likeness in robots correlates highly with anthropomorphism”⁶⁸ or “aesthetically pleasing robots are thought to possess more social capabilities [...]”⁶⁹

Very calmly, almost in between the lines, Hegel introduces the principle for a proper fair robot design: the “fulfilling anthropomorphic form,”⁷⁰ which should immediately lead humans to understand a robot’s purpose and capabilities. Affordance for a new age.

Robots are here, they are not industrial machines, but social, or even “lovable,” their main purpose is not to replace people, but to be among people. They are anthropomorphic, they look more and more realistic. They have eyes... but not because they need them to see. Their eyes are there to inform us that seeing is one of the robot’s functions. If a robot has a nose it is to inform the user that it can detect gas and pollution, if it has arms it can carry heavy stuff; if it has hands it is to grab smaller things, if these hands have fingers, you expect it can play a musical instrument. Robots’ eyes beam usability, their bodies express affordances. Faces literally become an interface.

Back to Norman’s wisdom:

“Affordances provide strong clues to the operations of things. Plates are for pushing. Knobs are for turning. Slots are for inserting things into. Balls are for throwing or bouncing. When affordances are taken advantage of, the user knows what to do just by looking: no picture, label, or instruction needed.”⁷¹

Manual affordances (“strong clues”) are easy to comprehend and accept when they are part of a GUI: they are graphically represented and located, somewhere... on screen. Things got more complex for designers and users when we moved to so called “post GUI,” to gestures in virtual, augmented, and invisible space. Yet this cannot be compared with the astonishing level of complexity when our thoughts move from Human Computer Interaction to Human Robot Interaction.





Andreas Eisenhut, Concept for Swimming Lifesaver Robot, Video Still, June 2018.

The image above is from a selection of students sketches, I asked them to embrace the principle of the fulfilling anthropomorphic form and take it to the limit. What could be an anthropomorphic design if everything that doesn't signal a function is removed? Like if the robot can't smell there just no nose. And what for to have two hands if you only need one? What could this un-ambiguity mean for interaction and product design?

And tonight's final question: How is the HCI principle of forgiveness appearing in HRI? In contrast to the current situation in graphical and touch-based user interfaces, forgiveness is doing very well in the realms of robots and AI.

It is built in: "[t]he external observer of an intelligent system can't be separated from the system."⁷² Robot companions are here "[n]ot because we have built robots worthy of our company but because we are ready for theirs" and "[t]he robots are shaping us as well, teaching us how to behave so they can flourish."⁷³ These quotes from Turkle and Zarkadakis remind us of Licklider's man-computer-symbiosis, Engelbart's concept of bootstrapping, and other advanced projections for the coexistence of man and computer, just this time it is about man and robot, not man and computer-on-the-table situations.

Forgiveness is built-in, but in HRI it is built into the human part. It is all on our side.

We are witnessing how the most valuable concept of HCI—Undo—meets a fundamental principle of Symbolic AI—scripting the human interactor.⁷⁴ I'm curious to see what affordances will further emerge. And who will undo whom when Symbolic AI is replaced by a "Strong" or "Real" AI as they say now.

* * *

Olia Lialina, June 2018

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May 21, 2018 -

As told to Laurel Schwulst, 2220 words.

Tags: Design.



My website is a shifting house next to a river of knowledge. What could yours be?

For TCI x Are.na's Library of Practical and Conceptual Resources, Laurel Schwulst encourages all artists to create and cultivate websites.

* Library of Practical and Conceptual Resources

* View Laurel's Are.na channel

What is a website?

For the past handful of years, I've been teaching courses about interactive design and the internet.

I teach within art departments at universities, so we learn about the internet's impact on art—and vice versa—and how technological advance often coincides with artistic development.

In class, we make websites. To do this, we learn the elemental markup and code languages of the web—HTML, CSS, and some JavaScript.

However, sometimes after the semester is over, I receive perplexing emails from students asking, "So how do I actually make a website?"

This sparked my own questioning. "What is a website, anyway?" It's easy to forget. Today there are millions of ways to make a website, and the abundance is

daunting. But at its core, a website is still the same as ever before:

A website is a file or bundle of files living on a server somewhere. A server is a computer that's always connected to the internet, so that when someone types your URL in, the server will offer up your website. Usually you have to pay for a server. You also have to pay for a domain name, which is an understandable piece of language that points to an IP. An IP is a string of numbers that is an address to your server.

Links (rendered default blue and underlined—they're the hypertext "HT" in HTML) are the oxygen of the web. Not all websites have links, but all links connect to other webpages, within the same site or elsewhere.

But my students already know this! So when they ask me about actually making a website, they are referring to a website in the world ... today.

It's healthy to acknowledge today's web is much different than the web many of us grew up using. So when they ask how to make a website (despite having already "learned"), they are alluding to the technological friction and social pressures that often come along with creating and maintaining a website in 2018.

Although they may seem initially accommodating and convenient to their users, universally popular social media sites—like Facebook, Instagram, Snapchat, and Pinterest—are private companies that prioritize advertising above their users' needs. Their users' happiness is not the primary focus, so it's perfectly normal for you to feel anxiety when using or even thinking about social media. In this age of digital cacophony dominated by these platforms, no one is looking out for you... but you. It makes perfect sense, then, when individuals tell me they want their website to do the job of "setting the record straight" on who they are and what they do.

However, clarity is one of many possible intentions for a website. There are other legitimate states of mind capable of communication—a surprising, memorable, monumental, soothing, shocking, unpredictable, radically boring, bizarre, mind-blowing, very quiet and subtle, and/or amazing website could work. You also need not limit yourself to only one website—as perhaps you'd like to confuse or surprise with multiple.

My favorite aspect of websites is their duality: they're both subject and object at once. In other words, a website creator becomes both author and architect simultaneously. There are endless possibilities as to what a website could be. What kind of room is a website? Or is a website more like a house? A boat? A cloud? A garden? A puddle? Whatever it is, there's potential for a self-reflexive feedback loop: when you put energy into a website, in turn the website helps form your own identity.

Why have a website?

Today more than ever, we need individuals rather than corporations to guide the web's future. The web is called the web because its vitality depends on just that—an interconnected web of individual nodes breathing life into a vast network. This web needs to actually work for people instead of being powered by a small handful of big corporations—like Facebook/Instagram, Twitter, and Google.

Individuals can steer the web back to its original architecture simply by having a website. I think artists, in particular, could be instrumental in this space—showing the world where the web can go.

Artists excel at creating worlds. They do this first for themselves and then, when they share their work, for others. Of course, world-building means creating everything—not only making things inside the world and also the surrounding world itself—the language, style, rules, and architecture.

This is why websites are so important. They allow the author to create not only works (the "objects") but also the world (the rooms, the arrangement of rooms, the architecture!). Ideally, the two would inform each other in a virtuous, self-perfecting loop. This can be incredibly nurturing to an artist's practice.

To those creative people who say "I don't need a website," I ask: why not have a personal website that works strategically, in parallel to your other activities? How could a website complement what you already do rather than competing or repeating? How can you make it fun or thought-provoking or (insert desired feeling here) for you? How can the process of making and cultivating a website contribute to your approach?

A website can be anything. It doesn't (and probably shouldn't) be an archive of your complete works. That's going to be dead the moment you publish. A website, or anything interactive, is inherently unfinished. It's imperfect—maybe sometimes it even has a few bugs. But that's the beauty of it. Websites are living, temporal spaces. What happens to websites after death, anyway?

What can a website be?

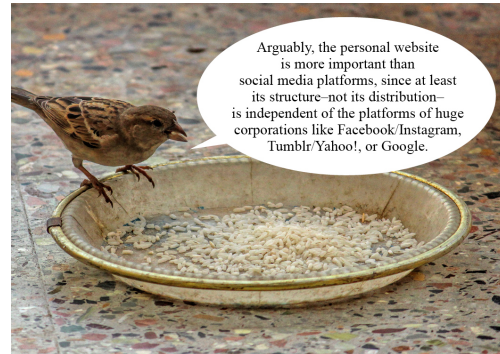
Website as room

In an age of information overload, a room is comforting because it's finite, often with a specific intended purpose.



Louis Rossetto

**



Orit Gat

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Simultaneously, a room can be flexible: you can shift its contents or even include a temporary partition, depending on occasion. You can also position elements in spatial juxtaposition, or create entrances to adjacent rooms through links.

In the early days of The Creative Independent, we sometimes thought of TCI's website like a house next to a river. We considered the interviews the flowing water, as they were our house's nutrients and source of life. We would collect and drink from the water every day. But sometimes, depending on its nutrient makeup, the water would change our house. We'd wake up to see a new door where a picture frame once was. Knowledge became the architect.

Like any metaphor, it's not perfect. For better or worse, it's much more difficult to delete a building than a website.

Website as shelf

Zooming into this room inside this house, we see a shelf. Maybe a shelf is easier to think about than a whole room. What does one put on a shelf? Books and objects from life? Sure, go ahead. Thankfully there's nothing too heavy on the shelf, or else it would break. A few small things will do, knowledge-containing or not. Plus, lighter things are easy to change out. Is a book or trinket "so last year?" Move it off the shelf! Consider what surprising juxtapositions you can make on your little shelf.

Website as plant

Plants can't be rushed. They grow on their own. Your website can be the same way, as long as you pick the right soil, water it (but not too much), and provide adequate sunlight. Plant an idea seed one day and let it gradually grow.

Maybe it will flower after a couple of years. Maybe the next year it'll bear fruit, if you're lucky. Fruit could be friends or admiration or money—success comes in many forms. But don't get too excited or set goals: that's not the idea here. Like I said, plants can't be rushed.



Paul Ford

★★

Website as garden

Fred Rogers said you can grow ideas in the garden of your mind. Sometimes, once they're little seedlings and can stand on their own, it helps to plant them outside, in a garden, next to the others.

Gardens have their own ways each season. In the winter, not much might happen, and that's perfectly fine. You might spend the less active months journaling in your notebook: less output, more stirring around on input. You need both. Plants remind us that life is about balance.

It's nice to be outside working on your garden, just like it's nice to quietly sit with your ideas and place them onto separate pages.



Fred Rogers

★★

Website as puddle

A website could also be a puddle. A puddle is a temporary collection of rainwater. They usually appear after rainstorms. Like a storm, creating a website can happen in a burst. Sometimes it's nice to have a few bursts/storms of creating a website, since the zone can be so elusive. Some people even call rain "computer weather."

There is also no state of "completeness" to a website, like a puddle, since they're ephemeral by nature. Sometimes they can be very big and reflective. Despite their temporal nature, I've even seen some creatures thrive in puddles. Meanwhile, some smaller puddles may only last a day.

Not everything, even the most beautiful puddle with its incredible reflective surface, needs to last long. If the world doesn't end tomorrow, there will be another storm. And where there's a hole, a puddle will appear again.

Puddles evaporate slowly over time. It might be difficult, but I would love to see a website evaporate slowly, too.

Website as thrown rock that's now falling deep into the ocean

Sometimes you don't want a website that you'll have to maintain. You have other things to do. Why not consider your website a beautiful rock with a unique shape which you spent hours finding, only to throw it into the water until it hits the ocean floor? You will never know when it hits the floor, and you won't care.

Thankfully, rocks are plentiful and you can do this over and over again, if you like. You can throw as many websites as you want into the ocean. When an idea comes, find a rock and throw it.



J.R. Carpenter

★★

The web is what we make it

While an individual website could be any of those metaphors I mentioned above, I believe the common prevailing metaphor—the internet as cloud—is problematic. The internet is not one all-encompassing, mysterious, and untouchable thing. (In early patent drawings depicting the internet, it appears as related shapes: a blob, brain, or explosion.) These metaphors obfuscate the reality that the internet is made up of

individual nodes: individual computers talking to other individual computers.



The World Wide Web recently turned 29. On the web's birthday, Tim Berners Lee, its creator, published a letter stating the web's current state of threat. He says that while it's called the "World Wide Web," only about half the world is connected, so we should close this digital divide.

But at the same time, Berners Lee wants to make sure this thing we're all connecting to is truly working for us, as individuals: "I want to challenge us all to have greater ambitions for the web. I want the web to reflect our hopes and fulfill our dreams, rather than magnify our fears and deepen our divisions."



"Metaphor unites reason and imagination," says George Lakoff and Mark Johnson in their book, *Metaphors We Live*

By (1980). "Metaphors are not merely things to be seen beyond. In fact, one can see beyond them only by using other metaphors. It is as though the ability to comprehend experience through metaphor were a sense, like seeing or touching or hearing, with metaphors providing the only ways to perceive and experience much of the world. Metaphor is as much a part of our functioning as our sense of touch, and as precious."

Instead of a cloud, let's use a metaphor that makes the web's individual, cooperative nodes more visible. This way, we can remember the responsibility we each have in building a better web. The web is a flock of birds or a sea of punctuation marks, each tending or forgetting about their web garden or puddle home with a river of knowledge nearby.

If a website has endless possibilities, and our identities, ideas, and dreams are created and expanded by them, then it's instrumental that websites progress along with us. It's especially pressing when forces continue to threaten the web and the internet at large. In an age of information overload and an increasingly commercialized web, artists of all types are the people to help. Artists can think expansively about what a website can be. Each artist should create their own space on the web, for a website is an individual act of collective ambition.

To accompany this essay, I've created a channel on Are.na called "Sparrows talking about the future of the

web." There you'll find a handful of quotes from essays, also linked, that informed this piece.



Tim Berners Lee

★★

Name

Laurel Schwulst

Vocation

Designer, Artist, Writer

Fact



Photo: Bettina Yung

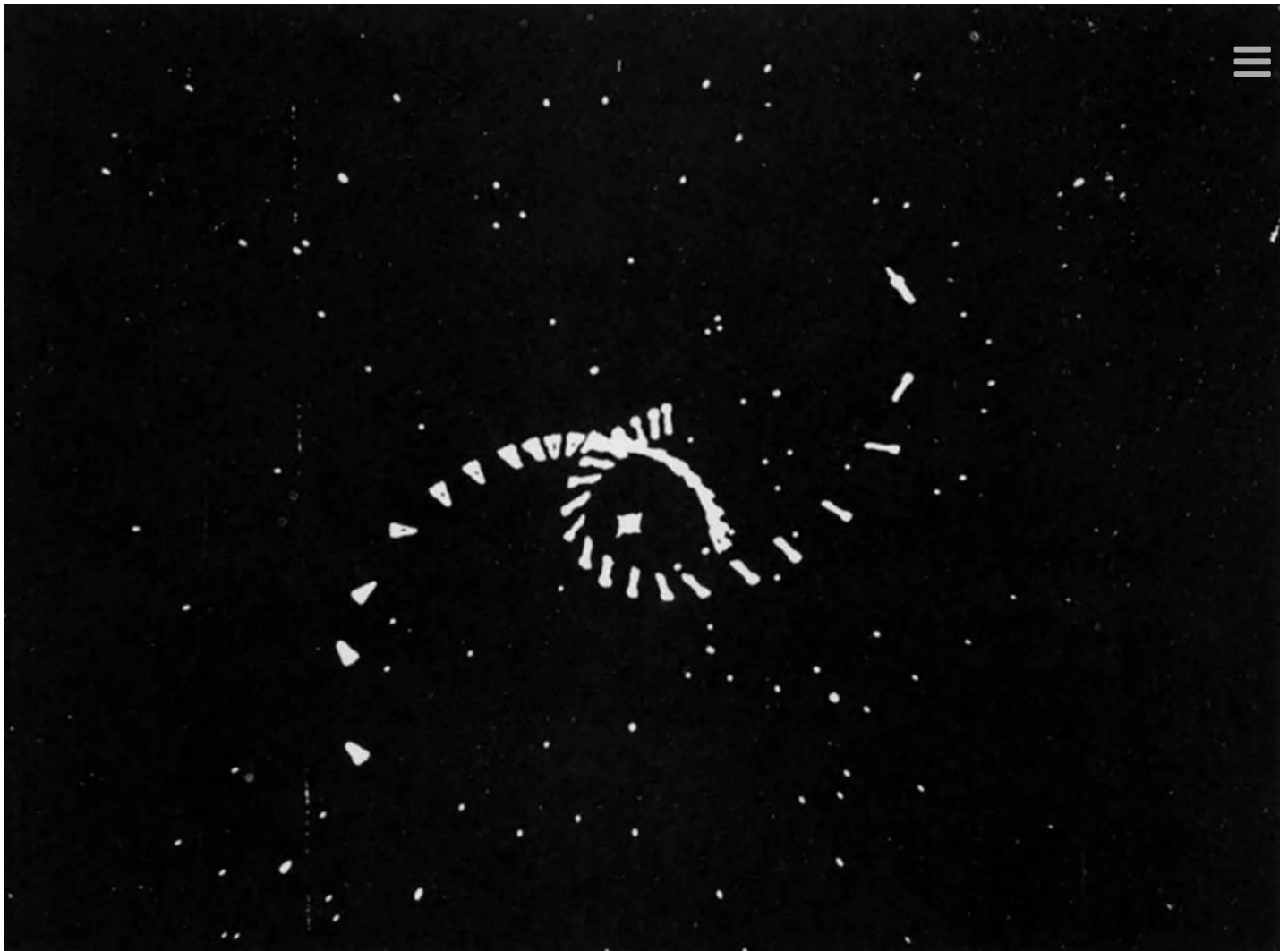


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BLACK GOOEY UNIVERSE

American Artist

“This is called a graphical user interface—GUI or gooey—where they come up with these names. The battle to bring gooey to PCs and make them more user-friendly took ten years and is a helluva story—that is what this program is about. It’s also about how Bill Gates ended up master of the gooey universe and a gazillionaire. I never said it was a fairy story.” – Triumph of the Nerds, PBS (1996)



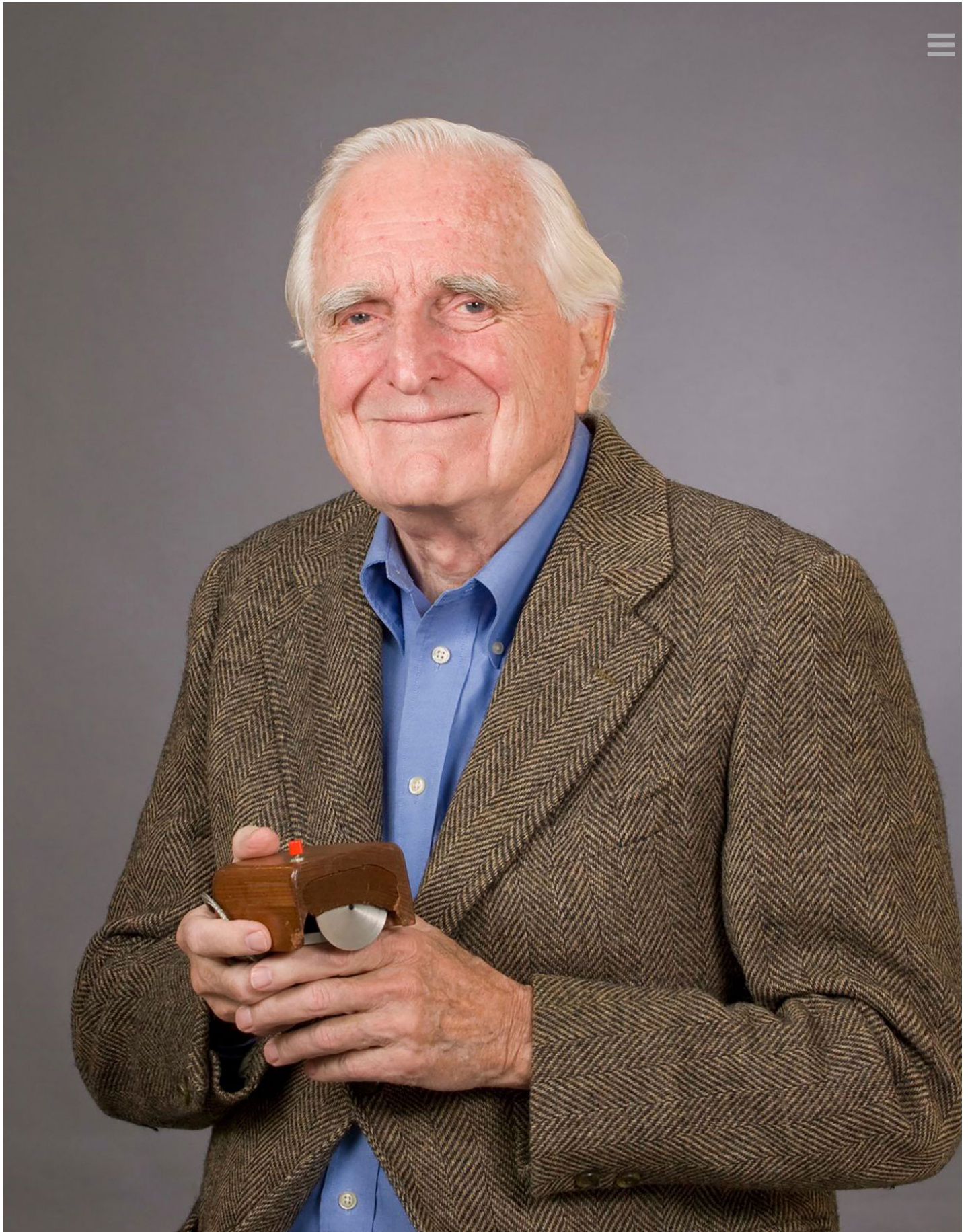
A timelapse screencapture of the game *Spacewar!* (1969) being played on the PDP-1 monitor.

INCUBATING WHITENESS

The area of California south of the Bay Area, mythologized through the moniker “Silicon Valley,” is an incubator for the research and production of high technology. Research labs that develop tools symbolic of contemporary digital life have been based in this high-technology economic sector since the 1940s. This began primarily with a varied base of entrepreneurs deployed out of Stanford University and mentored by the dean of the School of Engineering (1944-1958) who facilitated tech industry entrepreneurship efforts by recent Stanford graduates (e.g. Hewlett-Packard, 1938). Much of this was made possible through the receipt of necessary funding from the national defense sector of the federal government after World War II.

Stanford Research Institute (SRI, 1946) created Silicon Valley “creativity” by making a space for engineers free of economic pressures they might face in a standard corporate context—a place for straight cis white men in business ties to sit on bean bag chairs and embrace consequential ideas without fear of retribution. This model has been repeated at XeroxPARC (Xerox Palo Alto Research Center), Apple, Ideo, Google, and Facebook, and exemplifies the liberal impetus of Silicon Valley. The first iterations of a graphical user interface (GUI)—a clickable interface, cursor, and remedial computer mouse—were demoed at SRI’s Augmented Intellect Research Center in 1968. This demo, known colloquially as “mother of all demos” served as the harbinger of high-tech innovation.

When funds from the national defense department became sparse, many of SRI’s employees were absorbed into XeroxPARC (1970). The impulse to mitigate the human relationship to binary technology that started at SRI was carried by the same group of white men as they moved to PARC and other Silicon Valley operations, including Apple. Xerox poured money into PARC, intent on unveiling a successor to the paper and pen office space. They ultimately found an answer in the Xerox Alto, a \$10,000 minicomputer with a working GUI, but didn’t know how to make the machine cheap or practical enough for people to buy. Apple’s CEO (1979) offered shares of stock to XeroxPARC in trade for what was perceived to be their most valuable inventions: the GUI, mouse, and ethernet. Apple then popularized these devices by appropriating them into the Apple Lisa.



Founder of Augmented Research Center at SRI holding the first mouse which he developed alongside ethernet and a rudimentary form of gooey.

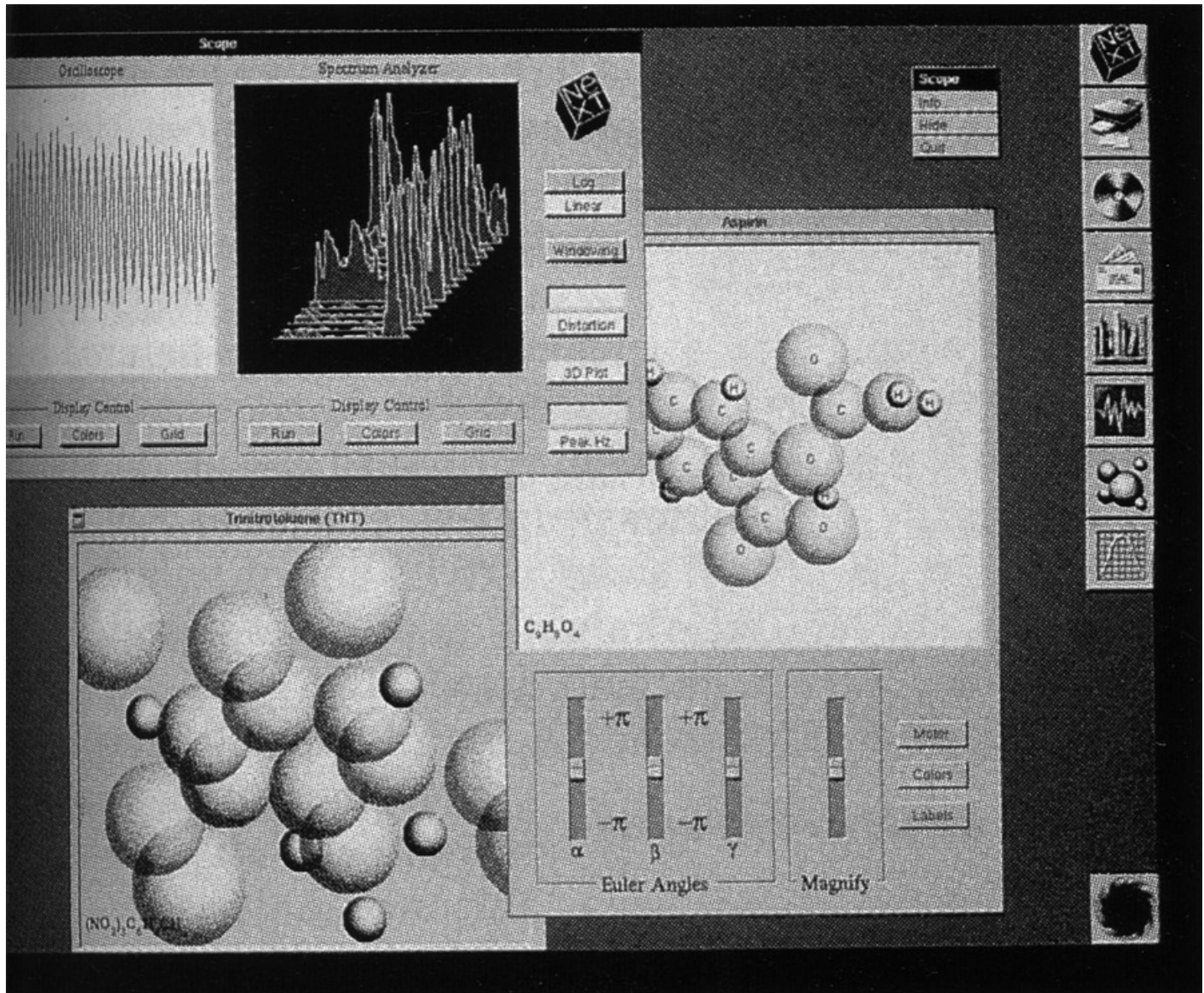
Lisa was the first commercial computer to include a GUI. Before this, computer monitors appeared black, a color native to screens at the time, upon which lines of code were input in green or white characters. Between the Xerox Alto and Apple Lisa, the negative space of the screen began to appear white, replacing the black command-line interface used on computers prior to that. The Apple Lisa outsold the black-screened Apple II of 1977, offering buyers the ability to point and click on “folders” and “windows” in white space reminiscent of blank paper sheets.

Users of computer technology now encompass a general populace rather than just colleagues and fellow white male nerds¹In “What Was the Nerd?” Willie Osterweil contends that the “nerd” began as a faux-subject position formed by popular depictions of smart but awkward white males being persecuted by jock antagonists. Osterweil argues that the construction of the nerd served to “subsume and mystify true social conflict—the ones around race, gender, class, and sexuality that shook the country in the 1960s and ‘70s,” but the industry is still white. The push from Stanford to begin a startup culture in the 40s and 50s is contrary to the ivory tower model that defines Silicon Valley industry in the present moment. Instead of restricting the brain pool of Stanford to a theoretical domain, the focus at the time was on applying technology in practical ways. Over the last few decades, as the Internet has become commercialized and consumer technology ubiquitous, developers have grown increasingly out of touch with the interests of their users. As technology becomes compressed in size and time, and its values hardened, the field continues to elude non-white critique.

Racial Slavery—which generated Blackness as a site of permanent extraction, gratuitous physical violence, and social death—provided the material and ideological basis for the United States. Unsurprisingly, Silicon Valley advances this constitutive anti-blackness through its technological products and processes. Whiteness in the space of high technology requires: market driven products that are anti-black, an echo chamber of white ideals (i.e. an ivory tower), and the creation of public-facing devices and platforms where white space is posited as neutral. The transition of the computer interface from a **black screen**, to the **white screen** of the 70s, is an apt metaphor for the theft and erasure of blackness, as well as a literal instance of a white ideological mechanism created with the intent of universal application.

Given this context, it can be said that whiteness is the core of the labs that exist in Silicon Valley, and inscribes all of the products borne out of it in a multitude of ways. I will address the way it informed and continues to inform the development of a GUI: an

abstracted representation of a person's relationship to a machine.



THE GOOEY UNIVERSE

In contrast to the singular notion of the “computer” we think of today, early computers required programmers to reorient arrays of cable connections, tediously input binary figures through physical switches, feed a roll of paper tape into the machine or type the code into a typewriter. These varied methods of interface had different benefits and were developed at different times for the same machines—there was no singular format for

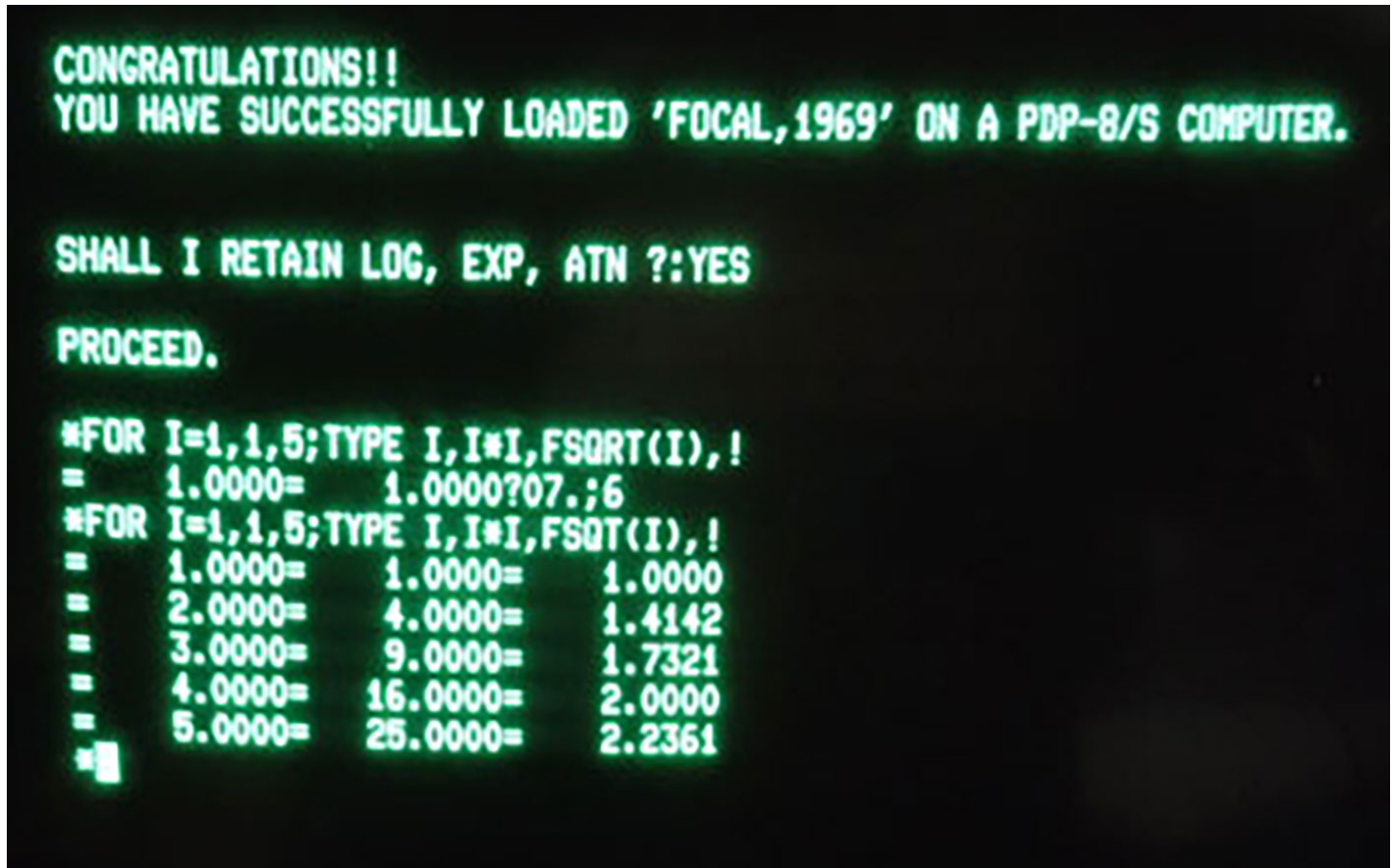
interfacing with a computer (the single-channel monitor or phone screen interface that has come to define PCs and smartphones was designed later on, and for laypeople). By simplifying the programming process to one method and abstracting it further through clickable icons and images, a limitation was placed on transgressive or nuanced possibilities available in early devices.

Designed as a solve for the tedious and tenuous personal computer, the GUI, phonetically “gooey,” was a consolidation of **all** interfacing methods into a single screen, keyboard, and mouse. A software by modern definition, gooey involves a mouse and abstract screen display, which reduces literal movements of textual characters and bytes of data into icons with human readable names. This is called a What You See Is What You Get (WYSIWYG) interface, with skeuomorphs of the Xerox office regime: “folders”, “documents”, a “trash bin” and the like. In the computers we interact with most often at this moment (our smartphones), this interface has been further reduced by superimposing the map of correspondence of the mouse and cursor onto the virtual display itself. With this reduction comes a lack of mobility on behalf of the user (only being in one program at a time, never really closing, opening or “seeing” files), which reflects a pattern of making the mechanic apparatus invisible and thus easier to consume from and pour oneself into. The impulse to render complex programming methods abstract through a higher-level computer language that was able to reuse code reflected a desire to make computers accessible by meeting the user at their level of intuitive technical knowledge. These limitations and autonomous processes compel users to process the white neutrality of the screen and anti-blackness of technology uncritically because it is so easy and efficient to use.

In “On Software, or the Persistence of Visual Knowledge,” Chun argues that the ultimate illusion of the interface is its association with transparency. Contrary to this association, the screen never represents something existent elsewhere but renders for the first time all things seen, whether a reference exists prior to its representation on screen is arbitrary. For Chun, software is analogous to ideology and its critique, mapping a logic of immaterial beliefs represented in superimposition to a material hardware which always exists but is somehow beyond vision.

Giving credence to this analogy, the social embeddedness of the gooey is fundamental to its ideological assertion of white neutrality. The social effect of the gooey resides in the conditioning of the netizen to an expectation of being reinterpreted as data within an economy of biometric data outside of one’s self and simple visuality that is no longer

derived from a WYSIWYG icon system but an acceptance of white space (no matter how abstract) as preliminary for virtual innovation and communication from which IRL social relations are extrapolated.



SOFTBLACKWARE

I want to propose Blackness as counterpunal and primordial to the whiteness of the screen. But what is **black**? Speaking technically, light determines the nature of color. Light determines whether blackness is the amalgam of all colors in the spectrum²Subtractive color: material substances (pigments, inks, dyes, etc.) converging to limit which bands of light are reflected from what is otherwise a “white” surface (one from which all light is reflected). or a void empty of light from which all sight must occur³Additive color: bands of light converge to evoke certain tones. Blackness—lack of all visible light—serving as a starting point. This is the case in

devices such as CRT monitors and video projectors.. Within the screen, color is always determined by light, a light which is always fabricated, and a blackness which is always already present, and foundational to light. 

In “All Black Everything,” Jared Sexton says, “Black, then, begins and ends as a paradox or a problem of definition; it may even be the paradox or problem of definition itself, which is to say the paradox or problem of beginning and ending, being and nothingness.” As Sexton points out in a later interview, his argument “is **not** that blackness is everything and so nothing (unless we want first to revise what is meant by nothing and nothingness), but rather that everything is (always and already) black, all black, inescapably black, despite its best attempts at distancing. Black, I contend, is something that is involved in all appearance, all existence, and all signification because it relates to their common conditions of possibility and emergence, which is to say it relates, for the same reason, to the disappearance, inexistence, and insignificance of everything and of all things.”

In the backlit screen of an LCD monitor, blackness is omnipresent: it is a liquid crystal actor within the screen that chooses how and when to be represented, allowing the screen to appear momentarily black. In the CRT monitors crucial to computers before the 90s, the screens appear black, where white or green forms are inscribed by cathode rays. The early white gooey of the Apple Lisa was an artificial backdrop for corporate productivity, an entire plane of rapidly blinking white within the black CRT monitor space, sustained by a continuous energy draw representative of the wasteful impetus of capitalism.

The command-line interface and programming languages that predated the gooey were complex and required a proprietary knowledge of computer science. The development of gooey was a project to create an accessible computer, lessening the burden of knowledge required to complete a task. But this also created the “user” as we know it by creating a user/programmer dichotomy. The desire for a black screen is that of removing the dichotomy in favor of an interface without subjection, without users and/or programmers alike. It is from a black interface (and interface absent of this dichotomy) that contemporary computer interfaces developed. It is in Blackness that the development of gooey from Alto, to Lisa, the smartphone and beyond is indebted.



Blackness has, so to say, formed the ground for white, with black gooey being antithetical to the values of the white screen. Black gooey might then be a platform of slowness (“dragged time”, “colored time”⁴“And so ‘colored time’ enters this drama, ‘this maniacal tale emerging at the century’s apex of black radicalism’ (Sexton 2009: 44), with the force of dread: interminable, perhaps even incalculable, stalled time [...] This is the slow time of captivity, the dilated time of the event horizon, the eternal time of the unconscious, the temporality of atomization.”), refusal, thought, complexity, critique, softness, loudness, transparency, uselessness, and brokenness. A planar body that longs for the solitude and vastness of the command-line, yet nuanced and sharp, to usurp and destroy a contemporary hegemonic interface.

As there can be no form to it, denying both a canonical hardware and interface, where does the black screen reside? Building on brokenness, or the break, we take up Frank Wilderson’s proposal to remain **in the hold**, within a broken (too slow, too complex) interface, to analyze and comprehend a totalizing anti-blackness. Fred Moten’s **fantasy in the hold** then opens a new line of inquiry: how a broken screen—situated against whiteness, unfixable, unfixed—might operate.

When some say “black gooey is unusable and unknowable,” its users, programmers, those dwellers of brokenness, will reply “for who?”



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1. ↑ In “What Was the Nerd?” Willie Osterweil contends that the “nerd” began as a faux-subject position formed by popular depictions of smart but awkward white males being persecuted by jock antagonists. Osterweil argues that the construction of the nerd served to “subsume and mystify true social conflict—the ones around race, gender, class, and sexuality that shook the country in the 1960s and ‘70s.”
 2. ↑ Subtractive color: material substances (pigments, inks, dyes, etc.) converging to limit which bands of light are reflected from what is otherwise a “white” surface (one from which all light is reflected).
 3. ↑ Additive color: bands of light converge to evoke certain tones. Blackness—lack of all visible light—serving as a starting point. This is the case in devices such as CRT monitors and video projectors.
 4. ↑ “And so ‘colored time’ enters this drama, ‘this maniacal tale emerging at the century’s apex of black radicalism’ (Sexton 2009: 44), with the force of dread: interminable, perhaps even incalculable, stalled time [...] This is the slow time of captivity, the dilated time of the event horizon, the eternal time of the unconscious, the temporality of atomization.”

◀ MILK BBY

CRUEL OATH ▶

The Concept of a Meta-Font

Donald E. Knuth

A single drawing of a single letter reveals only a small part of what was in the designer's mind when that letter was drawn. But when precise instructions are given about how to make such a drawing, the intelligence of that letter can be captured in a way that permits us to obtain an infinite variety of related letters from the same specification. Instead of merely describing a single letter, such instructions explain how that letter would change its shape if other parameters of the design were changed. Thus an entire font of letters and other symbols can be specified so that each character adapts itself to varying conditions in an appropriate way. Initial experiments with a precise language for pen motions suggest strongly that the font designer of the future should not simply design isolated alphabets; the challenge will be to explain exactly how each design should adapt itself gracefully to a wide range of changes in the specification. This paper gives examples of a meta-font and explains the changeable parameters in its design.

Some of Aristotle's philosophical writings were called *Metaphysics*, because they came *after* his *Physics*, in the conventional arrangement of his works. By the twentieth century, most people had forgotten the original meaning of Greek prefixes, so that 'meta-' was assumed to add a transcendent character to whatever it qualified. We now have metapsychology (the study of how the mind relates to its containing body), metamathematics (the study of mathematical reasoning), and metalinguistics (the study of how language relates to culture); a metamathematician proves metatheorems (theorems about theorems), and a computer scientist often works with metalanguages (languages for describing languages). Newly coined words beginning with 'meta-' generally reflect our contemporary inclination to view things from outside, at

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a more abstract level, with what we feel is a more mature understanding.

In this sense a 'meta-font' is a *schematic description of how to draw a family of fonts*, not simply the drawings themselves. Such descriptions give more or less precise rules about how to produce drawings of letters, and the rules will ideally be expressed in terms of variable *parameters* so that a single description will actually specify many different drawings. The rules of a meta-font will thereby define many different individual fonts, depending on the settings of the parameters. For example, the American Type Founders specimen book of 1923 included the following members of its 'Caslon' family: plain, oldstyle, lightface, bold, heavy, condensed, lightface condensed, bold condensed, extra condensed, bold extended, shaded, and openface, not to mention American Caslon, New Caslon, Recut Caslon, and Caslon Adbold; each of these was available in about sixteen different point sizes, so the total number of Caslon roman fonts was about 270. There was an overall design concept loosely tying all these fonts together so that they were recognizably 'Caslon', although the changes in size and weight were accompanied by more or less subtle changes in the letter shapes. We can regard this overall design as a meta-font that specified how the letters would change in different circumstances—the meta-font governed the metamorphoses.

Of course, the actual design of all these Caslon varieties was not completely explicit; it was conveyed implicitly by means of a few drawings

that specified a few critical examples. A skilled workman could make the appropriate modifications for intermediate sizes and styles just as skilled animators do the ‘in-betweening’ for Walt Disney cartoons. It would be preferable, however, to have a completely explicit design, so that the designer’s intentions would be unambiguously recorded; then we wouldn’t have to resort to the vague notion of ‘appropriate modifications’. Ideally, the designer’s intentions should be so explicit that they can be carried out satisfactorily by somebody who doesn’t understand letter shapes at all—even by a stupid, inanimate, electronic computer!

George Forsythe once wrote that ‘The question “What can be automated?” is one of the most inspiring philosophical and practical questions of contemporary civilization.’ We know from experience that we understand an idea much better after we have succeeded in teaching it to someone else; and the advent of computers has brought the realization that even more is true: The best way to understand something is to know it so well that you can teach it to a computer. Machines provide the ultimate test, since they do not tolerate ‘hand waving’ and they have no ‘common sense’ to fill the gaps and vagaries in what we do almost unconsciously. In fact, research in artificial intelligence has shown that computers can do virtually any task that is traditionally associated with ‘thinking,’ but they have great difficulty accomplishing what people and animals do ‘without thinking.’ The art of letter design will not be fully understood until it can be

explained to a computer; and the process of seeking such explanations will surely be instructive for all concerned. People often find that the knowledge gained while writing computer programs is far more valuable than the computer's eventual output.

In order to explain a font design to a machine, we need some sort of language or notation that describes the process of letter construction. Drawings themselves do not suffice, unless the design is so simple that all fonts of the family are related to each other by elementary transformations. Several notations for the precise description of letter shapes have been introduced in recent years, including one that the author developed during 1977–1979. The latter system, called METAFONT, differs from previous approaches in that it describes the motion of the center of a 'pen' or 'eraser' instead of describing the boundary of each character. As a result, the METAFONT language appears to facilitate the design of font families; for example, it took only about two weeks of work to create the crude but passable meta-font described in reference [5].

After another six months of development, during which literally thousands of refinements were made, the design of this prototype meta-font has reached its current state, which was used to typeset the present article. The name Computer Modern has been attached to the resulting group of fonts, a family that includes meta-fonts for both roman and italic styles in addition to the Greek and Cyrillic alphabets and an upper-case calligraphic script, together with an extensive set of mathematical

symbols. The basic idea underlying the design of this font family was to capture the spirit of the 'Monotype Modern Extended 8A' fonts used in the first printings of the author's books on computer programming, but to cast the design in the METAFONT idiom and to include a wide range of parametric variations.

So many variations are possible, in fact, that the author keeps finding new settings of the parameters that give surprisingly attractive effects not anticipated in the original design; the parameters that give the most readability and visual appeal may never be found, since there are infinitely many possibilities. On the other hand, it would be possible to parameterize many other things that cannot be varied in the present design; an almost endless series of interesting experiments can be performed, now that METAFONT is available.

Computer Modern Roman has 28 parameters that affect the shapes of its letters, plus three parameters that help control inter-letter spacing. There are also a few miscellaneous parameters whose sole function is to select alternate character and ligature shapes in different fonts. For example, one of the latter parameters is used to select between two styles for the letter 'g'; the reader may have already noticed that the g's in the present paragraph are different from those used elsewhere in this article. A few other typographic tricks like this will be played in what follows; large type has been used so that the effects will not be impossible to perceive.

The most interesting and important parameters of Computer Modern will be changed in the following paragraphs, one at a time, in order to show how much variability is possible. Of course it is easy to find settings of the parameters that don't give satisfactory results, since a single design cannot be expected to solve all conceivable problems; therefore our examples will attempt to illustrate the limiting cases where things break down as well as the in-between regions where usable fonts are to be found.

The first and most obvious group of parameters controls the vertical dimensions of letters: The x-height and the heights of ascenders and descenders can be independently specified. There are, in fact, two independent measurements for descenders, one to control the depths of the letters g j p q y and the other to control the depths of other symbols like commas and the tail of the letter Q. The height of upper-case letters is independent of the height of lower-case letters, and the height of the numerals 0 to 9 can also be varied at will. The most unusual parameter relating to vertical dimensions is called the e-height, namely the height of the bar in a lower-case e; in the current designs the e-height also affects several other lower-case letters:

**the sack, the sack, the sack,
the sack, the sack!**

Another fairly obvious group of parameters governs the horizontal dimensions of the characters: It is possible to obtain fonts that are

extremely extended or extremely condensed without changing the heights or widths of the strokes.⁹ One can also imitate a typewriter by extending or condensing the individual characters so that each one has the same width. Note that the length of serifs is proportional to the width, so that an i has much longer serifs than an m in the typewriter style.

Of course we get a much better imitation of a typewriter when the distinction between thick and thin strokes disappears. Such a font looks typewriter-like even when its letters do not all have the same width.

The letters of Computer Modern are all drawn by pens having an elliptical nib; for example, the thick strokes of the h's in this sentence were made by a pen that would look like '—' if enlarged ten times. The ellipses have perfectly horizontal axes, not tipped as ' / ', because the letters are intended to have vertical stress. Different pens are used to draw different parts of the letters.

Five parameters control the dimensions of these elliptical pens: One for the thin hairlines, another for thick stem lines that are straight, another for thick stem lines that are curved, another for the bulbs on letters like acf...y, and another that gives an aspect ratio between horizontal and vertical dimensions. The height of the hairline pen is used also as the height of the pens that draw the thick vertical stem lines. If the first four of these pen-width parameters are equal and if the aspect ratio is 1/1, the pens will be perfect circles.

An ellipse like '●' has an aspect ratio of $1/3$, while the aspect ratio of '○' is $3/1$. It is interesting to see what happens when sans-serif letters are drawn with pens of different aspect ratios:

A pen of aspect $1/3$ generated these letters.

A pen of aspect $2/3$ generated these letters.

A pen of aspect $1/1$ generated these letters.

A pen of aspect $3/2$ generated these letters.

A pen of aspect $3/1$ generated these letters.

The aspect ratio can also be varied when the pens have different widths and serifs are present; in this case the aspect affects the darkness of letters like g and s that have thick horizontal strokes:

A pen of aspect $1/3$ generated these letters.

A pen of aspect $2/3$ generated these letters.

A pen of aspect $1/1$ generated these letters.

A pen of aspect $3/2$ generated these letters.

A pen of aspect $3/1$ generated these letters.

(In the examples above, the widths of thick vertical stems for aspect ratios less than 1 are equal to the heights of thick horizontal stems for aspect ratios greater than 1.)

Special care is needed in the choices of the pen-width parameters. For example, undesirable blotches appear when the bulbs are too large for the stems; and the type has a disturbing inconsistency when the curved stems are substantially wider than the straight ones. **A font cannot get too bold without having portions of the letters run into each other.** Perhaps future meta-fonts will be

set up to compute desirable pen dimensions from a smaller set of independent parameters, since the proper widths depend in a subtle way on each other; at the moment, trial and error is necessary to get a compatible set of pens, but further research should shed some light on this dependence.

Only five pen-width parameters have been mentioned, for simplicity, but the actual situation is somewhat more complex. In the first place, the pens used for drawing upper-case letters are specified separately from those used to draw the lower-case ones, and numerals are drawn by mixing these two specifications. There is also a parametric 'fudge factor' that takes some weight off of letters like *w* and *m*, which otherwise would look too dark in some styles; true uniformity in line widths does not lead to uniform appearance, because our eyes play tricks on us.

Another slightly subtle parameter of the Computer Modern fonts is the so-called 'overshoot' by which curves and sharp corners descend below the baseline and above the mean line. For example, the letters in this sentence have no overshoot at all. And certain letters in this sentence overshoot their boundaries by thrice as much as they do in the following sentences. Experimentation is still necessary to find the amount of overshoot that makes the letters look most stable, and on low resolution printing equipment it is desirable to eliminate overshoot entirely; further study of this parameter, in combination with the others, would be quite interesting.

Serif details can be varied in several ways. For example, there are no 'sheared' serifs on the letters in this sentence. And the letters you are now reading have thrice as much shear as usual, just to make sure that the concept of shear is clear. Another serif-oriented concept is the amount of 'bracketing'; the serifs in this sentence have no brackets. But the brackets are exaggerated in this sentence, so the serifs appear darker. The difference can be understood most easily if we enlarge the letters:

no bracketing;

normal bracketing;

noticeable bracketing.

A curve that starts at the edge of the serif will be tangent to the stem at some distance above or below the serif; this vertical distance is the 'bracketing' parameter.

A third parameter affecting serifs is called the 'crispness': The example serifs above have been crisply squared off, using a special rectangular pen instead of an ellipse, but one can also specify

no crispness,

in which case only the elliptical pens are used. The typewriter-like font examples above are non-crisp.

The length of serifs is, of course, controllable too. The letters in this sentence have serifs that are 50% shorter than before. And in this sentence they are 50% longer than before—so long

that they sometimes touch where they shouldn't. To get sans-serif letters, one simply sets the serif length to zero (and makes appropriate changes in the inter-letter spacing). The sans-serif letters in Computer Modern Roman have 'soft' endpoints because they are drawn with elliptical pens; it would be possible to get crisp edges by extending the Computer Modern routines, but sans-serif fonts were not given high priority in this particular design.

A 'slant' parameter transforms the pen motion, as shown in this sentence, but the pen shape remains the same. The degree of slant can be negative as well as positive, if unusual effects are desired. *Too much slant leads, of course, to letters that are nearly unreadable.* Perhaps the most interesting use of the slant parameter occurs when Computer Modern Italic fonts are generated without any slant: Italic letters have a different style from roman, and we are so used to seeing such letters slanted forward that they appear to be slanting backward when they are actually upright or slanting slightly forward.

The final parameter we shall discuss is the most interesting one; it is called 'the square root of 2'. From a mathematical standpoint, there is of course only one square root of 2, but the Computer Modern meta-fonts treat $\sqrt{2}$ as a variable parameter that is used to compute the 45° points when a pen is drawing elliptical curves. As a result, a value that is smaller than the true one will change an ellipse to a super-ellipse and open up the bowls, while a higher value will have the opposite effect:

The 'square root of 2' in these letters is 1.100.

The 'square root of 2' in these letters is 1.300.

The 'square root of 2' in these letters is 1.414.

The 'square root of 2' in these letters is 1.500.

The 'square root of 2' in these letters is 1.700.

Several additional parameters can be varied in addition to those we have mentioned; for example, there is an amount by which sharp corners in letters like V and M are spread apart to avoid unnecessary fill-in, and some parameters such as the serif length are specified independently for upper-case and lower-case letters. But a complete description of Computer Modern Roman is beyond the scope of this paper.

We have been studying the parameters one at a time—what happens when they are all changing at once? The next page shows one of the interesting transformations that are possible. At the top we have a font with an old-fashioned feeling, essentially the same as the style of type used so far in the text of this paper, except for scale: The h-height is 8.4 points, the x-height is 4 points, the e-height is 2.3 points, and the descender depth is 3 points. Hairlines are 0.26 points wide, compared to 1.2-point straight stems and 1.34-point curved stems; the bulb diameter is 1.36 points and the aspect ratio is 1/1. One em in this style equals 12.6 points; serifs are .07777 of an em long, and they have 0.54 points of shear, 0.8 points of bracketing. The overshoot parameter is 0.3 points, and the 'square root of 2' has its mathematically correct value 1.414214.

Continuous variation of parameters can gradually convert a font with an old-fashioned flavor into a contemporary style. All of the letters in this example have the same h-height, but their em width increases as their x-height increases. This gives a perspective effect in which the words come out of the past to the present, as they approach the future.

The LORD is my shepherd;
I shall not want.
He maketh me to lie down
in green pastures:
he leadeth me
beside the still waters.
He restoreth my soul:
he leadeth me
in the paths of righteousness
for his name's sake.
Yea, though I walk through the valley
of the shadow of death,
I will fear no evil:
for thou art with me;
thy rod and thy staff
they comfort me.
Thou preparest a table before me
in the presence of mine enemies:
thou anointest my head with oil,
my cup runneth over.
Surely goodness and mercy
shall follow me
all the days of my life:
and I will dwell
in the house of the LORD
for ever.

The letters at the end of the example on the previous page have been transformed into an almost hypermodern font, which will be used for the remainder of this article. The h-height is still 8.4 points, but the x-height has grown to 6.4 points and the e-height to 3.2; the descender depth is now 4 points. Hairlines and stem lines are both exactly one point wide, and bulbs have a diameter slightly larger (1.1 points); the aspect ratio is $3/5$. One em is now 21.6 points; the serif length is zero, and so are the shear and bracketing parameters. There are 0.1 points of overshoot, and the 'square root of 2' is 1.3.

Each of the 593 letters, spaces, and punctuation marks in the example belongs to a different font, obtained by going $1/592$ of the way further toward the final parameter settings. Thus, although each letter appears to be in the same font as its neighbors, the cumulative

change is quite dramatic—it is something like the gradual changes in our own faces as we grow older, except that this typeface is getting younger.

Hundreds of typefaces have appeared in this article, yet all of them belong to the Computer Modern Roman and Italic meta-fonts. Each letter has been specified by a computer program written in the METAFONT language, and the computer can draw any desired variant of that letter when the parameter values have been supplied. It is important to remember that none of these conventions and parameters are built into METAFONT itself; METAFONT is a general-purpose language intended to facilitate the design of meta-fonts, and Computer Modern is but one approach to font design using such a language.

Let us take a brief look at the program for the letter h, since this will give some insight into the way a meta-font can

be designed. Each Computer Modern Roman h is drawn essentially as follows, if we paraphrase the METAFONT code into English:

This character will be 10 units wide, where there are 18 units per em; however, the width should be adjusted by the 'serif correction' after the character has been drawn, to account for long or short serifs.

There are several key points in this letter, defined as follows: Take an elliptical pen whose height is equal to the hairline width times the aspect ratio, and whose width is equal to the straight stem width for lower-case letters. When this pen is centered at point 1, its center is approximately 2.5 units from the left edge of the character (rounded so that the center is in a good position with respect to the raster), and its top is at the h-height for lower-case letters. Point 2 is directly below point 1; the bottom of the pen will be exactly at the baseline when its center is at point 2. Points 3 and 4 both lie approximately 2.5 units from the right edge of the character; point 4 is directly to the right of point 2, while point 3 is $1/3$ of the way from the e-height to the x-height.

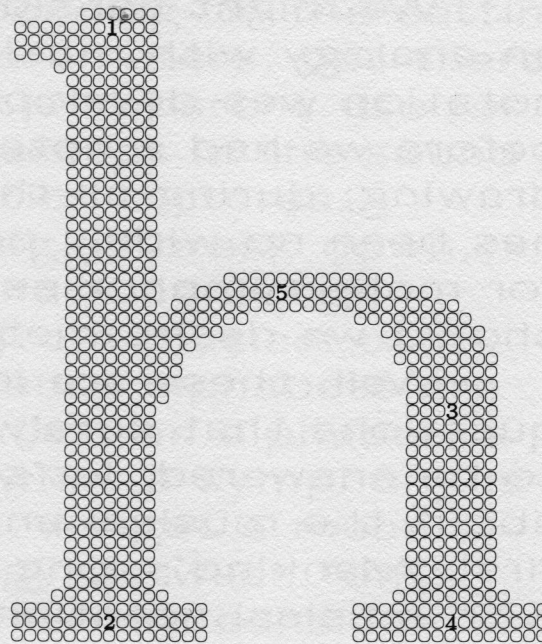
Take the pen and draw a straight stem from point 1 to point 2, and another from point 3 to point 4. Put a sheared serif at the left of point 1, and attach serifs at both sides of points 2 and 4, using the serif sub-programs (which take proper account of the shear, bracketing, crispness, and serif-length parameters).

Finally, the shoulder of the h is drawn as follows: The stroke begins vertically at a point $1/8$ of the way from the e-height to the x-height, using a hairline pen positioned flush right with the left stem line. This hairline pen traces a quarter-ellipse, ending at a point that is horizontally centered in the character and such that the pen's top is at the x-height plus half of the overshoot; let us call this point 5.

The shoulder is completed by drawing one quarter of a superellipse from point 5 to point 3 as the pen grows from the hairline width to the straight stem width; the midpoint of this arc is computed by using the geometric mean of the number 1.23114413 and the 'square root of 2' parameter, instead of $\sqrt{2}$, in the usual formulas for ellipses. (The strange constant 1.23114413 is $2^{3/10}$, chosen so that Piet Hein's famous superellipse will be obtained if the 'square root of 2' equals $\sqrt{2}$.)

Similar routines will yield the m and the n. Effects of the 'slant'

The program that is paraphrased in the text might prepare this character for a low-resolution printing device. Note the five key points numbered 1, 2, 3, 4, and 5; the center of the 'pen' travels through these points as it draws the letter.



parameter are not mentioned in this description, since slanting is done by a different part of the computer program, at the time the actual drawing is being produced.

The idea of a meta-font should now be clear. But what good is it? The ability to manipulate lots of parameters may be interesting and fun, but does anybody really need a $6\frac{1}{7}$ -point font that is one fourth of the way between Baskerville and Helvetica?

We might consider also an analogy with music: Musical notation was developed centuries before we had a notation for drawing; during all this time there has been no widely perceived need for meta-symphonies, so why should we desire meta-fonts?

Well, these are legitimate questions that surely deserve to be answered; let's think about the musical analogy first. Mankind's long experience with musical notation shows clearly that the mere existence of a precise language does not by itself call for the introduction of parameters into that notation. Indeed, parameters have not crept into serious music, even in primitive ways, until very recently, except in a few almost-forgotten pieces like Mozart's meta-waltz [11]. It would surely be interesting and instructive to write meta-music that would produce variable degrees of suspense, excitement, pathos, sturm und drang in the

listener, depending on the setting of certain parameters; but there would be little apparent use for such music except in the sound track of motion pictures.

All analogies break down, of course, and font design is different from musical composition because alphabets are not symphonies; an alphabet is a 'medium' while a symphony is a 'message'. We get a much better analogy between fonts and music when we consider background music rather than symphonies; since fonts serve as the background for an author's printed ideas. Many people resent background music because they feel that music should either be the main focus of a person's attention or it should be absent entirely, while it is generally agreed that the reader of a book should not be conscious of the g's and the k's in that book. A font should be sublime in its appearance but subliminal in its effect.

The utility of parametric variations comes from mankind's need for variety. We don't all want to live in identical houses or drive identical cars. Background music becomes especially tedious when it comes from a limited score having only a few motifs; and five centuries of typographic practice have witnessed a continual craving for new alphabets and for large families of related alphabets. Thus, although any one particular setting of a meta-font's parameters may seem to be somewhat silly and unnecessary, the ability to choose arbitrary parameter settings fills a real need.

Book designers and the designers of advertising copy will have greater freedom than ever before when they have several meta-fonts to work with. Personalized fonts and one-time-only fonts will also be easy for anyone to obtain.

Another reason why meta-fonts and meta-music were not

highly developed long ago is the fact that computers did not exist until recently. People find it difficult and dull to carry out calculations with a multiplicity of parameters, while today's machines do such tasks with ease.

Perhaps the most important practical result of parametric variations is the ability to make adjustments for each point size; the contemporary tendency to obtain 7-point fonts by 70% reduction of 10-point fonts has led to a lamentable degradation of quality. Another advantage is that a meta-font can adapt its curves so that they are properly 'rounded' for the digital typesetting machines that are based on discrete rasters. This leads to a significant reduction in the need for manual editing of the raster patterns.

It is, of course, quite a challenge to design a meta-font instead of a single font. A designer wants to remain in control, yet the great variety

of possible parameter settings means that the meta-font is able to generate infinitely many alphabets, most of which will never be seen by human eyes; only a few of the possibilities can really be looked at, much less fine-tuned, before the specification of the meta-font has been completed. On the other hand, the designer of a meta-font has compensating advantages, because it is often convenient to be able to postpone making decisions about many aspects of a design and to leave them as parameters, instead of 'freezing' their specifications in the initial stages. Such things as the amount of overshoot, the width of hairlines, the length of serifs, and so on, need not be decided once and for all; it is easy to ask the computer to make experiments by which the designer will be able to choose the best settings of these subtle quantities after viewing actual typeset material. Experiments of

this kind would be unthinkable if each character had to be drawn individually—i.e., if each character were simply in a font rather than a meta-font.

In the long run the scientific aspects of meta-fonts should prove to be the most important. The ability to adjust continuous parameters makes it possible to carry out controlled experiments about how such variations affect readability or visual appeal. And even more significant will be the knowledge that will be explicitly embedded in the descriptions of meta-fonts. For example, the author learned a great deal about font design while refining the Computer Modern alphabets, and this information is now accessible to anybody who reads the **META-FONT** code. It is tantalizing to think how much further the art of font design will be advanced when professionals who really know the subject begin to create meta-fonts in an explicit language like **METAFONT**.

Annotated Bibliography

The nine-point type used to set this bibliography reflects the parameter settings for Computer Modern Roman that were used in its original design, based on the 'Monotype Modern 8' font; the more extreme settings used to typeset the text of the paper were chosen long after the design itself was complete, in order to illustrate the meta-font concept.

- [1] P. J. M. Coueignoux, *Generation of roman printed fonts*, Ph.D. thesis, Dept. of Electrical Engineering, M.I.T., June 1975. This thesis represents the first use of sophisticated mathematical curves to describe letter shapes to a computer. Coueignoux and his students are presently continuing this research at the École Nationale Supérieure des Mines de Saint-Etienne, France.
- [2] Adrian Frutiger, *Type Sign Symbol* (Zürich: ABC Verlag, 1980); see especially pages 15–21, which describe 'Why Univers was designed and how it developed.' Univers was the first true meta-font, in the sense that a wide variety of different sizes and weights played a central rôle in its design from the very beginning. 'The decisive factor for the many new design possibilities provided by Univers was that it became possible, for the first time, to work with a set of typefaces as a complete system.' Page 59 of this fascinating book shows a meta-letter n, called the 'proportional schema of a typeface family,' graphically depicting the desirable stroke variations as the font gets bolder.
- [3] Peter Karow et al., 'IKARUS: computer controlled drafting, cutting and scanning of characters and signs. Automatic production of fonts for photo-, CRT and lasercomp machines. Summary.' (September 1979.) This booklet is available from URW Unternehmensberatung, Karow Rubow Weber GMBH, Harksheider Straße 102, 2000 Hamburg 65, Germany. The IKARUS system is now widely used to capture the shapes of letters in mathematical form, based on original artwork [cf. *Baseline* 3 (1981), 6–11]. The computer programs will also interpolate between different weights, although the number of independent parameters is quite limited; this feature was used successfully by Matthew Carter to develop several weights of his new Galliard type, including Ultra Roman [cf. Charles Bigelow, 'On type: Galliard,' *Fine Print* 5 (1979), 27–30].
- [4] David Kindersley and Neil Wiseman, 'Computer-aided letter design,' *Printing World* (October 31, 1979), 12, 13, 17. Discusses the ELF system at Cambridge University, which features a novel method of optical spacing between letters.
- [5] Donald E. Knuth, 'Mathematical typography,' *Bulletin of the American Mathematical Society* (new series) 1 (March 1979), 337–372; reprinted with corrections as part 1 of *T_EX and METAFONT: New Directions in Typesetting* (Providence, R.I.: American Mathematical Society, and Bedford, Mass.: Digital Press, 1979). A paper written shortly after the author began his research on font generation; it explains the initial motivations for this work and shows an experimental roman meta-font.
- [6] Donald E. Knuth, 'The letter S,' *The Mathematical Intelligencer* 2 (1980), 114–122. Discussion of the letter that is most difficult to incorporate into a parameterized meta-font.
- [7] Donald E. Knuth, *Seminumerical Algorithms*, Volume 2 of *The Art of Computer Programming* (Reading, Mass.: Addison-Wesley, 1981). This book was the first large work to be typeset entirely with the Computer Modern meta-fonts; indeed, Computer Modern was developed expressly for the books in this series. The design of Computer Modern had still not been fully completed at the time of

printing; for example, the x-height settings were slightly higher than they are now, and certain characters like '2' have been revised. However, the alphabets in the present paper were obtained from those in *Seminumerical Algorithms* by making only a few dozen refinements. Such revisions and afterthoughts are probably inevitable, especially when the computer representation of a meta-font makes changes so easy; it is very hard to stop and say 'there will be no more improvements made!'

- [8] Donald E. Knuth, *The Computer Modern Family of Type Faces*, a book in preparation, will contain the complete **METAFONT** programs for the Computer Modern Roman and Italic meta-fonts. A preliminary version of this book was published as Stanford Computer Science report STAN-CS-80-780 (January 1980), in order to illustrate the state of the work at that time, but hundreds of important refinements have been incorporated since those early days.
- [9] J. R. Manning, 'Computer-aided footwear design: A method of constructing smooth curves,' Research report 251, Shoe and Allied Trades Research Association (December 1972, revised February 1953); available from Satra House, Rockingham Road, Kettering, Northants NN16 9JH, England. The clothing industry has needs analogous to those of type designers; this paper discusses the generation of curves that pass through given key points, and it includes a 'meta-shoe' as an example.
- [10] H. W. Mergler and P. M. Vargo, 'One approach to computer assisted letter design,' *Visible Language* [née *The Journal of Typographic Research*] **2** (1968), 299–322. This paper describes the first computer system for parametric letter design; it included a meta-font for upper-case roman letters. The approach was limited and unsuccessful because it was entirely based on edge generation with a limited class of curves and because of the equipment limitations of the 1960s, but the authors had laudable goals.
- [11] Wolfgang A. Mozart, *Musikalisches Würfelspiel*, Edition Schott 4474 (Mainz: B. Schott's Söhne, 1957); see also Köchelverzeichnis 516f Anh. C30.01. This unusual score presents a waltz that can be played in 759,499,667,966,482 different ways, since there are eleven possibilities for most of the individual bars; the harmonic principles have been analyzed by Hermann Scherchen in *Gravesaner Blätter* **4** (May 1956), 3–14. Mozart also devised a meta-contredanse, and the British Museum reportedly owns a meta-score by Haydn. A noteworthy 20th-century example of meta-music can be found in *The Schillinger System of Musical Composition* by Joseph Schillinger (two volumes), New York: Carl Fischer, 1946.
- [12] Edward Rondthaler, 'From the rigid to the flexible,' *Penrose Annual* **53** (1959), xv, 1–9. An early description of the variability of type that is possible with photographic transformations alone.

The research reported in this paper was supported in part by National Science Foundation grants IST-7921977 and MCS-7723738, and in part by the IBM Corporation. The author also wishes to thank Charles Bigelow, Matthew Carter, Douglas Hofstadter, Jill Knuth, and Michael Parker for numerous suggestions that helped to improve the presentation; and he owes a special debt of gratitude to Hermann Zapf for dozens of invaluable suggestions that helped greatly to improve the design of the Computer Modern meta-fonts. This paper was typeset on an Alphatype CRS machine, using software developed by the author and an interface developed by David R. Fuchs. Apologies are made to language purists who object to mixing Greek and Latin stems: The Greek equivalent of *fons* is *πηγή*, so a word like 'metapeg' might be superior to 'metafont'. However, such a name would not be readily understood by people who encounter it for the first time, at least not until the day that the science of font design becomes known as pegology.

Typeface as Programme

The Nature of Type Design in the Digital Age

Written by Jürg Lehni for the book [Typeface as Program](#), published in 2009 by [ECAL](#) and [JRP](#).

Like many disciplines dependent on technology for execution or production, type design has undergone a series of fundamental revolutions and transitions in the past century. Driven by technological advance, this process has completely changed the way people work with type, to the point where someone employed in the field had to adapt to a significantly changing situation multiple times throughout a career. The change went from 19th century hot metal typesetting with its very complex and expensive mechanized equipment invented by Monotype and Linotype, through a period of opto-mechanical photocomposition systems, in which printing with cast letter-forms was replaced with exposure of optical outlines on spinning disks of glass onto light-sensitive paper, to the digital simulation of similar processes, formulated in computer programs and executed first by huge room-filling installations and later by affordable home computers.

The advent of computer technology and the digital revolution has had similar impacts on many other creative fields, such as graphic design, photography, film editing, or audio recording, with changes often similar in nature. Highly expensive equipment was made redundant by computer technology running software that simulates the same processes. The software and the user interfaces often uses metaphors from within the field known from the time before the revolution, and the role of the computer is that of a machine simulating other machines or processes as a sort of a meta-tool. Even today, software is largely defined as that, and therefore computers function mostly as replacements for previously existing processes, the type-writer and postal service being two of the most common examples.

Democratization is another important part of these developments. The sudden general availability of processes through computerization has continued to increase the number of people who have access to and start engaging in them. In the

creative sector, this also led to a change in the nature of the work being done, often to the disapproval of the previous specialists in the field. While type design in the 19th century was a craft accessible to very few selected typographers who together with punch cutters worked on designs for one of the companies producing typesetting equipment, it is now a discipline that anyone who has access to a computer and a license for a type design software can engage in.

These are generally known aspects of this revolution that have been looked at closely many times before. But the role of software is rarely analyzed beyond this point. It appears that the general function of the computer is still accepted simply as a simulation machine, and the question what software could or should provide in any given field is rarely raised. Instead, the status quo is often accepted as a given, a language we use in our daily work and that we have stopped questioning, since it is so ubiquitous that it is almost invisible.

Furthermore, in the historic discourse of digital typefaces, questions regarding the definition and nature of digital typefaces are hardly risen and the status quo is rarely questioned beyond the boundaries of the industrial standards.

Fonts, Tools and Software

Traditionally, a font was a complete set of metal characters of a particular typeface in a given size and style. Etymologically, the word goes back to the French word *fonte* and the verb *fondre*, meaning to melt or to cast, referencing the way fonts were produced by type foundries. Fonts were one of the ingredients needed in the printing process in order to be able to print text, and they were bought in full sets from the foundries. A set included more copies of some letters than others, depending on the statistical occurrence of each letter in any given language. The structure of the letter cases that hold the letters represented this distribution.

A font was not a full, independent tool in itself, but rather a part of a tool based process, which, without it could not take place. Given its physical nature at that time, it is imaginable that fonts were perceived as tools in themselves. At the same

time they could also be seen as an artwork designed by a typographer and executed by a punch cutter.

Today, digital fonts are legally defined as software, once again as the digital counterpart of a tool. This has broad consequences for the way fonts are distributed and sold, and the way type designers are earning their money, since licensing schemes similar to the ones found in software applications are in place: The End User License Agreements (EULA) entitle the end users of fonts to install them on a defined number of computers within the same household or office. The degree of usage of the font in this case has no impact on the price. As soon as the user has bought the license, he owns the right of usage within the defined boundaries and therefore can use the font as a tool as much as he likes, as long as he does not infringe the rules of the agreement. This leads for example to the absurd situation where a big TV company in certain circumstances may pay the same amount of money for a font that is aired daily for years on millions of TV screens as a small graphic design office that uses the font once for a client's job. Both buy the basic right to use the font as a tool for whatever they need it for, and the creative work in the typeface is unaccounted for.

While there are foundries that have created complicated agreements for such special cases, the basic problem of unequal usage remains and is criticised by many type designers: the fact that the creative work is not taken into account in the definition as a tool, ignoring the fact that a typeface is also an artistic work by a creative individual.

An alternative way of defining typefaces is as library or a family of graphical shapes along with rules that describe how to assign these to letters, and how to adjust the space between them. If this definition was used legally, another system would suggest itself: one based on royalties, as in the music industry or applied photography, both fields where an artwork or a composition is licensed for specific media based distribution. The licensing costs then mostly depend on the duration of the segment, the size of the image, visibility, distribution, etc. Specific associations claim these royalties and distribute them among their members, enforcing copyright law and ensuring rights of authorship for the protected works.

Such authorship based systems are not necessarily a viable way for typefaces, as they have their own share of problems in the digital age, namely software piracy. Digital Rights Management (DRM) as a possible solutions proposed by big corporations is in the process of failing and is mostly being abandoned at the moment of writing, since the consumers are not willing to follow to the rules they force upon them. Nevertheless it remains curious that this legal definition as software has been chosen, especially since there is little evidence that digital typefaces actually really work as software.

While it is true that the technologies used today for the digital definition of typefaces such as PostScript hold qualities of software and programming languages, there is little evidence that the file formats that describe typefaces such as Type 1 and OpenType actually take advantage of this flexibility. PostScript is a page description language developed by Adobe Systems Inc. In order to offer the greatest flexibility and future scalability, it was designed as a full programming language. Type 1 are the type-specific aspects of this language, and just like the rest of PostScript, typefaces in PostScript are formulated as sequences of program code. But since these codes describe graphical shapes and lists of sizes and spacing between characters, there is little reason that it really should be considered software. The recent introduction of a new open font format named Unified Font Object (UFO) that is entirely based on XML descriptions proves that all this information can be stored without being written as software, since XML is a descriptive markup language like HTML, not a programming language. TrueType is omitted in this comparison as basically the same applies to that format, and both Type 1 and TrueType formats are now merged in the more recent OpenType standard.

Another line of reasoning is that if typefaces were full software, they would not have to rely on a computer operating system (OS) and its underlying typesetting mechanisms. Just like the metal fonts that were an ingredient for a typesetting-machine, the digital fonts are data for a host software that knows how to read it and lay it out.

So if typefaces are legally defined as software, but are not currently behaving like software, this raises questions: Does the current definition of digital typefaces hold

unused potential? Could or should digital type design incorporate the possibilities of software more?

Approaches to Typefaces as Software

The process of digitalization and computerization of type-oriented technology is probably a never ending one since new innovative approaches are continuously being found for how to draw and produce type designs, but the most fundamental changes and revolutions in the field have happened, and the process of software standardization is largely completed. At the beginning of this process, there was the question of how typesetting is best represented in software and executed or output by printing devices. With the introduction of pixel based display technology such as CRT monitors, there was also the problem of how to represent glyph outlines appropriately on such low resolution devices and not lose the font's main characteristics. There were many different proposals, and through a slow process of selection and advancement, some of them were abandoned while others merged and became standards.

This exciting time of technical innovation has led to many different efforts and resulting systems, but now at the end of this process of standardization, there is primarily one system the whole industry is focused on: the previously mentioned OpenType, a standard coined by Microsoft together with Adobe Systems as a result of the "Type War" between Apple's TrueType standard and Adobe System's PostScript. Microsoft, who previously licensed the TrueType technology from Apple, decided to move ahead and create their own standard based on TrueType in the early 1990s, after negotiations with Apple to license their advanced typography technology called "GX Typography" failed. Adobe Systems joined in 1996 and added support for the glyph outline descriptions based on its PostScript's Type 1 fonts. In 2005, OpenType started migrating to an open standard under the International Organization for Standardization (ISO) and the process was completed in 2007 when it was accepted as a free, publicly available standard.

This system has become the standard for type on most of today's modern operating systems such as Mac OS X, Windows and Linux, and most typesetting applications

support its extended features. But there is a rather large niche in which one of the other proposals from the period of early digital type technology has survived until today: The typesetting system TeX with its spin-off project LaTeX, a collection of macros to simplify TeX, and its font system Metafont, used mostly in academia, especially in the mathematics, computer science, and physics communities. Both TeX and Metafont were conceived and designed by highly acclaimed computer scientist Donald E. Knuth as a solution to the problems of typesetting complex mathematical formulas and more generally scientific publications. TeX has been noted as one of the most sophisticated digital typographical systems in the world. TeX (and therefore LaTeX) have adapted to the same wider spread font standards mentioned above. Nevertheless Metafont is still relevant, as it is largely unknown in the domain of type design and has a history that is still of interest for more recent experiments in programmatic type design based on the principles of parametric variations.

TeX and Metafont as an Example of Early Parametrised Digital Typesetting

As the author of the highly acclaimed monograph *The Art of Computer Programming*, listed by the *American Scientist* as one of the 12 best physical-science monographs of the 20th century, Donald E. Knuth was always concerned with the printed appearance of his works and fascinated by the technical facilities and the skills of their operators. The quality of the first three published volumes of his monograph, all typeset in Monotype Modern 8A on mechanical hot type machines from the same company provided great satisfaction.

When in 1977 due to financial restrictions the new edition of volume 2 was to be reproduced with a new optical typesetting system rather than the already disappearing Monotype machines, he saw his world collapse. The optical typesetting systems mostly used typefaces of minor quality, copied or derived from the ones carefully designed by typographers for Monotype and other hot type foundries. For Knuth the beautifully typeset texts and mathematical equations were not simply a feature nice to have, they were part of his motivation to actually write these books. Knuth was obsessed with the beauty of his printed works. In the

introduction to Computer Modern Typefaces, the book about a family of parametrizable fonts that he developed using his Metafont system, he says he has “ink running through his veins.” If his works were going to be badly type set, he decided there was no point in continuing to write them since the finished products were just too painful to look at. He realized he would have to do something about it.

Excited by the impending technological revolution in print that would bring digital printing at a high enough resolution that the pixels would not be visible to the human eye, he decided to come up with a new system that would correctly compose typography in pixels, independent from machines and their resolution. The little squares that either contain 1 or 0, to represent ink or no ink, he concluded, were part of his realm as a computer scientist, so he assumed he should be able to come up with a better solution rather quickly. Knuth reasoned that if solved properly, this work could be of use for a very long time, since this basic principle of pixels as the core component of digital printing would not change, no matter how much the technology surrounding it does.

All this happened before Adobe Systems was founded and the base for the page description language PostScript was laid out. At the beginning of this endeavour, Knuth did not even have the possibility to see the results on screen. Each time he wanted to try out a change in the software he had to make digital prints on a facility without easy or regular access. These huge devices were very expensive to run and an acquisition only made sense for large corporations with continuous use.

In 1978 Knuth was invited to speak in the prestigious Josiah Willard Gibbs Lecture, established by the American Mathematical Society (AMS) in 1923 and held annually to to increase public awareness of the aspects of mathematics and its applications (<http://en.wikipedia.org/wiki/Mathematics>). Knuth quite bravely decided that instead of speaking purely about mathematics or algorithms, his talk should be about this new project that at the time received all his focus, preventing him from advancing with other projects. In the lecture entitled “Mathematical Typography,” Knuth presented his first analysis of the problems of recent printing technology in the domain of mathematical publications to a large group of mathematicians and scientists. Studying and comparing many different examples from the “Transactions of the American Mathematical Society,” a publication that

began in 1900 and has more than 230 volumes to date, Knuth found that they were printed in at least 12 different styles. Of these the quality appeared to have generally declined to an absolute low in recent years, at which time he decided there was no point in continuing to write for these publications anymore.

Knuth then proposed solutions involving a row of computer-assisted methods of composition and layout that form the core of TeX, as well as basic principles for mathematical type design. In order to explain that territory, he first focused on past proposals of typography based on mathematical and geometric constructions, such as the mostly geometry-based works by Felice Feliciano, Luca Pacioli, Francesco Torniello and Giovanni Battista Palatino in Italy, as well as Geoffroy Tory and later the commission of a group of artists and typographers to create a royal alphabet for Louis XIV in France, before dwelling on his proposal for a remedy that finally included some mathematical formulas to describe the characteristics of the curves he was looking for. He ended the talk by presenting a row of tests made with a rough, early version of Metafont, all playful and experimental in nature.

It is interesting to note that the term Mathematical Typography for him really goes both ways in a symbiotic, symmetrical way: there are the new typographic tools, to be created to help mathematical formulas to be correctly and appropriately typeset, and the mathematical formulas needed to solve the typographic problems that the tools required to be designed stood in a mutual relation.

To his surprise, the somewhat unconventional lecture seemed to strike a cord with many of the attendees, and soon after he received various proposals for mathematical solutions to the outlined problems: the perfect mathematical formulation of curves that offer all the flexibility and freedom to describe and modulate the strokes of fonts in an abstract and flexible way.

In his speech he formulated the basic idea of imaginary pen strokes that follow lists of co-ordinates, all parametrised, to describe the glyphs of the typeface. He assumed that such a system, formulated as a specific programming language, would offer all the required flexibility. According to Knuth there was an interesting and very pragmatic reason that led to this pen-based approach over the outline based strategy that Adobe Systems and others have chosen later: in his early experiments, Knuth tried to scan existing mechanical font glyphs in order to

compose their outlines digitally. But since the available equipment at the time was a video camera that distorted the image and was very sensitive to light changes, the results were far from satisfactory and Knuth decided that it would make more sense to produce a system that would allow the formulation of the logic of the glyphs of a font in the way that they were initially drawn and produced by their designers, rather than simply describing their final appearance for production by a printing device. The solution therefore had to be based on calligraphic principles of pen strokes with different nibs and the possibility to extend the resulting geometry with additions, such as serifs. If a font was formulated in its own inherent logic, he concluded, it would be much easier to adapt it for printing in various sizes, changing its contrast, glyph width, x-height, etc. These requirements were directly inspired by the observation that metal letters were produced for specific sizes with different features depending on the size. By making these variations automatic the highest quality possible would be achieved at any size while at the same time respecting typographic tradition.

At the beginning of this digressive side-project he thought would only take six months to complete, Knuth had little knowledge of typography and type design beyond the appreciation of his printed works and a fascination for the trade. But soon it became apparent that the project was going to be far more complex. The process of finalizing the first versions of both Metafont and TeX in the end took four years until the reprint of volume 2 could finally be produced in 1981.

After seeing the results, Knuth was highly disappointed. The volume was printed with a newer facility at a higher resolution than the one he had available for doing his tests, which brought out details he had not been able to see before. While the quality was still better than what the optical system would have produced at that time, they did not match the quality of the mechanically printed earlier volumes, and he was therefore not yet satisfied with the results. Instead of giving up, he went on to improve the situation, and the project grew to what in retrospect made him “put the rest of his life on hold” for eight to 10 years. This strongly affected the work on the missing four of the seven planned volumes of the monograph.

Immediately after the reprint of volume 2, the phase of refinement started, for which Knuth sought support from professional typographers, including Hermann Zapf, whom he first met in 1980, as well as Charles Bigelow, Matthew Carter, Kris

Holmes and Richard Southall. Based on the input of these professionals, Knuth went on redesigning and improving large parts of both Metafont and his Computer Modern typefaces. During this time, Knuth and Zapf were also commissioned by the American Mathematical Society (AMS) to work on a new typeface for mathematics, called AMS Euler. They were joined in their efforts at refinement by the PhD student John D. Hobby, who worked on improving the curve algorithms based on many observations made with the first version. In the years that followed, TeX and Metafont started to be adapted by larger groups of users mostly in the academic world. Workshops were held, and the adaption of the system beyond the scope of roman typefaces was tested, which led to further improvements. It was Knuth's aim to provide a system that could be finalised once and for all and would never have to change again once the work was finished, a system that 30 years later still would produce the same results in print, with varying quality depending on the equipment used. In 1984, Knuth finally published the revised system Metafont84 and started to be satisfied with the results. In 1987, the AMS started to encourage authors to submit their papers for the "Transactions of the American Mathematical Society" in TeX form. This was the very journal that Knuth had analyzed in his speech almost 10 years earlier, the journal for which he threatened to stop publishing articles if the quality was going to degrade beyond a point of acceptable quality.

Now, at the age of 71, Knuth is still in the process of finishing Volume 4 of The Art of Computer Programming, a work highly anticipated for decades. Volume 5 is currently planned to be released in 2015. He may never be able to finish volumes 6 and 7.

Knuth likes to think that of the 10 years spent on TeX and Metafont, 6 - 7 would be regained by being far more efficient with publishing, and maybe more importantly by again enjoying doing so. There are other reasons for the delay of his Volume 4 than simply this digression. But it is hard to completely rule it out as one of the factors for the delay of his highly respected work on computer science. It is an interesting thought that his obsession with the beauty of printed matter might play a role in the fact that he may never be able to publish the full extent of his knowledge.

As a final observation, maybe the stated technical reason of the lack of suitable equipment was partly an excuse for Knuth to indulge in this far more interesting and rewarding task than the simple description of clearly defined outlines, a project that was also closer to his heart as a passionate computer scientist: the use of computer technology and mathematics to formulate a flexible language suitable to describe letter-forms in an abstract, flexible way. It is this decision that makes Metafont such an interesting proposal that even today, 30 years later, it is as relevant as then, when it was one of the first projects for digitized type. Many of the more recent experiments with scripted typefaces, such as Calligrapher by François Rappo and myself Type Generator by Remo Caminada and Ludovic Varone or Kalliculator by Frederik Berlaen share quite a lot of its mindset and could learn a lot from Knuth's endeavors, were they more accessible to people from the field of digital typography.

While most of the questions raised about the nature of digital typefaces as software remain open, ideally they will contribute to a clearer understanding of the different possibilities and ways forward. It seems that we are just at the beginning of a general exploration into the field of self made tools to produce new results, very much along the lines of Knuth's thinking. He was willing to sacrifice a respectable amount of his scientific career to this cause. In the following interviews, such questions of licensing, authorship, design, creativity and the role of software and tools are further expanded upon.

Additional reading

Robin Kinross, *Modern typography*, Hyphen Press, London, 2004, p. 158-182, Chapter 13 "Modernity after modernism", sub-chapter "Letters as bits, The moment of PostScript, Font wars, Legibility wars, reform and research",

Fred Smeijers, *Type Now*, Hyphen Press, London, 2003. p. 60-66, Glossary

Fred Smeijers, *Counterpunch*, Hyphen Press, London, 1996

Robert Southall, Printer's Type in the twentieth century, British Library, London, 2005

Donald E. Knuth, Digital Typography, Center for the Study of Language and Information, Stanford, California, 1999

Donald E. Knuth, Computers & Typesetting Volume E, Computer Modern Typefaces, Addison-Wesley, Reading, Massachusetts, 1986

Dexter Sinister: LETTER & SPIRIT

This bulletin flows directly from “A Note on the Type” by Dexter Sinister, first published in *The Curse of Bigness*, Queens Museum of Art (2010), then as wall vinyl that comprised an exhibition called “The Plastic Arts,” Gallery 400 at University of Illinois, Chicago (2010), subsequently as a text in *Dot Dot Dot 20* (2010), in vinyl for the exhibition “A Note on the Signs” at Artissima, Torino, Italy (2010), and the exhibition “A Note on the T” at Graphic Design Worlds, Milan, Italy (2011), as a text in *Bulletins of the Serving Library #1, Afterall* (2011), and in the forthcoming *Graphic Design (History in the Making)*, Occasional Papers (2012).

The full caption for the image on p.158 is: Herbert Bayer, *Research in the development of Universal Type*, 1925. Black ink on paper, 11 3/4 x 23 5/8” (29.8 x 60 cm). Harvard Art Museums/Busch-Reisinger Museum, Gift of the artist. Photo: Imaging Department ©President and Fellows of Harvard College. ©2012 Artists Rights Society (ARS), New York/ VG Bild-Kunst, Bonn

Cover image: from The Hollows

Dexter Sinister: LETTER & SPIRIT

In the early 1980s, on the pages of academic design journal *Visible Language*, a classic thesis-antithesis-synthesis played out around the technological and philosophical fine points of computer-assisted type design. Stanford professor Donald Knuth begins with his article, “The Concept of a Meta-font” (Winter 1981). Two years prior, Knuth had conceived and programmed MetaFont—a software that enabled users to generate unlimited numbers of fonts by controlling a limited set of parameters. The article is a performative account of his intervening attempts, using MetaFont to harness the essential “intelligence” of letterforms. In Knuth’s view, the way a single letter is drawn—an *a priori* A, say—presupposes and informs all other letters in the same font. This information can be isolated, turned into a set of instructions, and put to work computer-automating the generation of new characters by filling in the features between two or more variables such as weight or slant.

Such intelligence is (and has always been) implicit in any typeface, but Knuth is out to omit all ambiguity and install a more definite system. He acknowledges that this preoccupation with designing meta-level instructions rather than the fonts themselves is typical of the contemporary inclination to view things “from the outside, at a more abstract level, with what we feel is a more mature understanding.” From this elevated vantage, MetaFont was set up to oversee “how the letters would change in different circumstances.”

A year later, fellow mathematician Douglas Hofstadter responded with his “MetaFont, Metamathematics, and Metaphysics” (Autumn 1982). While “charmed” by Knuth’s thesis, and admitting the bias of his own interests in artificial intelligence and aesthetic theory, Hofstadter proceeds to shoot down his colleague’s apparent claim that the shape of any given letterform is “mathematically containable.” To support his case, he invokes mathematician Kurt Gödel’s Incompleteness Theorems, which assert that any account of a logically coherent system always contains one root-level instance that cannot itself be contained by that account. Hofstadter’s antithesis then usefully couches the debate in terms of “the letter of the law” versus “the spirit of the law,” a familiar antinomy that posits an absolute deference to a set of set rules against a consistent-yet-fluid set of principles. Our prevailing legal system is, of course, based on both: judges base their decisions on firmly established precedent, but also map

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uncharted territory by bringing the full range of their experience to bear on specific cases “in a remarkably fluid way.” In this manner, the law itself adapts.

Hofstadter argues that an accordingly *spirited* conception of type design would therefore renounce Knuth’s ur-A-FORM in favor of a yet-higher-level abstraction, an ur-A-ESSENCE; the fundamental difference being that Hofstadter’s notion of “intelligence” extends beyond a Platonic shape, allowing for the concept of *what constitutes an A* to change, too—beyond what we can reasonably conceive of this possibly being in the future. Each new instance of an A adds to our general understanding of this idea (and ideal), which is necessarily assembled backwards over time.

Hofstadter includes this illustration of two letters vying for the same “typographic niche,” to make himself clear:



help help help
help help help
help help help help

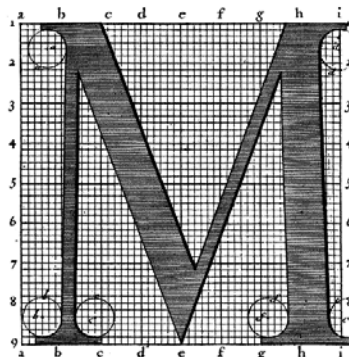
Neatly enough, the following year a linguistics professor called Geoffrey Sampson drafted a brief response to Hofstadter’s response to Knuth, titled “Is Roman Type an Open-Ended Question?” (Autumn 1983), which, it turns out, is decidedly rhetorical. Sampson argues that Hofstadter’s hairsplitting unfairly and unnecessarily exaggerates Knuth’s claims to the point of warping both his meaning and intentions. There is enough metaphysical latitude, the linguist referees, to accommodate both points of view without recourse to the misery of analytical one-upmanship. Sampson’s synthesis of letter and spirit contends that it is perfectly reasonable to conceive of letterforms as both a closed system (Knuth’s A-shape) AND as an open-ended system (Hofstadter’s A-ness).

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Relatively speaking, it depends *what you're after.*

. . .

The history of typography is marked by a persistent drive to rationalize. Following the invention of movable type in the mid-15th century, the Renaissance saw several attempts to prescribe the construction of the Roman alphabet: Fra Luca Pacioli's alphabet of perfect relations, Albrecht Dürer's letters of mathematical instructions, and Geoffroy Tory's humanistic rationalizations. These attempts were, however, essentially calligraphic exercises in determining "divine proportions;" the first to apply Enlightenment rationality to properly technical ends was the so-called *Romain du Roi*, or the "King's Roman." Commissioned by Louis XIV in Paris at the end of the 17th century, it was a typical Age of Reason project—the imposition of a mathematically-rigorous structure on forms that had, until now, developed organically, initially shaped by the human hand (calligraphy, inscriptions, woodcuts) and adapted according to the various demands and opportunities of the printing press and its attendant technologies. Designed by "a royal committee of philosophers and technologists" from the Academy of Sciences, the *Romain du Roi* was initially plotted on an orthogonal 48 x 48 grid, and a corollary "sloped Roman" italic variant derived by skewing the upright version.



The coordinates were first engraved as a set of instructions, then cut into punches to make metal type, which were to be used exclusively on official or state-approved materials. In this way, the King's letters exerted state power like a great seal or particular signature.

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Such ratiocination was revived at the Bauhaus in the 1920s, in line with two of the school's foundational principles set up to meet the demands of industrialization: the omission of ornament and the reduction to geometric elements. The most celebrated outcome was Herbert Bayer's 1925 Universal Alphabet, a pared-down sans-serif comprised exclusively of lower-case characters. Bayer adapted the basic glyphs for typewriter and handwriting, experimented with phonetic alternatives, and proposed a wide family of variants, such as the condensed bold version drawn on this panel:



Alongside the basic character set (minus a presumably redundant o, but with alternatives to a and g, as well as two d's that anticipate lighter weights), Bayer has further abstracted the tools he used to draw it: ruler, T-square, set square, compass and protractor. As such, the drawing captions itself, pointing to its point—that this is a project *intrinsically concerned with a particular mode of construction.*

Around the same time, fellow Bauhausler Josef Albers followed similar principles to slightly different ends with his Stencil Alphabet. This, too, was a single-case font, now entirely configured from ten rudimentary shapes, also typically isolated and presented alongside the assembled letters. Drawn and photographed for exclusive use in the school's own publications and publicity, these elemental Bauhaus fonts remained closeted explorations rather than properly industrial products. Neither was properly developed into a “working” typeface, mass-manufactured in metal for wider use. Outside the school, though, prominent *Werkbunder* Paul Renner toned down the hard geometry with gentler, “humanist” sensibilities—more modulation, less harsh on the eye—to yield

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his commercially successful Futura. When it was issued in 1927, godfather of the nascent “New Typography,” Jan Tschichold, wrote that

it cannot be open to one person to create the letterform of our age, which is something that must be free of personal traces. It will be the work of several people, among whom one will probably find an engineer.

During the 1930s, British type designer Stanley Morison was in charge of Monotype, the most significant type foundry of the day. Morison was solicited by *The Times*, London’s principal newspaper, to take out a £1,000 full-page ad. Morison responded yes, as long he could typeset the page himself, because the newspaper’s existing design was in such a dire state. This conversation reportedly carried itself up the *Times*’ chain of command, prompting its director to invite Morison to oversee a complete overhaul of the paper’s typography. Morison accepted, again on one condition—that the paper abolish the use of full points after isolated proper nouns, which he (rightly) considered superfluous and a prime example of the sort of typographic depravity he intended to stamp out. The paper removed the offending punctuation, and Morison climbed aboard.

Newspaper typography is a particularly sensitive art. Minute adjustments have critical knock-on effects for the amount of news that can be issued—especially when multiplied by the massive circulation figures of *The Times*. In a 25-page memorandum, Morison concluded that the house typeface needed to be updated. What became Times New Roman, however, was neither redrawn from scratch nor merely an amendment of the existing version, but rather *amalgamated* from a number of different typefaces made at various points over the previous 400 years. The monogrel result was effectively collaged from past forms, so the lowercase e doesn’t exactly “match” the lowercase a—at least not according to the usual standards of typographic consistency. Up close, Times New Roman is full of such quirks.



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The design of letterforms usually manifests an individual designer's aesthetic impulse at a given point in time, but Times New Roman was the bastard offspring of MANY designers working ACROSS time, with Morison's role something like that of producer, editor, or arranger. The most frequently repeated account of the type's development suggests that Morison gave an existing type sample and some rough sketches to an assistant in the paper's advertising department, who duly cobbled together the new font. Whatever the story, in a note on HIS type, Morison concluded, auspiciously enough: "Ordinary readers, for whom a type is what it does, will be pleased to leave them to analyze the spirit of the letter."

French type designer Adrian Frutiger took the rational mapping of the Romain du Roi to another plateau with Univers, released by the foundry Deberny & Peignot in 1957. In line with the all-encompassing aspirations of mid-20th century Swiss design—locus of the so-called International Style—Univers was conceived as an unusually extended family of fonts. The standard palette of variants, traditionally limited to regular, italic, bold, and sometimes bold italic, was expanded sevenfold, yielding a total of 21 fonts to be cut at any given size. In the foundry's publicity, the family was usually housed in a two-dimensional matrix: an X-axis charts relative WIDTH interspersed with POSITION (Frutiger's term for slant), while the Y-axis charts relative WEIGHT. The family DNA is manifest in a few eccentricities, such as a square dot over the i and a double-barred lower-case a, while individual character sets are named according to their position in the matrix—55 for standard roman, 56 for standard oblique, 65 for medium roman, 66 for medium oblique, and so on.



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Univers' matrix implies that the family could potentially procreate in any direction *ad infinitum*, and, in fact, the project has remained notably open since its inception. Frutiger himself reworked the typeface for digital release by Linotype in 1997, raising the total number of distinct character sets from the original 21 to 63. These included additions to both ends of the chart (Ultra Light and Extended Heavy), along with new monospace variants, requiring a third number to be added to the identifying code. In the wake of Univers' popularity, further dimensions have since been introduced, including extended character sets such as Central European, and non-Latin alphabets such as Greek, Cyrillic, Arabic, and Japanese. This globalization culminated in 2011 with Linotype rechristening the entire design "Univers Next."

...

Towards the end of "The Concept of a Meta-font," an admirably frank Knuth wonders: "The idea of a meta-font should now be clear. But what good is it?"

Hofstadter, for one, had an idea: "Never has an author had anything remotely like this power to control the final appearance of his or her work." Indeed, seeing his own writing in print years earlier, Knuth had been so upset by the shoddy standards of early digital typesetting that he resolved to do it himself—not unlike Morison with his *Times* ad. It took longer than expected, but a decade later, Knuth had designed TeX, an automated typesetting system still in wide use today within academic publishing. MetaFont was initially developed as handmaiden to TeX, to generate the fonts to be used within the broader tasks of document markup and page assembly. However, as MetaFont developed as a project in its own right, its purpose was less immediately apparent. At the time of his *Visible Language* article at least, MetaFont appears to be more a case of hobbyist tinkering in search of an eventual application.

To be fair, Knuth does propose a few uses, all of which were already possible but certainly enhanced by the speed of computer processing. One is the ability to adjust the details of a particular font in line with the limits of a given output device—to make letters thinner or less intricate, for instance, so as to resist type "filling in" with either ink (on paper) or pixels

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(on low-resolution monitors). A second is the possibility of generating countless iterations of the same basic design with slight differences in order to compare and contrast. But a more surprising (and most emphatically-stated) third function of MetaFont, according to its creator, is to meet the “real need” of “mankind’s need for variety.” In other words, to create difference for the sake of difference.

And so the notion of developing MetaFont as an autonomous project rather than as one of TeX’s machine-parts appears to aim foremost at expanding the possibilities of literary expression—anticipating “greater freedom,” a “typeface of one’s own,” “multiple fonts to articulate multiple voices,” and so on. It’s worth recalling, though, that when Knuth invented TeX in order to better typeset his own pages, or Morison refurbished *The Times*, their impetus was fundamentally reactive, not constructive. They weren’t out to expand the possibilities for expression *per se*, only to reinstate standards that had been eroded—ones that had been established in the first place to articulate written language as clearly as possible, not to pile on the effects. As Knuth himself states, typefaces are more medium than message, to the extent that “A font should be sublime in its appearance but subliminal in its effect.” What he didn’t foresee (or at least worry over) is that mankind’s real need for variety would tend towards the wholesale takeoever of novelty as an end in itself.

. . .

In his 1928 book *One-Way Street*, the German cultural critic Walter Benjamin had already anticipated Knuth’s “power to control the final appearance of his or her work,” alluding to the artistic ends that an increased intimacy between writer and technology might foster. Specifically, he predicted that the writer will start to compose his work with a typewriter instead of a pen when “the precision of typographic forms has entered directly into the conception of his books,” to the degree that “new systems with more variable typefaces might then be needed.”

By writing directly into a mechanical form rather than a manuscript (as we’re doing right now) the writer would be working closer to the nature of the multiplied result, and through an increasing awareness and gradual mastery of the form’s new limitations and possibilities *the writing itself

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would evolve;* the shorter the distance between the raw material of words and their processed output, the more entwined the content and form from the outset. This line of thinking was more famously expounded by Benjamin in his 1936 essay “The Work of Art in the Age of Mechanical Reproduction,” which more broadly argues that an authentic, pertinent art is the result of engagement with the latest technological innovations.

Benjamin was an active Marxist, committed to the notion that the technologies of manufacture—the “means of production”—ought to be owned by the people who operate them. In 1934’s “The Author as Producer,” instead of focusing on factories and workers, he attempts to pinpoint the nature of a *socially committed art.* Writing and the other arts, he writes, are grounded in social structures such as educational institutions and publishing networks, but rather than merely asking how an artist’s work stands in relation TO these structures, he queries how it stands IN them. He demands that artists refrain from merely adopting political “content,” propagating an ideological cause, and work instead to transform the root-level MEANS by which their work is produced and distributed. This “progressive” artistic approach INEVITABLY manifests a “correct” political tendency. The work practices in lieu of preaching.

Benjamin’s first case study in “The Author as Producer” is the Soviet writer Sergei Tretiakov, who lived and worked on an agricultural commune for extended periods before writing his experiences up into a novel. He is offered as an exemplary “operative writer,” implicating himself in the matter at hand, as opposed to the common hack who merely observes and “gives information.” Benjamin’s Exhibit A, though, is his immediate contemporary Bertolt Brecht, who subverted orthodox drama by way of his epic theatre’s celebrated “distancing effects”—leaving the lights on, renouncing expository narrative, presenting a series of objective “situations” in order that the spectators draw their own conclusions. Via these and other manipulations of “technique,” Brecht transformed “the functional relation between the stage and the public, text and production, director and actor.”

Necessarily leading by his own and others’ example, then, Benjamin urges the artist to perpetually reconsider his role away from prevailing norms, job descriptions, professional standards, and outside expectations

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generally. What MIGHT the work of a constructively-minded “writer” constitute? Are the abilities to distill an opinion and turn a phrase adequately deployed via the regular mediums—newspaper columns, books, journals and pamphlets—or might they be more usefully channeled through writing, say, captions to photographs, or scripts to make films; or indeed by renouncing writing altogether and taking up photography instead? Hence the essay’s title is also its proposition: the writer (or artist) should be less a hemmed-in author than a free-ranging producer, closing the divide between her “intellectual” and “productive” activities.

...

In “A Note on the Type” (2010) we previously offered a history and extension of Knuth’s MetaFont project. Our appreciative “note” (more a love-letter written 30 years late) was then typeset in our own updated version of MetaFont—basically Knuth’s project rebooted for the PostScript generation and, following a throwaway remark by the late David Foster Wallace, rechristened Meta-The-Difference-Between-The-Two-Font. That “single” note has since been published in multiple contexts and formats—on screens, pages, and walls. While all conform to the same basic essay template, each new instance adds three bits of writing by other people, each typeset in unique, freshly-generated MTDBT2-fonts to demonstrate the software’s essential plasticity. These extra texts have alluded to various facets of the project—*repetition,* *habit,* or *the gray area between art and design,* for example—that have suggested themselves as it has rolled palimpsestuously along.

Meta-The-Difference-Between-The-Two-Font picked up where Knuth’s MetaFont left off. In fact, the only OSTENSIBLE difference between the two is that the new version was re-scripted in contemporary code to run on current computers. When typefaces are reduced to on/off bits of information, the typographic norms established by metal type (and carried over into photocomposition) are no longer bound to material necessity—they can be ignored and modified, and this is precisely what Knuth did. However, it was only with the advent and proliferation of PostScript in the early 1980s that typefaces became “device independent,” freed from their association with particular composing machines and their controlling companies. But beyond this nominal “language difference,” MTDBT2F

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remained more or less faithful to MetaFont’s founding principles — not least its wacko parameters borrowed from Knuth’s Computer Modern font, which include “SUPERNESS,” “CURLINESS,” and so on.

The ACTUAL difference between the two, on the other hand, is less easy to discern. One clue is the simple difference in time: what it meant to make it **then,** and what it means to make it **now.**

In his essay “On the New” (2002), Russian art theorist Boris Groys wrote:

Being new is, in fact, often understood as a combination of being different and being recently-produced. We call a car a NEW car if this car is different from other cars, and at the same time the latest, most recent model produced ... But as Kierkegaard pointed out, to be new is by no means the same as being different ... the new is a DIFFERENCE WITHOUT DIFFERENCE, or a difference which we are unable to recognize because it is not related to any pre-given structural code.

He continues:

For Kierkegaard, therefore, the only medium for a possible emergence of the new is the ordinary, the “non-different,” the identical — not the OTHER, but the SAME.

MTDBT2F is, more-or-less, the same as MetaFont, abiding the obvious fact that it swallows its predecessor. Although the result may look the same, it clearly can’t be, because in addition to the “productive” software, the new version embeds its “intellectual” backstory — a story which is not merely supplementary but absolutely essential. MTDBT2F is a tool to generate countless PostScript fonts, sure, but it is **at least equally** a tool to think around and about MetaFont.

This broader notion is already ingrained in that original *Visible Language* debate, again most keenly foreseen by Hofstadter, who wrote that one of the best things MetaFont might do is inspire readers to chase after the intelligence of an alphabet, and “yield new insights into the elusive ‘spirits’ that flit about so tantalizingly, hidden just behind those lovely shapes we call ‘letters.’” Hofstadter is still referencing fonts and computers here, but

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his sentiments can easily be read under what art critic Dieter Roelstraete recently called “the taunting of thought.” In fact, Walter Benjamin closed “The Author as Producer” with the following summary:

You may have noticed that the chain of thought whose conclusion we are approaching only presents the writer with a single demand, the demand of REFLECTING, of thinking about his position in the process of production.

At least as much as MTDBT2F serves as a functioning typeface, or set of typefaces, then, it is also a red herring, a carrot, and a mirror. It is a nominal setup for a nominal subject to play out, typically moving in and out of focus, veering off into other fields, and trespassing on other topics. In this unruly manner, the font serves us (or anyone else) exactly as it serves language—as rubber cement, a bonding agent.

...

In “The Designer as Producer,” a quick riff on “The Author as Producer” from 2004, design critic Ellen Lupton writes that Benjamin “celebrated the proletarian ring of the word ‘production,’ and the word carries those connotations into the current period,” offering us “a new crack at materialism, a chance to reengage the physical aspects of our work.” To claim, or reclaim, the “tools of production” in the arts today, though, shouldn’t imply some form of engagement, or worse, REengagement, with heavy machinery, hand tools, hard materials, or the studio (art-equivalent of the factory floor). More plausibly, it implies digital code.

Code resides in The Hollows, the curiously-named engine room of immaterial media, domain of scripts and programs, that has been likened by design group Metahaven to the stock market crash: “surface without surface, the exposure of the naked infrastructure or root level system language which precedes surface itself, surface without its effects.”

Another recent essay titled after Benjamin and written by Boris Groys, “Religion in the Age of Digital Reproduction,” invokes the protagonists of *The Matrix* as being uniquely equipped to perceive the workings of The Hollows. While Neo and co. were able to read image files as code, the average spectator “does not have the magic pill ... that would allow him

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or her to enter the invisible digital space otherwise concealed behind the digital image.” And auspiciously enough, Groys also draws on our by-now-familiar terms, letter and spirit.

In updating Benjamin’s title, Groys signals the same basic investigation —of an existing phenomenon (this time religion rather than art) in a new milieu (digital rather than mechanical). Religious practice, he writes, has always involved the reproduction of institutionalized forms, but as Western religion has become increasingly personal and privatized, an unconditional “freedom of faith” has developed alongside traditional, conditional forms. Contemporary fundamentalist religion remains, by definition, grounded in the devout repetition of a fixed “letter” rather than a free “spirit” —material and external rather than essential and implied. This antinomy of “dead letter vs. living spirit” (which tallies easily enough with the legal one related by Hofstadter) informs all Western discourse on religion. On one hand, the typically “spirited” anti-fundamentalist account favors a living, powerful tradition capable of adapting its central message to different times and places, thus maintaining its vitality and relevance. Conversely, the ritualized repetition of the fundamentalist “letter” amounts to a kind of revolutionary stasis or violent rupture in the ever-changing order of things. Religious fundamentalism can thus be conceived as religion *after the death of the spirit:* letter and spirit are separated and polarized to the extent that the former no longer guarantees the latter. “A material difference is now JUST a difference,” Groys writes, “—there is no essence, no being, and no meaning underlying such a formal difference at a deeper level.”

While earlier media suited and so precipitated the circulation of conditional religion (1:1 mechanically-reproduced texts and images disseminated via orthodox channels), contemporary web-based media more closely approximate and so facilitate the unconditional—the wild dissemination of idiosyncratic views. And as digital reproduction supplants mechanical reproduction, the video image becomes the medium of choice. The cheap, anonymous, promiscuous character of digital information guarantees reproduction and dissemination more than any other historical medium. But what’s REALLY being duplicated is, of course, the image’s code —its invisible DNA.

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In the 1930s, Benjamin had reasonably assumed that future technologies would only continue to guarantee the resemblance between an original and its copy, but now the opposite is true: each manifestation of the original is actually **different,** because typically overridden and recalibrated according to each spectator's local preferences (resolution, color calibration, style sheets, etc.) while ONLY THE CODE REMAINS THE SAME. In Groys' final analysis, spirit and letter are transposed from a metaphysical to a technological plane, where "spirit" is script, and each new visualization of that script is a corresponding "letter." (Picture m4v's, jpeg's and mp3's as angels "transmitting their divine command.") By now the terms are confused to the point of inversion: the so-called "spirit" of digital code is fixed, while the so-called "letter" of its various manifestations is fluid. Consequently, forms — surfaces — are no longer tethered to definite meaning, no longer plausible, and so no longer to be trusted.

This is old news. However, as digital media become increasingly ubiquitous, templates increasingly homogenous and entrenched, the most likely place a "writer" might usefully "produce" today is in The Hollows. Hidden or invisible, and otherwise inaccessible to most, this is where we might conceivably reconnect spirit and letter, essence and identity —for "Ordinary readers, for whom a type is what it does."

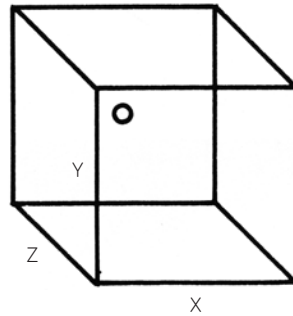
...

How to keep things moving?

MetaFont and MTDBT2F were both set up to generate an infinite number of individual typefaces by tweaking a few simple parameters at different points in time. But what if we make one of those parameters **time itself*?*

First let's transpose the extant ones onto a 3-D graph, running WEIGHT (a kind of bold) along the X-axis, SLANT (more or less italic) up the Y, and extending SUPERNESS (a kind of chutzpah) off into the Z beyond. We'll ignore CURLINESS for the time being, but we do have to account for a fourth factor, PEN, best conceived as a digital "nib" that determines the line's fundamental shape and angle at any given point.

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Now let's send that point **constantly moving** through this imaginary cube. As it wanders randomly and aimlessly through the space, it trails a script that renders an alphabet whose form morphs according to its position relative to the other parameters—not forgetting the fact that the point-nib-pen itself is in perpetual flux. And, crucially, it never stops. The outcome might be usefully apprehended as the potentially endless matrix of Frutiger's Univers, amalgamated over time like Morison's Times New Roman, articulating itself in the manner of Bayer's Geometric Alphabet, over the precise wireframe of Louis XIV's Romain du Roi. Which amounts to a typographic oxymoron: a SINGLE typeface that's simultaneously MANY typefaces and never stops moving.

Naming this shapeshifter is easy enough—just shunt another couple of boxcars onto the end of the night train to arrive at (deep breath) Meta-The-Difference-Between-The-Two-Font-4-D, or MTDBT2F4D for short.

...

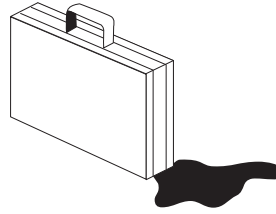
Writing in one place inevitably **performs** in another.

Here, for example, reflecting on Hofstadter's and Morison's and Groys' various assimilations of the terms "letter" and "spirit" fosters a more robust, compound sense of their allegorical purpose. It produces a cosmopolitan thought. When grappling with ideas in one domain is brought to bear on another, those ideas are more firmly grasped and so more readily utilized somewhere else ... towards considering (say) the ways in which relative chauvinism and relative open-mindedness manifest themselves in daily life and work.

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Or, equally, writing the first small script when learning a new programming language, the sole purpose of which is to generate two words that mark the border between instruction & instance. Swaddled in asterisks and set without a full point, this text always reads:

****Hello world****



FONTS AS THE PENULTIMATE INTERACTIVE ART FORM, SECOND ONLY TO SEX

— or —

A FAQ (frequently asked questions) ABOUT ALTERNUMERICS

(1) What is Alternumerics?

Alternumerics explores the relationship between language and interactivity by transforming the simple computer font into an art form that explores the fissure between what we write and we what mean. By replacing individual letters and numbers (known as alphanumerics) with textual and graphic fragments that signify what is typed in radically different ways, *Alternumerics* transforms any computer connected to a standard printer into an interactive artmaking installation.

There are currently four Alternumeric fonts. They are Macintosh and Windows compatible and work with any application that uses fonts. Each font is accompanied with work that uses the font to explore the relationship between what is typed, what is translated—and fundamentally—what is communicated when we use language to describe the pleasures of utopia (see Figure 1), the slipperiness of the self (see Figure 2), the friction of desire (see Figure 3), and the poetry of silence (see Figure 4).

Alternumerics fonts can be downloaded on-line at:
www.nationalphilistine.com/alternumerics/

(2) What do you have against Helvetica?

I don't remember why I began mutating fonts into forms that both reduce and expand its signifying possibilities. It wasn't as if language had stopped working for me. I could still express love and malice and the infinite space of the future with the existing alphanumeric set on my keyboard: I could still write. But I wanted more. I got greedy. I wanted language to only work for me and no one else.

(3) Why fonts? Why not a linux based, MIDI controlled linguistics database with an interactive satellite link to a camera spying on Japanese schoolgirls?

First of all, it is easy to make fonts. Unlike other new media art practices, the technologies used to make fonts have remained relatively unchanged. The politics of perpetual obsolescence in technology forces most new media art into a state of permanent retardation. Technology should never dictate the form; it can only dictate the field.

The field that fonts play in is expansive and intimate. It is loaded into your computer on a systems level, so any application that uses fonts can play. Word processing applications become linguistic desiring machines; database software becomes De Sadean regulator of philosophical pies charts and perverse graphs. Did I mention that fonts are very small? Their file size is invariably under 100K so virtually any computer can work with them. Simple. Ubiquitous. Viral.

(4) What have you really done? Really.

I have essentially reduced the material possibilities of these fonts to signify the immaterial by making the material more specific, more historical, less universal, and more accountable, to me. And like any system that reduces a world it is inherently tragic. Think Diderot's Encyclopedia. Think Socialism.

This is why the word "tragic" always comes to mind. These fonts write with scars from other bodies. They work like systems that bleed.

Figure 1



The future must be sweet

Figure 2



Self portrait as a font V.2

Figure 3



Sexual healing / Shift for harassment

Figure 4



Blurry but not blind

Geert Lovink

Overcoming Internet Disillusionment: On the Principles of Meme Design

01/11

e-flux journal #83 — Geert Lovink
Overcoming Internet Disillusionment: On the Principles of Meme Design

“Artificial intelligence is not the answer to organized stupidity” – Johan Sjerpstra. “Please don’t email me unless you’re going to pay me” – Molly Soda. “Late capitalism is like your love life: it looks a lot less bleak through an Instagram filter” – Laurie Penny. “Wonder how many people going on about the necessity of free speech and rational debate have blocked and muted trolls?” – Nick Srnicek. “Post-truth is to digital capitalism what pollution is to fossil capitalism – a by-product of operations” – Evgeny Morozov. “I have seen the troll army and it is us” – Erin Gün Sirer.

1. Internet Disillusionment

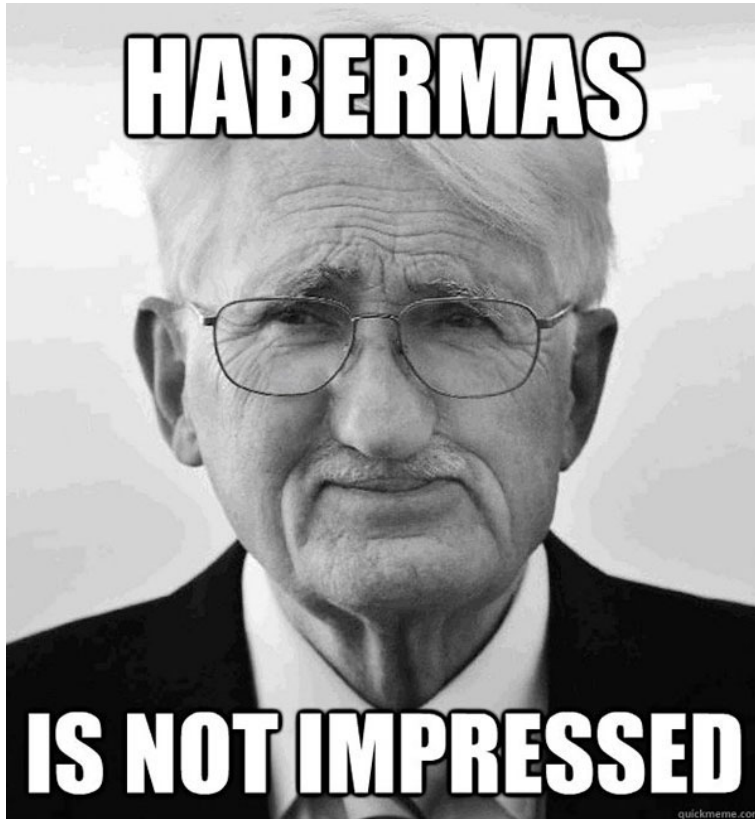
Our disenchantment with the internet is a fact. Yet again, enlightenment does not bring us liberation but depression. The once fabulous aura that surrounded our beloved apps, blogs, and social media has deflated. Swiping, sharing, and liking have begun to feel like soulless routines, empty gestures. We’ve started to unfriend and unfollow, yet we can’t afford to delete our accounts, as this implies social suicide. If “truth is whatever produces most eyeballs,” as Evgeny Morozov states, a general click strike seems like the only option left.¹ But since this is not happening, we feel trapped and console ourselves with memes.

The multi-truth approach of identity politics, according to Slavoj Žižek, has produced a culture of relativism.² Chomsky’s process of “manufacturing consent” has taken hold completely. As Žižek explains in a British TV interview, the Big Other has vanished.³ There is no BBC World Service anymore, the moderate radio voice that once provided us with balanced opinions and reliable information. Every piece of information is self-promotion, crafted by public-relations managers and spin doctors – and by us users as well (we are our own marketing interns). What’s collapsing right now is the imagination of a better life. It is no longer the “wretched of the earth” who revolt, because they’ve got nothing left to lose, but rather the stagnating middle class and “young professionals,” who face permanent precarity.

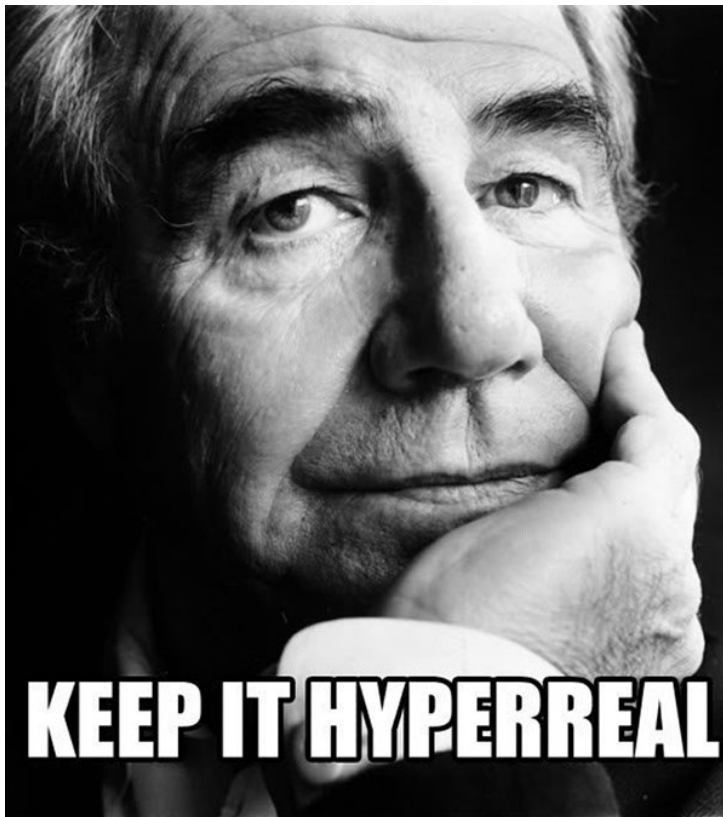
After hubris come guilt, shame, and remorse. Mass conformity didn’t pay off. The question is how the current discontent will ultimately play out on the level of internet architecture. What is techno-repentance? What comes after the Exorbitant Detriment? Once the love affair with apps is over and the addiction reveals itself, the mood flips to cold turkey. What some see as a relief is experienced by many as frustration, if not hatred. The online Other cannot possibly be classified any longer as a “friend”: “If people in the outside world scare you, people on the internet will downright terrify you” is a general warning applicable to all websites. The

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the ends
JUSTIFY THE
memes "
- Augustus



A meme posted
at loltheorists.livejournal.com.



A meme featuring Jean
Baudrillard posted
at loltheorists.livejournal.com.

guilt is produced by the pressure to perform. Users are under constant risk of financial collapse, and once they're poor, they will be subjected to the post-money economy in which only imaginary entities circulate. After they're written off, being online is their last refuge.

"We're terroffucked." That's how Jarett Kobek sums up the general feeling in his 2016 novel *I Hate the Internet*. The guilt and frustration is both personal and political, on a global scale. Throughout the story, set in the gentrified streets of San Francisco, computers coordinate the exploitation of "the surplus population into perpetual servants." What happens once the realization sinks in that "all the world's computers were built by slaves in China" and that it is you who is using those same devices? What happens when we're personally addressed as the guilty partners, "suffering the moral outrage of a hypocritical writer who has profited from the spoils of slavery"?⁴

This is the intriguing part of Kobek's DIY philosophy, which he presents as a science fiction of the present. What if the current internet economy of the free is the default future scenario for the 99 percent? What will happen when the concentration of power and money in the hands of the few becomes irreversible and we abandon all hope for the redistribution of revenues? For Kobek, this is already the case. Failed traditional money has been replaced by micro-fame, "the world's last valid currency," which is even more subject to oscillations than old-fashioned money. "Traditional money [has] ceased to be about an exchange of humiliation for food and shelter. Traditional money [has] become the equivalent of a fantasy world."⁵

Kobek calls himself a proponent of the "bad novel," in contrast to CIA-sponsored literary fiction from the Cold War, called the "good novel" – a category which continues to exist in the form of Jonathan Franzen, who writes "about people from the American Middle West without much eumelanin in their epidermises."⁶ Bad novels are defined here as stories that "[mimic] the computer network in its obsession with junk media, in its irrelevant and jagged presentation of content," filled with characters that have a "deep affection for juvenile literature" such as Heinlein, Tolkien, and Rand.⁷ This all makes you wonder in which category Dave Eggers's novel *The Circle* – an update of Orwell's *1984* – would fit. Can Eggers's internet novel about *Minority Report*–style measures enforced by a fictitious company that's a cross between Google and Facebook be classified as the *ur*–bad novel of this type? What happens when we can no longer distinguish between utopia and dystopia?

The promise of fame deluges people with images of grotesque success. Everyone is a

performer and a celebrity, as long as they believe in their dreams and strive to be like Beyoncé and Rihanna, who are inspirations rather than vultures. Such celebrity cases show "how powerless people [demonstrate] their supplication before their masters."⁸ Fans are fellow travellers on a journey through life; they are not consumers that purchase a product or service. According to Kobek, "the poor [are] doomed to the Internet, a wonderful resource for watching shitty television, experiencing angst about other people's salaries."⁹ Built by "pointless men," the net invokes nothing but trash and hate, leaving the poor empty-handed, with nothing to sell.¹⁰ The poor make money for Facebook. It will never be the other way round.

Kobek has been compared with Houellebecq because of the harshness of each writer's characters. In *I Hate the Internet*, we wander through the cynical start-up environment of Silicon Valley, but Kobek shies away from taking us inside. Unlike the cyberpunk novel, we do not enter cyberspace; we don't swipe through profiles or flow through Instagram pictures. This is not about an "illusion of the end" (and that's the main difference from the 1968 generation: we have the uncanny feeling that something has barely started). In this hyperconservative era, we no longer confront ourselves with the historical duty to face the end of the welfare state, neoliberalism, globalization, the European Union, or other modern institutions. Instead, we're lured into a perpetual state of retromania, because, as the late Mark Fisher pointed out, it is the present that has gone missing ("Make America Dank Again").

Pseudo-events have no chronology, no development, no beginning or middle, let alone an end. We're beyond the terminal process, beyond the postmodern patchwork. Everything accelerates. This must be the twenty-first-century-style catastrophe that so many films have introduced us to. Still, we remain encapsulated, captured inside cybernetic loops that go nowhere, in which meaningless cycles of events, series, and seasons pass by. What happens when the anxiety of information saturation flips into a profound feeling of emptiness? Once we've passed this point, the digital neither disappears nor ends. Events simply no longer turn into Roman spectacles. Instead, we experience simulacrum as prime reality. We cannot process such a sudden overproduction of reality. We no longer turn on television news thinking that we're watching a film. We've moved on. It is not life that has become cinematographic; it is film scenarios and their affects that shape the grand designs of our technological societies. Films anticipated our condition, and now we're situated in the midst of

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yesteryear's science fiction. *Minority Report* is now a techno-bureaucratic reality, driven by the integration of once-separate data streams. Virtual reality feels like *The Matrix*. Trump's reality TV show proved to be a rehearsal. The logic of the avant-garde is very much alive. The last industry to deal with the fake and real whirlpool is the news industry. Hyperreality becomes our everyday situation – regardless of whether we perceive it as boring or absurd.

Let's look at radical disillusionment as form and celebrate the return of its high priest, Jean Baudrillard. Our social media rage is not just a medical condition of the few; it is the human condition. Will the disenchantment turn into a revolt, as Camus once contemplated? The spiritual exhaustion is certainly there (#sleepnomore). Empty-handed, we discuss one powerless critique of the database form after another. To put it in spatial terms, cyberspace has turned out to be a room containing a house containing a city that has collapsed into a flat landscape in which created transparency turns into paranoia. We're not lost in a labyrinth but rather thrown out into the open, watched and manipulated, with no center of command in sight.

The *mille plateaux* of tweets, blogs, and Instagram and Facebook postings have created a culture of deep confusion. Fragmentation was supposed to enrich us, so why are we now paying the bill for all its unforeseen consequences? This was not supposed to happen. Is this the "difference" we once aimed for? Mainstream media play a crucial role in this process of decay. While their legitimacy has faded, their influence is still believed to be significant. This creates an atmosphere of permanent ambivalence. Why bother? Their role as "clearinghouses" of facts and opinion has been undermined for decades by growing centrifugal forces in society that no longer accept particular baby-boomer sentiments (and interests) as the legitimate consensus. The stunning inability of "the press" to deal with recent changes in society has led to a widespread form of indifference. The theoretical blind spots of successive postmodern generations are too numerous to list. The elephant in the room here is Jürgen Habermas. Many of us still subscribe to his notion of the bourgeois public sphere as an arena where different opinions compete in a rational dialogue – even if we do not believe in the core values of Western society, such as democracy. And who's the "counterpublic" in this context? The "user-generated content" of 4Chan, Reddit, and YouTube? What's the organized answer to all this? What would a contemporary version of Indymedia look like? And if such a federated model of "independent media" is so 1999, then

why is it so hard to put together a 2017 upgrade?

There is a crisis of "participatory culture." Let's look at the example of danah boyd and how she's deconstructing the "media literacy" discourse for which so many had such high hopes. The cynical reading of the news has overshadowed critical capacities. In the aftermath of Donald Trump's election, boyd asked if media literacy had backfired.¹¹ Have trolling, clickbait, and fake news undermined the classic belief in the democratization of news production? Whereas for the pre-internet baby-boom generation media literacy was synonymous with the ability to question sources, deconstruct opinions, and decode ideology, media literacy has now turned into the ability to produce one's own content in the form of responses, blog postings, and social media updates. The shift from critical consumer to critical producer has come with a price: namely, information inflation. (The well-meaning "prosumer" synthesis never materialized.) According to boyd, media literacy has become synonymous with distrusting media sources rather than engaging in fact-based critique. Instead of examining the evidence of experts, it is now enough to cite one's own personal experience. This has led to a doubt-centric culture that can only ever be outraged, a culture incapable of reasonable debate – a polarized culture that favors tribalism and self-segregation.

The current situation demands a rethink of the usual demands of activists and civil-society players regarding media literacy. How can the general audience be better informed? Is this an accurate diagnosis of the current problem in the first place? How do we poke holes in the filter bubbles? How can "do-it-yourself" be a viable alternative when social media is already experienced in those terms? And can we still rely on the emancipatory potential of "talking back to the media" via the familiar social networking apps? How does manipulation work today? Is it still productive to deconstruct the *New York Times* (and its equivalents)? How would we explain the workings of the Facebook News Feed to its user base? If we want to blame the algorithms, how do we translate their hidden complexity so that large audiences can understand them?

An effort at such translation is Cathy O'Neil's *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, in which she describes how "ill-conceived mathematical models now micromanage the economy, from advertising to prisons."¹² Her question is how to tame, and disarm, dangerous algorithms. These mathematical models are not neutral tools. However, in everyday life we increasingly

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experience ranking as destiny. Coining the term “Weapons of Math Destruction,” or “WMDs,” O’Neil writes: “Promising efficiency and fairness, [WMDs] distort higher education, drive-up debt, spur mass incarceration, pummel the poor at nearly every juncture, and undermine democracy.”¹³ In her account of the jobs she has had in numerous algorithm-focused industries, she shows that this software is “not just constructed from data but from the choices we make about which data to pay attention to – and which to leave out. Those choices are not just about logistics, profits, and efficiency. They are fundamentally moral.”¹⁴ And class-biased, she adds: “The privileged are processed by people, the masses by machines.”¹⁵ Once installed and running for a while, these WMDs create their own reality and justify their own results, a model which O’Neil calls self-perpetuating and highly destructive.

Techniques such as leaks, fake news, socialbots, *kompromat*, and agitprop confuse the political climate. Disorientation is sufficient; it is not longer necessary to, for instance, manipulate election outcomes. In this “post-factual era,” we’re left with the instant beliefs of celebrity commentators and media experts. Look at Donald Trump’s tweets, an ultimate form of media literacy and a perverse flood of self-expression. His personal tweets have become indistinguishable from policy, state propaganda, and info warfare. In this case, power no longer operates through the pornographic overexposure of the hi-res 3-D image. This is not big data, but singular data. Tiny messages with a “tremendous” fallout. At this level, we leave behind the realm of both Hollywood glamour and reality TV and enter the real-time realm of communication-with-consequences, a next-level hybrid in which sovereign executive power and marketing become inseparable.

What does contemporary psychoanalysis have to offer? As evidenced in Kristin Dombek’s *The Selfishness of Others: An Essay on the Fear of Narcissism*, there is a renaissance of narcissism as cultural diagnosis. While Dombek avoids referencing internet cultures and refrains from selfie and social media complaints, she does point to a crucial change in psychoanalytic practice: from therapeutic to quantitative methods. Today’s narcissism is social and contagious in nature; it consists of traits that “can be measured across large groups of people.”¹⁶ Generation Me spans the planet. We need to move beyond the illness metaphors when discussing Trump, the alt-right, and social media at large. It could be a fatal mistake to attempt to marginalize (as both diagnostics and tactics) the self-absorbed populist right as “sick patients.” In a review of *The Selfishness of*

Others, Jennifer Schuessler writes that “Ms. Dombek’s own view echoes that of the philosopher René Girard, who argued that our tendency to see narcissism in parents and partners is an effort to reassure ourselves that if those we desire are less than ideally responsive to us it’s because they are sick, not because we are uninteresting.”¹⁷

Beyond the fear of narcissism, let’s look at Trump again, a man who “seems supremely cognizant of the fact that he is always acting. He moves through life like a man who knows he is always being observed.” This quote is taken from “The Mind of Donald Trump,” a June 2016 piece in *The Atlantic* written by Dan P. McAdams.¹⁸ Here, Trump is described as a “flummoxing” figure, exhibiting sky-high extroversion combined with off-the-charts low agreeableness. He’s portrayed as a dynamo – driven, restless, unable to sit still, getting by with very little sleep. A cardinal feature of Trump’s acute extroversion is his relentless reward-seeking. Prompted by the activity of dopamine circuits in the brain, highly extroverted people are driven to pursue positive emotional experiences. As McAdams writes,

Anger can fuel malice, but it can also motivate social dominance, stoking a desire to win the adoration of others. Anger lies at the heart of Trump’s charisma, dominated by ebullient extroversion, the relentless showmanship, and the larger-than-life celebrity, who never thinks twice about the collateral damage he will leave behind.

Highly narcissistic people draw attention to themselves. Repeated and inordinate self-reference is a distinguishing feature of their personality. Over time, people become annoyed, if not infuriated, by their self-centeredness. When narcissists begin to disappoint those whom they once dazzled, their descent can be especially precipitous. There is still truth today in the ancient proverb “Pride goeth before the fall.” The world is saturated with a sense of danger and a need for toughness: the world cannot be trusted. It is a ferocious combatant who fights to win. Are you preoccupied with fantasies that the world is ending because of the selfishness of others? McAdams:

Who, really, is Donald Trump? What’s behind the actor’s mask? I can discern little more than narcissistic motivations and a complementary personal narrative about winning at any cost. It is as if Trump has invested so much of himself in developing and refining his socially dominant role that he has nothing left over to create a meaningful story for his life, or for the

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nation. *It is always Donald Trump playing Donald Trump, fighting to win, but never knowing why.*

What would a philosophy of disbelief look like today? Let's seek out a secular follow-up to the critique of religion. What is atheism in the information context? The multiplicity of sources and points of view, once celebrated as a "diversity of opinion," has now reach a nihilistic "zero point" in which the accumulation of possible meanings can either lead to critical insights (or even knowledge), or implode into a pool of indifference (possibly resulting in the disappearance of networks such as Twitter, which thrive on individual expressions, judgements, and preferences).

These days, institutional dogmas are hidden inside media folklore, hardwired into network architectures, steered by algorithms. The mental rejection of authority is now so widespread, and has sunken so far into daily routines and mentalities, that it's now irrelevant whether we deny, endorse, or deconstruct a particular piece of information. That's the tricky aspect of the current social media disposition.

Meme producers have become immune to the criticism of third-way liberal moralists. Their firewall of indifference has not yet been hacked. Ironical deconstruction isn't doing the job either. Says Tara Burton: "Given the ideological anarchy inherent in shitposting, it tends to defy analysis. Shitposters, who are bound by nothing, set a rhetorical trap for their enemies, who tend to be bound by having an actual point." Burton concludes that "shitposting can't be refuted; it can only be repeated."¹⁹ This is simply not the age of the Renaissance (Wo)Man. The disillusionment is overwhelming.

2. Defining the Rules of Meme Design

We're overwhelmed by media events that unfold in real time. Is this spectacle a smoke screen for more drastic, long-term measures? What's our own plan? The politically correct strategies of "civil society" are all well-meaning and target important issues, but they seem to operate in a parallel universe, unable to respond to the cynical meme design that is rapidly taking over key sites of power. Are there ways to not just hit back but also be one step ahead? What's on our minds? How can we move from data to Dada and become a twenty-first-century avant-garde, one that truly understands the technological imperative and shows that "we are the social in social media"? How do we develop, and then scale up, critical concepts and bring together politics and aesthetics in a way that speaks to the online millions? Let's identify the hurdles, knowing that it's time to act. We know that

making fun of the petty world of xenophobes isn't working. What can we do other than coming together? Can we expect anything from the designer as lone wolf? How do we organize this type of political labor? Do we need even more tools that bring us together? Have you already used Meetup, Diaspora, DemocracyOS, and Loomio? Do we perhaps need a collective dating site for political activism? How can we design, and then mobilize, a collective networked desire that unites us in a "deep diversity"? Is the promise of open, distributed networks going to do the job, or are you looking for strong ties – with consequences?

Generations have studied the fatal mistakes made in the interbellum years, but what are the conclusions, now that we're entering similar territory? It's time to reread Hannah Arendt's *The Origins of Totalitarianism* (in which we find David Rousset's famous quote: "Normal men do not know that everything is possible"). We should also revisit Wilhelm Reich's *Mass Psychology of Fascism*, Adorno and Horkheimer, Elias Canetti's *Crowd and Power*, and the opus that defined my own intellectual destiny, Klaus Theweleit's *Male Fantasies*. This is a subjective list; there are so many other classics in this genre.²⁰ Will these authors assist us in discovering the defining factors of our age? How can we identify these key issues and then act upon this knowledge? Crucial are alternative narratives, which, once they have been developed and tested, can be condensed into memes. As we know, memes can and must be mutated. This means that the overall narrative will have to be robust (while "agile"). Memes are designed to be jammed, yet the core message stays the same no matter how radically the meme is altered. We can also call this condensed semiotic unit a symbol, although the symbolic aspect of a meme often remains invisible.

As soon as we understand resistance as organized interference, we can start doing counter-mapping, monitoring the silence and bringing out the hysterical realism that has been hidden for so long. We need to blast lasting holes in the self-evident infrastructure of the everyday. As we have learned from Silicon Valley business gurus, disruption is enough to bring down vast systems, which really just consist of meaningless routines. It's much easier than we think. This also brings closer the possibility of revolution – an event that even the most dogmatic critics of the neoliberal regime ruled out ages ago.

In preparation for things to come, I asked a few people the perennial question: what is to be done? I started off with Nick Srnicek, coauthor of *Inventing the Future*, who just published a treatise called *Platform Capitalism*. According to him, we should start getting into the habit of

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blocking users on social media. “The basic idea on social media also holds for broader issues of public debate: how to refuse voices that are purposefully attacking the basis of reasonable debate?”²¹ Eva Illouz, author of *Why Love Hurts* and *Cold Intimacies*, argues that we need to start with the question of how to design truth:

The problem is that they fight with lies. They have no moral limits. Immoral fighters have an advantage because they are not constrained. We would have to counteract with truth, but truth is binding and constraining, so the question is, how do you make truth as powerful or more powerful than lies, which have the advantage of being invented quickly and tailored to meet your needs?

A possible answer lies in the refusal to deal with memes as isolated digital objects that can be reassembled randomly. We should not start at the very end and get stuck on the Know Your Meme pages. Srnicek:

We need new stories, and that’s different from just thinking about counter-memes or stopping the flow of information. It’s a different temporality effectively, but a new narrative then provides the basis for more immediate responses via social media,

memes, etc. There *is* a narrative to Trump and the rising far right, for instance. And it’s a seductive narrative for some people, which then gets expressed in various forms. The left is, mostly, missing that narrative. We need to get to the heart of the matter, rather than attempting to deal with symptoms. There is all this effort to block “fake news,” but no one questions why the public has a new demand for these stories, or why they don’t have the critical capacity to spot them. Just changing some newsfeed algorithms doesn’t seem adequate.

Memes are the perfect way to enter a story – but which story? The cry for new narratives coincides with calls to go “beyond the fragments,” as expressed by Jodi Dean in her 2016 book *Crowds and Party*. Can memes play a role in the centripetal social forces that bring us together? Dean:

It will be a good experiment to see if meme wars can be effective in undermining the right (that is, making them appear unappealing and undesirable to potential supporters). The challenge is creating bubble-breaking memes since most memes tend to circulate within bubbles of people who already agree. But even if your memes

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The Billbord Liberation Front has, in the spirit of culture jamming, been “improving” outdoor advertising since 1977. Prior campaigns have targeted ads by Exxon, R. J. Reynolds, and Apple Computers.

don't break bubbles they can still be effective if they inspire the left. Bernie Sanders' Dank Meme Stash was a fantastic source of fun and inspiration during the US election.

Alex Galloway isn't sure "culture jamming" is as successful a tactic today as it was in the 1990s. "Memes seem to be operating almost entirely under what we used to call ideology. The power and interest that memes have is entirely due to their status as ideological machines, which doesn't mean they are useless, debased, etc. – on the contrary, it demonstrates how complex and powerful they are." Johannes Grenzfurthner from the Viennese art collective Monochrom adds: "You need a lot of user/follower/creator-power to really create outreach. 4Chan only became the breeding ground of super-memes because of their sheer endless pool of Darwinian non-archival users, some of them online for almost the entire day – and that for years." Grenzfurthner also reminds us that creating political memes is a PR approach to internet culture:

People sniff out PR very fast. And in the end it can turn against you and your campaign. I understand the need to create easily shareable counter-info-memes, but that's pretty much already happening. A ton of good images are already circulating in the specific bubbles. But how to get out of the bubble? You can't penetrate conservative bubbles with liberal content. Your content has to be so obscure and mysterious that it's not working as a propaganda tool anymore. Or will just be used for ridicule.

According to free software thinker and Anonymous historian Gabriele Coleman, we simply cannot afford not to use memes:

When the alt-right was gaining ground and various journalists were horrified that images and emotions could "tug" at people and sway them politically, I was equally horrified that they were so naive and negative about emotions and visual culture. Yes, progressives and leftists must include memes and humor in their arsenal to fight back at some quarters of the right and to steer some portion of the Internet-crazed youth toward the left. Without it, we will lose a huge base of people. Whether this can be designed through a group effort or must bubble up from below is a whole other question. My sense is that it would be more effective coming from a subcultural base rather than an elite art vanguard.

I also asked Matt Goerzen, who's doing meme research with Coleman, about the sought-after recipe for a successful meme:

The alt-right memes are so successful due to their bottom up, populist nature. I've come to understand image board memes as a toolset that can be put to different uses, but only where they fit the job at hand. Memes can be effectively weaponized, as in shitposting on Twitter, a form of cognitive denial-of-service attack, to use Rand Waltzman's term. But they're most powerful as a site of identification, coalescing the values of the individuals who identify with them through thematic sentiment.

According to Goerzen, a significant portion of alt-righters devoted their memetic labors to Bernie while he was still in the running. Goerzen noticed that there was almost no attempt to meme for Hillary:

It's worth wondering why that is. My understanding is that memes are sort of a vessel or coordinating point for organization, but without themes they are largely lacking in ideological value. They are like a vocabulary, and need to be animated and organized by an imperative or narrative. The trajectory of Pepe is very instructive in this regard, and I believe it is telling that the Bernie memes that were getting going utilized Wojak. Pepe and Wojak are like yin and yang – where Pepe is rash, manic, provocative, devious, extroverted, Wojak is deliberative, depressive, reserved, empathetic, and introverted. When Bernie was eliminated the positive identifications enabled through Wojak were stalled, while the positive identifications enabled through Pepe to Trump gained extra momentum, as many of the chan Bernie supporters were enraged by the foul play they deemed responsible for his disqualification – essentially Pepifying them. This is just one example, but the point is this: I believe the effective way to weaponize memes for ideological purposes is to steer ones already popular and meaningful for a contested demographic. This aligns with the "redirect method" that attempts to counter violent extremism circles. The idea of designing or topdowning memes (or "forcememing" in the parlance of imageboard culture) is a pretty challenging task. Many of the government types I've spoken with in elucidating these questions over the past months have ideas about how

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this can be done, but it involves pretty vast resources, and more resembles the sort of work done by Cambridge Analytica than anyone in the imageboard or alt-right cultural orbit.²²

Apart from the need for a narrative, there's the issue of acceleration. Should alternative memes circulate at the same speed as the overall internet? Are we running out of time? How about slow memes? What if "real time" is itself part of the problem? According to Franco Berardi, we need a new rhythm of elaboration; we need to slow down sequentiality, heal from acceleration, and find a new tempo of movement. This cannot be realized through further acceleration. Real-time communication already ruins our bodies, our minds. According to Berardi, the digital realm is leading to "decorpetization," creating a "bodiless brain." The infosphere is one giant nervous stimulation. What we need, before we can even start telling the New Narrative, is a "reconfiguration of mental elaboration."²³

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Geert Lovink is a Dutch media theorist, internet critic, and author of *Uncanny Networks* (2002), *Dark Fiber* (2002), *My First Recession* (2003), *Zero Comments* (2007), *Networks Without a Cause* (2012), and *Social Media Abyss* (2016). In 2004 he founded the Institute of Network Cultures at the Amsterdam University of Applied Sciences. This center organizes conferences, publications, and research networks such as Video Vortex (online video), Unlike Us (alternatives in social media), Critical Point of View (Wikipedia), Society of the Query (the culture of search), MoneyLab (internet-based revenue models in the arts). Recent projects deal with digital publishing and the future of art criticism. He also teaches at the European Graduate School (Saas-Fee/Malta), where he supervises PhD students.

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THE COMING AGE OF CALM TECHNOLOGY[1]

Mark Weiser and John Seely Brown

Xerox PARC

October 5, 1996

INTRODUCTION

The important waves of technological change are those that fundamentally alter the place of technology in our lives. What matters is not technology itself, but its relationship to us.

In the past fifty years of computation there have been two great trends in this relationship: the mainframe relationship, and the PC relationship. Today the Internet is carrying us through an era of widespread *distributed computing* towards the relationship of *ubiquitous computing*, characterized by deeply imbedding computation in the world. Ubiquitous computing will require a new approach to fitting technology to our lives, an approach we call "calm technology".

This article briefly describes the relationship trends, and then expands on the challenges of designing for calm using both the center and the periphery of our perception and the world.

The Major Trends in Computing	
Mainframe	many people share a computer
Personal Computer	one computer, one person
Internet - Widespread Distributed Computing	. . . transition to . . .
Ubiquitous Computing	many computers share each of us

PHASE I - THE MAINFRAME ERA

The first era we call "mainframe", to recall the relationship people had with computers that were mostly run by experts behind closed doors. Anytime a computer is a scarce resource, and must be negotiated and shared with others, our relationship is that of the mainframe era. There is mainframe computing today: a shared office PC, and the great physical simulations of everything from weather to virtual reality, have in common sharing a scarce resource. If lots of people share a computer, it is mainframe computing.

PHASE II - THE PC ERA

The second great trend is that of the personal computer. In 1984 the number of people using personal computers surpassed the number of people using shared computers.[2] The personal computing relationship is personal, even intimate. You have *your* computer, it contains your stuff, and you interact directly and deeply with it. When doing personal computing you are occupied, you are not doing something else. Some people name their PC - many people curse or complain to their PC.

The personal computer is most analogous to the automobile - a special, relatively expensive item, that while it may "take you where you want to go", requires considerable attention to operate. And just as one can own several cars, one can own several personal computers: for home, for work, and for the road. Any computer with

which you have a special relationship, or that fully engages or occupies you when you use it, is a personal computer. Most handheld computers, such as the Zaurus, the Newton, or the Pilot, are today still used as personal computers. A \$500 network computer is still a personal computer.

TRANSITION - THE INTERNET AND DISTRIBUTED COMPUTING

A lot has been written about the Internet and where it is leading. We will say only a little. The Internet is deeply influencing the business and practice of technology. Millions of new people and their information have become interconnected. Late at night, around 6am while falling asleep after twenty hours at the keyboard, the sensitive technologist can sometimes hear those 35 million web pages, 300 thousand hosts, and 90 million users shouting "pay attention to me!"

Interestingly, the Internet brings together elements of the mainframe era and the PC era. It is client-server computing on a massive scale, with web clients the PCs and web servers the mainframes (without the MIS department in charge). Although transitional, the Internet is a massive phenomena that calls to our best inventors, our most innovative financiers, and our largest multinational corporations. Over the next decade the results of the massive interconnection of personal, business, and government information will create a new field, a new medium, against which the next great relationship will emerge.

PHASE III - THE UC ERA

The third wave of computing is that of ubiquitous computing, whose cross-over point with personal computing will be around 2005-2020[3]. The "UC" era will have lots of computers sharing each of us. Some of these computers will be the hundreds we may access in the course of a few minutes of Internet browsing. Others will be imbedded in walls, chairs, clothing, light switches, cars - in everything. UC is fundamentally characterized by the connection of things in the world with computation. This will take place at a many scales, including the microscopic[4].

There is much talk today about "thin clients," meaning lightweight Internet access devices costing only a few hundred dollars. But UC will see the creation of *thin servers*, costing only tens of dollars or less, that put a full Internet server into every household appliance and piece of office equipment. The next generation Internet protocol, IPv6[5], can address more than a thousand devices for every atom on the earth's surface[6]. We will need them all.

The social impact of imbedded computers may be analogous to two other technologies that have become ubiquitous. The first is writing, which is found everywhere from clothes labels to billboards. The second is electricity, which surges invisibly through the walls of every home, office, and car. Writing and electricity become so commonplace, so unremarkable, that we forget their huge impact on everyday life. So it will be with UC.

Two harbingers of the coming UC era are found in the imbedded microprocessor, and the Internet. It is easy to find 40 microprocessors in a middle class home in the U.S.A. today. They will be found in the alarm clocks, the microwave oven, the TV remote controls, the stereo and TV system, the kid's toys, etc. These do not yet qualify as UC for two reasons: they are mostly used one at a time, and they are still masquerading as old-style devices like toasters and clocks. But network them together and they are an enabling technology for UC. Tie them to the Internet, and now you have connected together millions of information sources with hundreds of information delivery systems in your house. Clocks that find out the correct time after a power failure, microwave ovens that download new recipes, kids toys that are ever refreshed with new software and vocabularies, paint that cleans off dust and notifies you of intruders, walls that selectively dampen sounds, are just a few possibilities.

The UC will bring information technology beyond the big problems like corporate finance and school homework, to the little annoyances like Where are the car-keys, Can I get a parking place, and Is that shirt I saw last week at Macy's still on the rack? Many researchers are working towards this new era - among them our work at Xerox PARC, MIT's AI-oriented "Things That Think" program[7], the many mobile and wearable computing programs[8] (many funded by ARPA), and the many companies integrating computation into everyday objects, including Mattel and Disney.

What qualifies these as fundamental trends? First, they are about basic human relationships, and so are trends about what matters to us, what we cannot avoid. Second, they have the property of building upon one another. It is apparent that the mainframe relationship will never die completely away, nor the personal computing relationship. Each is used as a ground for the next trend, confirming its importance in its own mode of decline. Third, they are each bountiful sources of innovation, and have required reopening old assumptions, and re-appropriating old technology into new contexts.

It has been said many times that PC operating systems are about twenty years behind mainframe operating systems - but this statement misunderstands what happens in technological revolutions. The radically new context of the PC - uncontrolled room, uncontrolled third party software, uncontrolled power, third party hardware components, retail sales, low-cost requirements, frequent upgrades - meant that mainframe technologies required considerable adaptation. The era of ubiquitous computing is already starting to see old assumptions questioned top to bottom in computer systems design. For instance, our work on ubiquitous computers required us to introduce new progress metrics such as MIPS/Watt and Bits/Sec/M³. (After over a decade of stagnation, MIPS/Watt has improved over a hundred-fold in the past three years.) Research from radios to user interface, from hardware to theory, are impacted by the changed context of ubiquity.[9]

The most potentially interesting, challenging, and profound change implied by the ubiquitous computing era is a focus on *calm*. If computers are everywhere they better stay out of the way, and that means designing them so that the people being shared by the computers remain serene and in control. Calmness is a new challenge that UC brings to computing. When computers are used behind closed doors by experts, calmness is relevant to only a few. Computers for personal use have focused on the excitement of interaction. But when computers are all around, so that we want to compute while doing something else and have more time to be more fully human, we must radically rethink the goals, context and technology of the computer and all the other technology crowding into our lives. Calmness is a fundamental challenge for all technological design of the next fifty years. The rest of this paper opens a dialogue about the design of calm technology.

CALM TECHNOLOGY

Designs that encalm and inform meet two human needs not usually met together. Information technology is more often the enemy of calm. Pagers, cellphones, news-services, the World-Wide-Web, email, TV, and radio bombard us frenetically. Can we really look to technology itself for a solution?

But some technology does lead to true calm and comfort. There is no less technology involved in a comfortable pair of shoes, in a fine writing pen, or in delivering the New York Times on a Sunday morning, than in a home PC. Why is one often enraging, the others frequently encalming? We believe the difference is in how they engage our attention. Calm technology engages both the *center* and the *periphery* of our attention, and in fact moves back and forth between the two.

THE PERIPHERY

We use "periphery" to name what we are attuned to without attending to explicitly.[10] Ordinarily when driving our attention is centered on the road, the radio, our passenger, but not the noise of the engine. But an unusual

noise is noticed immediately, showing that we were attuned to the noise in the periphery, and could come quickly to attend to it.

It should be clear that what we mean by the periphery is anything but on the fringe or unimportant. What is in the periphery at one moment may in the next moment come to be at the center of our attention and so be crucial. The same physical form may even have elements in both the center and periphery. The ink that communicates the central words of a text also peripherally clues us into the genre of the text though choice of font and layout.

A calm technology will move easily from the periphery of our attention, to the center, and back. This is fundamentally encalming, for two reasons.

First, by placing things in the periphery we are able to attune to many more things than we could if everything had to be at the center. Things in the periphery are attuned to by the large portion of our brains devoted to peripheral (sensory) processing. Thus the periphery is informing without overburdening.

Second, by recentering something formerly in the periphery we take control of it. Peripherally we may become aware that something is not quite right, as when awkward sentences leave a reader tired and discomforted without knowing why. By moving sentence construction from periphery to center we are empowered to act, either by finding better literature or accepting the source of the unease and continuing. Without centering the periphery might be a source of frantic following of fashion; with centering the periphery is a fundamental enabler of calm through increased awareness and power.

Not all technology need be calm. A calm videogame would get little use; the point is to be excited. But too much design focuses on the object itself and its surface features without regard for context. We must learn to design for the periphery so that we can most fully command technology without being dominated by it.

Our notion of technology in the periphery is related to the notion of affordances, due to Gibson[11] and applied to technology by Gaver[12] and Norman[13]. An affordance is a relationship between an object in the world and the intentions, perceptions, and capabilities of a person. The side of a door that only pushes out *affords* this action by offering a flat pushplate. The idea of affordance, powerful as it is, tends to describe the surface of a design. For us the term "affordance" does not reach far enough into the periphery where a design must be attuned to but not attended to.

THREE SIGNS OF CALM TECHNOLOGY

Technologies encalm as they empower our periphery. This happens in two ways. First, as already mentioned, a calming technology may be one that easily moves from center to periphery and back. Second, a technology may enhance our *peripheral reach* by bringing more details into the periphery. An example is a video conference that, by comparison to a telephone conference, enables us to attune to nuances of body posture and facial expression that would otherwise be inaccessible. This is encalming when the enhanced peripheral reach increases our knowledge and so our ability to act without increasing information overload.

The result of calm technology is to put us at home, in a familiar place. When our periphery is functioning well we are tuned into what is happening around us, and so also to what is going to happen, and what has just happened. This is a key property of information visualization techniques like the cone tree,[14] that are filled with detail yet engage our pre-attentive periphery so we are never surprised. The periphery connects us effortlessly to a myriad of familiar details. This connection to the world we called "locatedness", and it is the fundamental gift that the periphery gives us.

EXAMPLES OF CALM TECHNOLOGY

We now consider a few designs in terms of their motion between center and periphery, peripheral reach, and locatedness. Below we consider inner office windows, Internet Multicast, and the Dangling String.

INNER OFFICE WINDOWS



We do not know who invented the concept of glass windows from offices out to hallways. But these inner windows are a beautifully simple design that enhances peripheral reach and locatedness.

The hallway window extends our periphery by creating a two-way channel for clues about the environment. Whether it is motion of other people down the hall (its time for a lunch; the big meeting is starting), or noticing the same person peeking in for the third time while you are on the phone (they really want to see me; I forgot an appointment), the window connects the person inside to the nearby world.

Inner windows also connect with those who are outside the office. A light shining out into the hall means someone is working late; someone picking up their office means this might be a good time for a casual chat. These small clues become part of the periphery of a calm and comfortable workplace.

Office windows illustrate a fundamental property of motion between center and periphery. Contrast them with an open office plan in which desks are separated only by low or no partitions. Open offices force too much to the center. For example, a person hanging out near an open cubicle demands attention by social conventions of privacy and politeness.

There is less opportunity for the subtle clue of peeking through a window without eavesdropping on a conversation. The individual, not the environment, must be in charge of moving things from center to periphery and back.

The inner office window is a metaphor for what is most exciting about the Internet, namely the ability to locate and be located by people passing by on the information highway, while retaining partial control of the context, timing, and use of the information thereby obtained.

INTERNET MULTICAST

A technology called Internet Multicast[15] may become the next World Wide Web (WWW) phenomenon. Sometimes called the MBone (for Multicast backBONE), multicasting was invented by a then graduate student at Stanford University, Steve Deering.

Whereas the World Wide Web (WWW) connects only two computers at a time, and then only for the few moments that information is being downloaded, the MBone continuously connects many computers at the same time. To use the familiar highway metaphor, for any one person the WWW only lets one car on the road at a time, and it must travel straight to its destination with no stops or side trips. By contrast, the MBone opens up streams of traffic between multiple people and so enables the flow of activities that constitute a neighborhood. Where a WWW browser ventures timidly to one location at a time before scurrying back home again a few milliseconds later, the MBone sustains ongoing relationships between machines, places, and people.

Multicast is fundamentally about increasing peripheral reach, derived from its ability to cheaply support multiple multimedia (video, audio, etc.) connections all day long. Continuous video from another place is no longer

television, and no longer video-conferencing, but more like a window of awareness. A continuous video stream brings new details into the periphery: the room is cleaned up, something important may be about to happen; everyone got in late today on the east coast, must be a big snowstorm or traffic tie-up.

Multicast shares with videoconferencing and television an increased opportunity to attune to additional details. Compared to a telephone or fax, the broader channel of full multimedia better projects the person through the wire. The presence is enhanced by the responsiveness that full two-way (or multiway) interaction brings.

Like the inner windows, Multicast enables control of the periphery to remain with the individual, not the environment. A properly designed real-time Multicast tool will offer, but not demand. The MBone provides the necessary partial separation for moving between center and periphery that a high bandwidth world alone does not. Less is more, when less bandwidth provides more calmness.

Multicast at the moment is not an easy technology to use, and only a few applications have been developed by some very smart people. This could also be said of the digital computer in 1945, and of the Internet in 1975. Multicast in our periphery will utterly change our world over the next fifty years.

DANGLING STRING

Bits flowing through the wires of a computer network are ordinarily invisible. But a radically new tool shows those bits through motion, sound, and even touch. It communicates both light and heavy network traffic. Its output is so beautifully integrated with human information processing that one does not even need to be looking at it or be very near to it to take advantage of its peripheral clues. It takes no space on your existing computer screen, and in fact does not use or contain a computer at all. It uses no software, only a few dollars in hardware, and can be shared by many people at the same time. It is called the "Dangling String".



Created by artist Natalie Jeremijenko, the "Dangling String" is an 8 foot piece of plastic spaghetti that hangs from a small electric motor mounted in the ceiling. The motor is electrically connected to a nearby Ethernet cable, so that each bit of information that goes past causes a tiny twitch of the motor. A very busy network causes a madly whirling string with a characteristic noise; a quiet network causes only a small twitch every few seconds. Placed in an unused corner of a hallway, the long string is visible and audible from many offices without being obtrusive. It is fun and useful. At first it creates a new center of attention just by being unique. But this center soon becomes peripheral as the gentle waving of the string moves easily to the background. That the string can be both seen and heard helps by increasing the clues for peripheral attunement.

The dangling string increases our peripheral reach to the formerly inaccessible network traffic. While screen displays of traffic are common, their symbols require interpretation and attention, and do not peripheralize well. The string, in part because it is actually in the physical world, has a better impedance match with our brain's peripheral nerve centers.

IN CONCLUSION

It seems contradictory to say, in the face of frequent complaints about information overload, that more information could be encalming. It seems almost nonsensical to say that the way to become attuned to more information is to attend to it less. It is these apparently bizarre features that may account for why so few designs properly take into account center and periphery to achieve an increased sense of locatedness. But such designs are crucial as we move into the era of ubiquitous computing. As we learn to design calm technology, we will enrich not only our space of artifacts, but also our opportunities for being with other people. When our world is filled with interconnected, imbedded computers, calm technology will play a central role in a more humanly empowered twenty-first century.

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THE COBWEB

Can the Internet be archived?

By Jill Lepore January 19, 2015

Malaysia Airlines Flight 17 took off from Amsterdam at 10:31 A.M. G.M.T. on July 17, 2014, for a twelve-hour flight to Kuala Lumpur. Not much more than three hours later, the plane, a Boeing 777, crashed in a field outside Donetsk, Ukraine. All two hundred and ninety-eight people on board were killed. The plane's last radio contact was at 1:20 P.M. G.M.T. At 2:50 P.M. G.M.T., Igor Girkin, a Ukrainian separatist leader also known as Strelkov, or someone acting on his behalf, posted a message on VKontakte, a Russian social-media site: "We just downed a plane, an AN-26." (An Antonov 26 is a Soviet-built military cargo plane.) The post includes links to video of the wreckage of a plane; it appears to be a Boeing 777.

Two weeks before the crash, Anatol Shmelev, the curator of the Russia and Eurasia collection at the Hoover Institution, at Stanford, had submitted to the Internet Archive, a nonprofit library in California, a list of Ukrainian and Russian Web sites and blogs that ought to be recorded as part of the archive's Ukraine Conflict collection. Shmelev is one of about a thousand librarians and archivists around the world who identify possible acquisitions for the Internet Archive's subject collections, which are stored in its Wayback Machine, in San Francisco. Strelkov's VKontakte page was on Shmelev's list. "Strelkov is the field commander in Slaviansk and one of the most important figures in the conflict," Shmelev had written in an e-mail to the Internet Archive on July 1st, and his page "deserves to be recorded twice a day."

On July 17th, at 3:22 P.M. G.M.T., the Wayback Machine saved a screenshot of Strelkov's VKontakte post about downing a plane. Two hours and twenty-two minutes later, Arthur Bright, the Europe editor of the *Christian Science Monitor*, tweeted a picture of the screenshot, along with the message "Grab of Donetsk militant Strelkov's

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page had already been edited: the claim about shooting down a plane was deleted. The only real evidence of the original claim lies in the Wayback Machine.

The average life of a Web page is about a hundred days. Strelkov's "We just downed a plane" post lasted barely two hours. It might seem, and it often feels, as though stuff on the Web lasts forever, for better and frequently for worse: the embarrassing photograph, the regretted blog (more usually regrettable not in the way the slaughter of civilians is regrettable but in the way that bad hair is regrettable). No one believes any longer, if anyone ever did, that "if it's on the Web it must be true," but a lot of people do believe that if it's on the Web it will stay on the Web. Chances are, though, that it actually won't. In 2006, David Cameron gave a speech in which he said that Google was democratizing the world, because "making more information available to more people" was providing "the power for anyone to hold to account those who in the past might have had a monopoly of power." Seven years later, Britain's Conservative Party scrubbed from its Web site ten years' worth of Tory speeches, including that one. Last year, BuzzFeed deleted more than four thousand of its staff writers' early posts, apparently because, as time passed, they looked stupider and stupider. Social media, public records, junk: in the end, everything goes.

Web pages don't have to be deliberately deleted to disappear. Sites hosted by corporations tend to die with their hosts. When MySpace, GeoCities, and Friendster were reconfigured or sold, millions of accounts vanished. (Some of those companies may have notified users, but Jason Scott, who started an outfit called Archive Team—its motto is "We are going to rescue your shit"—says that such notification is usually purely notional: "They were sending e-mail to dead e-mail addresses, saying, 'Hello, Arthur Dent, your house is going to be crushed.'") Facebook has been around for only a decade; it won't be around forever. Twitter is a rare case: it has arranged to archive all of its tweets at the Library of Congress. In 2010, after the announcement, Andy Borowitz tweeted, "Library of Congress to acquire entire Twitter archive—will rename itself Museum of Crap." Not long after that, Borowitz abandoned that Twitter account. You might, one day, be able to find his old tweets at the Library of Congress, but not anytime soon: the Twitter Archive is not yet open for research. Meanwhile, on the Web,

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The Web dwells in a never-ending present. It is—elementally—ethereal, ephemeral, unstable, and unreliable. Sometimes when you try to visit a Web page what you see is an error message: “Page Not Found.” This is known as “link rot,” and it’s a drag, but it’s better than the alternative. More often, you see an updated Web page; most likely the original has been overwritten. (To overwrite, in computing, means to destroy old data by storing new data in their place; overwriting is an artifact of an era when computer storage was very expensive.) Or maybe the page has been moved and something else is where it used to be. This is known as “content drift,” and it’s more pernicious than an error message, because it’s impossible to tell that what you’re seeing isn’t what you went to look for: the overwriting, erasure, or moving of the original is invisible. For the law and for the courts, link rot and content drift, which are collectively known as “reference rot,” have been disastrous. In providing evidence, legal scholars, lawyers, and judges often cite Web pages in their footnotes; they expect that evidence to remain where they found it as their proof, the way that evidence on paper—in court records and books and law journals—remains where they found it, in libraries and courthouses. But a 2013 survey of law- and policy-related publications found that, at the end of six years, nearly fifty per cent of the URLs cited in those publications no longer worked. According to a 2014 study conducted at Harvard Law School, “more than 70% of the URLs within the Harvard Law Review and other journals, and 50% of the URLs within United States Supreme Court opinions, do not link to the originally cited information.” The overwriting, drifting, and rotting of the Web is no less catastrophic for engineers, scientists, and doctors. Last month, a team of digital library researchers based at Los Alamos National Laboratory reported the results of an exacting study of three and a half million scholarly articles published in science, technology, and medical journals between 1997 and 2012: one in five links provided in the notes suffers from reference rot. It’s like trying to stand on quicksand.

The footnote, a landmark in the history of civilization, took centuries to invent and to spread. It has taken mere years nearly to destroy. A footnote used to say, “Here is how I know this and where I found it.” A footnote that’s a link says, “Here is what I used to know and where I once found it, but chances are it’s not there anymore.” It doesn’t matter whether footnotes are your stock-in-trade. Everybody’s in a pinch. Citing a Web

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The day after Strelkov's "We just downed a plane" post was deposited into the Wayback Machine, Samantha Power, the U.S. Ambassador to the United Nations, told the U.N. Security Council, in New York, that Ukrainian separatist leaders had "boasted on social media about shooting down a plane, but later deleted these messages." In San Francisco, the people who run the Wayback Machine posted on the Internet Archive's Facebook page, "Here's why we exist."

VIDEO FROM THE NEW YORKER

Why Noise Pollution Is More Dangerous Than We Think

The address of the Internet Archive is archive.org, but another way to visit is to take a plane to San Francisco and ride in a cab to the Presidio, past cypresses that look as though someone had drawn them there with a smudgy crayon. At 300 Funston Avenue, climb a set of stone steps and knock on the brass door of a Greek Revival temple. You can't miss it: it's painted wedding-cake white and it's got, out front, eight Corinthian columns and six marble urns.

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pedimented Greek temple. When Kahle started the Internet Archive, in 1996, in his attic, he gave everyone working with him a book called “The Vanished Library,” about the burning of the Library of Alexandria. “The idea is to build the Library of Alexandria Two,” he told me. (The Hellenism goes further: there’s a partial backup of the Internet Archive in Alexandria, Egypt.) Kahle’s plan is to one-up the Greeks. The motto of the Internet Archive is “Universal Access to All Knowledge.” The Library of Alexandria was open only to the learned; the Internet Archive is open to everyone. In 2009, when the Fourth Church of Christ, Scientist, decided to sell its building, Kahle went to Funston Avenue to see it, and said, “That’s our logo!” He loves that the church’s cornerstone was laid in 1923: everything published in the United States before that date lies in the public domain. A temple built in copyright’s year zero seemed fated. Kahle hops, just slightly, in his shoes when he gets excited. He says, showing me the church, “It’s *Greek!*”

Kahle is long-armed and pink-cheeked and public-spirited; his hair is gray and frizzled. He wears round wire-rimmed eyeglasses, linen pants, and patterned button-down shirts. He looks like Mr. Micawber, if Mr. Micawber had left Dickens’s London in a time machine and landed in the Pacific, circa 1955, disguised as an American tourist. Instead, Kahle was born in New Jersey in 1960. When he was a kid, he watched “The Rocky and Bullwinkle Show”; it has a segment called “Peabody’s Improbable History,” which is where the Wayback Machine got its name. Mr. Peabody, a beagle who is also a Harvard graduate and a Nobel laureate, builds a WABAC machine—it’s meant to sound like a UNIVAC, one of the first commercial computers—and he uses it to take a boy named Sherman on adventures in time. “We just set it, turn it on, open the door, and there we are—or *were*, really,” Peabody says.

When Kahle was growing up, some of the very same people who were building what would one day become the Internet were thinking about libraries. In 1961, in Cambridge, J. C. R. Licklider, a scientist at the technology firm Bolt, Beranek and Newman, began a two-year study on the future of the library, funded by the Ford Foundation and aided by a team of researchers that included Marvin Minsky, at M.I.T. As Licklider saw it, books were good at displaying information but bad at storing,

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2000. Licklider envisioned a library in which computers would replace books and form a “network in which every element of the fund of knowledge is connected to every other element.”

In 1963, Licklider became a director at the Department of Defense’s Advanced Research Projects Agency (now called DARPA). During his first year, he wrote a seven-page memo in which he addressed his colleagues as “Members and Affiliates of the Intergalactic Computer Network,” and proposed the networking of ARPA machines. This sparked the imagination of an electrical engineer named Lawrence Roberts, who later went to ARPA from M.I.T.’s Lincoln Laboratory. (Licklider had helped found both B.B.N. and Lincoln.) Licklider’s two-hundred-page Ford Foundation report, “Libraries of the Future,” was published in 1965. By then, the network he imagined was already being built, and the word “hyper-text” was being used. By 1969, relying on a data-transmission technology called “packet-switching” which had been developed by a Welsh scientist named Donald Davies, ARPA had built a computer network called ARPANET. By the mid-nineteen-seventies, researchers across the country had developed a network of networks: an internetwork, or, later, an “internet.”

Kahle enrolled at M.I.T. in 1978. He studied computer science and engineering with Minsky. After graduating, in 1982, he worked for and started companies that were later sold for a great deal of money. In the late eighties, while working at Thinking Machines, he developed Wide Area Information Servers, or WAIS, a protocol for searching, navigating, and publishing on the Internet. One feature of WAIS was a time axis; it provided for archiving through version control. (Wikipedia has version control; from any page, you can click on a tab that says “View History” to see all earlier versions of that page.) WAIS came before the Web, and was then overtaken by it. In 1989, at CERN, the European Particle Physics Laboratory, in Geneva, Tim Berners-Lee, an English computer scientist, proposed a hypertext transfer protocol (HTTP) to link pages on what he called the World Wide Web. Berners-Lee toyed with the idea of a time axis for his protocol, too. One reason it was never developed was the preference for the most up-to-date information: a bias against obsolescence. But the chief reason was the premium placed on ease of use. “We were so young then, and the Web was so

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worked on ARPANET in the seventies, and now holds the title of Chief Internet Evangelist at Google, has started talking about what he sees as a need for “digital vellum”: long-term storage. “I worry that the twenty-first century will become an informational black hole,” Cerf e-mailed me. But Kahle has been worried about this problem all along.

“I’m completely in praise of what Tim Berners-Lee did,” Kahle told me, “but he kept it very, very simple.” The first Web page in the United States was created at SLAC, Stanford’s linear-accelerator center, at the end of 1991. Berners-Lee’s protocol—which is not only usable but also elegant—spread fast, initially across universities and then into the public. “Emphasized text like *this* is a hypertext link,” a 1994 version of SLAC’s Web page explained. In 1991, a ban on commercial traffic on the Internet was lifted. Then came Web browsers and e-commerce: both Netscape and Amazon were founded in 1994. The Internet as most people now know it—Web-based and commercial—began in the mid-nineties. Just as soon as it began, it started disappearing.

And the Internet Archive began collecting it. The Wayback Machine is a Web archive, a collection of old Web pages; it is, in fact, *the* Web archive. There are others, but the Wayback Machine is so much bigger than all of them that it’s very nearly true that if it’s not in the Wayback Machine it doesn’t exist. The Wayback Machine is a robot. It crawls across the Internet, in the manner of Eric Carle’s very hungry caterpillar, attempting to make a copy of every Web page it can find every two months, though that rate varies. (It first crawled over this magazine’s home page, [newyorker.com](http://www.newyorker.com), in November, 1998, and since then has crawled the site nearly seven thousand times, lately at a rate of about six times a day.) The Internet Archive is also stocked with Web pages that are chosen by librarians, specialists like Anatol Shmelev, collecting in subject areas, through a service called Archive It, at archive-it.org, which also allows individuals and institutions to build their own archives. (A copy of everything they save goes into the Wayback Machine, too.) And anyone who wants to can preserve a Web page, at any time, by going to archive.org/web, typing in a URL, and clicking “Save Page Now.” (That’s how most of the twelve screenshots of Strelkov’s VKontakte page entered the Wayback Machine on the day the Malaysia Airlines flight

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I was on a panel with Kahle a few years ago, discussing the relationship between material and digital archives. When I met him, I was struck by a story he told about how he once put the entire World Wide Web into a shipping container. He just wanted to see if it would fit. How big is the Web? It turns out, he said, that it's twenty feet by eight feet by eight feet, or, at least, it was on the day he measured it. How much did it weigh? Twenty-six thousand pounds. He thought that *meant* something. He thought people needed to *know* that.

Kahle put the Web into a storage container, but most people measure digital data in bytes. This essay is about two hundred thousand bytes. A book is about a megabyte. A megabyte is a million bytes. A gigabyte is a billion bytes. A terabyte is a million million bytes. A petabyte is a million gigabytes. In the lobby of the Internet Archive, you can get a free bumper sticker that says "10,000,000,000,000,000 Bytes Archived." Ten petabytes. It's obsolete. That figure is from 2012. Since then, it's doubled.

The Wayback Machine has archived more than four hundred and thirty billion Web pages. The Web is global, but, aside from the Internet Archive, a handful of fledgling commercial enterprises, and a growing number of university Web archives, most Web archives are run by national libraries. They collect chiefly what's in their own domains (the Web Archive of the National Library of Sweden, for instance, includes every Web page that ends in ".se"). The Library of Congress has archived nine billion pages, the British Library six billion. Those collections, like the collections of most national libraries, are in one way or another dependent on the Wayback Machine; the majority also use Heritrix, the Internet Archive's open-source code. The British Library and the Bibliothèque Nationale de France backfilled the early years of their collections by using the Internet Archive's crawls of the .uk and .fr domains. The Library of Congress doesn't actually do its own Web crawling; it contracts with the Internet Archive to do it instead.

The church at 300 Funston Avenue is twenty thousand square feet. The Internet Archive, the building, is open to the public most afternoons. It is, after all, a library. In addition to housing the Wayback Machine, the Internet Archive is a digital library, a vast collection of digitized books, films, television and radio programs, music, and other

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armchairs, a coffee table, a pair of bookshelves, two iPads, and two sets of headphones. “You can listen to anything here,” Kahle says. “We can’t put all our music on the Internet, but we can put everything here.”

Copyright is the elephant in the archive. One reason the Library of Congress has a very small Web-page collection, compared with the Internet Archive, is that the Library of Congress generally does not collect a Web page without asking, or, at least, giving notice. “The Internet Archive hooovers,” Abbie Grotke, who runs the Library of Congress’s Web-archive team, says. “We can’t Hoover, because we have to notify site owners and get permissions.” (There are some exceptions.) The Library of Congress has something like an opt-in policy; the Internet Archive has an opt-out policy. The Wayback Machine collects every Web page it can find, unless that page is blocked; blocking a Web crawler requires adding only a simple text file, “robots.txt,” to the root of a Web site. The Wayback Machine will honor that file and not crawl that site, and it will also, when it comes across a robots.txt, remove all past versions of that site. When the Conservative Party in Britain deleted ten years’ worth of speeches from its Web site, it also added a robots.txt, which meant that, the next time the Wayback Machine tried to crawl the site, all its captures of those speeches went away, too. (Some have since been restored.) In a story that ran in the *Guardian*, a Labour Party M.P. said, “It will take more than David Cameron pressing delete to make people forget about his broken promises.” And it would take more than a robots.txt to entirely destroy those speeches: they have also been collected in the U.K. Web Archive, at the British Library. The U.K. has what’s known as a legal-deposit law; it requires copies of everything published in Britain to be deposited in the British Library. In 2013, that law was revised to include everything published on the U.K. Web. “People put their private lives up there, and we actually don’t want that stuff,” Andy Jackson, the technical head of the U.K. Web Archive, told me. “We don’t want anything that you wouldn’t consider a publication.” It is hard to say quite where the line lies. But Britain’s legal-deposit laws mean that the British Library doesn’t have to honor a request to stop collecting.

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CULTURAL CHRONICLES

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BOOKS

Briefly

Legal-deposit laws have been the standard in Western Europe for centuries. They provide national libraries with a form of legal protection unavailable to the Library of Congress, which is not strictly a national library; also, U.S. legal-deposit laws have exempted online-only works. “We are citadels,” Gildas Illien, the former Web archivist at the Bibliothèque Nationale de France, told me. The Internet Archive is an invaluable public institution, but it’s not a national library, either, and, because the law of copyright has not kept up with technological change, Kahle has been collecting Web sites and making them freely available to the public without the full and explicit protection of the law. “It’s extremely audacious,” Illien says. “In Europe, no organization, or very few, would take that risk.” There’s another feature to legal-deposit laws like those in France, a compromise between advocates of archiving and advocates of privacy. Archivists at the BnF can capture whatever Web pages they want, but those collections can be used only in the physical building itself. (For the same reason, you can’t check a book out of the Bibliothèque Nationale de France; you have to read it there.) One result is that the BnF’s Web archive is used by a handful of researchers, a few dozen a month; the Wayback Machine is used by hundreds of thousands of people a day.

In 2002, Kahle proposed an initiative in which the Internet Archive, in collaboration with national libraries, would become the head of a worldwide consortium of Web archives. (The Internet Archive collects from around the world, and is available in most of the world. Currently, the biggest exception is China—“I guess because we have materials on the archive that the Chinese government would rather not have its citizens see,” Kahle says.) This plan didn’t work out, but from that failure came the International Internet Preservation Consortium, founded in 2003 and chartered at the BnF. It started with a dozen member institutions; there are now forty-nine.

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“The library is a target.” When we spoke, the suspects were still at large; hostages had been taken. Illien and his colleagues had started a Web archive about the massacre and the world’s response. “Right now the media is full of it, but we know that most of that won’t last,” he said. “We wrote to our colleagues around the world and asked them to send us feeds to these URLs, to Web sites that were happening, right now, in Paris, so that we could collect them and historians will one day be able to see.” He was very quiet. He said, “When something like that happens, you wonder what you can do from where you sit. Our job is memory.”

The plan to found a global Internet archive proved unworkable, partly because national laws relating to legal deposit, copyright, and privacy are impossible to reconcile, but also because Europeans tend to be suspicious of American organizations based in Silicon Valley ingesting their cultural inheritance. Illien told me that, when faced with Kahle’s proposal, “national libraries decided they could not rely on a third party,” even a nonprofit, “for such a fundamental heritage and preservation mission.” In this same spirit, and in response to Google Books, European libraries and museums collaborated to launch Europeana, a digital library, in 2008. The Googleplex, Google’s headquarters, is thirty-eight miles away from the Internet Archive, but the two could hardly be more different. In 2009, after the Authors Guild and the Association of American Publishers sued Google Books for copyright infringement, Kahle opposed the proposed settlement, charging Google with effectively attempting to privatize the public-library system. In 2010, he was on the founding steering committee of the Digital Public Library of America, which is something of an American version of Europeana; its mission is to make what’s in libraries, archives, and museums “freely available to the world . . . in the face of increasingly restrictive digital options.”

Kahle is a digital utopian attempting to stave off a digital dystopia. He views the Web as a giant library, and doesn’t think it ought to belong to a corporation, or that anyone should have to go through a portal owned by a corporation in order to read it. “We are building a library that is us,” he says, “and it is ours.”

When the Internet Archive bought the church, Kahle recalls, “we had the idea that we’d convert it into a library but what does a library look like anymore? So

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From the lobby, we headed up a flight of yellow-carpeted stairs to the chapel, an enormous dome-ceilinged room filled with rows of oak pews. There are arched stained-glass windows, and the dome is a stained-glass window, too, open to the sky, like an eye of God. The chapel seats seven hundred people. The floor is sloped. “At first, we thought we’d flatten the floor and pull up the pews,” Kahle said, as he gestured around the room. “But we couldn’t. They’re just too beautiful.”

On the wall on either side of the altar, wooden slates display what, when this was a church, had been the listing of the day’s hymn numbers. The archivists of the Internet have changed those numbers. One hymn number was 314. “Do you know what that is?” Kahle asked. It was a test, and something of a trick question, like when someone asks you what’s your favorite B track on the White Album. “Pi,” I said, dutifully, or its first three digits, anyway. Another number was 42. Kahle gave me an inquiring look. I rolled my eyes. Seriously? But it is serious, in a way. It’s hard not to worry that the Wayback Machine will end up like the computer in Douglas Adams’s “Hitchhiker’s Guide to the Galaxy,” which is asked what is the meaning of “life, the universe, and everything,” and, after thinking for millions of years, says, “Forty-two.” If the Internet can be archived, will it ever have anything to tell us? Honestly, isn’t most of the Web trash? And, if everything’s saved, won’t there be too much of it for anyone to make sense of any of it? Won’t it be useless?

The Wayback Machine is humongous, and getting humongouser. You can’t search it the way you can search the Web, because it’s too big and what’s in there isn’t sorted, or indexed, or catalogued in any of the many ways in which a paper archive is organized; it’s not ordered in any way at all, except by URL and by date. To use it, all you can do is type in a URL, and choose the date for it that you’d like to look at. It’s more like a phone book than like an archive. Also, it’s riddled with errors. One kind is created when the dead Web grabs content from the live Web, sometimes because Web archives often crawl different parts of the same page at different times: text in one year, photographs in another. In October, 2012, if you asked the Wayback Machine to show you what cnn.com looked like on September 3, 2008, it would have shown you a page featuring stories about the 2008 McCain-Obama Presidential race, but the advertisement

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Strelkov's page, a man in St. Petersburg tweeted back, "Yep. Perfect tool to produce 'evidence' of any kind." Kahle is careful on this point. When asked to authenticate a screenshot, he says, "We can say, 'This is what we know. This is what our records say. This is how we received this information, from which apparent Web site, at this IP address.' But to actually say that this happened in the past is something that we can't say, in an ontological way." Nevertheless, screenshots from Web archives have held up in court, repeatedly. And, as Kahle points out, "They turn out to be much more trustworthy than most of what people try to base court decisions on."

You can do something more like keyword searching in smaller subject collections, but nothing like Google searching (there is no relevance ranking, for instance), because the tools for doing anything meaningful with Web archives are years behind the tools for creating those archives. Doing research in a paper archive is to doing research in a Web archive as going to a fish market is to being thrown in the middle of an ocean; the only thing they have in common is that both involve fish.

The Web archivists at the British Library had the brilliant idea of bringing in a team of historians to see what they could do with the U.K. Web Archive; it wasn't all that much, but it was helpful to see what they *tried* to do, and why it didn't work. Gareth Millward, a young scholar interested in the history of disability, wanted to trace the history of the Royal National Institute for the Blind. It turned out that the institute had endorsed a talking watch, and its name appeared in every advertisement for the watch. "This one advert appears thousands of times in the database," Millward told me. It cluttered and bogged down nearly everything he attempted. Last year, the Internet Archive made an archive of its .gov domain, tidied up and compressed the data, and made it available to a group of scholars, who tried very hard to make something of the material. It was so difficult to recruit scholars to use the data that the project was mostly a wash. Kahle says, "I give it a B." Stanford's Web archivist, Nicholas Taylor, thinks it's a chicken-and-egg problem. "We don't know what tools to build, because no research has been done, but the research hasn't been done because we haven't built any tools."

The footnote problem, though, stands a good chance of being fixed. Last year, a tool called Perma.cc was launched. It was developed by the Harvard Library Innovation

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Legal Information Preservation Alliance, and the Digital Public Library of America. Perma.cc promises “to create citation links that will never break.” It works something like the Wayback Machine’s “Save Page Now.” If you’re writing a scholarly paper and want to use a link in your footnotes, you can create an archived version of the page you’re linking to, a “permalink,” and anyone later reading your footnotes will, when clicking on that link, be brought to the permanently archived version. Perma.cc has already been adopted by law reviews and state courts; it’s only a matter of time before it’s universally adopted as the standard in legal, scientific, and scholarly citation.

Perma.cc is a patch, an excellent patch. Herbert Van de Sompel, a Belgian computer scientist who works at the Los Alamos National Laboratory, is trying to reweave the fabric of the Web. It’s not possible to go back in time and rewrite the HTTP protocol, but Van de Sompel’s work involves adding to it. He and Michael Nelson are part of the team behind Memento, a protocol that you can use on Google Chrome as a Web extension, so that you can navigate from site to site, and from time to time. He told me, “Memento allows you to say, ‘I don’t want to see this link where it points me to today; I want to see it around the time that this page was written, for example.’ ” It searches not only the Wayback Machine but also every major public Web archive in the world, to find the page closest in time to the time you’d like to travel to. (“A world with one archive is a really bad idea,” Van de Sompel points out. “You need redundancy.”) This month, the Memento group is launching a Web portal called Time Travel. Eventually, if Memento and projects like it work, the Web will have a time dimension, a way to get from now to then, effortlessly, a fourth dimension. And then the past will be inescapable, which is as terrifying as it is interesting.

At the back of the chapel, up a short flight of stairs, there are two niches, arched alcoves the same shape and size as the stained-glass windows. Three towers of computers stand within each niche, and ten computers are stacked in each tower: black, rectangular, and humming. There are towers like this all over the building; these are only six of them. Still, this is *it*.

Kahle stands on his tiptoes, sinks back into his sneakers, and then bounds up the stairs. He is like a very sweet boy who, having built a very fine snowman, drags his mother

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“Think of them as open stacks,” he says, showing me the racks. “You can walk right up to them and touch them.” He reaches out and traces the edge of one of the racks with the tip of his index finger. “If you had all the words in every book in the Library of Congress, it would be about an inch, here,” he says, measuring the distance between his forefinger and thumb.

Up close, they’re noisy. It’s mainly fans, cooling the machines. At first, the noise was a problem: a library is supposed to be quiet. Kahle had soundproofing built into the walls.

Each unit has a yellow and a green light, glowing steadily: power indicators. Then, there are blue lights, flickering.

“Every time a light blinks, someone is uploading or downloading,” Kahle explains. Six hundred thousand people use the Wayback Machine every day, conducting two thousand searches a second. “You can *see* it.” He smiles as he watches. “They’re glowing books!” He waves his arms. “They glow when they’re being read!”

One day last summer, a missile was launched into the sky and a plane crashed in a field. “We just downed a plane,” a soldier told the world. People fell to the earth, their last passage. Somewhere, someone hit “Save Page Now.”

Where is the Internet’s memory, the history of our time?

“It’s right *here!*” Kahle cries.

The machine hums and is muffled. It is sacred and profane. It is eradicable and unbearable. And it glows, against the dark. ♦

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Jill Lepore is a staff writer at The New Yorker and a professor of history at Harvard University. Her latest book is “These Truths: A History of the United States.” [Read more »](#)

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Dear Reader,

Welcome to your Conditional Design Workbook.

This book is the result of what began in 2008 with impromptu meetings on Tuesday nights between us, Luna Maurer, Edo Paulus, Jonathan Puckey and Roel Wouters, around Luna's kitchen table. As designers and artists we were looking for ways to avoid being defined by the media we worked with. Instead, we were searching for new words and definitions to describe our way of working. We formulated a Manifesto, the Conditional Design Manifesto, in which we stated our shared views on design and art. We actually 'practiced what we preached' during weekly mini workshops that lasted between 1 and 3 hours. We would set to work with just a sheet of paper, a couple of pens and a few simple rules one of us had determined beforehand to guide us. We recorded these workshops, shared them online, and to our great pleasure we learned that they were picked up quickly by others who organized their own workshops all over the world.

So, what should you be doing with this book? We don't want to show off how great our drawings are, although we were often pleasantly surprised with the outcome. We feel that Conditional Design's focus on the process is not just relevant to artists or designers, but can be useful for anyone looking for a new and invigorating way of exploring the creative process, or any process for that matter. Instead of inviting you to like or dislike a drawing as a finished product, we hope to turn your attention to the process and the dynamics that allowed the drawings to take shape. We hope this book inspires you to make your own drawings or even create your own workshops. We believe the best way to appreciate thinking in processes—which is what Conditional Design and this book are all about—is by actually doing it yourself. Whether you're a design student hungry for new ideas, a manager reflecting on the dynamics of the team you work with or a group of friends looking for something fun to do on a rainy day, grab this book, a piece of paper and some pens and get started.

We wish you lots of happy drawing!

LM
EP
JP
RW

Conditional Design Manifesto

A manifesto for artists and designers

Through the influence of the media and technology on our world, our lives are increasingly characterized by speed and constant change. We live in a dynamic, data-driven society that is continually sparking new forms of human interaction and social contexts. Instead of romanticizing the past, we want to adapt our way of working to coincide with these developments, and we want our work to reflect the here and now. We want to embrace the complexity of this landscape, deliver insight into it and show both its beauty and its shortcomings.

Our work focuses on processes rather than products: things that adapt to their environment, emphasize change and show difference.

Instead of operating under the terms of Graphic Design, Interaction Design, Media Art or Sound Design, we want to introduce Conditional Design as a term that refers to our approach rather than our chosen media. We conduct our activities using the methods of philosophers, engineers, inventors and mystics.

Process

The process is the product.

The most important aspects of a process are time, relationship and change.

The process produces formations rather than forms.

We search for unexpected but correlative, emergent patterns.

Even though a process has the appearance of objectivity, we realize the fact that it stems from subjective intentions.

Logic

Logic is our tool.

Logic is our method for accentuating the ungraspable.

A clear and logical setting emphasizes that which does not seem to fit within it.

We use logic to design the conditions through which the process can take place.

Design conditions using intelligible rules.

Avoid arbitrary randomness.

Difference should have a reason.

Use rules as constraints.

Constraints sharpen the perspective on the process and stimulate play within the limitations.

Input

The input is our material.

Input engages logic and activates and influences the process.

Input should come from our external and complex environment: nature, society and its human interactions.

=====

Luna Maurer, Edo Paulus, Jonathan Puckey, Roel Wouters

=====

Ghost in the Machine: Distributing Subjectivity

Andrew Blauvelt

'Instead of operating under the terms of Graphic Design, Interaction Design, Media Art or Sound Design, we want to introduce Conditional Design as a term that refers to our approach rather than our chosen media. We conduct our activities using the methods of philosophers, engineers, inventors and mystics.'
— Conditional Design Manifesto¹

'Conceptual artists are mystics rather than rationalists. They leap to conclusions that logic cannot reach.'
— Sol LeWitt²

In their manifesto on conditional design, Luna Maurer, Edo Paulus, Jonathan Puckey, and Roel Wouters articulate several important defining principles of their work: that process trumps product, that logic is their guiding method, and that they embrace external influences, which they call 'input.' At first glance the manifesto recalls the system theories of the 1950s and 1960s, conceptual and process art of the 1960s and 1970s, or perhaps even the more scientifically tinged language of graphic design of the same period. Certainly there are affinities that connect the two, bridging a time span of nearly fifty years. The desire to form a common practice rather than a shared medium reflects the blurred nature of today's design practices and at the same time recalls the intermedia experiments, interdisciplinary design studios, and post-studio artistic practices of a previous era. Another common thread connects these historically distinct practices, as evident in the epigraphs above, namely the need to guard against the specter of a totalizing, closed, and rationalized system. When the signers of the Conditional Design Manifesto say: 'We conduct our activities using the methods of philosophers, engineers, inventors and mystics,' it cannot help but bring to mind another manifesto, by artist Sol LeWitt, who proclaimed: 'Conceptual

artists are mystics rather than rationalists.' LeWitt recuperates the idea of artists having special insights that operate beyond logic, and, as is the case with mystics, these ideas might be eminently pragmatic but might seem esoteric and eccentric to others. For conditional design, the mystic is one more choice in the methodological mix, not a conflation of the designer as mystic. Nonetheless, this recourse to mysticism is an interesting rhetorical choice, one that simultaneously contrasts and distances both conceptual art and conditional design from the arid objectivity of a machine-like rationality. Writing just two years earlier, LeWitt had spelled out the methodological terms for producing a process-oriented art:

'To work with a plan that is preset is one way of avoiding subjectivity. It also obviates the necessity for designing each work in turn. The plan would design the work. Some plans would require millions of variations, and some a limited number, but both are finite. Other plans imply infinity. In each case, however, the artist would select the basic form and rules that would govern the solution of the problem. After that the fewer decisions made in the course of completing the work, the better. This eliminates the arbitrary, the capricious, and the subjective as much as possible. That is the reason for using this method.'³

Seeking to produce an art of seriality, which would allow for permutation and variability within a given rule set, LeWitt would famously remark: 'The idea is the machine that makes the art.'⁴ But this seemingly mechanistic, prescriptive view always had a more subjective, human dimension since it assigned to the artist a new priority for the conception and articulation of an idea to make art instead of understanding art as simply a by-product of a series of variable techniques, codified styles, and specific media to be chosen by the artist. The idea for LeWitt was inherently generative in nature, capable of producing more than a singular work.

In the world of design, a similar discourse was taking place. Writing four years before LeWitt, in his book *Designing Programmes*, designer Karl Gerstner proclaimed:

'Instead of solutions for problems, programmes for solutions—the subtitle can also be understood in these terms: for no problem (so to speak) is there an absolute solution. Reason: the possibilities cannot be delimited absolutely. There is always a group of solutions, one of which is the best under certain conditions.'

To describe the problem is part of the solution. This implies: not to make creative decisions as prompted by feeling but by intellectual criteria. The more exact and complete these criteria are, the more creative the work becomes. The creative process is to be reduced to an act of selection.⁵

Gerstner was redefining the truism of the graphic designer as a problem solver by adopting a broader, more holistic conception of design that could be informed by more scientific choices and systematic approaches. In this way design shifts from being a different series of styles and techniques more or less appropriate to a particular problem to a process and method for solving not singular but recurrent problems. One might say that graphic design moves from product to process, or from object to tool—an instrument for making many things.

If the idea is the machine that makes the art, then we might rightly ask: who makes the idea? In conceptual art the subjective dimension, of course, enters from where it is initiated, its point of origin is in the artist. In conditional design the authors make a similar claim: 'Even though a process has the appearance of objectivity, we realize the fact that it stems from subjective intentions.'⁶ For LeWitt, once initiated, '[t]he process is mechanical and should not be tampered with. It should run its course.'⁷ This lack of interference by the artist in the outcome could be seen from one perspective as an embrace of a machine-age modernism whose faith in the exactitude of the input can thus reliably predict the output, and from an opposing perspective as a purposeful desire to introduce uncontrollable and unpredictable elements that can alter the course of events. The latter sees the process as an opportunity to test and possibly even undermine certain assumptions, while the former views the process as a closed and predictable system for the faithful replication of intentions. LeWitt's proclamation that 'conceptual art is good only when the idea is good,'⁸ certainly parallels the adage of contemporary programming, 'garbage in, garbage out.'

Gerstner's use of the word 'programmes' immediately recalls its contemporary usage in digital terms, although decades before the advent of the personal computer in design. Its original context would have been situated at the transition from the mechanical to the electronic age, in a period dominated by systems theory and where permutations and iterations could be exhausted by moving methodically through a matrix of options

or criteria. In its electronic guise, the word program entails a series of instructions for machines to execute particular commands.

Modern design born in the age of mechanical reproduction—whether graphic, product, or architectural in nature—has been nothing if not an exercise in communicating intentions (plans or designs) to others who must realize the final product, whether a poster, a chair, or a building. In order to secure the most faithful enactment of these intentions, design has produced numerous systems and devices to facilitate it: drawings, blueprints, PDFs, coordinated color references and systems, standardized material sizes, common programming languages, shared technical standards, and vehicles to simulate the final result whether prototypes, models, or proofs, to name but a few. The point of all of these things is to ensure greater accuracy in the implementation of a design idea.

As early as 1922, László Moholy-Nagy is said to have produced a series of paintings through a set of instructions given to a sign painter over the telephone using a common color chart and line coordinates through graph paper. Writing in *Der Sturm* about these works, he states:

'The period of industrial production and technical accuracy has made us realize that works of art, too, can be carried out with perfect precision. My recent production, shown in Der Sturm Gallery, includes a number of enamel pictures executed by industrial methods. These methods, I should add, are only applicable if the artist believes in achieving the desired results by means of precise and impersonal methods. Work of this kind can be carried out with the help of Ostwald's color chart and exact instructions transmitted to a factory by means of graph paper. This might even be done over the telephone.'⁹

The radical nature of this act to produce a work of art should not be underestimated. It is however less surprising when viewed in the context of producing a design, which has rarely been misunderstood for the reality it seeks to produce: a blueprint is not a house, a prototype is not a product, a paste-up is not a poster. Both LeWitt and Gerstner see process as a kind of program, a way of generating more possibilities, a method more systematic in scope and thus more likely to avoid the randomness of approach that seemed both limitless and chaotic without it. What is radical to ask is: Where in the process does the subjective lie?

Traditionally, the subjective has been located with the artist and designer. What is different about process-oriented approaches

today and in the case of conditional design in particular is that the subjective has been distributed throughout the process. Its instructions can only guide and offer constraints, it is not a puzzle whose successful completion was telegraphed in advance by the designer. It is in this way an open system. An open system collects its input from the world in which it is situated and returns its results back to that world. It responds to feedback and adapts in order to sustain itself. Conditional design supports this notion insofar as it recognizes that its input: 'should come from our external and complex environment: nature, society and its human interactions.'¹⁰

LeWitt's own work moved from serial objects whose permutations were the result of a generative process, toward more open-ended methods of realization by others of his famous wall drawings that re-inscribed the subjective in a more radical way. As John S. Weber explains:

'The wall drawings' very nature is collaborative and participatory. They are called to life only in order to be seen, and only when someone beyond the artist expresses a desire to see them. They are conceived to accommodate their forms to different architectural situations and sites. When necessary, they can inhabit both public and private spaces at the same time, can be both sold and given away, and can be drawn by LeWitt's team of experienced professionals, other skilled artists, or dedicated amateurs following his instructions. In essence, they are more 'digital' than 'analog,' in that they are based on an art equivalent of code strings that allow them to be reproduced authentically again and again—thereby playing sweet havoc with inherited notions of authenticity.'¹¹

Here the introduction of 'other skilled artists,' or even 'dedicated amateurs,' to realize the work is to let go of absolute control over the final product. It is more variable than digital replication, wherein the copy is another original. It foregrounds the subjective acts of translation, adaptation, and interpretation on the part of this team of producers. In the end, LeWitt's wall drawings are in effect authorized reproductions that are still governed by the notion of faithful reproduction of someone else's idea.

Today's world of open source computing, social networking, crowdsourcing, user-generated content, app store platforms, and other manifestations of the participatory culture of Web 2.0, suggest systems that are more radically open in nature, soliciting input from and

empowering creation by many users. Although the rhetoric of decentralized authority pervades these endeavors, the question of control as an expression of authority (and design's role in it) lingers. It is not simply a question of no control or no design, but rather a question of where control and design happen in an open system. Luna Maurer states: 'I choose to give control away. That is a deliberate act. In the act of giving up control, there is a certain connotation of losing it. In my design I give the control away. But to who, or what?' She adds: 'Before I give control away, I must develop a system that will take over the decisions of design. I make decisions on which factors will influence the design, but also what kind of rules and properties this system will follow. In my creative process I'd like to think in terms of organisms.'¹²

Although design has always been open to the fallibility of others in terms of its realization, it has largely been a closed system or aspired to be so. So much effort has been directed to close the gap between idea and object that the opposite course of action seems implausible. However, in recent years design has become a much more open system. First of all, the tools of creation have been made more widely available, the mechanisms for distribution are more pervasive, the distinction between professional and amateur has become blurred, the feedback loop has shortened, and the notion of systems has grown more nuanced and complex, whether referring to a technological or ecological system. It is in this historical context that the ideas and actions of conditional design resonate and prosper. If the old operative metaphor for systematic thinking and production was the machine, then the new one is biological, as Maurer suggests, a living organism.

Contemporary designers make tools that enable others to use design, they create systems to engage the intrinsic complexity of technology and life, and they create platforms that harness the creativity of many people's ideas. If Gerstner's directive in the 1960s was for designers to create programs that could help solve problems in systematic ways, today's analogous imperative is to design designing: to open the closed system of design, which is no longer just about the controlled production of discrete objects but involves itself in larger questions such as who designs, what kinds of tools will be available to create with, and what kinds of systems will be available to share and distribute this production. All of this potential requires a radical rethinking of the designer as only a manipulator of tools. The computer as a meta-tool promised this long ago. As Jonathan Puckey proclaims, 'We must learn to create tools ourselves. After all, the

computer is exactly that: a tool for creating tools.¹³

I have written elsewhere¹⁴ about the larger historical shifts in modern design as it has moved from its roots in the aesthetic logic of formalism in the first half of the twentieth century with its basis in the object to the symbolic logic of a designed object's meaning in society and culture at large in the second half. From this research I believe that today's design explores the programmatic logic of constraints—technological, economic, ecological, and so on—that are embraced as affordances rather than obstacles to the creation of new work. This is the relational and conditional culture of contemporary design that seeks its progress not in the name of form or content, but in the myriad contexts that it both creates and to which it responds. In this environment, the if/then logic of the program replaces the binary nature of either/or dualisms. Belief becomes conditional and appropriateness is situational. In this realm, the subjective and objective are dialogical qualities rather than mutually exclusive concepts, populating a spectrum of positions in the process of designing. The subjective is no longer the exclusive domain of artistic and design intentions but can be found distributed throughout an open system. In this sense the concept of a distributed subjectivity recalls the notion of distributed computing whereby autonomous but connected computers collectively solve problems. Further complicating the equation, is the fact that the subjective is no longer limited to the domain of human capriciousness as algorithmic randomness attests. Whether LeWitt's ideas, Gerstner's programs, or conditional design's inputs, the initiation of designing can happen from a single individual, a community action, or a collaborative undertaking. It might be enacted or processed by human thought and action or literally by machines. It might be realized or produced by designers, non-designers, or machines. The end result can be circulated in the world, and its reception and reaction provides the feedback that, in turn, influences the agents that first initiated the process. And so the cycle begins again.

- 7 Sol LeWitt, 'Sentences on Conceptual Art,' first published in *Art-Language*, May 1969, and reprinted in Alicia Legg, *Sol LeWitt* (New York: Museum of Modern Art, 1978), 168.
- 8 Sol LeWitt, 'Paragraphs on Conceptual Art', *Artforum*, June 1967, 80.
- 9 László Moholy-Nagy, 'Emaile im Februar,' *Der Sturm*, 15 (February 1924), 1, quoted in Joseph Harris Caton, *The Utopian Vision of Moholy-Nagy* (Ann Arbor, MI: The University of Michigan Press, 1984, 30).
- 10 Luna Maurer, Edo Paulus, Jonathan Puckey, and Roel Wouters, *Conditional Design Manifesto*.
- 11 John S. Weber, 'Sol LeWitt: The Idea, the Wall Drawing, and Public Space,' *Sol LeWitt: A Retrospective* (New Haven, CT: Yale University Press, 2000), 98.
- 12 Luna Maurer, 'Algorithms as airbrush,' published on Poly-luna.com, 2007, <http://www.poly-luna.com/3/algorithms-as-airbrush>.
- 13 Jonathan Puckey, 'On Tools,' unpublished manuscript from the author, January 9, 2011.
- 14 Andrew Blauvelt, 'Towards Relational Design,' essay published on DesignObserver.com, November 3, 2008, <http://observatory.designobserver.com/feature/towards-relational-design/7557/>. See also: Andrew Blauvelt, 'Relational Design,' in *Graphic Design: Now in Production* (Minneapolis, MN: Walker Art Center), 2011.

- 1 Luna Maurer, Edo Paulus, Jonathan Puckey, and Roel Wouters, *Conditional Design Manifesto*, <http://www.conditionaldesign.org/manifesto/>, 2008.
- 2 Sol LeWitt, 'Sentences on Conceptual Art,' *Art-Language*, May 1969, X.
- 3 Sol LeWitt, 'Paragraphs on Conceptual Art', *Artforum*, June 1967, 80.
- 4 Ibid.
- 5 Karl Gerstner, *Designing Programmes* (Baden, Switzerland: Lars Müller Publishers, 2007), 12.
- 6 Luna Maurer, Edo Paulus, Jonathan Puckey, and Roel Wouters, *Conditional Design Manifesto*.

How Conditional Design Changed the World

Koert van Mensvoort

Just imagine: It is 12 January 2061, and a remarkable exhibit opens in the museum of contemporary art in Zhiango, China. It is a retrospective of the Conditional Design movement. The turnout is staggering. Everyone in the city wants to see the exhibit. That is no coincidence, for the work of the conditional designers is closely connected with the history of the city. For the first time people can visit a show—so runs the announcement—that offers a blueprint of the city which has become world-famous because it doesn't have a blueprint.

Zhiango was originally 100% planned. The metropolis as a centrally run mega-project was a brainchild of the Chinese government. To encourage people to move from the countryside to the city, Beijing had come up with the idea at the start of the 21st century of building an extra city next to the existing metropolises that were bursting at the seams.

State engineers were instructed to make building drawings, existing villages and landscapes had to make way for the new, the first pile was driven in 2016, the city was complete two years later, and another six years on the project was recognized as a total failure.

The reason given for the failure of the fully planned metropolis was the complete mismatch between plan and reality. It was carefully calculated that eight million people would go to live in Zhiango, mainly from the wealthier Chinese middle class, who were tired of the cramped quality of life in Hong Kong and Shanghai and wanted larger apartments with sun and a view. However, apart from the fact that China has never been strong in having a middle class, it turned out that the people for whom the apartments in Zhiango were intended had become so rich by now that they went looking for alternative places to live, such as in the villa districts on the outskirts of the existing cities or in one of the Chinese residential colonies in Africa. As a consequence,

Zhiango was completely filled with a homogeneous group of poor Chinese farmers from the countryside. By about 2026 there were 22 million people in the city, most of them fully occupied with gold farming (playing video-games to collect virtual money for wealthier players). Cases were known of apartment complexes in which 8,000 people worked as gold farmers on a full-time 24-hour shift. And because the influx from the countryside was much larger than the cramped apartments could sustain, enormous slum neighborhoods arose around the city, which exceeded the appalling living conditions of African slums and South American favelas. With its shortage of space, inadequate food and energy supply, poor hygiene, chaos and violence, everyone could see that as a totally planned project Zhiango was a disaster. If you had the chance, you didn't go there, let alone live there.

So much for the difficult early years of Zhiango. Now comes the story of how conditional design saved the city. The U-turn started with a young and visionary mayor, Chin Ong, who had been sent from Beijing to sort the city out. Actually, he was sent there as a punishment because, although he was regarded as a great administrative talent and a potential prominent party leader in the future, a number of his administrative decisions in Beijing were considered too easy-going and frivolous. What was needed in Zhiango was a hard line, and Ong was sent there to show that he could do just that.

As soon as Ong arrived in Zhiango it was patently obvious that the situation had become impossible. The city needed rules. But while the average administrator had cleaned up the slums and replaced them with a rigid centrally directed structure, Ong came up with a creative solution. A few years earlier he had taken part in a conditional design workshop during an international cultural exchange. During that session, led by the artist-designers Luna Maurer and Edo Paulus, the participants had made—or rather, generated—drawings on big A0 sheets. The most fantastic patterns were generated on the basis of simple rules such as 'choose the longest side of an existing triangle and add a triangle to it'. Ong had been very inspired at the sight of how a few simple rules could lead to unpredictable, layered, complex structures. All the participants had been given a book at the end of the workshop, and he still leafed through it now and then. He came across the book again during the move from Beijing to Zhiango. He remembered the wonderful, complex bubble structure that he and his fellow participants had generated during the workshop. Ong wondered whether what they had done on a sheet of paper could

be transferred to his new city. And he got down to work.

His initial conditions, unlike those of the workshop, were very pragmatic and aimed at basic urban planning facilities. There were rules such as 'every street should have piped water', 'a building may not be more than one floor higher than the building next to it', and 'twenty solar panels must be placed around every internet connection'. The conditions were deliberately aimed at bringing about a balanced urban structure without the need to plan it completely beforehand. The rules that were drawn up were strictly observed under the motto No Rules, No Fun. Existing structures were demolished or transformed to comply with the conditions imposed. The new approach was not an immediate success everywhere. Ong had told his staff to experiment with different rules in the various neighborhoods and zones of the city. Whereas some rules were felt to be stifling and bureaucratic, others proved to lead to a flourishing, dynamic situation. It soon became clear that the conditions laid down must not only be comprehensible, clear and feasible, but should preferably also leave a maximum of space for individual interpretation. Meaningless arbitrariness was out: the conditions had to be intelligible and to be the result of a clear vision and source of authority.

One of the first success stories was the slum neighborhood Banguit, which had been practically written off. Instead of simply razing it to the ground, Ong had brought in a number of trucks with specially designed building components that were easy to combine. The color codes indicated how they could be fitted together in different ways like the pieces of a jigsaw puzzle. No other explanation was needed. Within a few weeks the residents of Banguit had turned their neighborhood into a colorful ensemble of existing and improved infrastructure. The success of this semi-autonomous process in Banguit was trumpeted all over the world. Apparently Ong had found a method to administer the complexity of the megacity of Zhiango without the need or the desire to control it completely. As similar urban planning problems could be encountered in various other places in the world—Lagos, Caracas, the slums of Europe, and so on—the Chinese success story hit the international headlines.

The process was taken a stage further in the new districts of Zhiango that were to be built. Only conditions were laid down instead of the usual ground plans and building plans. Architects and urban planners were either

sacked or turned into conditional designers faced with the challenging assignment of implementing an aesthetically tasteful and smoothly functioning neighborhood by means of a minimal number of cleverly chosen rules. All kinds of experiments were made. In the Quinoa district, the permitted form of the continuously changing apartments was determined by the shadow that the sun cast at noon. In Nitsang a 100% sustainable and self-sufficient district was created based on a number of simple criteria regarding rooftop vegetable gardens on office blocks. In the Tsintao suburb an ambitious young conditional designer had devised an ingenious 3D building printer. The 8 × 6 meter printer was supplied with milled scrap material from existing structures, mixed with a tough glue-like mortar. If you wanted to modify your home, you had the printer brought in for an extreme makeover—all within the conditions laid down, of course.

One of the main advantages of the urban development based on conditional design was that it could be kept in continuous movement. The city should be seen not as a design but as a process in which time, mutual relations and change were the primary factors. If you wanted to change your home, there was no need to submit a formal request for a permit. All you had to do was to consult the conditions that applied to your neighborhood. This resulted in an extremely dynamic and vital urban landscape. If a couple had a baby, they could simply decide to add an extra room to their home. Because the conditions were very cleverly formulated to promote social cohesion, people helped one another to build their homes, whether they shared the same common interest or not. 'If my neighbor wants an extra floor in his home, then I can add one too, so I'll lend him a helping hand.' An extreme case of this was the Jinzohu district, where a resident who had unexpectedly become immensely wealthy had all the homes around him extended in order to be able to implement his own dream home. The result was a group of homes with an attractive angular architecture that stood out above the rest of the district. The mayor Ong saw it and, behold, it was very good—even though, or perhaps precisely because he would never have been able to think of it himself.

Zhiango had a lot to thank the conditional design method for. By around 2050 the city of 84 million residents had grown to become the largest urban conglomeration in the world. Like a living urban coral, it spanned an area of 38,000 square kilometers in the middle of China. The scale was not a problem because most of the districts were self-sufficient.

The city could keep on growing without any limit, the quality of life was good.

The Conditional Design Academy was set up on the initiative of the mayor in 2038 to maximize and underline the success of the conditional design method in Zhiango. Under the inspiring guidance of Roel Wouters and Jonathan Puckey—both conditional designers from the very beginning—the academy grew in less than a decade to become an influential institute that was often compared with the 20th-century Bauhaus, which had been an important outpost of Modernism in its day. Like the Bauhaus, teaching in the academy was based on a vision and method rather than on medium-specific courses. Its graduates included graphic designers, game designers, musicians, tissue engineers, film directors and urban planners. Conditional design was the new Modernism. Zhiango was the first real 21st-century city.

It's strange, in fact, that there has never been a major retrospective on the foundations of the conditional design movement before. Now there is one. Better last than never. The people from the city thronged enthusiastically around the hundreds of drawings, scale models, projections and soundscapes in the museum of contemporary art. It was their first opportunity to see the blueprints of their blueprint-less city. The former mayor Chin Ong, by now president of the Chinese council, performed the opening ceremony. He talked about gardening and embracing complexity. He referred to the workshop that he had attended years before and that had been such a decisive influence. He praised the minds behind the conditional design movement for their special vision and contribution to the city. All of them—Luna Maurer, Edo Paulus, Roel Wouters and Jonathan Puckey—were there to receive the applause. They realized that they had changed the world.

Rules

Workshop I PERFECT CIRCLE

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns lasting 30 seconds. × Use a stopwatch.

- 1, ● First turn:
Draw a filled-in circle in the center of the paper.
- 2, ● Following turns:
Improve the circle's round shape by enlarging its borders.
- 3, ● Stop when the circle is perfect.

Workshop II HATCHING

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns.

- 1, ● First round, each player:
Arbitrarily place a dot on the paper.
 - 1.1, The dots may not be placed further than 10 cm apart.
- 2, ● Next turns:
Draw a line and place a dot.
 - 2.1, The line must connect two dots.
 - 2.2, The line's angle must obey the following range for each color: 0 to 45° for black, 45° to 90° for blue, 90° to 135° for red, 135° to 180° for green.
 - 2.3, If possible, connect the line to an existing one.
 - 2.4, The line must always be as short as possible.
 - 2.5, When you enclose an area (creating a surface surrounded by lines), hatch it parallel to the last drawn line.
 - 2.5.1, The enclosed area may not contain unconnected dots or open-ended lines.
 - 2.6, The dot may not be placed further than 10 cm away from other dots.
 - 2.7, The dot may not be inside the convex hull of all dots.
- 3, ● Stop drawing when you have reached the edges of the paper.

Workshop III CUSTOM RULES

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns.

- 1, ● First round, each player:
Draw one straight line with a maximum length of 10 cm near the center of the paper.

- 2, ● Following round, each player:
Choose one sentence from both cards by underlining one of the options in brackets [see cards in section III, Custom Rules, 2.1]
- 3, ● Next turns:
Draw a straight line following the two rules you have chosen.
 - 3.1, Only draw a line when it does not conflict with the two rules you have chosen.
 - 3.2, Do not cross other lines unless explicitly stated otherwise.
- 4, ● Stop drawing when you have reached the edges of the paper.

Workshop IV THE BEACH

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns.

- 1, ● First turn:
Place a dot.
- 2, ● Following turns:
Place a dot in the center of the largest empty space on the paper.
- 3, ● Stop drawing when you think the beach is crowded.

Workshop V FOUR LONG LINES

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players draw simultaneously.

- 1, ● Draw one long line during 1.5 hours.
 - 1.1, The pen may not leave the paper during the entire time.
 - 1.2, You may stop for a maximum of 5 seconds without lifting the pen.
 - 1.3, Do not cross any other lines.

Workshop VI FLUXFOLD

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns. × Each player is assigned one corner of the paper.

- 1, ● First round, all players:
Fold your corner of the paper over its entire short or entire long side.
 - 1.1 After unfolding it, place a dot on the inside fold.
- 2, ● Following turns:
Make a fold and draw a straight line.
 - 2.1, The fold is made by bringing the corner of the paper to the end of the line drawn by the player on the right.
 - 2.1.1, As an exception, on the second round, the fold is made by bringing the corner of the paper onto the dot of the player to the right.
 - 2.2, If the fold is almost parallel to the edge of the paper, find a way to mark it and do not mix it up with your neighbor's fold.
 - 2.3, The line must start at the end of your last drawn line.
 - 2.3.1, As an exception, on the second round, start your line at your initial dot.

- 2.4, The line must end where one of your folds crosses somebody else's fold.
 - 2.5, The line must be drawn on a fold.
 - 2.6, You may cross other lines but not follow a fold on which there already is a line.
 - 2.7, If you cannot draw a line, place a new dot somewhere on one of your folds.
- 3, ● Stop drawing when the paper is full of folds.

Workshop VII KNOTS

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns.

- 1, ● First round, first player:
Draw a line (of between 5–10 cm) anywhere on the paper.
- 2, ● First round, remaining 3 players:
Draw a line by looping it over and under the line of another color.
- 3, ● Following turns:
Elongate your line on both ends by looping it over and under a line of another color.
 - 3.1, You may not loop your own line.
 - 3.2, You may not loop a line from a previous turn.
 - 3.3, When no options are left on one of the ends, that end is dead.
 - 3.4, When both ends are dead, you may start with a new line.
- 4, ● Stop drawing when you are fully entangled.

Workshop VIII NETWORKS

× Play with four players. × Each player has a colored pen: red, green, blue, or black. × The sheet is invisibly divided into a grid of four equal columns, and four rows. × Each round starts at a new row. × The players draw simultaneously, each in a different column at the same row. × Per round, each player is assigned one of the following elements: circles, lines, arrows, titles.

- 1, ● Make a drawing in the upper part of your column using your given element.
 - 1.1, Try to create something that has a specific meaning, knowing that others will complete the drawing.
- 2, ● After each turn, move one column to the right and repeat the previous step.
- 3, ● After four turns each player is assigned a new element and starts drawing in a fresh row.
- 4, ● Repeat until the paper is full.

Workshop IX FLATLAND FAMILY TREE

× Play with four players, with at least one female or one male player. × Each player has a colored pen: red, green, blue, or black. × The players take clockwise turns.

In Flatland Family Tree a two-dimensional world is created where inhabitants are shaped as equilateral polygons. Females are lines and males are polygons varying from 3 to 8 sides: the isosceles triangle (the male serf); the equilateral triangle; the square; regular pentagon, hexagon, heptagon and octagon. The number of sides of each inhabitant-polygon is determined by its genealogical family.

A family consists of a mother (a line) and a father (a polygon). Together they produce male children (polygons). A child is a polygon with one more side than its father, with one exception: an equilateral triangle is the child of an isosceles triangle.

- 1, ● Each turn:
Draw an element of your own gender.
 - 1.1, A female (a line) can be drawn anywhere, without any documented origin. She does not have any parents.
 - 1.2, A male serf (an isosceles triangle) can be drawn anywhere, without any documented origin. He does not have any parents.
 - 1.3, All other males (polygons) must be connected by one of their corners to a corner of their father and by one of their other corners to one end of the mother's line.
 - 1.4, The sides of each polygon must be approximately 3–4 cm long.
 - 1.5, Polygons may not overlap or intersect.
 - 1.6, Any polygon corner may connect to only one other polygon corner.
 - 1.7, Draw a child if possible, not a serf.
- 2, ● Stop drawing when you have reached the edges of the paper.

Workshop X BLIND BLACK

× Play with four players. × Each player has a colored pen: red, green, blue, or orange. × The players draw simultaneously.

- 1, ● Blindfold yourself.
- 2, ● Cover the entire surface of the paper with your own color.
- 3, ● Stop when you think the paper is black.

[The drawings were done on sheets of paper of 70 × 100 cm. Other paper sizes can be used as well. You can adapt the rules wherever you feel it is necessary.]

Conditional Design Glossary

Arbitrary,

A *behavior* freed from necessity, reason, or principle. When a player is asked during a *drawing session* to place a dot arbitrarily on the paper, the action is only determined by his or her spontaneous personal *choice*.

Association,

A mental connection or relation between thoughts, *feelings* and ideas triggered from the act of drawing, the representation of the drawing itself or from *chatting* during a *session*.

Behavior,

A performative action in which the personal character of the player can be expressed. Most *behavior* that occurs during a *session* can be viewed as *emergent*, because it receives its own unpredicted character.

Beholder,

An observer who witnesses the *process* and comprehends its *residue* (i.e.: the *poster*).

By-product,

A secondary result or a side effect produced by the *process*. I.e.: The *posters* are the *by-products*.

Challenge,

A mental or physical test of one's abilities imposed by a set of restricting *rules* in a demanding but stimulating undertaking. The level of *challenge* in the execution directly influences how *satisfying* a *process* is.

Change,

A situation that is always different and never fixed. A fundamental aspect of a *process*.

Chat,

Informal conversations that occur spontaneously during each *session*, usually in the form of *associative* connections triggered by the act of drawing or by the representation of the drawing itself. No matter how unrelated to the *conditions*, the *chat* always influences the *process*.

Collaboration,

The joint intellectual effort between *participants* to execute a set of restricting *rules*. The level of *collaboration* directly influences how *satisfying* a *process* is.

Complexity,

The level of difficulty, unpredictability, and richness in variety. The *complexity* of *conditions*, *dynamics* and *residue* stand in relationship to each other. Some *processes* have very simple *rules*, others have rather complex *rules*. The *dynamics* and the *residue* also vary in *complexity*. All combinations of *complexity* between *rules*, *dynamics* and *residue* are possible.

Conditional Design,

A methodology that determines a set of restricting *rules* for the *process*, as opposed to a plan that determines the final result of something. The term was coined by Luna Maurer, Edo Paulus, Jonathan Puckey and Roel Wouters in their manifesto.

Conditions,

A set of restricting *rules* or parameters that define an *environment*.

Choice,

A personal and *subjective* decision during a *workshop*. A design *choice* can occur on three levels: in the *setup*, in the restricting *rules* and during the execution of the *rules*.

Control,

The authoritative influence over the *process*. In a *conditional design* the *control* is always limited and is closely connected to the *limitations* and *freedom* of the player.

Designer,

The person who defines the *conditions*.

Documentation,

The capturing of the *process* in order to share it and talk about it with others. The *residue* is part of the *documentation*.

Dynamics,

All interactions between *participants* and *conditions* during the *process*. The *dynamics* are the core of each *workshop session*.

Emergence,

Tendencies and patterns that become visible in the *process* without being anticipated. Tendencies and patterns can become visible in the *residue*, in the *dynamics* and in the phantasies and *associations* of the players.

Environment,

A limited space defined by *conditions* in which a process can take place.

Experience,

The *feelings* and *dynamics* during a process as witnessed by the *participants*.

Feedback,

The output of one action becomes the *input* of the next. If you continue each *turn* or *round* where you have left off, this creates a *feedback*. It is easier to see a development in the *residue* if there was a *feedback*.

Feeling,

Instinctive *behavior* or intuition that is acted upon and influences the decisions. It is an important part of the *experience*.

Framework,

A complete set of *conditions*.

Freedom,

The individual capacity to exercise *choice* within a restrictive set of *rules*. *Participants* always have some degree of *freedom*, differing per session from very few to very many *choices*.

Human Computation,

A situation in which people execute a tight set of *rules* similar to computers executing code. In such a situation the human characteristics get emphasized and the black box of the computer is unveiled.

Human Imperfection,

A characteristic that can be *challenged* when designing the *conditions*.

Idiosyncrasy,

A structural or *behavioral* characteristic peculiar to a *participant* that tones his or her execution of a set of restrictive *rules* (i.e.: a *participant's* way of holding the pen).

Input,

That what comes from outside and influencing the *process*, such as: nature, society or human interaction. In the drawing session the *input* are the *participants* with their individual *behavior* and the material that needs to be *processed*.

Intelligibility,

When the *process* or the *conditions* can be comprehended in what you see, i.e. in the *residue*. Ideally the history and traces of a processes are made visible.

Limitations,

Restrictions imposed by the set of *rules* and reducing the number of *choices*. The *limitations* of the human body are a particular characteristic that form a base for the drawing *experience*.

Logic,

The *tool* to act with precision and reason when designing *conditions*.

Mistake,

An error or fault that occurs while executing a set of restrictive *rules*. *Mistakes* may become an important force field during a session and are appreciated.

Participant,

Person who is taking part in the execution of the *process*. All examples contained in this *Workbook* were executed by Luna Maurer, Edo Paulus, Jonathan Puckey and Roel Wouters.

Posters,

The *residue* of each session of the workshops in this *Workbook*.

Process,

That what *emerges* when *input* engages and tussles with the *logical framework*, when *participants* execute a set of restricting *rules*. The *process* is the fundamental substance of *conditional design*.

Random,

Of or relating to a type of circumstance or event that is described by a probability distribution. *Random* does not necessarily mean *arbitrary*. *Conditional design* refers to *random* as a computational *randomness* and prefers to avoid it.

Realism,

As opposed to abstraction, elements that stem from literal, representational, or narrative sources. Realistic elements may be present in the title of a *workshop*, serve as inspiration to the *conditions*, are present in the *dynamics*, or visible in the *residue*.

Residue,

The physical remains from the *process* (i.e.: the *poster*). By just experiencing the *residue*, the drawing should be intelligible and one should be able to get an idea of the *process*.

Round,

A sequence of *turns* consisting of one *turn* by each *participant*, clockwise or counter-clockwise.

Rule,

A single instruction that determines an action (i.e.: draw a line, place a dot) and how to perform this action. *Rules* may be more or less specific and restrictive, however there is always some degree of *freedom*. *Conditional design rules* should be simple; the *complexity* should lie in the *dynamics* or in the *residue*.

Satisfaction,

A *process* is known to be more *satisfying* when it contains one (or more) of the following aspects: 1. play with *human imperfection* and *physical challenge*; 2. *strategy* and *collaboration*; and 3. *storytelling*, within the drawing or triggered by the drawing.

Science,

Although *conditional design* employs scientific methodologies such as *logic*, it does not aim at proving or disproving something. Its interest lies in developing a *process* from a gut *feeling* that can generate surprising outcomes and new insights.

Session,

A limited amount of time in which a *process* can take place. One *workshop* may contain several *sessions*.

Setup,

The *conditions* under which the *process* is taking place (i.e.: a table, a sheet of paper, four pens, et cetera).

Storytelling,

Narratives that *emerge* during the execution of a drawing. The stronger the focus on the *storytelling*, the more one empathizes with a drawing. The abstraction of a drawing yields for the memory of the story.

Strategy,

A plan, method, or series of maneuvers for obtaining a specific goal or result. *Strategy* is one of the three main *satisfactory* principles upon which *conditions* can be built.

Subjective,

Personal preferences, driven by *idiosyncrasy* or *taste*, that color the *choices* in a *workshop*. Because it deploys *logic*, *conditional design* may at first glance seem objective, but in fact the *process* stems from *subjective* decisions.

Taste,

Personal aesthetic repertoire that influences a *participant's choice* of action (i.e.: 'it looked better this way').

Tool,

An instrument or device used to perform or facilitate a certain task. The most important *tool of conditional design* is *logic*.

Turn,

A *participant's* period of action during one *round*.

Workbook,

A guide that helps to understand and explain *conditional design*, full of useful information.

Workshop,

One or multiple *sessions* with *participants*, a *setup* and a set of restrictive *rules (conditions)* that enables a *process* and a *by-product*, a *residue*.

Zhiango,

A fictitious Chinese city from the year 2061, built according to *conditional design* principles.

INTERNET EXPLORERS

Ceci Moss

I'm still wondering if the Internet is a representational medium, or whether it will be more about having an experience. Probably the Internet will seem to disappear because of its growing transparency and ubiquity. Then 'Internet artists' will gradually be perceived as 'artists.'

—Harm van den Dorpel, "Interview with Harm van den Dorpel on Club Internet's 'Free Fall,'" Rhizome, October 17, 2008

Within the first ten years of the 2000s, the media landscape underwent a tremendous shift. The internet, in particular, drifted far beyond the screen and the stationary computer work station, finding its way into every aspect of our lives, a process accelerated by advances such as faster bandwidths, smart phones, and social media.

The following brief timeline of product launches is illustrative: 2002, Friendster; 2003, Myspace; 2004, Facebook; 2005, YouTube; 2006, Twitter; 2007, iPhone and Tumblr. An increasingly mobile, networked world arose alongside these developments, resulting in a new phase for contemporary art, one that witnessed artistic practices becoming more fluid, elastic, dispersed, and expanded. Internet artists began to make art *about* informational culture using various online and offline means, no longer determining their practice solely by an online existence. This essay examines a micro-history, from roughly 2005 to 2010, in which an international network of artists, many of them millennials, working on the internet turned their focus to mainstream user-generated content as a form of popular culture following the rise of social media. This anthropological approach to the popular culture of social media subsequently developed into a larger desire to excavate the web's involvement in the everyday, at a moment



John Michael Boling, *Lord of the Flies*, 2006 (still).
Web-based video. Courtesy the artist

when the internet became more mobile and integrated into daily life. Turning to art practices (such as surf clubs, or artist-run, collaboratively authored blogs for artistic experimentation) and artist-run curatorial platforms active during this short, rapidly paced period, this essay will elaborate a perspective in which self-identified “internet-based artists” simply became “contemporary artists” engaged with a thoroughly informational world and milieu.

The introduction of social media opened the gates for an explosion of user content online. Artists, drawn to the cultural relevance of this material, began to sift, navigate, and respond to everything from Yahoo! Answers to Myspace introductions. During this same period, the experience of browsing became dramatically more self-customized and streamlined, guided by the links shared on one’s own social networks, RSS feeds, and Twitter subscriptions, as well as a continually optimized, personalized search. The collaboratively produced artist-run blogs known as surf clubs became a way for artists to develop a visual vocabulary

in conversation, to share the fruits of their searches, and to experiment with those findings in the form of blog posts. Exploring the diverse ephemera of web culture, contributors to these surf clubs created a visual dialogue, scrapbook, and archive of their discoveries online alongside their own creations, such as found YouTube videos and animated GIFs.

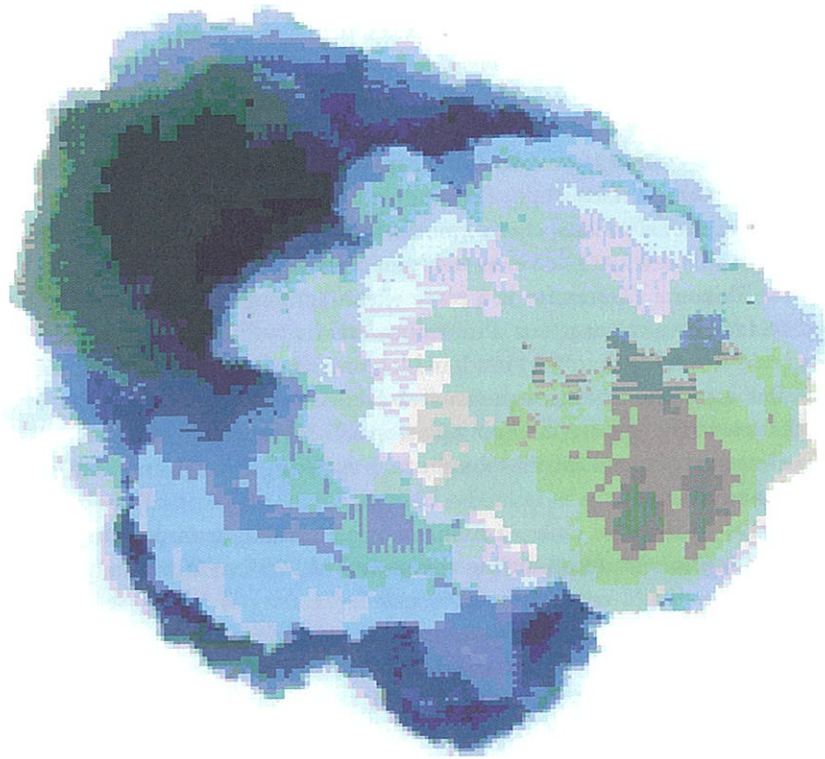
In 2006, curator Lauren Cornell organized an online exhibition for Rhizome entitled “Professional Surfer,” thus coining the term in a project that boldly considered web browsing an art form, and assembled a few of these websites as works in themselves. The artists/bloggers behind exhibited projects like Supercentral, Cosmic Disciple, Nasty Nets, and Chillsesh—such as Kevin Bewersdorf, Marisa Olson, Joel Holmberg, Guthrie Lonergan, Charles Broskoski, John Michael Boling, Chris Coy, Michael Bell-Smith, and Travis Hallenbeck—approached massive user output like an amateur ethnographer or anthropologist, interpreting this content through a lens cognizant of its cultural weight. A single post to Nasty Nets, for example, often generated a flood of posts and related imagery by its members, such as Michael Bell-Smith’s “The post where ... we share awesome gradients,” which collected animated gradients from all over the web, or Guthrie Lonergan’s suite of YouTube videos of users demoing the opening and closing of garage doors. Posts such as these were attempts to draw attention to the artistic merit and value of user content, from the weird to the banal. Another work in the “Professional Surfer” exhibition *Lord of the Flies* (2006) by Nasty Nets member John Michael Boling, but hosted on his own website 53 o’s, loops a video depicting an anxious swarm of mouse pointers hovering over the Google search page as a low-fi midi version of the *Twin Peaks* theme song plays. As goofy as it is ominous, the work gets at the underlying desire for information driving the millions of users searching the web every day.

Surf clubs championed the idea that searching was equivalent to making, a form of craft. Artist Kevin Bewersdorf, with the launch of the surf club Spirit Surfers with Paul Slocum in 2007, aimed to push the findings associated with searching into something more significant by reflecting on the spiritual and psychological space of the web. In the *Spirit Surfing* manifesto, he states: “Perhaps finding is making, but finding is not enough.”¹ Envisioning his posts as “jewels publicly removed and reset,”² Bewersdorf sought to elevate the act of web surfing, and his findings, into something greater—a pathway to a spiritual realm. The quasi-spiritual aspect of the blog was set against the deeply commercial space of the web, and the reality that users produced and consumed content. While others used the web for shopping and entertainment—a group of people Bewersdorf termed “INFObrats”—some turned their attention to the “boons” and “wakes” of the surf, not as customers but as “INFOmonks” who lose themselves in the

infinite horizon of information, or the “INFOspirit.” The power was in Spirit Surfers’ intention and in the care behind the framing of the group’s finds, a gesture that Bewersdorf compared to Joseph Cornell’s boxes. While other surf clubs took content found online out of orbit and into a sort of détournement, indexed and cataloged within the context of the blog, Bewersdorf aimed to assemble his finds like beads on a prayer necklace. Bewersdorf asks, What does a surfer seek, what does it mean to find, and what can a frame do?

The “professional surfers” of this period participated in a type of reframing, and reorganization, of their finds, activities informed by the software that regulated these experiences. As users blindly or expertly navigated the web, populating it with comments, animated GIFs, or mash-ups, artists teased out and picked up on their interaction with software, especially its automatic settings, or defaults. In his 2009 text for Rhizome, “After the Amateur: Notes,” Ed Halter argues that internet artists absorbing or mirroring mass user-generated content in their work present a different turn, that of the “sub-amateur.”³ Halter was particularly interested in the status of the “amateur” practitioner and how artists have assimilated such a designation over time, from avant-garde cinema to art photography. Unlike the amateur photographer in decades past who aspired toward professionalism, the user is interested in the pure and immediate functionality of his tools, often realized through defaults. Internet artists responding to the user or “sub-amateur” prefer function over form, favoring the “raw instrumentality” of images. For example, Halter points to Petra Cortright’s *VVEBCAM* (2007), which features the artist staring blankly at the camera while activating a series of default effects that crowd the screen, such as dancing pizza slices and lightning. The artist’s concentrated expression contrasts with the lighthearted nature of the animations, an effect that is both humorous and disarming. As Halter argues, artists like Cortright are specifically attentive to software’s functions, a move that draws up the vocabulary and register of these functions as absorbed by the web’s mass audience.

While Halter’s essay is specifically concerned with how artists adopt the amateur vernacular on the web, his attention to defaults in the essay touches on software’s widespread influence on culture itself, the subject of Lev Manovich’s 2013 book *Software Takes Command*. Here Manovich argues that the computer’s permanent extendibility through software disrupts “medium” by transferring the techniques and interfaces of *all* previous media technologies to software.⁴ Drawing a comparison to ecology, Manovich argues that media techniques start acting like a species in shared software environments, interacting, mutating, and making hybrids of themselves.⁵ This, in turn, influences how and what users can create in endless combinations, translating software into culture. Manovich’s



Marcin Ramocki for Spirit Surfers, *blue explosion*, 2008 (screen capture). Animated GIF. Courtesy the artist

observations on user behavior in *Software Takes Command* in some ways sets the stage for the artistic shifts that occurred in the mid-2000s. While the book focused on how programmers and users were creatively producing or hybridizing new software, many of the internet artists working in the mid-2000s were in turn concentrating on how users navigated these platforms, the default being one example. Some artists—like Ryder Ripps—started programming their own platforms, taking the concept of a surf club in a new direction. Ripps's 2009 project *dump.fm* is a visual chat room that allows participants to share images from the web, their hard drive, or web cam instantly. As Ripps stated in a blog post for Rhizome, "Dump.fm is a place where content is hyper-transient and used to facilitate connections and induce creativity."⁶ More ephemeral, fast-paced, and unwieldy than the standard blog format of a surf club, *dump.fm* has cultivated a community through visual conversation. In many ways, surf clubs foreshadowed the popular blogging platform Tumblr, which, by the 2010s, became a key part of mainstream web culture as speaking through and with images became a new norm.

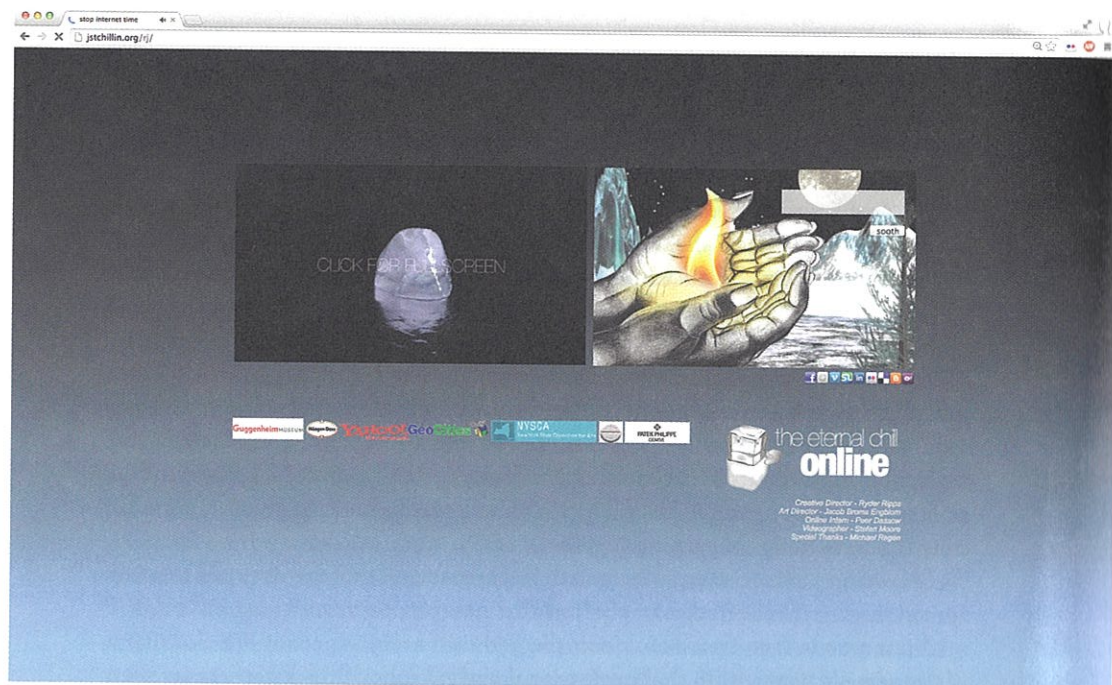
Parallel to the surf clubs, a number of compelling artist-initiated online curatorial projects surfaced during the period of 2005 to 2010 that, through selected themes and custom formats, pondered the psychological and philosophical impact of informational overload. These projects were attentive to the drift-like experience of surfing the web and were engineered to complement that environment. From 2008 to 2009, artist Harm van den Dorpel organized exhibitions for Club Internet around loose themes, often with fifteen or more artists. The rotating exhibitions functioned like a surf club in that van den Dorpel viewed exhibiting artists as "members"; however, the site itself was designed as an online gallery, not a blog. These busy, populous shows invited the user to float through the exhibition; for instance "Tag Team," curated by Guthrie Loneragan, riffed on the surf club by asking artists to submit "non-art" links, while in "Reverse Engineering: the Uncurated Reunion," members of Club Internet were asked by van den Dorpel to create a new work on the spot and within a four-hour time frame. The curatorial platform of artists Parker Ito and Caitlin Denny, *JstChillin* (which operates under the tagline "real without being actual, ideal without being abstract. Time doesn't exist when you're...jstchillin!"), focused the user's attention through bimonthly rotations of single online artworks that reflected on the time and space of the web environment from 2009 to 2011. In lieu of a manifesto or mission statement, Ito and Denny recorded and looped an Instant Messenger conversation titled "An Essay about Chillin'," time-stamped at 3:25 a.m., which considers the metaphysics of web surfing. Accompanied by a choral soundtrack, Ito makes the observation that: "The net is all around us,

an indescribable feeling, soaring, tumbling, freewheeling, through an endless diamond sky." Exemplifying this sense of free-floating space is Mitch Trale's otherworldly virtual environment *Analog Environments* (2009) or Michelle Ceja's *Silicon Velocity* (2009), with its looped, roller coaster-like descent—presented full screen—into a gridded tube. Jacob Broms Engblom and Ryder Ripps's *Stop Internet Time (The Eternal Chill Online)* (2009) is more explicitly contemplative; the website features a video of a slowly melting ice cube next to an animated GIF of hands outstretched whose search button promises to "sooth." A voiceover declares: "The internet is like a well, used but never used up, it is like the eternal void, filled with infinite possibilities."

If Jstchillin contemplated the realities of time spent together online, artists Mark Brown and Kari Altmann's curatorial platform *Netmares/Netdreams* (2007–09) seemed to mine the web's dark subconscious, pointing toward collective fantasies. Begun originally as two separate image blogs—"Netmares" and "Netdreams"—the project developed into a more formal curatorial platform that allowed users to scroll through a curated selection of artworks that seemed to hold together through dream logic. Exhibitions were mysterious; stripped of a descriptive introduction, the artworks were linked in the navigation bar by letter Zs, which would gradually fade in and out. The works themselves were equally cryptic. For example, Damon Zucconi's *Shining (Ghost)* (2006)—which was included in the online exhibition "v 2.0" in 2008—features an obscured figure in white set in a white room with a strobe light flickering along to an ecstatic techno track; presented in the same rotation was Nathan Hauenstein's animation *Pillars* (2008), which depicts two totem poles advancing and retreating into a black abyss. In an interview with Brian Droitcour for Rhizome, in which Droitcour makes the observation that *Netmares/Netdreams* almost functions as a larger, layered work unto itself, Altmann notes in response that all artworks are increasingly operating as an open structure, stating, "As we've expanded our view of the relationships and voids between everything from databases or networks to dataclouds and holograms, we've arrived at a better realization of the virtual and physical properties inherent in everything. Everything becomes matter, energy, and representation, and is connected to everything else." The dreams and nightmares illuminated in *Netmares/Netdreams* might indicate a collective consciousness or groupthink, but as Altmann suggests, there's a greater, scalable connection holding everything together.

Altmann's observations articulate a perspective that became more widespread during this period, namely that the internet, far from being an isolated medium, was in fact a powerful force filtered into every aspect of life. For many of the same artists within the "professional surfer" cohort, the internet was seen

Ryder Ripps and Jacob Broms Englom, *Stop Internet Time (The Eternal Chill Online)*, 2009.
Web-based project from Jstchillin.org, October 2009–February 2011. Courtesy the artists



not as the sole platform for the production of a work, but instead as a crucial nexus around which to research, assemble, transmit, and present data, both online and offline. In an often-quoted Rhizome interview from 2008, internet artist and Nasty Nets member Guthrie Lonergan described a move in his practice toward "Internet Aware Art" by saying:

I'm scheming how to take the emphasis off of the Internet and technology, but keep my ideas intact. Objects that aren't objects. I got a couple of books and a t-shirt in the works. Right now I'm really into text (not visually/typography...just...text...), and lots and lots of lists.... "Internet Aware Art."⁸

Lonergan's statement regarding "Internet Aware Art" can best be understood as works that depend on the internet for their transmission and, in some instances, reflect on that process itself, but do not need to reside completely within that environment, and often go offline. A few weeks after Lonergan's interview was published on Rhizome, artist and Nasty Nets member Marisa Olson echoed a similar shift in an interview with *we make money not art* blogger Regine Debatty, stating:

There doesn't seem to be a need to distinguish, any more, whether technology was used in making the work—after all, everything is a technology, and everyone uses technology to do everything. What is even more interesting is the way in which people are starting to make what I've called "Post-Internet" art in my own work (such as my *Monitor Tracings*), or what Guthrie Lonergan recently called "Internet Aware Art." I think it's important to address the impacts of the internet on culture at large, and this can be done well on networks but can and should also exist offline. Of course, it's an exciting challenge to explain to someone how this is still internet art.... If that really matters.⁹

For artists and curators at the time, these two interviews expressed a change in how internet artists were approaching their practice in a way that resonated strongly within the community. Under the designation postinternet or internet aware, internet art was not required to be online, but rather referred to art enmeshed within an informational culture, online and off.

The capture and transmission of digital information is now a defining characteristic of our environment, a fact that is apparent all around us, in everything from car design to ATM machines. All art regardless of medium becomes, on some

level, legible as data to computers and a network. Theorist Benjamin Bratton describes the omnipresence of this informational reality as “The Stack,” explaining:

Instead of viewing the various scales of emergent ubiquitous computing technologies as a haphazard collection of individual processes, devices and standards (RFID, cloud storage, augmented reality, smart cities, conflict minerals, etc.), it is more illuminating to model them as components of a larger, comprehensive, meta-technology. The Stack is planetary-scale computation understood as a megastructure. The term “stack” is borrowed from the TCP/IP or OSI layered model of distributed network architecture. At the scale of planetary computation, The Stack is comprised of 7 interdependent layers: Earth, Cloud, City, Network, Address, Interface, User. In this, it is an attempt to conceive of the technical and geopolitical structures of planetary computation as a “totality.”¹⁰

Software is one through-line and mechanism within The Stack, but computation as a whole is shifting everything around us. Given this complex contemporary reality, terminology that references internet artists moving offline suggests much more than internet artists simply making objects, but rather indicates how artists engage the widespread epistemological and ontological change due to the rise of a deeply informational culture.

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This essay was commissioned in 2014 for the present volume.

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NOTES

1. Kevin Bewersdorf, *Spirit Surfing* (Brescia: LINK Editions, 2011), 24.
2. Ibid., 23.
3. Ed Halter, “After the Amateur: Notes,” Rhizome, April 29, 2009, <<http://rhizome.org/editorial/2009/apr/29/after-the-amateur-notes/>>.
4. Lev Manovich, *Software Takes Command* (New York: Bloomsbury Academic, 2013), 180.
5. Ibid., 164.
6. Ryder Ripps, “Introducing: Dump.fm,” Rhizome, March 5, 2010, <<http://rhizome.org/editorial/2010/mar/5/introducing-dumpfm/>>.
7. Brian Droitcour, “Turn On, Tune In, Zoom Out: An Interview with Kari Altmann,” Rhizome, March 13, 2009, <<http://rhizome.org/editorial/2009/mar/13/turn-on-tune-in-zoom-out/>>.

8. Thomas Beard, "Interview with Guthrie Loneran," Rhizome, March 26, 2008, <<http://rhizome.org/editorial/2008/mar/26/interview-with-guthrie-loneran/>>.
9. Regine Debatty, "Interview with Marisa Olson," *we make money not art*, March 28, 2008, <<http://we-make-money-not-art.com/archives/2008/03/how-does-one-become-marisa.php>>.
10. Metahaven, "The Cloud, the State, and the Stack: Metahaven in Conversation with Benjamin Bratton," Tumblr, December 16, 2012, <<http://mthvn.tumblr.com/post/38098461078/thecloudthestateandthestack>>.

The Image Object Post-Internet Artie Vierkant

Preface Being Post-Internet

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This PDF is to serve as an extended statement of artistic purpose and critique of our contemporary relation to objects and images in Post-Internet culture. More than anything, it poses a survey of contemplations and open questions on contemporary art and culture after the Internet.

“Post-Internet Art” is a term coined by artist Marisa Olson^o and developed further by writer Gene McHugh in the critical blog “Post Internet”^o during its activity between December 2009 and September 2010. Under McHugh's definition it concerns “art responding to [a condition] described as 'Post Internet'—when the Internet is less a novelty and more a banality. Perhaps ... closer to what Guthrie Lonergan described as 'Internet Aware'—or when the photo of the art object is more widely dispersed [&] viewed than the object itself.” There are also several references to the idea of “post-net culture” in the writings of Lev Manovich as early as 2001.^o

Specifically within the context of this PDF, Post-Internet is defined as a result of the contemporary moment: inherently informed by ubiquitous authorship, the development of attention as currency, the collapse of physical space in networked culture, and the infinite reproducibility and mutability of digital materials.

Post-Internet also serves as an important semantic distinction from the two historical artistic modes with which it is most often associated: New Media Art and Conceptualism.

New Media is here denounced as a mode too narrowly focused on the specific workings of novel technologies, rather than a sincere exploration of cultural shifts in which that technology plays only a small role. It can therefore be seen as relying too heavily on the specific materiality of its media. Conceptualism (in theory if not practice) presumes a lack of attention to the physical substrate in favor of the methods of disseminating the artwork as idea, image, context, or instruction.

Post-Internet art instead exists somewhere between these two poles. Post-Internet objects and images are developed with concern to their particular materiality as well as their vast variety of methods of presentation and dissemination.

It is important to also note that “being Post-Internet” is a distinction which carries ramifications beyond the art context as a societal condition at large, and that it would be antithetical to attempt to pinpoint any discrete moment at which the Post-Internet period begins. Any cultural production which has been influenced by a network ideology falls under the rubric of Post-Internet. The term is therefore not discretely tied to a certain event, though it could be argued that the bulk of the cultural shifts described herein come with the introduction of privately-run commercial Internet service providers and the availability of personal computers.

^o Régine Debatty, *Interview with Marisa Olson*, *We Make Money Not Art* (2008), <http://www.we-make-money-not-art.com/archives/2008/03/how-does-one-become-marisa.php>
^o Gene McHugh, *Post Internet* blog (2009-10), <http://122909a.com>
^o Lev Manovich, *Post-Media Aesthetics* (2001)

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Art is a social object.

From the rise of a liberal market economy through the build-up and ubiquity of the “middle class,” art has matched and excused itself with the social conditions of its production. The rise of the “industrialized arts” gave way to lofty notions of art-after-object as late capitalism approached, all the while explaining itself as obligated to echo existing cultural conditions rather than move to shape them.

Where are we left now? Art and arts pedagogy has become so inextricably linked with a variety of interpretations on the Conceptual art doxa that it would be impossible to argue *against* any artistic gesture being automatically tied to its reception and the language surrounding it. At least from a historical perspective, Conceptual art assured its own legacy by the overwhelming volume of language produced within and around it at a time when summary-through-language was the easiest means of disseminating an object (profoundly simpler, even, than reproducing a photograph).

We find ourselves in radically different times. Increasingly the majority of both our cultural reception and production is mediated through some descendant of a Turing machine—taken now both technically and culturally for Turing's “universal machine,” a “single machine which can be used to compute any computable sequence.”¹ In cultural terms, assuming a certain level of access which does not yet exist in all cases,² the ubiquity of these devices and their massively interconnected nature signifies two realities which are crucial to an understanding of art after the Internet.

First, nothing is in a fixed state: i.e., *everything is anything else*, whether because any object is capable of becoming another type of object or because an object already exists in flux between multiple instantiations. The latter is a schema already intuitively arrived at by artists in recent history, prompting writers as diverse as Rosalind Krauss and Lev Manovich to proclaim a “Post-Medium Condition”³ and the rise of “Post-Media Aesthetics”⁴ (Krauss using it as a vessel to decry art marooned in medium specificity, what she calls “technical support,” Manovich uses it to offer a sketch of how one might categorize different types of art in an environment without traditional notions of “medium”).

The former, an art object's lack of fixity in representational strategy, is less often explored. This is not to say that artists are not involved in exploring the relationship of many copies and variations of a single object to one another. Artists like Oliver Laric and Seth Price routinely present multiple variations of the same object—Laric's *Versions* exists as “a series of sculptures, airbrushed images of missiles, a talk, a PDF, a song, a novel, a recipe, a play, a dance routine, a feature film and merchandise,”⁵ Price's *Dispersion* “[taking] the form of a widely reproduced essay, an artists' book, a freely available online PDF, as well as [a] sculpture.”⁶ These works are emblematic as Post-Internet gestures and have surely been influential in different ways, but step only lightly away from the tautological rationale of Conceptual art (typified in Joseph Kosuth's 1965 *One and Three Chairs*, an arrangement of three versions of the same object, each signifying “chair,” and language surrounding the

1 Alan Turing, *On Computable Numbers, with an application to the Entscheidungsproblem*, in *Proceedings of the London Mathematical Society*, Series 2 Volume 42 (1937)

2 http://en.wikipedia.org/wiki/Global_digital_divide

3 Rosalind Krauss, *Reinventing the Medium* from *Critical Inquiry* Volume 25, No. 2 (1999)

4 Lev Manovich, *Post-Media Aesthetics* (2001)

5 *The Real Thing*, interview with Oliver Laric by Domenico Quaranta, *Art Pulse Magazine* (2010), <http://artpulemagazine.com/the-real-thing-interview-with-oliver-laric>

6 Lauren Cornell, Seth Price artist page in The New Museum's *Free* catalogue (2010), <http://www.newmuseum.org/free/#sethprice>

piece to assert that nothing is being missed and the art is in the idea—Kosuth's "Art as Idea as Idea").

In the Post-Internet climate, it is assumed that the work of art lies equally in the version of the object one would encounter at a gallery or museum, the images and other representations disseminated through the Internet and print publications, bootleg images of the object or its representations, and variations on any of these as edited and recontextualized by any other author. The less developed stratagem for pointing to a lack of representational fixity is that of taking an object to be represented (to be more direct, *presented*) as another type of object entirely, without reference to the "original." For objects after the Internet there can be no "original copy."

Even if an image or object is able to be traced back to a source, the substance (substance in the sense of both its materiality and its importance) of the source object can no longer be regarded as inherently greater than any of its copies. When I take a moving image and represent it through an object (video rendered sculpturally in styrofoam for example), I am positing an alternative method of representation without ever supplying a way to view the source. A source video exists. The idea of a source video exists. But the way the object is instantiated denies both the necessity of an original and adherence to the representational norms that follow the creation of "video" as both technical device and terminology.

The possibilities for these transformations, alternative methods of viewing "media" which essentially amounts to an arbitrary assemblage of data, has thus far been most thoroughly examined in the field of "information aesthetics," a field as distanced from Post-Internet art as it is close to design, cartography, and indexing. Its fault is in its attempt to encapsulate large amounts of data—practical information, experience—into an aesthetic and understandable shorthand. In other words, information aesthetics provides in one object both a representation and the components which make up its source in an attempt to illustrate or arrive at knowledge. While Conceptualism as outlined by Kosuth may be limiting in its reliance on art propositions as enclosed tautological systems, its foundations—delineating progressive art with the same zeal Greenberg applied to ascribing modernism its "purity"⁷—hold true: "art's viability is not connected to the presentation of visual (or other) kinds of experience."⁸ For us to receive a piece of art and determine from it some piece of empirical information about the world at large would seem almost a bewildering proposition, even in a cultural climate where we have accepted that the singular qualification for the moniker "art" is the intention of any one individual to label it as such.

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The second aspect of art after the Internet deals with not the nature of the art object but the nature of its reception and social presence.

To be "progressive" in art is a fundamental impulse which which seems to pervade the majority of our judgements of the quality of art propositions. This leads to the use of such terms as the "avant-garde," which in the twentieth century held as its central project the delineation of a cultural space for art to occupy in relation to "mass media." However the nature of mass media is now profoundly different, in that we are both its subject and the engine behind it.

Attention has always been a currency, but with the proliferation of networking methods and infinitely alterable and reproducible media, that attention has diverged and become split amongst anyone and everyone who wishes to seek it. Fixed (which is to say, physical) media once imposed an economy to the image and object, a value driven by scarcity which necessitated a one-to-many system of distribution. Over time this spread and democratization of image and object production tools has led to a perpetual iconoclasm, each successive volley of formats breeding a new dogma and its own particular set of aesthetic principles. Hyperreal tableau

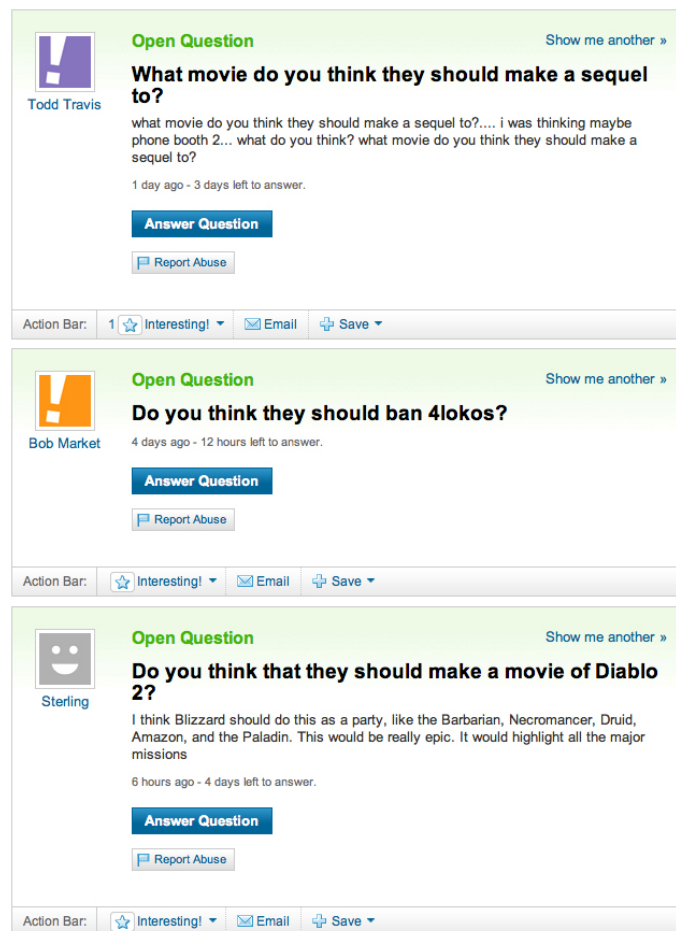
⁷ Clement Greenberg, *Modernist Painting* (1960)

⁸ Joseph Kosuth, *Art After Philosophy* (1969)

photography gives way to the fetishized imperfection of the polaroid, tape hiss is abandoned for ironic autotuning, &c.

What has remained through each iconoclasm is an inability to fully break the mentality imposed by a one-to-many system of distribution. The continual use of “They” in language: “They should make a second one, They should have done it this way, They should stop doing this,” &c., can be seen as sort of philosophical litmus test in which our method of discussing cultural production continually falls short.

“They” implies an alienation from production, a continuous deferral to action. It is a vacant critique, either proposal for the perpetuation of the same image unchanged (“They should release this on another platform”) or proposal for an iconoclasm which will never take place, the genesis of the proposition being encased entirely in a passive mode of reception. This deferral is an act which accepts dogma, accepts a dominant image paradigm as an unchanging absolute rather than the result of a complicated history of new approaches. “They” venerates this absoluteness, sanctifies it, while its opposite, “We,” postures towards the creation of an alternative and constitutes an actual schism; Baudrillard writes: “One can see that the iconoclasts, whom one accuses of disdaining and negating images, were those who accorded them their true value, in contrast to the iconolaters who only saw reflections in them and were content to venerate a filigree God.”⁹



Open questions.

The use of “We” is not to advocate solely for participatory structures of art but to insist on a participatory view of culture at large, and ultimately of taking iconoclasm itself as a quotidian activity. Whereas in previous times it was legitimate to conceive of culture as a greater system with impassable barriers to entry and a finitude of possibilities, culture after the Internet offers a radically different paradigm which our “They” idiom does not allow for. This is not to say that we have entered a fully utopian age of endless possibilities but simply to claim that culture and language are fundamentally changed by the ability for anyone to gain free access to the same image-creation tools used by mass-media workers, utilize the same or better structures to disseminate those images, and gain free access to the majority of canonical writings and concepts offered by institutions of higher learning.¹⁰

⁹ Jean Baudrillard, *Simulacra and Simulation* (1985)

¹⁰ The majority of texts researched in preparation for and cited within this writing are available as free PDFs on the Internet through some

These are conditions endemic to Post-Internet society, allowing for a ubiquitous authorship which challenges notions of the “definitive history” or the “original copy.” Just as Barthes’ proclamation of the “death of the author” is in fact a celebration of the “birth of the reader” and the “overthrow[ing of] the myth,”¹¹ culture Post-Internet is made up of reader-authors who by necessity must regard all cultural output as an idea or work in progress able to be taken up and continued by any of its viewers.

With this comes new issues, though. As Alexander Galloway and Eugene Thacker point out, “the mere existence of networks does not imply democracy or equality ... [we] suggest [that] rhizomatics and distribution signal a new management style ... as real as pyramidal hierarchy, corporate bureaucracy, [&c.].”¹²

While art may no longer have to contend with an idea of “mass media” as a fixed, monolithic system, instead it must now deal with both itself and culture at large as a constellation of diverging communities, each fixated on propagating and preserving itself. This condition is espoused in the writings of Nicolas Bourriaud as “constructing archipelagoes ... a voluntary grouping of islands networked together to create autonomous entities” as a means of proclaiming that “the universalist and progressive dream that governed modern times is in tatters.”¹³ Elsewhere Critical Art Ensemble (CAE) explain similar ideas, expressing culture as already beholden to a “bunker” ideology, a self-preserving and replicating tendency towards the formation of specified bureaucratic structures, a tendency CAE pinpoints equally in “community-based art”¹⁴ and traditional mass media. CAE write, “While mass media brings its viewer the world, the world is also held at bay while the viewer commits h/er gaze to the screen, forever separated from others and from communal space”¹⁵

Increasingly though, mass media and the world of “the screen” *is* our communal space. And with it comes new fragments with their own particular hierarchies. As reader-authors navigating these fragments, where now would we find a space within which to delineate “art”? Or, if the new “mass media” is as distributed and varied as our social networks themselves, and in fact driven by them, is that delineation even necessary? Ironically, the most radical and “progressive” movements of the Post-Internet period would be those who either pass by either largely unnoticed due to a decision to opt out of any easily-accessible distribution networks, or else would be composed of a community of people producing cultural objects not intended as artistic propositions and not applying themselves with the label of artist.¹⁶

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The “bunker” of art and artist persists, however. The goal of some Post-Internet practices is to engage with this proliferation of images and objects—“general web content,”¹⁷ items of culture created without necessarily being described as art—and proclaim an authorial stance by indexing / curating these objects. These projects are as wide-ranging as Jon Rafman’s “Nine Eyes of Google Street View” project¹⁸ and some of the earlier works done

combination of Google searches, AAAARG.org and Gigapedia.com. For more see this interview with Sean Dockray, founder of AAAARG.org, The Public School, Telic Arts Exchange, and more: <http://127prince.org/2010/10/04/sean-dockray-interview-by-randall-szott/>

11 Roland Barthes, *The Death of the Author* (1967)

12 Alexander Galloway and Eugene Thacker, *The Exploit* p.13 & 39 (2007)

13 Nicolas Bourriaud, *The Radicant* p.185 (2009)

14 Critical Art Ensemble, *On Electronic Civil Disobedience* p.39 (1996)

15 *ibid.*, p.37

16 For a case study in a networked community engaged in artistic production without adherence to self-proclamation as “artists” see Brad Troemel’s anonymously released essay *What Relational Aesthetics Can Learn from 4Chan* (2010), <http://www.artfagcity.com/2010/09/09/img-mgmt-what-relational-aesthetics-can-learn-from-4chan/>

17 http://www.google.com/#sclient=psy&hl=en&safe=off&site=&source=hp&q=site:rhizome.org+%22general+web+content%22&aq=f&aql=&aql=&oq=&gs_rfai=&pbx=1&fp=1bde53b2ade8e603

18 <http://www.googlestreetviews.com>

by Surf Clubs¹⁹ and their participants, among them Guthrie Lonergan who was one of the first artists to release works in the form of YouTube playlists. Artists after the Internet thus take on a role more closely aligned to that of the interpreter, transcriber, narrator, curator, architect.

This is often broadly ascribed to traditions of artists dealing with the banal, the everyday: “surfing as art” articulating quotidian Internet-user “tactics”²⁰ or the artists acting, essentially, as ethnographers who would chart and explain the new variety of images found within visual culture.²¹ I would argue for a slightly different case.

In his essay *On the New*, Boris Groys writes:

... art can [become unusual, surprising, &c.] only by tapping into classical, mythological, and religious traditions and breaking its connection with the banality of everyday experience. The successful (and deservedly so) mass cultural image production of our age concerns itself with attacks by aliens, myths of apocalypse and redemption, heroes endowed with superhuman powers, and so forth. All of this is certainly fascinating and instructive. Once in a while, though, one would like to be able to contemplate and enjoy something normal, something ordinary, something banal as well. ... In life, on the other hand, only the extraordinary is presented to us as a possible object of our admiration.²²

But just as any object is conceivably any other object, our ubiquitous authorship marks a point in cultural production at which the extraordinary is now also the ordinary—the myth is also the everyday. In many of my video works, I make a point to appropriate imagery from recent popular films, mass media spectacles made with all of the fervor and resolution of an empire that only partially realizes its own decay. The striking thing about these images is not their content but their availability and the context within which they are now received. Where once an experience of cinema was that of receiving an absolute, fixed icon—a definitive copy, inaccessible and precious—that is now far from the case. Cinema now becomes encapsulated, transferrable and transformable in the same vain as everything else, a “file” to be treated with all the levity we reserve for any other file.

The images I deal with in my work, authentic unauthorized copies of spectacle films, thus represent the absolute collapse of the mythological and the quotidian into a single indistinguishable whole.

The goal of organizing appropriated cultural objects after the Internet cannot be simply to act as a didactic ethnographer but to present microcosms and create propositions for arrangements or representational strategies which have not yet been fully developed. Taking a didactic stance amounts to perpetuating a state of affairs of art positioned in contradiction to an older one-to-many hierarchy of mass media. For the new hierarchies of many-to-many production, the cultural status of objects is now influenced entirely by the attention given to them, the way they are transmitted socially and the variety of communities they come to inhabit.

Thus in the same way that all cultural images and objects become general—the film *Independence Day* being not dissimilar in homogeneity and degree of spectacle from any individual's photos of their newborn child on Facebook—so too does the authorial stance of the artist become general. Any sorting of images or aspects of culture, applied with a declaration or narrative gesture, becomes not dissimilar to our experience of everyday life, regardless of the degree to which the images are spectacular. What comes to matter is not that an artist has presented some aspect of the spectacle and how it fits neatly into some aspect of a linear historical trajectory. What matters is that in the presentation they have created a proposition towards an alternate conception of cultural objects.

19 See Marcin Ramocki's *Surf Clubs: organized notes and comments* (2008), <http://ramocki.net/surfing-clubs.pdf>

20 A term adopted from Michel de Certeau's *L'invention du Quotidien* (1980)

21 See Hal Foster's *The Archive Without Museums* (1996)

22 Boris Groys, *On the New* (2002)

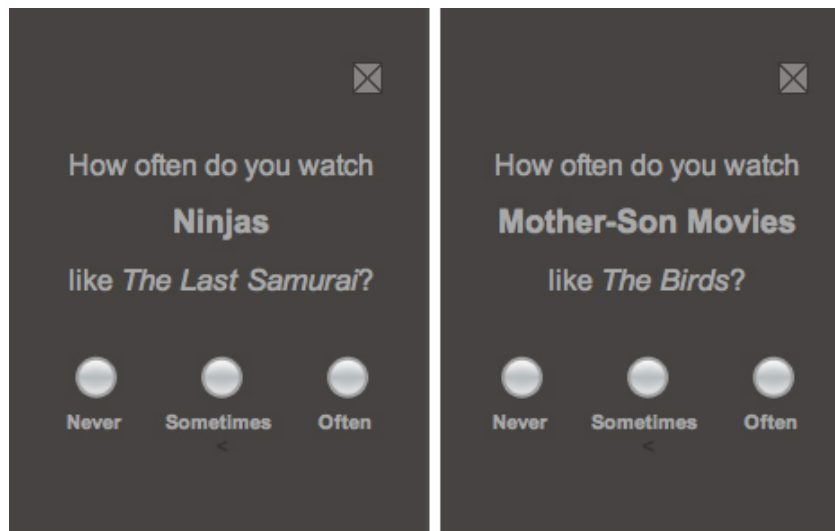
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If, in Post-Internet culture, artistic production must deal with arrangements and representations of images and objects taken from any cultural context, how do we conceive of sorting the artists themselves? How do we judge the spaces in which this work is exhibited, on the Internet and off?

As Lauren Christiansen writes, “with today’s burgeoning potential for digital mass viewership, transmission becomes as important as creation. Contemporary online artists are aware of this fact and seek to actively make use of its potential.”²³ As artists come to self-sort and form international communities based on mutual investigations, it is absurd to think of being able to act with any curatorial agency in selecting from the vast array of “contemporary artists” without being in some way tied directly to those artists’ social networks. The methods of transmission these artists use become imbricated with the work they create, who accesses it, and the spaces they ultimately show in.

This is a complicated turn, as communities are for the moment more likely to form based on aesthetic principles than conceptual or ideological ones. Whether these aesthetic principles mean a preference for sleek geometric shapes with gradient overlays or mean a preference for a particular blogging platform, the underlying segmentation is the same. Posting an image of a gradient implicates an artist within a particular aesthetic mindset in the same way that having a Tumblr adheres an artist to a particular format of transmission. In either case, the architecture of the Internet—an arrangement of language, sound, and images in which imagery is the most dominant, immediate factor—helps facilitate an environment where artists are able to rely more and more on purely visual representations to convey their ideas and support an explanation of their art independent of language. This is a crucial point of departure from recent art history, as arguably it marks an abandonment of language and semiotics as base metaphors for articulating works of art and our relationship to objects and culture.²⁴

This should come as little surprise as, especially after the Internet, the far more instantaneous and safe method of communication is through imagery. Dealing with language can too forcibly illustrate the thoughts behind an image, or belittle a work if the text is not as clever or aesthetic as the image itself. Language can also be excruciatingly limiting for those who trained to think beyond the fixity of “mediums,” especially as the involvement of language in most average Internet use comes down to having a keen memory for appropriate search terms, keywords, tags: a simple but nevertheless grossly limiting architecture.



Deprecated tags

²³ Lauren Christiansen, *Redefining Exhibition in the Digital Age* (2010)

²⁴ Haim Steinbach describes his relationships to objects as such: “objects, commodity products, or art works have functions for us that are not unlike words, language. We invented them for our own use and we communicate through them”—interviewed by Joshua Decter, *Journal of Contemporary Art* (1993), <http://www.jca-online.com/steinbach.html>

Further, it marks a denigration of objects and our relationship to space: if an object before us in a gallery is only one of an infinite multitude of possible forms that object could take, its value to the viewer becomes little more than a curiosity. The viewer can judge it only by visually and conceptually relating it to every other project they are aware of by said artist and the other artists within their aesthetic community.

The strategy employed by myself and others towards this physical relationship has been to create projects which move seamlessly from physical representation to Internet representation, either changing for each context, built with an intention of universality, or created with a deliberate irreverence for either venue of transmission. In any case, the representation through image, rigorously controlled and edited for ideal viewing angle and conditions, almost always becomes the central focus. It is a constellation of formal-aesthetic quotations, self-aware of its art context and built to be shared and cited.

It becomes the image object itself.

Metahaven

Captives of the Cloud: Part I

01/14

e-flux journal #37 — september 2012 Metahaven
Captives of the Cloud: Part I

We are the voluntary prisoners of the cloud; we are being watched over by governments we did not elect.

Wael Ghonim, Google's Egyptian executive, said: "If you want to liberate a society just give them the internet."¹ But how does one liberate a society that already has the internet? In a society permanently connected through pervasive broadband networks, the shared internet is, bit by bit and piece by piece, overshadowed by the "cloud."

The Coming of the Cloud

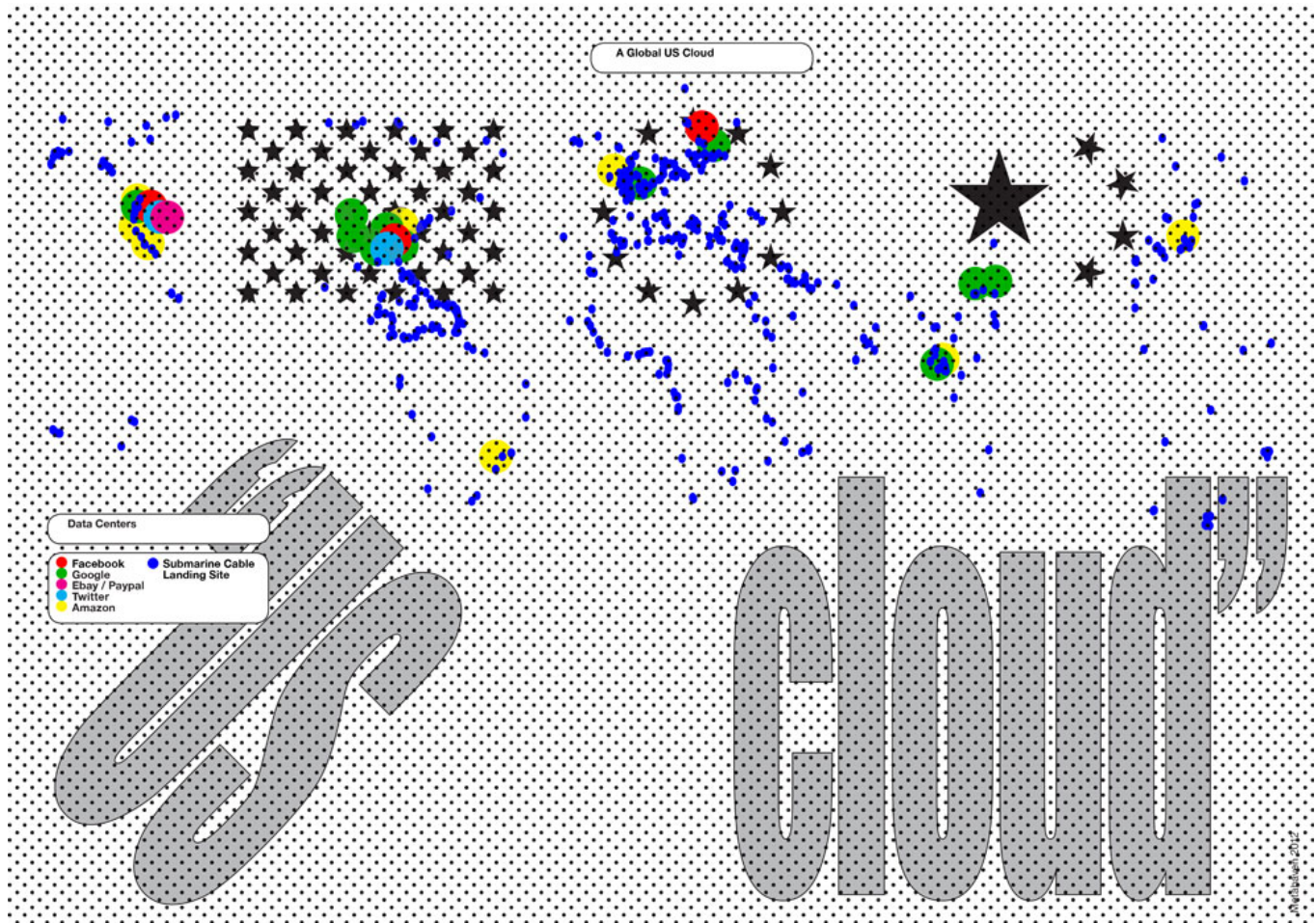
The cloud, as a planetary-scale infrastructure, was first made possible by an incremental rise in computing power, server space, and trans-continental fiber-optic connectivity. It is a by-product and parallel iteration of the global (information) economy, enabling a digital (social) marketplace on a worldwide scale. Many of the cloud's most powerful companies no longer use the shared internet, but build their own dark fiber highways for convenience, resilience, and speed.² In the cloud's architecture of power, the early internet is eclipsed.

A nondescript diagram in a 1996 MIT research paper titled "The Self-governing Internet: Coordination by Design," showed a "cloud" of networks situated between routers linked up by Internet Protocol (IP).³ This was the first reported usage of the term "cloud" in relation to the internet. The paper talked about a "confederation" of networks governed by common protocol. A 2001 *New York Times* article reported that Microsoft's .NET software programs did not reside on any one computer, "but instead exist in the 'cloud' of computers that make up the internet."⁴ But it wasn't until 2004 that the notion of "cloud computing" was defined by Google CEO Eric Schmidt:

I don't think people have really understood how big this opportunity really is. It starts with the premise that the data services and architecture should be on servers. We call it cloud computing – they should be in a "cloud" somewhere. And that if you have the right kind of browser or the right kind of access, it doesn't matter whether you have a PC or a Mac or a mobile phone or a BlackBerry or what have you – or new devices still to be developed – you can get access to the cloud. There are a number of companies that have benefited from that. Obviously, Google, Yahoo!, eBay, Amazon come to mind. The computation and the data and so forth are in the servers.⁵

The internet can be compared to a patchwork of city-states, or an archipelago of islands. User

02/14



A selection of the global US social media cloud, resorting under the Patriot Act.

data and content materials are dispersed over different servers, domains, and jurisdictions (i.e., different sovereign countries). The cloud is more like Bismarck's unification of Germany, sweeping up formerly distinct elements, bringing them under a central government. As with most technology, there is a sense of abstraction from prior experiences; in the cloud the user no longer needs to understand how a software program works or where his or her data really is. The important thing is that it works.

In the early 1990s, a user would operate a "personal home page," hosted by an internet Service Provider (ISP), usually located in the country where that user lived. In the early 2000s, free online services like Blogspot and video sites like YouTube came to equal and surpass the services of local providers. Instead of using a paid-for local e-mail account, users would switch to a service like Gmail. In the late 2000s and the early 2010s this was complemented, if not replaced, by Facebook and other social media, which integrate e-mail, instant messaging, FTP (File Transfer Protocol), financial services, and other social interaction software within their clouds. Cloud-based book sales, shopping, and e-reading have brought about the global dominance of Amazon, the world's biggest cloud storage provider and the "Walmart of the Web."⁶ By 2015, combined spending for public and private cloud storage will be \$22.6 billion worldwide.⁷ Given this transition, it is no exaggeration to proclaim an exodus from the internet to the cloud. The internet's dispersed architecture gives way to the cloud's central model of data storage and management, handled and owned by a handful of corporations.

The coming of the cloud is spelled out by Aaron Levie, founder and CEO of Box, one of Silicon Valley's fastest growing cloud storage providers. As Levie states, the biggest driver of the cloud is the ever-expanding spectrum of mobile devices – iPhones, iPads, Androids, and such – from which users tap into the cloud and flock around its server spine:

If you think about the market that we're in, and more broadly just the enterprise software market, the kind of transition that's happening now from legacy systems to the cloud is literally, by definition, a once-in-a-lifetime opportunity. This is probably going to happen at a larger scale than any other technology transition we've seen in the enterprise. Larger than client servers. Larger than mainframes.⁸

Google, one of the world's seven largest cloud companies, has recently compared itself to a bank.⁹ That comparison is apt. If data in the

cloud is like money in the bank, what happens to it while it resides "conveniently" in the cloud?

The US Cloud and the Patriot Act

Where and by whom sites are registered and data is hosted matters a great deal in determining who gains access to and control over the data. For example, all data stored by US companies (or their subsidiaries) in non-US data centers falls under the jurisdiction of the USA Patriot Act, an anti-terrorism law introduced in 2001.¹⁰ This emphatically includes the entire US cloud – Facebook, Apple, Twitter, Dropbox, Google, Amazon, Rackspace, Box, Microsoft, and many others. Jeffrey Rosen, a law professor at George Washington University, has established that the Patriot Act, rather than investigating potential terrorists, is mostly used to spy on innocent Americans.¹¹ But the people being watched need not even be Americans. Via the cloud, citizens across the world are subject to the same Patriot Act powers – which easily lend themselves to misuse by authorities. Matthew Waxman of the Council on Foreign Relations outlines the situation:

These kinds of surveillance powers have historically been prone to abuse. Some of the legal restrictions on surveillance that the Patriot Act was designed to roll back were actually the direct product of abuses by the FBI, the CIA, and other government agencies. During the 1960s and '70s, national security intelligence powers were used by government agents to spy on political opposition [and] cast abusively wide nets. That legacy of abuse has raised a lot of concerns about whether there is adequate oversight with respect to these new surveillance powers.¹²

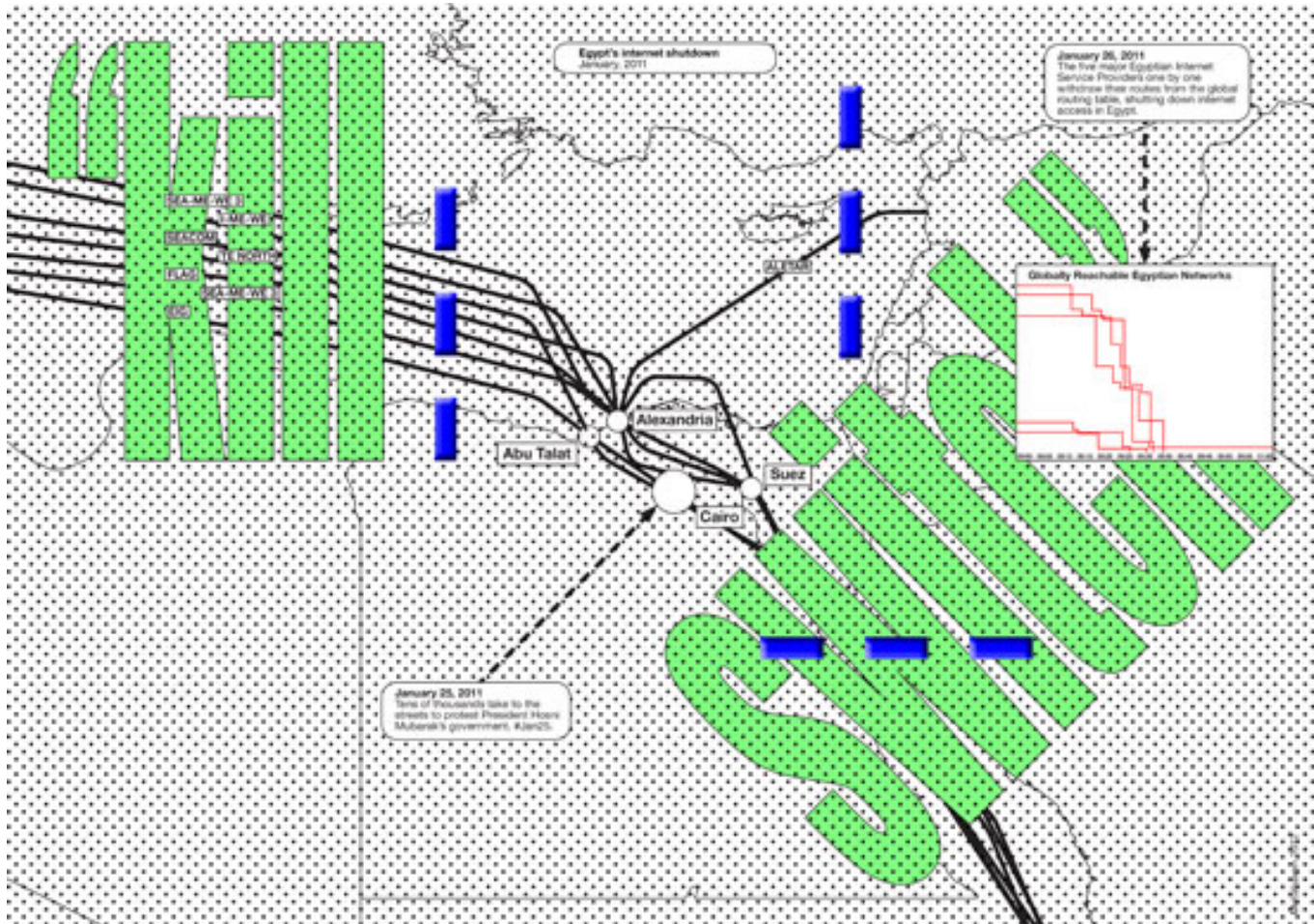
The sociologist Saskia Sassen adds to this perspective:

Through the Patriot Act [...] the government has authorized official monitoring of attorney-client conversations, wide-ranging secret searches and wiretaps, the collection of Internet and e-mail addressing data [...] All of this can be done without probable cause about the guilt of the people searched – that is to say, the usual threshold that must be passed before the government may invade privacy has been neutralized. This is an enormous accrual of powers in the administration, which has found itself in the position of having to reassure the public that it can be 'trusted' not to abuse these powers. But there have been abuses.¹³

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The Mubarak “kill switch” which took Egypt off the internet in January, 2011.

Microsoft was the first cloud company to publicly confirm Patriot Act access to its data stored outside the US.¹⁴ In August 2011, Google also confirmed that its data stored overseas is subject to “lawful access” by the US government.¹⁵ A 2012 white paper by the law and privacy firm Hogan Lovells examined these findings, concluding that while the Patriot Act does give the US government access to the cloud, many other governments enjoy similar forms of access under their own laws – and further, that using the “location” of a cloud server to determine legal protection was a mistaken idea altogether.¹⁶ The paper noted the widespread use of so-called Mutual Legal Assistance Treaties (MLATs), which streamline the exchange between countries of data needed for investigative purposes. Apart from treaty-backed requests, “informal relationships between law enforcement agencies [...] allow for governmental access to data in the ‘possession, custody, or control’ of cloud service providers over whom the requesting country does not otherwise have jurisdiction.” The legality of such informal relationships was not examined by the study. Neither did it backlog any recorded abuses of the Patriot Act, or discuss reports by two US Senators about a “secret interpretation” of the law, which would give the FBI far-reaching extra surveillance powers that the public is unaware of.¹⁷

One of the most powerful instruments the US government uses to look into the so-called “non-content information” of ISPs and cloud providers is the National Security Letter (NSL). NSLs demand specific information about users and are issued directly by the FBI. After the Patriot Act was signed into law, the number of letters issued rose exponentially: from 8,500 in 2000 to 39,346 in 2003. An NSL automatically includes a gag order that prohibits the recipient from notifying users about the request. The FBI need only assert that the information sought is “relevant” to an investigation.¹⁸ The crucial question in the Hogan Lovells report – “Are government orders to disclose customer data subject to review by a judge?” – is answered with “yes” in Australia, Canada, Denmark, France, Germany, Ireland, Japan, Spain, the United Kingdom, and the US. However, in the US this condition is only met if the cloud provider, after receiving the NSL, first challenges its built-in gag order. Only when the NSL is unsealed by a judge can the cloud provider inform the user about the existence of the letter. For the Hogan Lovells report, this procedure counts as judicial review.

Super-Jurisdiction

In Egypt, during the revolution, Facebook and

Twitter played the role of subversive, uncensorable alternative media – in part because the servers of these wildly popular services were beyond the reach of local authorities. Indeed, Hosni Mubarak's best bet to fend off the power of the internet was to switch it off entirely. To do so, “just a few phone calls probably sufficed.”¹⁹ While Mubarak's *ultima ratio* as a sovereign ruler over Egyptian soil proved sufficient to wall the country off from the network, the violent crudeness of this act also demonstrated the dictator's much more substantial *lack of power* over the network's larger infrastructure. Sovereign control over the cloud, in contrast to authoritarian power-mongering, is a sophisticated affair. One might draw a very different map here: the global spread of the US cloud, for example, results in a kind of “super-jurisdiction” enjoyed by its host country.

Super-jurisdiction can be seen in action in the 2012 seizure of Megaupload.com by the US Department of Justice (DOJ). Megaupload.com was a Hong Kong-based internet enterprise paying loving tribute to all kinds of Hollywood films (to say it politely). The site offered, according to its own self-description, “no-registration upload and sharing of files up to 1 gigabyte.” It was seized in January 2012 by the DOJ and the FBI, backed by film industry copyright claimants. Megaupload.com stands accused of generating “more than \$175 million in criminal proceeds” and causing “more than half a billion dollars in harm to copyright owners.”²⁰

The site's founder, thirty-seven-year-old internet millionaire Kim Dotcom, and three of his associates were brought to a New Zealand court to face extradition to the US. They'd been living like self-styled oligarchs. In a gesture toward transparency, they said they had “nothing to hide.”²¹ In particular, Dotcom himself embodies the absurd saga of a contemporary, deeply self-parodying internet hooligan – a legal black hole turned persona, unprepared in every way to be “famous,” yet accepting the challenge wholeheartedly. Megaupload.com was, at least in its own self-imagination, nothing more than a technical conduit between those who upload and those who download, its content-indiscriminate policy a typical example of laissez-faire anarcho-capitalism. The US government's prosecution of the site remains highly debated, because the DOJ interpreted the site's global user base as a willful conspiracy to break US law. As Jennifer Granick at Stanford Law notes, the DOJ referenced “unknown parties” (i.e., the users of Megaupload.com) as members of a conspiracy to conduct a crime in the US. Granick notes that such users “were located all over the world, and may or may not have acted willfully.” Indeed, with Megaupload.com, the government alleges “an

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agreement to violate a US civil law, including by many people who are not subject to US rules.” As Granick then asks, “Does the United States have jurisdiction over anyone who uses a hosting provider in the Eastern District of Virginia? What about over any company that uses PayPal?”²² Indeed, these are the sorts of questions prompted by super-jurisdiction.

Super-jurisdiction means that the law of one country can, through various forms of cooperation and association implied by server locations and network connections, be extended into and enacted in another. The US, as a result of its unique position in managing the internet’s core, also has jurisdiction over all so-called top level domains, no matter where they are hosted and by whom. All top-level domain names (dot-com, dot-org, dot-net, etc.) must be registered through VeriSign, a Virginia-based company. Using its jurisdiction over the domain name registry, in 2012 the DOJ seized Bodog.com, a gambling website operated from Canada. A US Customs Enforcement spokesperson confirmed to *Wired* that the US had in a similar manner seized 750 different domain names of sites it believed committed intellectual property theft.²³ Michael Geist, an internet law professor at the University of Ottawa, observes that, indeed, “All Your internets Belong to US”:

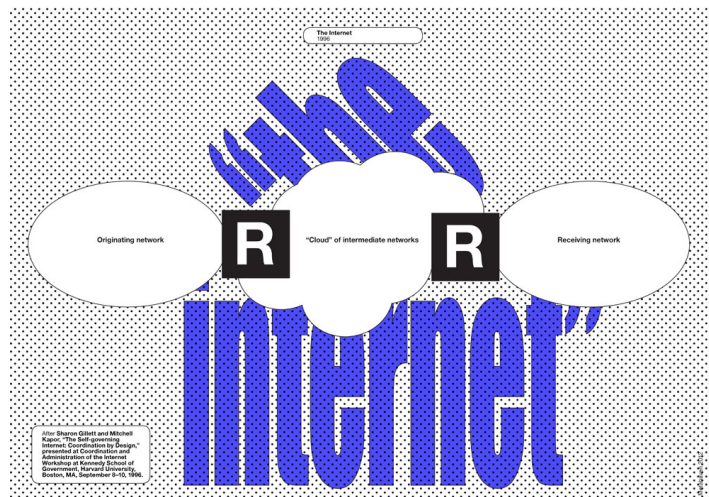
The message from the [Bodog] case is clear: all dot-com, dot-net, and dot-org domain names are subject to US jurisdiction regardless of where they operate or where they were registered. This grants the US a form of “super-jurisdiction” over internet activities since most other countries are limited to jurisdiction with a real and substantial connection. For the US, the location of the domain name registry is good enough.²⁴

Cloud Surveillance

The various technical components that enable global communication – server, network, and client – all lend themselves to surveillance. *Access Controlled*, a MIT Press handbook on internet surveillance and censorship, states that “the quest for information control is now beyond denial.”²⁵ It mentions the so-called “security first” norm, by which the combined threats of terrorism and child pornography create a mandate for the state to police the net without restriction. As the authors assert in their conclusion, “The security-first norm around internet governance can be seen, therefore, as but another manifestation of these wider developments. Internet censorship and surveillance – once largely confined to

authoritarian regimes – is now fast becoming the global norm.”²⁶ Indeed, if a lawsuit brought by the Electronic Frontier Foundation (EFF) against AT&T is any indication, the US government seems determined to expand its access to electronic communication. The EFF’s star witness in the case was Mark Klein, a former AT&T technician who claimed to have seen, in 2002, the creation and ongoing use of a dedicated private room where the National Security Agency (NSA) had “set up a system that vacuumed up internet and phone-call data from ordinary Americans with the cooperation of AT&T.”²⁷ Klein said the system allowed the government full surveillance of not just the AT&T customer base, but that of sixteen other companies as well.²⁸ The US government dismissed the case against the telecommunications provider, asserting the privilege of state secrets. The government has also dismissed cases against itself and other telecom companies that assisted with similar endeavors, including Sprint, Nextel, and Verizon.²⁹ If the allegations are true, according to *Access Controlled*, “they show that the United States maintains the most sophisticated internet surveillance regime.”³⁰

06/14



The first mention of the notion of the “cloud” was in a 1996 diagram in an MIT research paper, redrawn here.

As technologies expand, the governance, legislation, and legalities of surveillance become increasingly complicated. In May 2012, CNET reported that the general counsel of the FBI had drafted a proposed law that would require social-networking sites, e-mail and voice-over-IP (VoIP) providers, as well as instant messaging platforms, to provide a backdoor for surveillance – a demand from the US government for cloud companies to “alter their code to ensure their products are wiretap-friendly.”³¹ In 2012, the UK Government announced the installation – in collaboration with telecom companies and ISPs – of so-called “black boxes” which would retrieve

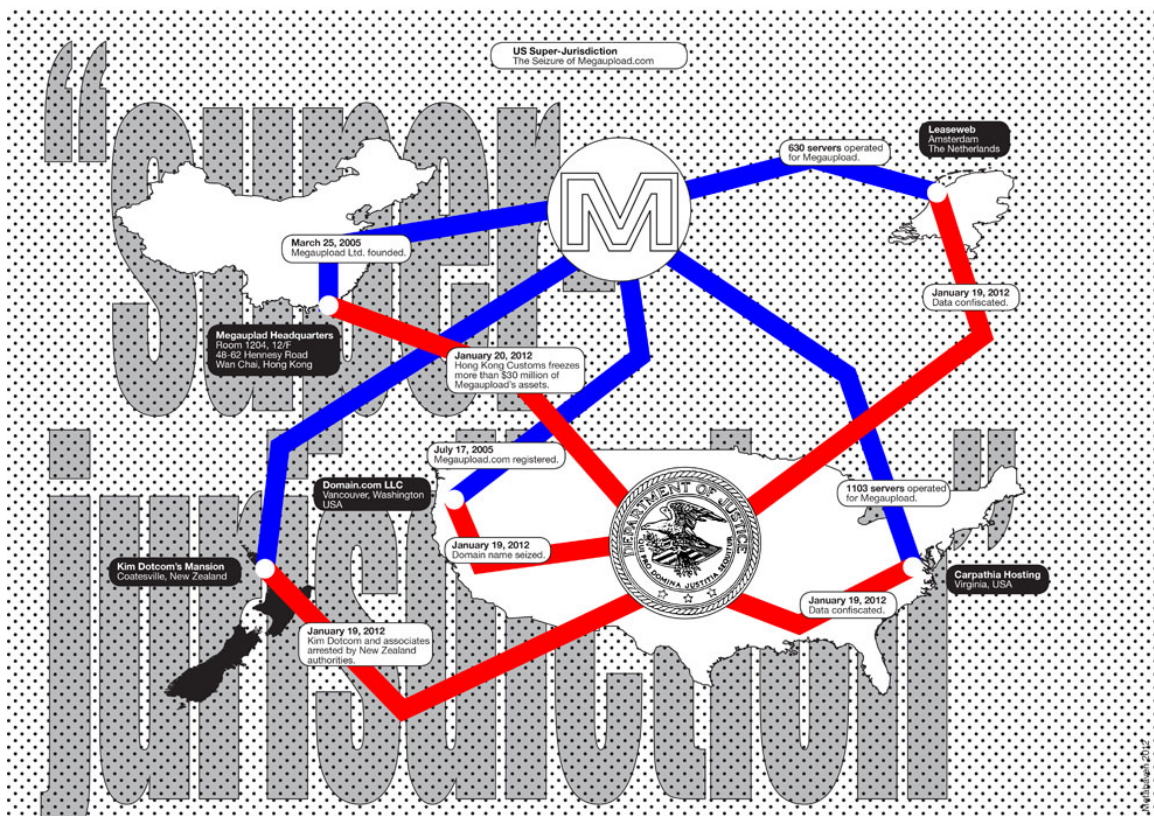
and decrypt communications from Gmail and other cloud services, storing the non-content data from these communications.³² But the cloud is nothing like a national telephone network. Whenever the cloud is “wiretapped,” authorities listen into a global telecommunications oracle; the data of everyone using that cloud, regardless of where and who they are, and regardless of whether or not they are the suspect of a crime, is at least in principle at the disposal of law enforcement.

Most journalism routinely criticizes (or praises) the US government for its ability to spy on “Americans.” But something essential is not mentioned here – the practical ability of the US government to spy on everybody else. The potential impact of surveillance of the US cloud is as vast as the impact of its services – which have already profoundly transformed the world. An FBI representative told CNET about the gap the agency perceives between the phone network and advanced cloud communications for which it does not presently have sufficiently intrusive technical capacity – the risk of surveillance “going dark.” The representative mentioned “national security” to demonstrate how badly it needs such cloud wiretapping, inadvertently revealing that the state secrets

privilege – once a legal anomaly, now a routine – will likely be invoked to shield such extensive and increased surveillance powers from public scrutiny.

Users' concerns about about internet surveillance increased with the proposed Stop Online Piracy Act (SOPA), which was introduced into the US House of Representatives in late 2011. How the government would police SOPA became a real worry, with the suspicion that the enforcement method of choice would be standardized deep packet inspections (DPI) deployed through users' internet service providers – a process by which the “packets” of data in the network are unpacked and inspected.³³ Through DPI, law enforcement would detect and identify illegal downloads. In 2010, before SOPA was even on the table, the Obama Administration sought to enact federal laws that would force communications providers offering encryption (including e-mail and instant messaging) to provide access by law enforcement to unencrypted data.³⁴ It is, however, worth noting that encryption is still protected as “free speech” by the First Amendment of the US Constitution – further complicating, but not likely deterring, attempts to break the code. One way of doing so consists

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The seizure of Megaupload.com; using super-jurisdiction to allege a global conspiracy.

of surrounding encryption with the insinuation of illegality. The FBI in 2012 distributed flyers to internet cafe business owners requesting to be wary of “suspicious behavior” by guests, including the “use of anonymizers, portals or other means to shield IP address” and “encryption or use of software to hide encrypted data.” In small print, the FBI added that each of these “indicators” by themselves, however, constituted lawful conduct.³⁵

Coercive Paternalism

“Real name” requirements by the cloud-based social networking platforms Facebook and Google+ expressly attack anonymity and pseudonymity online, affecting the fundamentals of political speech. Real name directives require users to register with a service using the name that is in their passport. The reasons given by cloud services for such real name requirements are vague – perhaps for fear of sounding too directly authoritarian. The preferred route, instead, is that of fatherly advice. Facebook claims that it has a real name policy “so that you always know who you’re connecting with,” while Google states that it requires real names so “that the people you want to connect with can find you.”³⁶ These explanations gesture towards a conception of normative social arrangements – requiring that you use the same name that you’d use among your friends, family, or coworkers. Alexis Madrigal points out a certain irony in the Google+ real name requirement:

The kind of naming policy that Facebook and Google Plus have is actually a radical departure from the way identity and speech interact in the real world. They attach identity more strongly to every act of online speech than almost any real world situation does.³⁷

Cloud providers such as Amazon use real name registration as a mechanism for accountability. Though Amazon still allows users to use a “pen name,” the trademarked “real name” attribution is advertised as having the ability to “potentially increase your reputation in the community” as a retailer, seller, or reviewer.³⁸ Some see the real name badge as a step towards “fixing their flawed [and] exploitable review system” for reviewing books – a system notoriously dominated by biased “anonymous” users, often thought to be, and sometimes proven to be, other authors, their family members, or the books’ publishers.³⁹ Though Amazon’s reasoning for promoting the use of real names is more explicit than that of Facebook and Google+, one can imagine the marketing benefits of a synchronized real name system between social media and

retail websites – and the connection that such a synchronicity might have with the government. Such requirements can be seen as aligned with plans of the US government to introduce a universal “trusted identity” or “internet ID” system for US citizens, a commission the White House granted to the US Commerce Department in 2011. According to White House Cybersecurity Coordinator Howard Schmidt, the effort entails nothing less than creating an “identity ecosystem” for the internet.⁴⁰

Cass Sunstein, the Obama Administration’s chief internet advisor, has recently argued for government policy against the spread of “rumors” on the internet; as noted by the *New Yorker*, one of the most persistent of such rumors was the theory that President Obama had been born in Kenya – and thus holds his presidency illegally.⁴¹ Sunstein believes that certain properties of the internet gear public speech toward the uninformed forwarding and circulation of rumors and conspiracy theories. In “echo chambers” and through “cybercascades,” one-sided opinion would spread rapidly and widely in the network without rebuttal. Supposedly balanced reporting by professional journalists in the mainstream media now has to compete for attention with, and gets often surpassed by, every other blog post, Facebook update, or tweet. The effortless ability for all Internet users to compose and live on a “Daily Me” – a news diet catered to fit and maintain an individual, already established, self-referential set of beliefs – would result in a fragmentation of the general public into factions which no longer expose themselves to views held by other factions. Sunstein claims that under such fragmentation, “diverse speech communities” are created “whose members talk and listen mostly to one another.” And,

When society is fragmented in this way, diverse groups will tend to *polarize* in a way that can breed extremism and even hatred and violence. New technologies, emphatically including the Internet, are dramatically increasing people’s ability to hear echoes of their own voices and to wall themselves off from others.⁴²

Sunstein is concerned with how rumors may impair the effectiveness of government, and undermine its legitimacy. Early 2008, he and a co-author published a paper on conspiracy theories around the 9/11 attacks. In the paper, Sunstein recommended that “Government agents (and their allies) might enter chat rooms, online social networks, or even real-space groups and attempt to undermine percolating conspiracy theories by raising doubts about their

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factual premises, causal logic or implications for political action.”⁴³

Nowhere is the coercive government stance toward online rumors as clear as in China. Beijing put forth regulations requiring users to register on social media sites with their “real name identities” by March 2012 – regulation comparable to policies already spontaneously embraced by Facebook and Google. Sites including Sina Weibo, one of the country's largest microblogging sites, have begun implementing these regulations, which also forbid users from making statements against the state’s honor or statements that may disrupt civil obedience.⁴⁴ Around the same time, social media sites across the country flared up over the ouster of political leader Bo Xilai from the Communist Party. The Chinese police swiftly detained six people and shut down sixteen websites over “rumors” surrounding the incident, including claims that military vehicles were entering Beijing.⁴⁵

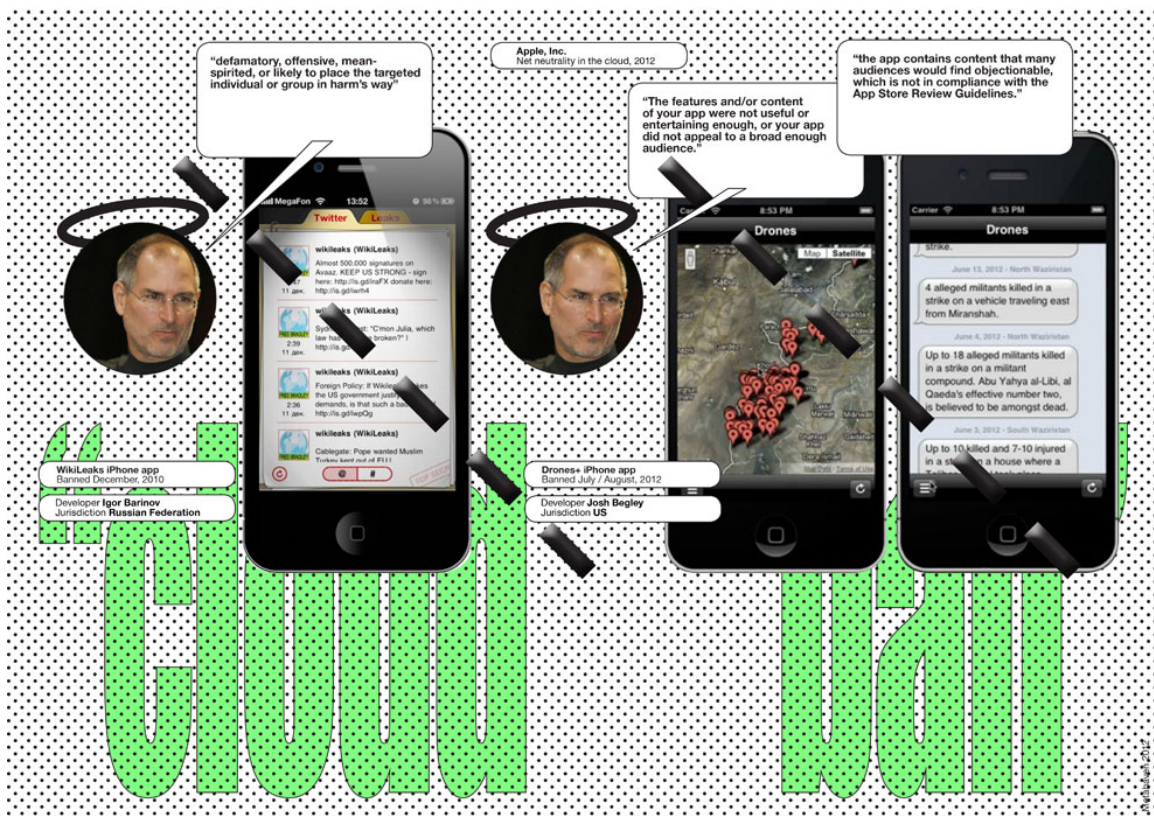
Cloud as a Political Space

The increasing prominence which cloud-based internet services, social media and VoIP technologies now enjoy over legacy tools of communication shows in how they enable new, virtually cost-free forms of organization. For

social movements relying on collective action, this factor has proven to be key. Unsurprisingly, when social media platforms are suddenly “switched off,” their ability to organize can be severely affected. Facebook, in the wake of nationwide anti-austerity protests in the UK in February 2011, deleted the profiles of dozens of political groups preparing to take part in further protests. In doing so, Facebook effectively disabled lawful political activism, which had, for obvious reasons, moved their coordination to the cloud. The reason for the purge is still not known and likely never will be. All the social networking behemoth could utter to justify its behavior was cryptic technospeak. Profiles had “not been registered correctly,” as a Facebook spokeswoman explained.⁴⁶ In 2010, UK Prime Minister David Cameron and other Conservative politicians met in London with Facebook founder Mark Zuckerberg. Their admiration was mutual.⁴⁷

Rebecca MacKinnon, a former CNN reporter and cofounder of the citizen media network Global Voices, asserts in her book *Consent of the Networked* that “we cannot understand how the internet is used unless we first understand the ways in which the internet itself has become a highly contested political space.”⁴⁸ This applies equally, and equally urgently, to the cloud.

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App neutrality? Apple's ban on two controversial iPhone apps in 2010 and 2012 shows a lack of network neutrality in the cloud.

The combined rights to a free flow of information, freedom of expression, and freedom from censorship, have been described as a compound right to “internet freedom.” Indeed, Google's Wael Ghonim at the beginning of this story suggested that unhindered access to, and use of, the internet enables the liberation of a society.

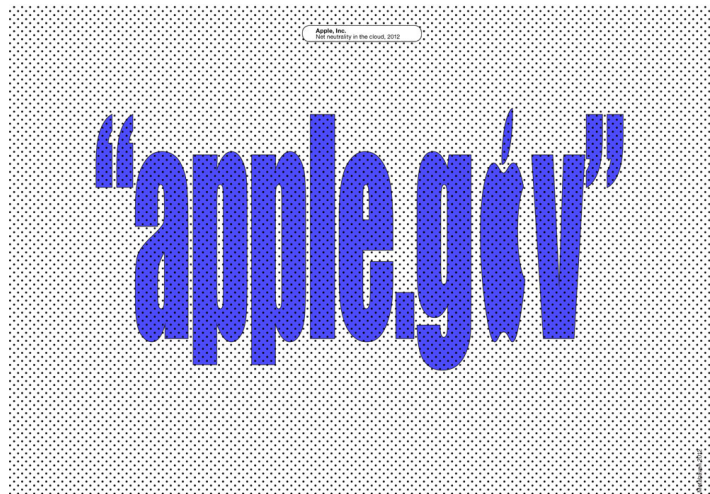
Here, the free flow of information is blocked by clearly identifiable authoritarian despots. To not have internet freedom, one must be under the oppression of a shameless tyrant, or be living in a “closed society” where the free flow of information is not sufficiently appreciated just yet. On January 21, 2010, US Secretary of State Hillary Clinton delivered a speech on US foreign policy and internet freedom, highlighting exactly this view. Clinton assured her audience in Washington, D.C. that “As I speak to you today, government censors are working furiously to erase my words from the records of history.”⁴⁹ Evgeny Morozov, a US-based, Belarusian-born internet scholar rightly criticized Clinton's “anachronistic view of authoritarianism.” As Morozov explained, “I didn't hear anything about the evolving nature of internet control (e.g. that controlling the internet now includes many other activities – propaganda, DDoS attacks, physical intimidation of selected critics/activists). If we keep framing this discussion only as a censorship issue, we are unlikely to solve it.” He went on to criticize the double standards the State Department advertised with regard to online anonymity:

On the one hand, they want to crack down on intellectual property theft and terrorists; on the other hand, they want to protect Iranian and the Chinese dissidents. Well, let me break the hard news: You can't have it both ways and the sooner you get on with “anonymity for everyone” rhetoric, the more you'll accomplish. I am very pessimistic on the future of online anonymity in general – I think there is a good chance it will be eliminated by 2015 – and this hesitance by the State Department does not make me feel any more optimistic.⁵⁰

Still, the definition of internet freedom remains relatively opaque. One example of this vagueness is provided by Internetfreedom.org, a global consortium, which aims to “inform, connect, and empower the people in closed societies with information on a free internet.”⁵¹

Savetheinternet.com, a project of Free Press, breaks down internet freedom into somewhat more clearly defined categories – “net neutrality (wired and wireless), strong protections for mobile phone users, public use of the public

airwaves and universal access to high-speed internet.”⁵² The notion of net neutrality is as relevant to internet freedom as it is to the structure of the cloud, since the network's management is in the hands of a patchwork of government agencies and private enterprises who may (or may not) hold a bias toward certain information on the network, or a bias toward one another. Coined by the legal scholar Tim Wu in 2003, network neutrality was originally meant to benchmark and promote the open nature of the internet for the sake of innovation – an “end-to-end” infrastructure unbiased towards its content. As Wu stated, “A communications network like the internet can be seen as a platform for a competition among application developers. Email, the web, and streaming applications are in a battle for the attention and interest of end-users. It is therefore important that the platform be neutral to ensure the competition remains meritocratic.”⁵³ Network neutrality applies to a decentralized architecture, with clearly divided roles between ISPs, broadband service providers, content providers, and services and applications on the network. It justifies a *de facto* gentlemen's agreement through a joint economic interest in innovation and fair competition. Indeed, also political speech can be considered part of a competition – one of ideas on how to (not) govern ourselves. Venture capitalist Joichi Ito expressed this view in 2003, when he wrote that such a competition of ideas “requires freedom of speech and the ability to criticize those in power without fear of retribution.”⁵⁴



Apple.gov: governmentality in the cloud.

Insofar as the cloud's software services use the shared internet, they can be considered applications run on the network. To this end, network neutrality applies to the cloud (for example, the cloud is expected to consume more and more bandwidth in the network, possibly at

the cost of other applications and services). The concept of network neutrality is more difficult to apply *in* the cloud, since some of the nominal conditions to institute neutrality are absorbed by the cloud's combination of hosting and software services within a single black box. In the cloud, there is no more principled separation between the hosting of data, software, and client-side tools through which the data is handled and experienced. Indeed, the enormous success of the cloud is that it provides for all of these things at once.⁵⁵

The Terms of Service of any cloud-based provider are a far cry from a binding agreement to net neutrality; they allow plenty of space for “cloudy bias.” For example, in August, 2012, Apple banned “Drones+” from its App Store. This app, developed by NYU student Josh Begley, provides aggregated news on US drone strikes in Pakistan, Yemen and Somalia, and it includes a Google map on which the strikes are marked. The app also prompts the user whenever a new drone strike has occurred, and says how many casualties it had produced. Crucially, the information aggregated by the app is already completely public and freely available through various other sources including *The Guardian's* iPhone app. Apple demonstrated its cloudy parody of network neutrality in the ever-changing reasons it gave for rejecting Drones+. Apple had problems with the Google logo appearing on the Google map. In July, the company stated in an e-mail that “The features and/or content of your app were not useful or entertaining enough, or your app did not appeal to a broad enough audience.” By August, Apple changed its mind. The app contained “content that many audiences would find objectionable, which is not in compliance with the App Store Review Guidelines.” Indeed, the company eventually concluded that Drones+, which does not show users any images of actual drone-related bloodshed, was “objectionable and crude.”⁵⁶ The *New York Times* wondered how on earth it could be that

the material Apple deemed objectionable from Mr. Begley was nearly identical to the material available through *The Guardian's* iPhone app. It's unclear whether Apple is treating the two parties differently because *The Guardian* is a well-known media organization and Mr. Begley is not, or whether the problem is that Mr. Begley chose to focus his app only on drone strikes.⁵⁷

One can endlessly ponder why Apple banned Drones+ from its cloud but admitted *The Guardian*, and one will never be finished

weighing the arguments. The point is that if its cloud operated even under something remotely looking like network neutrality, Apple could not have reasonably rejected the app. The case also brings to mind Evgeny Morozov's earlier warning that government censorship of the network nowadays is more sophisticated than a crude Mubarak internet kill switch. As Rebecca MacKinnon writes,

citizens are [...] vulnerable to abuse of their rights to speech and assembly not only from government but also from private actors. In democracies, it follows that citizens must guard against violations of their digital rights by governments and corporations – or both acting in concert – regardless of whether the company involved is censoring and discriminating on its own initiative or acting under pressure from authorities.⁵⁸

It is highly unlikely that Drones+ was banned after direct government interference. But it isn't difficult to imagine an informal, unstated, and rather intuitive constellation of interests between Apple – universally praised by US politicians on both sides of the aisle – and the US Government. Shared interests and informal ties between private enterprise and government, based on mutual forms of “Like,” rather than strict separations by Law, may account for *de facto* forms of censorship in the cloud, without the explicit order to enact it or the explicit obligation to justify it. In December 2010, Apple removed a WikiLeaks iPhone app from its store, citing its developer guidelines: “Any app that is defamatory, offensive, mean-spirited, or likely to place the targeted individual or group in harms [sic] way will be rejected.”⁵⁹ Simultaneous to the WikiLeaks app being banned, other US cloud companies, including Amazon and PayPal, stopped providing services to WikiLeaks.

The political, legal and jurisdictional consequences of the cloud are slowly becoming apparent – right at the time when we are unlikely to withdraw from it. The cloud is just too good. We won't stop using our iPhones, iPads, Androids and Kindles. Paypal is still our frenemy. Happily the captives of the cloud, we will tweet our critiques of it, and Facebook-broadcast our outcries over its government back doors. But the story is not over yet. Will the anarcho-libertarian roots of the internet kick back at the cloud's centralized architecture – or are they forever overrun by it? Has the cloud assumed its final form, or is there still a time and a place for surprises?

x

Written by Daniel van der Velden and Vinca Kruk. Research

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assistant: Alysse Kushinski. Design assistant: Rasmus Svensson. All images courtesy of Metahaven. Metahaven 2012.

→ *To be continued in "Captives of the Cloud: Part II."*

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Metahaven is an Amsterdam-based design collective on the cutting blade between politics and aesthetics. Founded by Vinca Kruk and Daniel van der Velden, Metahaven's work – both commissioned and self-directed – reflects political and social issues through research-driven design, and design-driven research. Research projects included the *Sealand Identity Project*, and currently include *Facestate*, and *Iceland as Method*. Solo exhibitions include *Affiche Frontière* (CAPC musée d'art contemporain de Bordeaux, 2008) and *Stadtstaat* (Künstlerhaus Stuttgart/Casco, 2009). Group exhibitions include *Forms of Inquiry* (AA London, 2007, cat.), *Manifesta8* (Murcia, 2010, cat.), the *Gwangju Design Biennale 2011* (Gwangju, Korea, cat.), *Graphic Design: Now In Production* (Walker Art Center, Minneapolis, 2011, and Cooper-Hewitt National Design Museum, New York, 2012, cat.) and *The New Public* (Museion, Bolzano, 2012, cat.). Metahaven's work was published and discussed in *The International Herald Tribune*, *The New York Times*, *Huffington Post*, *Courrier International*, *Icon*, *Domus*, *Dazed*, *The Verge*, *l'Architecture d'Aujourd'hui*, and *Mute*, among other publications. Vinca Kruk is a Tutor of Editorial Design and Design Critique at ArtEZ Academy of Arts in Arnhem. Daniel van der Velden is a Senior Critic at the Graphic Design MFA program at Yale University, and a Tutor of Design at the Sandberg Instituut Amsterdam. In 2010, Metahaven released *Uncorporate Identity*, a design anthology for our dystopian age, published by Lars Müller.

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On a related note, cyberlaw professor Jonathan Zittrain in 2008 wrote *The Future Of The Internet – And How To Stop It*, a book focusing on the rise of the web's "tethered appliances," which, like North Korean radio sets, can be attuned to exclude or disregard certain content, and are designed not to be tinkered with by their users. Zittrain argued that such closed service appliances – emphatically including design icons like iPods and iPhones, for example – would in fact contribute to stifle the generative and innovative capacity of the web. See Jonathan Zittrain, *The Future Of The Internet – And How To Stop It*, New Haven and London: Yale University Press, 2008.

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e-flux journal #37 — september 2012 Metahaven
Captives of the Cloud: Part I

A LIST APART

What We Mean When We Say “responsive”

by [Lyza Danger Gardner](#) · March 06, 2014

Published in [Industry](#), [Lyza Danger Gardner on Building the Web Everywhere](#), [Responsive Design](#)

My 2014 started with noble plans: not biting my fingernails anymore, learning actual math. One of those plans was to analyze, publicly—here—the divergent and dissonant definitions of our industry’s adjectival darling, “responsive.”

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Alas, I was beaten to the forum by Jason Grigsby, whose recent blog post, [Defining Responsiveness](#), explores some of the very same questions around the term that have dogged me lately.

There's a timeliness to this confusion over responsive-ness. Questions are being asked. Brows are furrowing. Blog-comment diatribes are taking on an almost doctrinal tone. Topical conference speakers are mobbed post-presentation by attendees who shout questions with the hopeful intensity and desperation of reporters outside Supreme Court hearings: But, look, look at this site! Is it really responsive? Can you tell me? Can you help? How do you know if it's responsive?

As if there are authorities who can divine every nuance of our pooled sense of responsive, or that there exists somewhere an immutable stone carved with its meaning, accessible only to the elect. Or perhaps, do we hope because we feel so lost?

Even in a more prosaic and realistic sense, these discussions often presuppose several things:

- There is a single, correct definition for “responsive” (and perhaps a nucleus of leaders consciously invented it)
- We have control over this definition and should seek to rally the web community around it
- We all mean the same thing when we say “responsive”

I’d gently argue against each of these premises. Instead, I believe the definition of “responsive” to be evolving, an abstract concept that eludes direct semantic policing. It’s as yet too nascent and amorphous to have a universally-accepted meaning; it’s a word whose genesis lacked unified intent. However, I do think that we are moving toward meaning the same general thing when we say something has the quality of being responsive. And therein lies hope for eventual clarity.

The one, true “responsive”

First, let’s distinguish between Responsive Web Design and “responsive.” I’m rattling on here about the latter, the adjectival form, the descriptive, little-r responsive as contrasted to Ethan Marcotte’s big-R Responsive Web Design techniques.

Ethan has consistently maintained that the definition of Responsive Web Design is constrained to the three specific techniques for making sites that adapt well across many browser environments: fluid layouts, flexible images (and media objects), and media queries. One, two, three.

As defined, then, Responsive Web Design doesn’t leave room for a lot of ambiguity (though, believe me, we have created a lot of it anyway). It’s a mechanical concept, the brainchild of a single person, based on finite, specific elements.

But RWD’s impact has been greatly informed by the conceptual notion of designing and building usable, broadly supported sites and apps now and in the future, now that we have all of those pesky devices to deal with.

Grasping around for a way to talk about this approach toward these bigger goals, we gravitated back to that seminal technique for accomplishing them. And so emerged an abstract modifier (“responsive”) from a concrete, technical noun phrase (Responsive Web Design). This isn’t surprising when you think about it—we didn’t have many other terms available on which to hang our proverbial hats.

But, as Jason and others have noted, there’s no consensus about what “responsive” means. I can tell you how to do Responsive Web Design. How we make things “responsive” is up to us. All of us.

Controlling the definition

Unlike Responsive Web Design, which is concrete and single-origin, the advent of “responsive” as describing web design was profoundly distributed. No identifiable individual first breathed life into the word; it is owned by all of us and none of us at the same time.

Language evolves, always and inexorably. In our rarified web world, it can evolve even faster. Head-spinningly fast. And the evolving meanings continually take influence from myriad, organic sources of input. So if pinning down the definition of “responsive” is hard enough, controlling it is futile.

What are we trying to say, anyway?

So what does “responsive” mean, already? At the risk of tilting toward pedantry, I’ll suggest that it means what we (collectively) think it means.

Language components—in our example, words—carry something like a tiny implicit covenant, a tacit community agreement about what each means.

Where we can go wrong here—that is, commit actual language errors in the linguistic sense of the term—is when the parties involved in communications have a different

understanding of the semantic payload (and “different understanding” can include one party not knowing what something means at all). Wires get crossed, connections missed.

I think when [Jason suggests that people might use “responsive” to imply certain qualities](#) like adaptive, accessible, or device-appropriate, he’s on to something. Though consensus is nowhere near solid, there’s a tugging momentum in the term that suggests its increasing use to convey the bigger picture of the things we’re doing right while building things for the pan-device web.

Will “responsive” become redundant?

So that raises the possibility that we’re using “responsive” in certain cases to communicate...well...web design, done thoughtfully.

Think about it for a moment. Guy Podjarny’s recent research indicates about [12 percent of the top 10,000 sites are responsively designed](#), according to his current responsive metric (fluid layouts, primarily). That number actually blows me away, and at the least promotes responsive out of the experimental. It sort of feels like that moment when you no longer need to use a vendor prefix for a CSS property. Training wheels: off.

In any case, I think we will continue to coalesce around a greater consensus on what makes something responsive, even if it’s not the meaning we had in mind for it originally. There are common undertones to the word, even if we still skirmish over the particulars. Its meaning already seems to be drifting a bit toward describing a site or app, versus providing a strict recipe for building one.

Does that mean “responsive,” whatever the heck it means, is poised to take over the world (well, our version of the world, anyway)? Will it achieve such dominance that the adjective itself will fade over time and disappear like a vestigial tail, leaving us simply...web design?

Recently by Lyza Danger Gardner
[How Do We Get It Done, Now?](#)

In the future that’s forever one short year away, brilliantly functional, widely implemented APIs will redeem us from our toil and trouble. We just have to get ready for their coming, while seeing to the nitty-gritty of making the web work in the present. Sadly, it’s a lot less predictable than that. Every new standard has to start small, and we’ll always need to choose which API to back and which to pass over.

Further reading about

Industry

Nothing Fails Like Success

Money and tech have a complicated relationship. We trained our users to expect things for free. Quickly we realized that wasn’t a sustainable business model, so we sold their data and served ads, which invites its own problems. Now, we’re trying to undo this tangled web. How do we get back to a democratized web? Our own Jeffrey Zeldman invites us to discuss how and to #LetsFixThis.

Canary in a Coal Mine: How Tech Provides Platforms for Hate

Like a mine can fill up with toxic gasses, technology can become a toxic platform for hate. As the people building the web, we have an ethical responsibility for how these products are used—whether we intended it or not. ALA’s own Tatiana Mac lays this out using her own experience as a woman of color in tech.

About the Author



Lyza Danger Gardner

Lyza Danger Gardner is a dev. Since cofounding Portland, Oregon-based mobile web startup [Cloud Four](#) in 2007, Lyza has tortured and thrilled herself with the intricate ins and outs of the bazillion devices and browsers now accessing the web globally. Lyza and cofounder Jason Grigsby are the authors of [Head First Mobile Web](#) (O’Reilly).

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Hito Steyerl

Too Much World: Is the Internet Dead?

01/10

Is the internet dead?¹ This is not a metaphorical question. It does not suggest that the internet is dysfunctional, useless or out of fashion. It asks what happened to the internet after it stopped being a possibility. The question is very literally whether it is dead, how it died and whether anyone killed it.

But how could anyone think it could be over? The internet is now more potent than ever. It has not only sparked but fully captured the imagination, attention and productivity of more people than at any other point before. Never before have more people been dependent on, embedded into, surveilled by, and exploited by the web. It seems overwhelming, bedazzling and without immediate alternative. The internet is probably not dead. It has rather gone all-out. Or more precisely: it is all over!

This implies a spatial dimension, but not as one might think. The internet is not everywhere. Even nowadays when networks seem to multiply exponentially, many people have no access to the internet or don't use it at all. And yet, it is expanding in another direction. It has started moving offline. But how does this work?

Remember the Romanian uprising in 1989, when protesters invaded TV studios to make history? At that moment, images changed their function.² Broadcasts from occupied TV studios became active catalysts of events – not records or documents.³ Since then it has become clear that images are not objective or subjective renditions of a preexisting condition, or merely treacherous appearances. They are rather nodes of energy and matter that migrate across different supports,⁴ shaping and affecting people, landscapes, politics, and social systems. They acquired an uncanny ability to proliferate, transform, and activate. Around 1989, television images started walking through screens, right into reality.⁵

This development accelerated when web infrastructure started supplementing TV networks as circuits for image circulation.⁶ Suddenly, the points of transfer multiplied. Screens were now ubiquitous, not to speak of images themselves, which could be copied and dispersed at the flick of a finger.

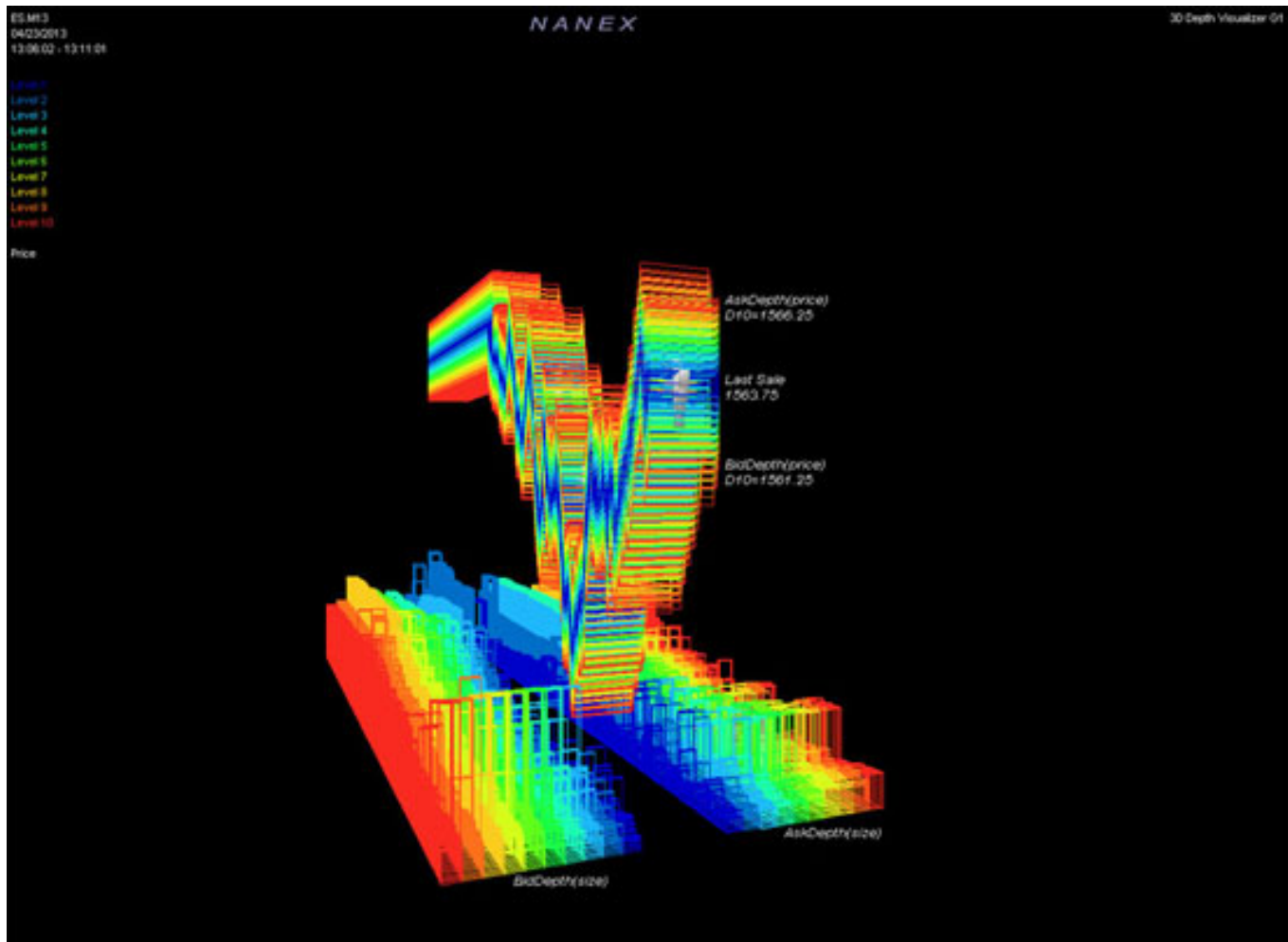
Data, sounds, and images are now routinely transitioning beyond screens into a different state of matter.⁷ They surpass the boundaries of data channels and manifest materially. They incarnate as riots or products, as lens flares, high-rises, or pixelated tanks. Images become unplugged and unhinged and start crowding off-screen space. They invade cities, transforming spaces into sites, and reality into reality. They materialize as junkspace, military invasion, and botched plastic surgery. They spread through and beyond networks, they contract and expand, they

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CAVEman is a 3-D virtual patient projected onto a holodeck which allows doctors to visualize and diagnose ailments in high-definition. Here scientist Christoph Sensen is pictured looking at his creation.

03/10



The market briefly lost \$136 billion on April 23rd, 2013, when the Associated Press' Twitter feed was hacked and tweeted that the White House had been attacked and that President Obama had been injured.

stall and stumble, they vie, they vile, they wow and woo.

Just look around you: artificial islands mimic genetically manipulated plants. Dental offices parade as car commercial film sets. Cheekbones are airbrushed just as whole cities pretend to be YouTube CAD tutorials. Artworks are e-mailed to pop up in bank lobbies designed on fighter jet software. Huge cloud storage drives rain down as skylines in desert locations. But by becoming real, most images are substantially altered. They get translated, twisted, bruised, and reconfigured. They change their outlook, entourage, and spin. A nail paint clip turns into an Instagram riot. An upload comes down as shitstorm. An animated GIF materializes as a pop-up airport transit gate. In some places, it seems as if entire NSA system architectures were built – but only after Google-translating them, creating car lofts where one-way mirror windows face inwards. By walking off-screen, images are twisted, dilapidated, incorporated, and reshuffled. They miss their targets, misunderstand their purpose, get shapes and colors wrong. They walk through, fall off, and fade back into screens.

Grace Jones's 2008 black-and-white video clip "Corporate Cannibal," described by Steven Shaviro as a pivotal example of post-cinematic affect, is a case in point.⁸ By now, the nonchalant fluidity and modulation of Jones's posthuman figure has been implemented as a blueprint for austerity infrastructure. I could swear that Berlin bus schedules are consistently run on this model – endlessly stretching and straining space, time, and human patience. Cinema's debris rematerializes as investment ruins or secret "Information Dominance Centers."⁹ But if cinema has exploded into the world to become partly real, one also has to accept that it actually did explode. And it probably didn't make it through this explosion either.

Post-Cinema

For a long time, many people have felt that cinema is rather lifeless. Cinema today is above all a stimulus package to buy new televisions, home projector systems, and retina display iPads. It long ago became a platform to sell franchising products – screening feature-length versions of future PlayStation games in sanitized multiplexes. It became a training tool for what Thomas Elsaesser calls the military-industrial-entertainment complex.

Everybody has his or her own version of when and how cinema died, but I personally believe it was hit by shrapnel when, in the course of the Bosnian War, a small cinema in Jajce was destroyed around 1993. This was where the Federal Republic of Yugoslavia was founded

during WWII by the Anti-Fascist Council for the National Liberation of Yugoslavia (AVNOJ). I am sure that cinema was hit in many other places and times as well. It was shot, executed, starved, and kidnapped in Lebanon and Algeria, in Chechnya and the DRC, as well as in many other post-Cold War conflicts. It didn't just withdraw and become unavailable, as Jalal Toufic wrote of artworks after what he calls a surpassing disaster.¹⁰ It was killed, or at least it fell into a permanent coma.

But let's come back to the question we began with. In the past few years many people – basically everybody – have noticed that the internet feels awkward, too. It is obviously completely surveilled, monopolized, and sanitized by common sense, copyright, control, and conformism. It feels as vibrant as a newly multiplexed cinema in the nineties showing endless reruns of *Star Wars Episode 1*. Was the internet shot by a sniper in Syria, a drone in Pakistan, or a tear gas grenade in Turkey? Is it in a hospital in Port Said with a bullet in its head? Did it commit suicide by jumping out the window of an Information Dominance Center? But there are no windows in this kind of structure. And there are no walls. The internet is not dead. It is undead and it's everywhere.

I Am a Minecraft Redstone Computer

So what does it mean if the internet has moved offline? It crossed the screen, multiplied displays, transcended networks and cables to be at once inert and inevitable. One could imagine shutting down all online access or user activity. We might be unplugged, but this doesn't mean we're off the hook. The internet persists offline as a mode of life, surveillance, production, and organization – a form of intense voyeurism coupled with maximum nontransparency. Imagine an internet of things all senselessly "liking" each other, reinforcing the rule of a few quasi-monopolies. A world of privatized knowledge patrolled and defended by rating agencies. Of maximum control coupled with intense conformism, where intelligent cars do grocery shopping until a Hellfire missile comes crashing down. Police come knocking on your door for a download – to arrest you after "identifying" you on YouTube or CCTV. They threaten to jail you for spreading publicly funded knowledge? Or maybe beg you to knock down Twitter to stop an insurgency? Shake their hands and invite them in. They are today's internet in 4D.

The all-out internet condition is not an interface but an environment. Older media as well as imaged people, imaged structures, and image objects are embedded into networked matter. Networked space is itself a medium, or

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This protest banner in Rio de Janeiro from June 17 reads, "We are the social network!" See →.

whatever one might call a medium's promiscuous, posthumous state today. It is a form of life (and death) that contains, sublates, and archives all previous forms of media. In this fluid media space, images and sounds morph across different bodies and carriers, acquiring more and more glitches and bruises along the way. Moreover, it is not only form that migrates across screens, but also function.¹¹ Computation and connectivity permeate matter and render it as raw material for algorithmic prediction, or potentially also as building blocks for alternate networks. As Minecraft Redstone computers¹² are able to use virtual minerals for calculating operations, so is living and dead material increasingly integrated with cloud performance, slowly turning the world into a multilayered motherboard.¹³

But this space is also a sphere of liquidity, of looming rainstorms and unstable climates. It is the realm of complexity gone haywire, spinning strange feedback loops. A condition partly created by humans but also only partly controlled by them, indifferent to anything but movement, energy, rhythm, and complication. It is the space of the rōnin of old, the masterless samurai freelancers fittingly called wave men and women: floaters in a fleeting world of images, interns in dark net soap lands. We thought it was a plumbing system, so how did this tsunami creep up in my sink? How is this algorithm drying up this rice paddy? And how many workers are desperately clambering on the menacing cloud that hovers in the distance right now, trying to squeeze out a living, groping through a fog which may at any second transform both into an immersive art installation and a demonstration doused in cutting-edge tear gas?

Postproduction

But if images start pouring across screens and invading subject and object matter, the major and quite overlooked consequence is that reality now widely consists of images; or rather, of things, constellations, and processes formerly evident as images. This means one cannot understand reality without understanding cinema, photography, 3D modeling, animation, or other forms of moving or still image. The world is imbued with the shrapnel of former images, as well as images edited, photoshopped, cobbled together from spam and scrap. Reality itself is postproduced and scripted, affect rendered as after-effect. Far from being opposites across an unbridgeable chasm, image and world are in many cases just versions of each other.¹⁴ They are not equivalents however, but deficient, excessive, and uneven in relation to each other. And the gap between them gives way to speculation and intense anxiety.

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Under these conditions, production morphs into postproduction, meaning the world can be understood but also altered by its tools. The tools of postproduction: editing, color correction, filtering, cutting, and so on are not aimed at achieving representation. They have become means of creation, not only of images but also of the world in their wake. One possible reason: with digital proliferation of all sorts of imagery, suddenly too much world became available. The map, to use the well-known fable by Borges, has not only become equal to the world, but exceeds it by far.¹⁵ A vast quantity of images covers the surface of the world – very in the case of aerial imaging – in a confusing stack of layers. The map explodes on a material territory, which is increasingly fragmented and also gets entangled with it: in one instance, Google Maps cartography led to near military conflict.¹⁶

While Borges wagered that the map might wither away, Baudrillard speculated that on the contrary, reality was disintegrating.¹⁷ In fact, *both* proliferate and confuse one another: on handheld devices, at checkpoints, and in between edits. Map and territory reach into one another to realize strokes on trackpads as theme parks or apartheid architecture. Image layers get stuck as geological strata while SWAT teams patrol Amazon shopping carts. The point is that no one can deal with this. This extensive and exhausting mess needs to be edited down in real time: filtered, scanned, sorted, and selected – into so many Wikipedia versions, into layered, libidinal, logistical, lopsided geographies.

This assigns a new role to image production, and in consequence also to people who deal with it. Image workers now deal directly in a world made of images, and can do so much faster than previously possible. But production has also become mixed up with circulation to the point of being indistinguishable. The factory/studio/tumblr blur with online shopping, oligarch collections, realty branding, and surveillance architecture. Today's workplace could turn out to be a rogue algorithm commandeering your hard drive, eyeballs, and dreams. And tomorrow you might have to disco all the way to insanity.

As the web spills over into a different dimension, image production moves way beyond the confines of specialized fields. It becomes mass postproduction in an age of crowd creativity. Today, almost everyone is an artist. We are pitching, phishing, spamming, chain-liking or mansplaining. We are twitching, tweeting, and toasting as some form of solo relational art, high on dual processing and a smartphone flat rate. Image circulation today works by pimping pixels in orbit via strategic sharing of wacky, neo-tribal, and mostly US-American content. Improbable

objects, celebrity cat GIFs, and a jumble of unseen anonymous images proliferate and waft through human bodies via Wi-Fi. One could perhaps think of the results as a new and vital form of folk art, that is if one is prepared to completely overhaul one's definition of folk as well as art. A new form of storytelling using emojis and tweeted rape threats is both creating and tearing apart communities loosely linked by shared attention deficit.

Circulationism

But these things are not as new as they seem. What the Soviet avant-garde of the twentieth century called productivism – the claim that art should enter production and the factory – could now be replaced by circulationism. Circulationism is not about the art of making an image, but of postproducing, launching, and accelerating it. It is about the public relations of images across social networks, about advertisement and alienation, and about being as suavely vacuous as possible.

But remember how productivists Mayakovsky and Rodchenko created billboards for NEP sweets? Communists eagerly engaging with commodity fetishism?¹⁸ Crucially, circulationism, if reinvented, could also be about

short-circuiting existing networks, circumventing and bypassing corporate friendship and hardware monopolies. It could become the art of recoding or rewiring the system by exposing state scopophilia, capital compliance, and wholesale surveillance. Of course, it might also just go as wrong as its predecessor, by aligning itself with a Stalinist cult of productivity, acceleration, and heroic exhaustion. Historic productivism was – let's face it – totally ineffective and defeated by an overwhelming bureaucratic apparatus of surveillance/workfare early on. And it is quite likely that circulationism – instead of restructuring circulation – will just end up as ornament to an internet that looks increasingly like a mall filled with nothing but Starbucks franchises personally managed by Joseph Stalin.

Will circulationism alter reality's hard- and software; its affects, drives, and processes? While productivism left few traces in a dictatorship sustained by the cult of labor, could circulationism change a condition in which eyeballs, sleeplessness, and exposure are an algorithmic factory? Are circulationism's Stakhanovites working in Bangladeshi like-farms,¹⁹ or mining virtual gold in Chinese prison camps,²⁰ churning out corporate consent on

07/10



A 2008 Smithsonian Museum of Natural History advertisement targets teenage audiences. Design by Holly Harter graphic design.

digital conveyor belts?

Open Access

But here is the ultimate consequence of the internet moving offline.²¹ If images can be shared and circulated, why can't everything else be too? If data moves across screens, so can its material incarnations move across shop windows and other enclosures. If copyright can be dodged and called into question, why can't private property? If one can share a restaurant dish JPEG on Facebook, why not the real meal? Why not apply fair use to space, parks, and swimming pools?²² Why only claim open access to JSTOR and not MIT – or any school, hospital, or university for that matter? Why shouldn't data clouds discharge as storming supermarkets?²³ Why not open-source water, energy, and Dom Pérignon champagne?

If circulationism is to mean anything, it has to move into the world of offline distribution, of 3D dissemination of resources, of music, land, and inspiration. Why not slowly withdraw from an undead internet to build a few others next to it?

×

This text comes from nearly two years of testing versions of it in front of hundreds of people. So thanks to all of you, but mostly to my students, who had to endure most of its live writing. Some parts of this argument were formed in a seminar organized by Janus Hom and Martin Reynolds, but also in events run by Andrea Phillips and Daniel Rourke, Michael Connor, Shumon Basar, Christopher Kulendran Thomas, Brad Troemel, and exchanges with Jesse Darling, Linda Stupart, Karen Archey, and many others. I am taking cues from texts by Redhack, James Bridle, Boris Groys, Jörg Heiser, David Joselit, Christina Kiaer, Metahaven, Trevor Paglen, Brian Kuan Wood, and many works by Laura Poitras. But the most important theoretical contribution to shape this text was my collaborator Leon Kahane's attempt to shoplift a bottle of wine for a brainstorming session.

08/10

Hito Steyerl is a filmmaker and writer. She teaches New Media Art at University of Arts Berlin and has recently participated in Documenta 12, Shanghai Biennial, and Rotterdam Film Festival.

e-flux journal #49 — november 2013 Hito Steyerl
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1
This is what the term “post-internet,” coined a few years ago by Marisa Olson and subsequently Gene McHugh, seemed to suggest while it had undeniable use value as opposed to being left with the increasingly privatised exchange value it has at this moment.

2
Cf. Peter Weibel, “Medien als Maske: Videokratie,” in *Von der Bürokratie zur Telekratie. Rumänien im Fernsehen*, ed. Keiko Sei (Berlin: Merve, 1990), 124–149, 134f.

3
Cătălin Gheorghe, “The Juridical Rewriting of History,” in *Trial/Proces*, ed. Cătălin Gheorghe (Iași: Universitatea de Arte “George Enescu” Iași, 2012), 2–4.
See http://www.arteiasi.ro/ita/publ/Vector_CercetareCriticalnContext-TRIAL.pdf.

4
Ceci Moss and Tim Steer in a stunning exhibition announcement: “The object that exists in motion spans different points, relations and existences but always remains the same thing. Like the digital file, the bootlegged copy, the icon, or Capital, it reproduces, travels and accelerates, constantly negotiating the different supports that enable its movement. As it occupies these different spaces and forms it is always reconstituting itself. It doesn’t have an autonomous singular existence; it is only ever activated within the network of nodes and channels of transportation. Both a distributed process and an independent occurrence, it is like an expanded object ceaselessly circulating, assembling and dispersing. To stop it would mean to break the whole process, infrastructure or chain that propagates and reproduces it.”
See <http://www.seventeengallery.com/exhibitions/motion-ceci-moss-tim-steer/>.

5
One instance of a wider political phenomena called transition. Coined for political situations in Latin America and then applied to Eastern European contexts after 1989, this notion described a teleological process consisting of an impossible catch-up of countries “belatedly” trying to achieve democracy and free-market economies. Transition implies a continuous morphing process, which in theory would make any place ultimately look like the ego ideal of any default Western nation. As a result, whole regions were subjected to radical makeovers. In practice, transition usually meant rampant expropriation coupled with a radical decrease in life expectancy. In transition, a bright neoliberal future marched off the screen to be realized as a lack of health care coupled with personal bankruptcy, while

Western banks and insurance companies not only privatized pensions, but also reinvested them in contemporary art collections.
See <http://transform.eipcp.net/correspondence/1145970626#redir>.

6
Images migrating across different supports are of course nothing new. This process has been apparent in art-making since the Stone Age. But the ease with which many images morph into the third dimension is a far cry from ages when a sketch had to be carved into marble manually. In the age of postproduction, almost everything made has been created by means of one or more images, and any IKEA table is copied and pasted rather than mounted or built.

7
As the New Aesthetic tumblr has brilliantly demonstrated for things and landscapes (see <http://new-aesthetic.tumblr.com/>), and as the Women as Objects tumblr has done to illustrate the incarnation of image as female body (see <http://womenasobjects.tumblr.com/>). Equally relevant on this point is work by Jesse Darling and Jennifer Chan.

8
See Steven Shaviro’s wonderful analysis in “Post-Cinematic Affect: On Grace Jones, Boarding Gate and Southland Tales,” *Film-Philosophy* 14.1 (2010): 1–102. See also his book *Post-Cinematic Affect* (London: Zero Books, 2010).

9
Greg Allen, “The Enterprise School,” *Greg.org*, Sept. 13, 2013.
See http://greg.org/archive/2013/09/13/the_enterprise_school.html.

10
Jalal Toufic, *The Withdrawal of Tradition Past a Surpassing Catastrophe* (2009).
See http://www.jalaltoufic.com/downloads/Jalal_Toufic_The_Withdrawal_of_Tradition_Past_a_Surpassing_Disaster.pdf.

11
“The Cloud, the State, and the Stack: Metahaven in Conversation with Benjamin Bratton.”
See <http://mthvn.tumblr.com/post/38098461078/thecloudthe-stack>.

12
Thanks to Josh Crowe for drawing my attention to this.

13
“The Cloud, the State, and the Stack.”

14
Oliver Laric, “Versions,” 2012.
See <http://oliverlaric.com/versions.htm>.

15

Jorge Luis Borges, “On Exactitude in Science,” in *Collected Fictions*, trans. Andrew Hurley (New York: Penguin, 1999): 75–82. “In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.” Suárez Miranda, *Viajes de varones prudentes*, Libro IV, Cap. XLV, Lérida, 1658.”

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L. Arlas, “Verbal spat between Costa Rica, Nicaragua continues,” *Tico Times*, Sept. 20, 2013.
See <http://www.ticotimes.net/More-news/News-Briefs/Verbal-spat-between-Costa-Rica-Nicaragua-continues-Friday-September-20-2013>. Thanks to Kevan Jenson for mentioning this to me.

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18
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See <http://eipcp.net/transversal/0910/kiaer/en>.
“Mayakovsky’s advertising jingles address working-class Soviet consumers directly and without irony; for example, an ad for one of the products of Mossel’prom, the state agricultural trust, reads: ‘Cooking oil. Attention working masses. Three times cheaper than butter! More nutritious than other oils! Nowhere else but Mossel’prom.’ It is not surprising that Constructivist advertisements would speak in a pro-Bolshevik, anti-NEP-business language, yet the picture of the *Reklam-Konstruktor* advertising business is more complicated. Many of their commercial graphics move beyond this straightforward language of class difference and utilitarian need to offer a theory of the socialist object. In contrast to Brik’s claim that in this kind of work they are merely

‘biding their time,’ I propose that their advertisements attempt to work out the relation between the material cultures of the prerevolutionary past, the NEP present and the socialist *novyi byt* of the future with theoretical rigor. They confront the question that arises out of the theory of Boris Arvatov: What happens to the individual fantasies and desires organized under capitalism by the commodity fetish and the market, after the revolution?”

19
Charles Arthur, “How low-paid workers at ‘click farms’ create appearance of online popularity,” *The Guardian*, Aug. 2, 2013.
See <http://www.theguardian.com/technology/2013/aug/02/click-farms-appearance-online-popularity>.

20
Harry Sanderson, “Human Resolution,” *Mute*, April 4, 2013.
See <http://www.metamute.org/editorial/articles/human-resolution>.

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And it is absolutely not getting stuck with data-derived sculptures exhibited in white cube galleries.

22
“Spanish workers occupy a Duke’s estate and turn it into a farm,” *Libcom.org*, Aug. 24, 2012. See <http://libcom.org/blog/spanish-workers-occupy-duke%E2%80%99s-estate-turn-it-farm-24082012>. “Earlier this week in Andalusia, hundreds of unemployed farmworkers broke through a fence that surrounded an estate owned by the Duke of Segorbe, and claimed it as their own. This is the latest in a series of farm occupations across the region within the last month. Their aim is to create a communal agricultural project, similar to other occupied farms, in order to breathe new life into a region that has an unemployment rate of over 40 percent. Addressing the occupiers, Diego Canamero, a member of the Andalusian Union of Workers, said that: ‘We’re here to denounce a social class who leave such a place to waste.’ The lavish well-kept gardens, house, and pool are left empty, as the Duke lives in Seville, more than 60 miles away.”

23
Thomas J. Michalak, “Mayor in Spain leads food raids for the people,” *Workers.org*, Aug. 25, 2012.
See <http://www.workers.org/2012/08/24/mayor-in-spain-leads-food-raids-for-the-people/>. “In the small Spanish town of Marinaleda, located in the southern region of Andalusia, Mayor Juan Manuel Sánchez Gordillo has an answer for the country’s economic crisis and the hunger that comes with it: He organized and led the town’s residents to raid supermarkets

TOWARD AESTHETIC GUIDELINES FOR PAINTINGS WITH THE AID OF A COMPUTER

Vera Molnar*

Abstract—*The author makes nonfigurative drawings and paintings that are the results of a procedure in which simple geometrical shapes and their combination were successively altered in specific ways. In 1968 she began to use a computer to assist her. The computer displays (on a CRT screen) images in which shapes and/or their arrangement are altered successively. When she sees a pleasing example that she may wish to execute as a drawing or a painting, she instructs the computer to record it on a plotter.*

She has studied a number of such series in which alterations occur successively in small steps to determine which alteration is responsible for the appearance of a picture that she judges to be aesthetically superior to those that preceded it. She includes an example of her judgment of the aesthetic quality of pictures chosen from a particular series.

I.

I am a painter, an image-maker, in particular, of images of a nonfigurative kind. I 'create' visual forms in the sense that they consist of combinations of shapes that cannot be found in nature.

I decided that I would become a painter when I was 12 years of age under the influence of an uncle of mine who, in his leisure time, painted a number of scenes of woodland nymphs in twilight. I began by making pictures of nymphs and trees but soon I replaced figurative subject matter by simple geometrical shapes. Later I began to make non-figurative pictures that were the result of a procedure in which initial simple geometrical elements and their combination were successively altered in specific ways, a procedure that I continue to follow. In 1968, I was able to gain access to a digital computer to facilitate the execution of this time-consuming procedure.

I am forcefully impressed by the fact that viewers tend to agree on what they consider as 'beautiful', 'indifferent' and 'ugly' compositional arrangements, in particular arrangements of squares, triangles and dots, which can be produced readily on a computer display. Osgood made psychological tests on artistic taste and found that there is less divergence of taste than is generally believed [1]. Personally, I doubt that 'beauty' is amenable to definition but I shall not explore the question here.

II.

What I should especially like to know is what changes have occurred in a picture on which I am working when it begins to please me. What are the specific elements of a composition that cause it to give to me aesthetic satisfaction and then later to a viewer? I seek a concrete answer, one that entails experimentation rather than philosophical speculations. I am not interested in my subconscious or unconscious states. I should like to avoid even the notion of consciousness and to follow the objective approach of behaviorist psychology.

Of course, to make good pictures one should know not only about composition but also about the psychology of perception and about experimental aesthetics [2]. It would be most helpful to an artist to be able to apply principles of aesthetics but, despite the efforts of painters and others interested in art during past centuries, such principles continue to elude discovery. There are those who believe that such principles do not exist, that art is solely intuitive. Nevertheless, some of these same sceptics have formulated arbitrary rules that, because there were arbitrary, did not have general utility. The principles that I believe exist are in the form of laws that are determined by human physiology and psychology and recent achievements in the human sciences encourage my belief. But I am certain that in order to find them experimental methods of science rather than philosophical speculation will be required [3, 4]. In effect, art can profitably use experimental methods of the physical sciences. But I do not mean to imply that art will become science.

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III.

I do not agree with those who believe that developments in art simply happen. I am convinced that initiative must be applied to obtain an understanding of these developments and I wish to do my part. Whenever I begin a picture, I have an initial idea of it in mind. The procedure that I use to arrive at the final work, to be described below, is tedious, if carried through by hand. Furthermore, the final picture rarely corresponds to my initial idea of it.

I develop a picture by means of a series of small probing steps and each step is followed by evaluation. In my opinion, painters should employ such a procedure, especially if they consciously wish to learn what of aesthetic importance is occurring on the canvas as the painting develops and what effect the work may have on viewers. Making a series of pictures that are alike except for the variation of one parameter is not uncommon. Many painters from those of Mount Athos to those of today have done this. Claude Monet, a good example, painted both a haystack and the Rouen cathedral repeatedly in different lighting.

When I have an idea for a new picture, I make the first version of it rather quickly. Usually I am more or less dissatisfied with it and I modify it. I alter in a stepwise manner the dimensions, proportions and arrangement of the shapes. When simple geometrical shapes are used, such modifications are relatively easy to make. By comparing the successive pictures resulting from a series of modifications, I can decide whether the trend is toward the result that I desire. What is so thrilling to experience is not only the stepwise approach toward the envisioned goal but also sometimes the transformation of an indifferent version into one that I find aesthetically appealing.

This stepwise procedure has, however, two important disadvantages if carried out by hand. Above all, it is tedious and slow. In order to make the necessary comparisons in a developing series of pictures, I must make many similar ones of the same size and with the same technique and precision. Another disadvantage is that, since time is limited, I can consider only a few of many possible modifications. Furthermore, these choices are influenced by disparate factors such as personal whim, cultural and educational background and ease of execution.

IV.

Using an IBM 370 computer, I have been able to minimize the effort required during the preparatory phase of making a picture. This computer can produce a series of images (the shapes and their arrangement may be simple or complicated) on an IBM 2250 CRT screen and/or of

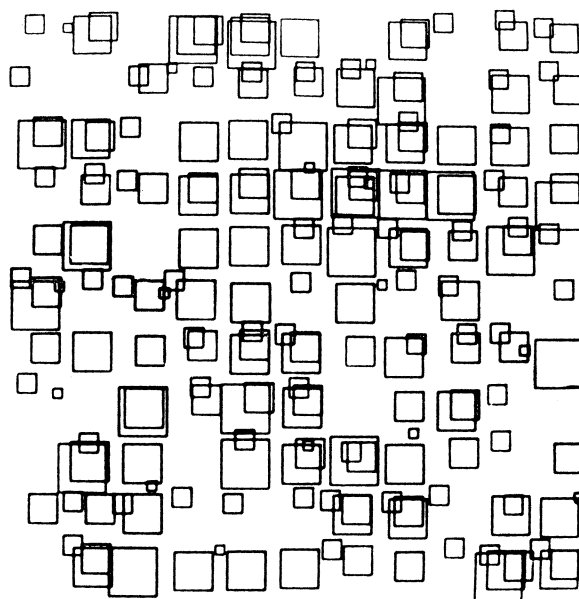
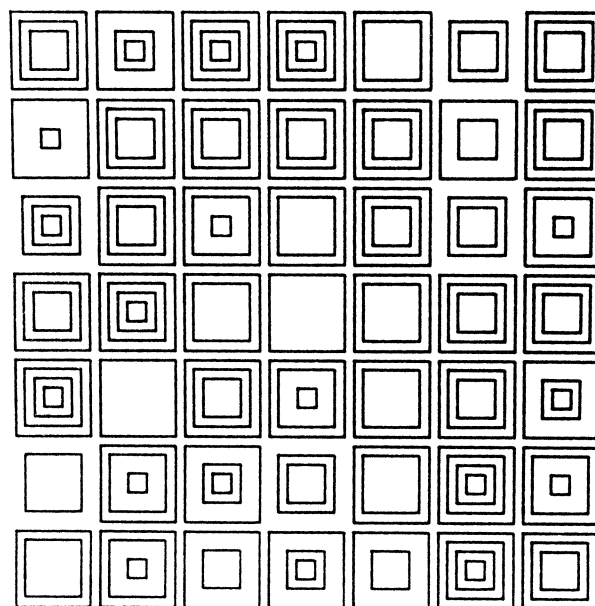
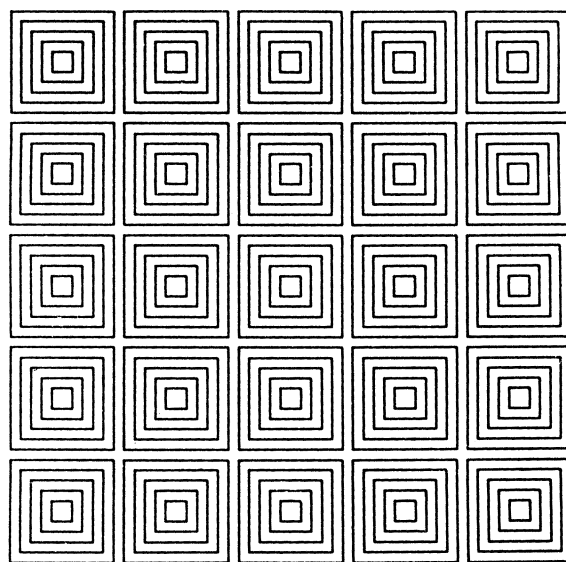


Fig. 1. Computer drawings, 25 × 25 cm. Top, 'Carrés, 000072/00', 1972 (Collection of Brys-Schatau, Brussels, Belgium); center, 'Carrés, 250173/1', 1973; bottom, 'Carrés, 071273/21', 1973.

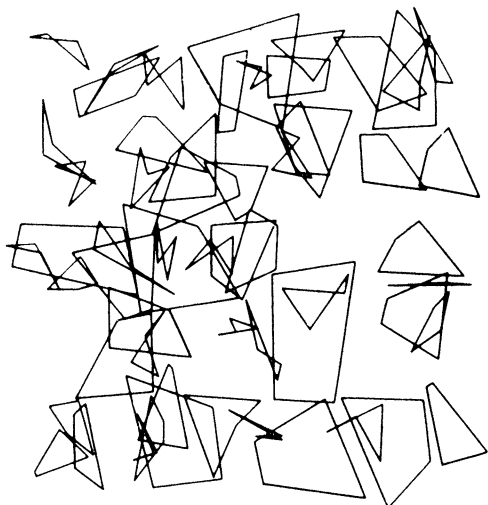
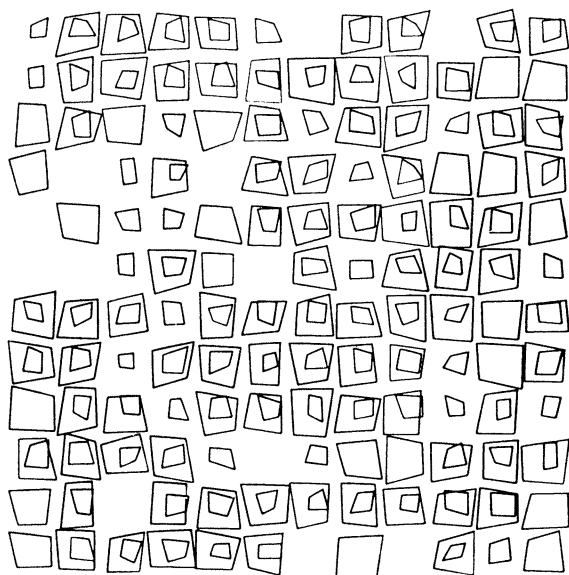
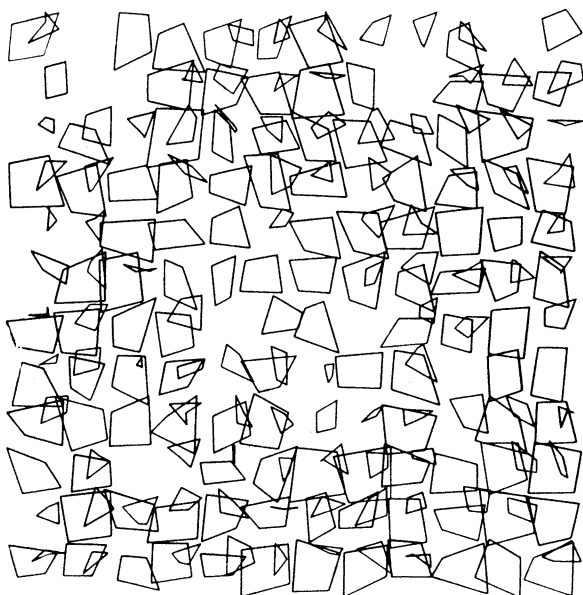


Fig. 2. Computer drawings, 25 × 25 cm., 1973. Top, 'Carrés, 071273/26'; center, 'Carrés, 071273/27'; bottom, 'Carrés, 071273/34'.

drawings on a Benson plotter. A program for a specific kind of image determined by a number of selected parameters is employed. The input data consists of instructions specifying, for example, to what extent particular parameters are to be varied and the amount of change in each step. Similar procedures have been described before in *Leonardo*, for example in the work of Z. Sýkora and J. Blažek [5] and C. J. and C. S. Bangert [6]. There are differences, however, between my method and that widely used by other artists. Whereas they begin with an initial set of rules (a grammar) specifying the way parameters are to be varied, I try to elaborate the rules as a work develops.

In a series of pictures drawn on paper by the plotter each version will differ from its predecessor in that only one parameter will have been varied, such as scale, shape, line thickness or color. This control over the stages in the development of a drawing permits me to decide when the picture that I wish to realize is being approached or departed from. When a good approximation has been achieved, then smaller changes are introduced in the succeeding drawings produced by the computer.

Another method, which I mainly employ, is essentially the same as that described above but, instead of making a parameter change and then waiting for a drawing to be plotted (the plotting operation may require several minutes or several hours, depending upon the size and complexity of the picture), I make the parameter changes quickly while viewing the images on the CRT screen. This is the so-called 'conversational method'. I select only a few of the images shown on the screen for recording by the plotter.

This approach is not new; it had been applied long before computers were constructed. Erasing, scraping, retouching or covering part of a picture

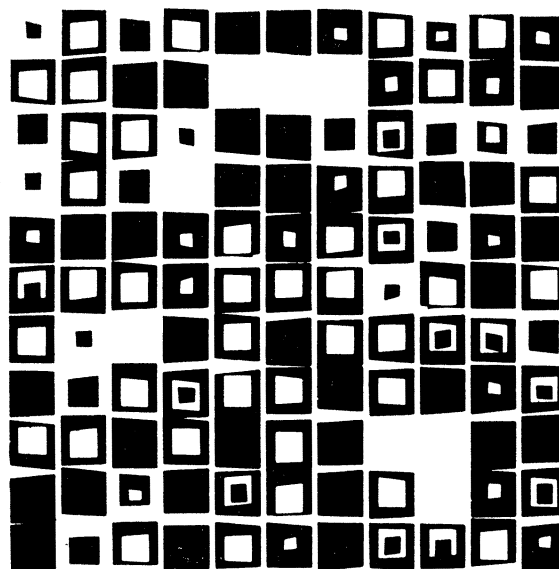


Fig. 3. 'Computer-Icône', polyvinyl emulsion paint on canvas, based on a computer drawing, 110 × 110 cm., 1973. (Collection of J. and J. Mayer, Paris, France.)

are familiar techniques used by painters. Thus my computer-aided procedure is simply a systematization of the traditional approach. I should mention here another advantage in using a computer: it is possible to 'go back', that is, to repeat drawings that had appeared before certain modifications were made.

In spite of their advantages, computers, no more than other simpler tools, do not guarantee that a work of art of good quality will result, for it is an artist's skill that is the decisive factor [7].

V.

The computer drawings that I shall discuss were made by the 'conversational method' with a program called RESEAU-TO, of the type used for composing music, for example MUSIC 5 of Mathews [8]. This program permits the production

of drawings starting from an initial square array of like sets of concentric squares. The available variables are : (1) the number of sets, (2) the number of concentric squares within a set, (3) the displacement of individual squares, (4) the deformation of squares by changing angles and lengths of sides, (5) the elimination of lines or entire figures and (6) the replacement of straight lines by segments of circles, parabolas, hyperbolas and sine curves. Thus from the initial grid a great variety of different images can be obtained.

To illustrate the possibilities of this program, I show an initial 5×5 array of sets of 5 concentric squares as drawn by the computer plotter (Fig. 1, top). In Fig. 1 (center) is a variation in which the array is now 7×7 and the number of squares in the sets is varied. In Fig. 1 (bottom) squares of different size are variously displaced within an

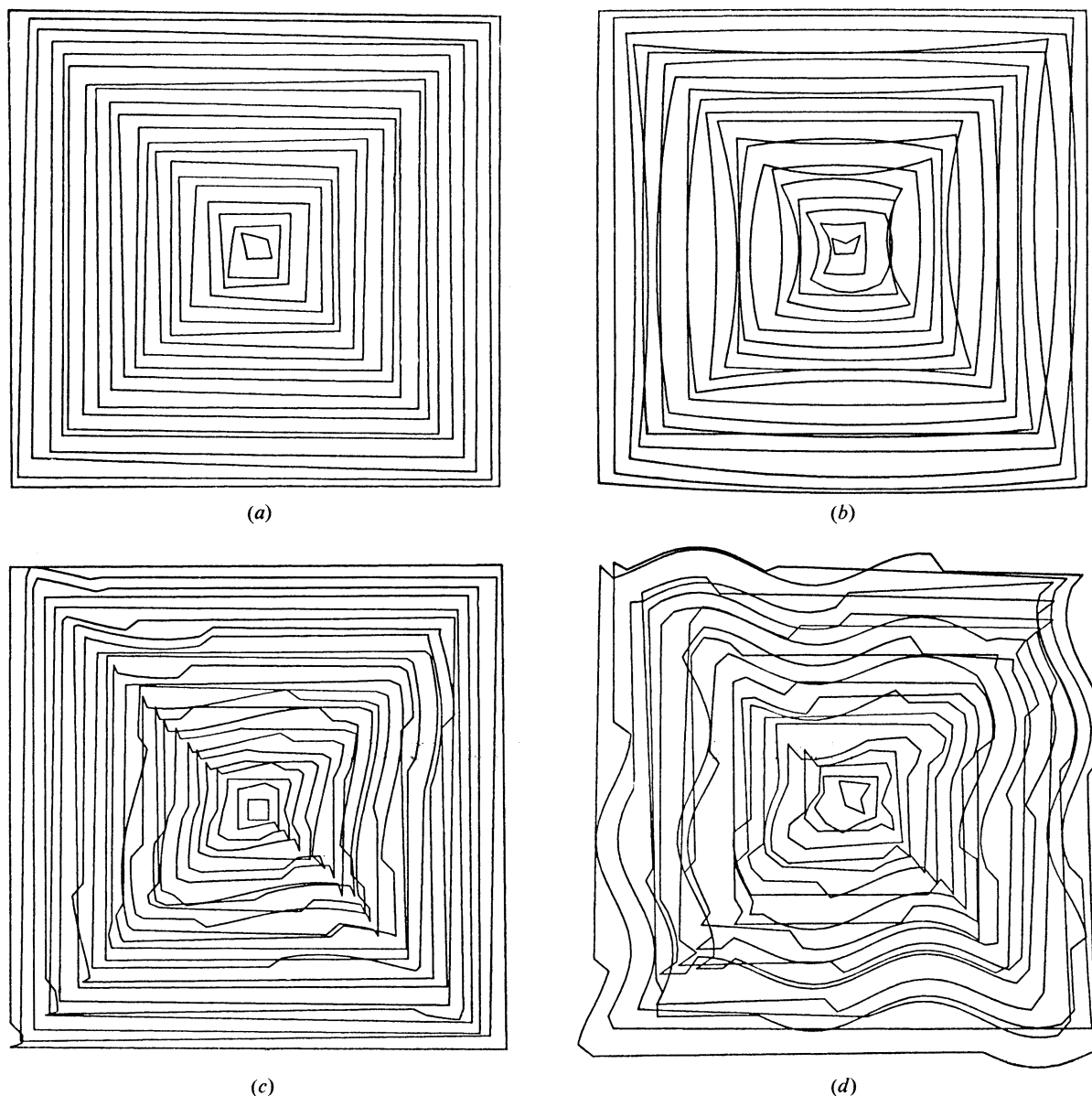


Fig. 4. Computer drawings, 25×25 cm., 1974. (a) 'Computer-rosace, 74.338-31'; (b) 'Computer-rosace, 74.338-39'; (c) 'Computer-rosace, 74.338-47'; (d) 'Computer-rosace, 74.338-54'.

11 × 11 grid. In Fig. 2 are shown variations of distorted squares. A painting that I made by hand in black on a gold background on the basis of one computer drawing is illustrated in Fig. 3.

I have mentioned my desire to learn what particular change in a series of changes to a picture gives rise to aesthetic satisfaction but my study so far has led only to some tentative conclusions. Fig. 4(a) is a picture that I find aesthetically 'indifferent'. Its aesthetic quality seems improved to me when some straight lines are replaced by segments of parabolas (Fig. 4(b)) and even more so when sine curve segments replace parts of the straight lines (Fig. 4(c)) but when the number and amplitude of the sine curve segments are increased, a result is obtained that I find aesthetically disappointing (Fig. 4(d)). I believe that the majority of those who view these examples will agree with my opinion as to their aesthetic quality.

In Fig. 5 (cf. color plate), is shown a reproduction of a painting on canvas whose design corresponds with high precision to a drawing produced by the computer plotter. The two hues were chosen arbitrarily but their Munsell values were kept the same.

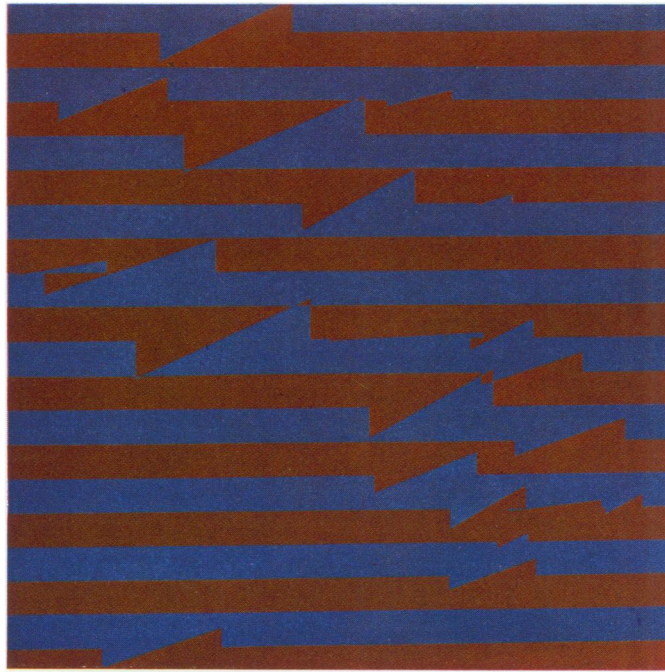
VI.

I do not make drawings and paintings with the aid of a computer solely for personal satisfaction; I hope that others will also enjoy them. I do not agree with the notion of art for art's sake and of science for the sake of science. Sartre convincingly explains why this notion is untenable [9]. I, personally, know of no artist who refuses to let people see his work. On the other hand, I do not believe that an artist should go to the extreme of ignoring his own taste and convictions in order to please others. There should be an intermediate ground where aesthetic satisfaction is experienced mutually.

The reactions that viewers voice, often in very diverse and obscure ways, should not be accepted without qualification. Often they do not analyze their own feelings. But even if they did, they would find it difficult to express them in words or they might hesitate to reveal their thoughts because of social pressures. People do not necessarily like what they say they like. Their judgments are influenced by factors that have little or nothing to do with the art object that they behold. They are influenced by the opinion of others, by the bias of education, by an object's price, etc. Yet, in spite of these problems, I subscribe to the belief that the underlying principles for giving aesthetic satisfaction to viewers of drawings and paintings can be found and I hope that my studies will help to verify my conviction.

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Top: Vera Molnar. 'Blue and Brown', polyvinyl emulsion paint on canvas, based on a computer drawing, 110 × 110 cm, 1974. (Fig. 5, cf. page 189.)

Bottom, left: Peter Lipman-Wulf. 'Chorus Mysticus', one of a portfolio of illustrations for Part II of Goethe's 'Faust', engraving, 15 × 11 in., 1972. (Photo: John Hensel, New York.) (Fig. 4, cf. page 194.)

Bottom, right: Robert Moro. Two tapestry modules (1B and 2A) from the 'Kundalini Shakti' matrix with back electric illumination, each module 188 × 67 cm, 1974. (Fig. 6, cf. page 236).

The definition of artistic activity occurs, first of all, in the field of distribution.

Marcel Broodthaers



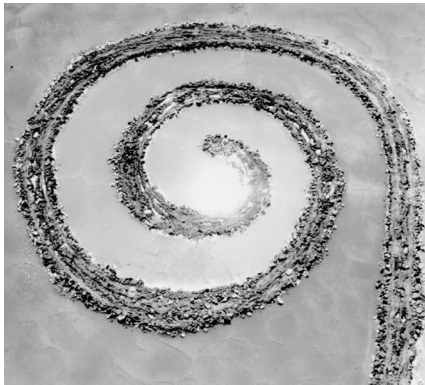
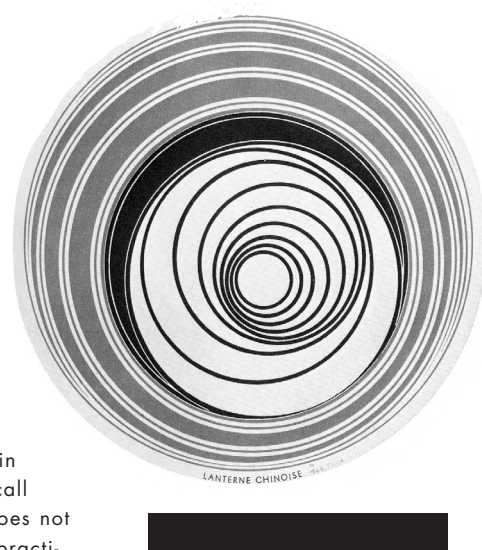
One of the ways in which the Conceptual project in art has been most successful is in claiming new territory for practice. It's a tendency that has been almost too successful: today it seems that most of the work in the international art system positions itself as Conceptual to some degree, yielding the "Conceptual painter," the "DJ and Conceptual artist," the "Conceptual web artist." Let's put aside the question of what makes a work Conceptual, recognizing, with some resignation, that the term can only gesture toward a forty year-old historical moment. But it can't be rejected entirely, as it has an evident charge for artists working today, even if they aren't necessarily invested in the concerns of what you could call the classical Conceptual moment, which included linguistics, analytic philosophy, and a pursuit of formal dematerialization.

What does seem to hold true for today's normative conceptualism is that the project remains, in the words of Art and Language, "radically incomplete": it does not necessarily stand against objects or painting, or for language as art; it does not need to stand against retinal art; it does not stand for anything certain, instead privileging framing and context, and constantly renegotiating its relationship to its audience. Martha Rosler has spoken of the "as-if" approach, where the Conceptual work cloaks itself in other disciplines, philosophy being the most notorious example, provoking an oscillation between skilled and de-skilled, authority and pretense, style and strategy, art and not-art.



Hermann Hugo. *Pia Desideria*. 1659.

Duchamp was not only here first, but staked out the problematic virtually single-handedly. His question “Can one make works which are not ‘of art’” is our shibboleth, and the question’s resolution will remain an apparition on the horizon, always receding from the slow growth of practice. One suggestion comes from the philosopher Sarat Maharaj, who sees the question as “a marker for ways we might be able to engage with works, events, spasms, ructions that don’t look like art and don’t count as art, but are somehow electric, energy nodes, attractors, transmitters, conductors of new thinking, new subjectivity and action that visual artwork in the traditional sense is not able to articulate.” These concise words call for an art that insinuates itself into the culture at large, an art that does not go the way of, say, theology, where while it’s certain that there are practitioners doing important work, few people notice. An art that takes Rosler’s as-if moment as far as it can go.



Not surprisingly, the history of this project is a series of false starts and paths that peter out, of projects that dissipate or are absorbed. Exemplary among this garden of ruins is Duchamp’s failure to sell his Rotorelief optical toys at an amateur inventor’s fair. What better description of the artist than amateur inventor? But this was 1935, decades before widespread fame would have assured his sales (and long before the notion that an artist-run business might itself constitute a work), and he was attempting to wholly transplant himself into the alien context of commercial science and invention. In his own analysis: “error, one hundred percent.” Immersing art in life runs the risk of seeing the status of art—and with it, the status of artist—disperse entirely.

These bold expansions actually seem to render artworks increasingly vulnerable. A painting is manifestly art, whether on the wall or in the street, but avant-garde work is often illegible without institutional framing and the work of the curator or historian. More than anyone else, artists of the last hundred years have wrestled with this trauma of context, but theirs is a struggle that necessarily takes place within the art system. However radical the work, it amounts to a proposal enacted within an arena of peer-review, in dialogue with the community and its history. Reflecting on his experience running a gallery in the 1960s, Dan Graham observed: “if a work of art wasn’t written about and reproduced in a magazine it would have difficulty attaining the status of ‘art’. It seemed that in order to be defined as having value, that is as ‘art’, a work had only to be exhibited in a gallery and then to be written about and reproduced as a photograph in an art magazine.” Art, then, with its reliance on discussion through refereed forums and journals, is similar to a professional field like science.



What would it mean to step outside of this carefully structured system? Duchamp's Rotorelief experiment stands as a caution, and the futility of more recent attempts to evade the institutional system has been well demonstrated. Canonical works survive through documentation and discourse, administered by the usual institutions. Smithson's *Spiral Jetty*, for example, was acquired by (or perhaps it was in fact 'gifted to') the Dia Art Foundation, which discreetly mounted a photograph of the new holding in its Dan Graham-designed video-café, a tasteful assertion of ownership.

That work which seeks what Allan Kaprow called "the blurring of art and life" work which Boris Groys has called biopolitical, attempting to "produce and document life itself as pure activity by artistic means," faces the problem that it must depend on a record of its intervention into the world, and this documentation is what is recouped as art, short-circuiting the original intent. Groys sees a disparity thus opened between the work and its future existence as documentation, noting our "deep malaise towards documentation and the archive." This must be partly due to the archive's deathlike appearance, a point that Jeff Wall has echoed, in a critique of the uninvitingly "tomb-like" Conceptualism of the 1960s.

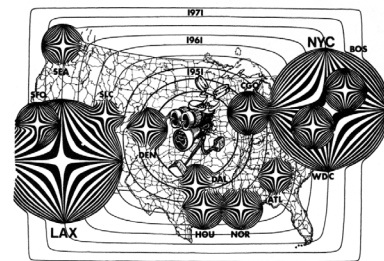
What these critics observe is a popular suspicion of the archive of high culture, which relies on cataloguing, provenance, and authenticity. Insofar as there is a popular archive, it does not share this administrative tendency. Suppose an artist were to release the work directly into a system that depends on reproduction and distribution for its sustenance, a model that encourages contamination, borrowing, stealing, and horizontal blur? The art system usually corrals errant works, but how could it recoup thousands of freely circulating paperbacks, or images of paperbacks?



"Clip Art," 1985.

It is useful to continually question the avant-garde's traditional romantic opposition to bourgeois society and values. The genius of the bourgeoisie manifests itself in the circuits of power and money that regulate the flow of culture. National bourgeois culture, of which art is one element, is based around commercial media, which, together with technology, design, and fashion, generate some of the important differences of our day. These are the arenas in which to conceive of a work positioned within the material and discursive technologies of distributed media.

Distributed media can be defined as social information circulating in theoretically unlimited quantities in the common market, stored on or accessed via portable means such as books and magazines, records and compact discs, videotapes and DVDs, or personal computers and mobile devices. Duchamp's question has new life in this space, which has greatly expanded during the last few decades of global corporate sprawl. It's space into which the work of art must project itself lest it be outdistanced entirely by these corporate interests. New strategies are needed to keep up with commercial distribution, decentralization, and dispersion. You must fight something in order to understand it.



You Are Information

Ant Farm, 1960s.

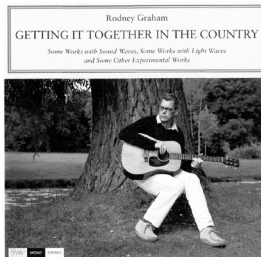
Mark Klienber, writing in 1975 in the second issue of *The Fox*, poses the question: "Could there be someone capable of writing a science-fiction thriller based on the intention of presenting an alternative interpretation of modernist art that is readable by a non-specialist audience? Would they care?" He says no more about it, and the question

stands as an intriguing historical fragment, an evolutionary dead end, and a line of inquiry to pursue in this essay: the intimation of a categorically ambiguous art, one in which the synthesis of multiple circuits of reading carries an emancipatory potential.



"Literature being reeled off and sold in chunks"—Grandville, 1844.

This tendency has a rich history, despite the lack of specific work along the lines of Klienber's proposal. Many artists have used the printed page as medium; an arbitrary and partial list might include Robert Smithson, Mel Bochner, Dan Graham, Joseph Kosuth, Lawrence Weiner, Stephen Kaltenbach, and Adrian Piper, and there have been historical watersheds like Seth Siegelaub and John Wendler's 1968 show *Xeroxbook*.



2000.

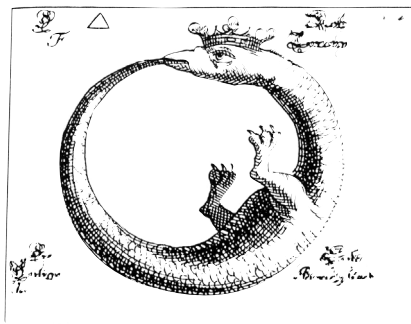
The radical nature of this work stems in part from the fact that it is a direct expression of the process of production. Market mechanisms of circulation, distribution, and dissemination become a crucial part of the work, distinguishing such a practice from the liberal-bourgeois model of production, which operates under the notion that cultural doings somehow take place above the marketplace. However, whether assuming the form of ad or article, much of this work was primarily concerned with finding exhibition alternatives to the gallery wall, and in any case often used these sites to demonstrate dryly theoretical propositions rather than address issues of, say, desire. And then, one imagines, with a twist of the kaleidoscope things resolve themselves.

This points to a shortcoming of classical conceptualism. Benjamin Buchloh points out that "while it emphasized its universal availability and its potential collective accessibility and underlined its freedom from the determinations of the discursive and economic framing conventions governing traditional art production and reception, it was, nevertheless, perceived as the most esoteric and elitist artistic mode." Kosuth's quotation from Roget's Thesaurus placed in an Artforum box ad, or Dan Graham's list of numbers laid out in an issue of Harper's Bazaar, were uses of mass media to deliver coded propositions to a specialist audience, and the impact of these works, significant and lasting as they were, reverted directly to the relatively arcane realm of the art system, which noted these efforts and inscribed them in its histories. Conceptualism's critique of representation emanated the same mandarin air as did a canvas by Ad Reinhardt, and its attempts to create an Art Degree Zero can be seen as a kind of negative virtuosity, perhaps partly attributable to a New Left skepticism towards pop culture and its generic expressions.

Certainly, part of what makes the classical avant-garde interesting and radical is that it tended to shun social communication, excommunicating itself through incomprehensibility, but this isn't useful if the goal is to use the circuits of mass distribution. In that case, one must use not simply the delivery mechanisms of popular culture, but also its generic forms. When Rodney Graham releases a CD of pop songs, or Maurizio Cattelan publishes a magazine, those in the art world must acknowledge the art gesture at the same time that these products function like any other artifact in the consumer market. But difference lies within

these products! Embodied in their embrace of the codes of the culture industry, they contain a utopian moment that points toward future transformation. They could be written according to the code of hermeneutics:

"Where we have spoken openly we have actually said nothing. But where we have written something in code and in pictures, we have concealed the truth..."



A. Eleazar. Ouroboros. 1735.

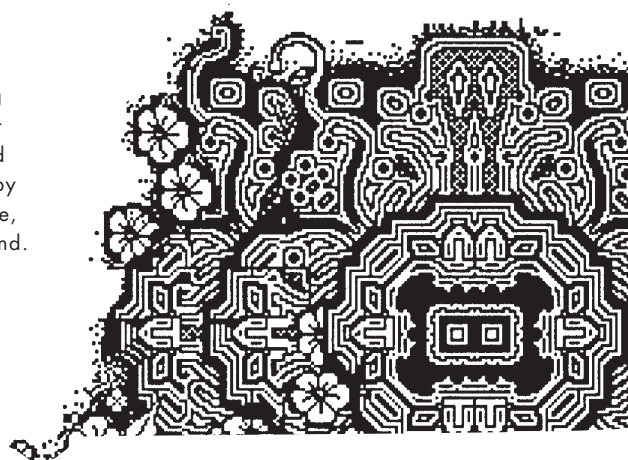
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Let's say your aesthetic program spans media, and that much of your work does not function properly within the institutionalized art context. This might include music, fashion, poetry, film-making, or criticism, all crucial artistic practices, but practices which are somehow stubborn and difficult, which resist easy assimilation into a market-driven art system. The film avant-garde, for instance, has always run on a separate track from the art world, even as its practitioners may have been pursuing analogous concerns. And while artists have always been attracted to music and its rituals, a person whose primary activity was producing music, conceived of and presented as Art, would find art world acceptance elusive. The producer who elects to wear several hats is perceived as a crossover at best: the artist-filmmaker, as in the case of Julian Schnabel; the artist as entrepreneur, as in the case of Warhol's handling of Interview magazine and the Velvet Underground; or, as with many of the people mentioned in this essay, artist as critic, perhaps the most tenuous position of all. This is the lake of our feeling.

One could call these niches "theatrical," echoing Michael Fried's insistence that "what lies between the arts is theater... the common denominator that binds... large and seemingly disparate activities to one another, and that distinguishes these activities from the radically different enterprises of the Modernist art." A practice based on distributed media should pay close attention to these activities, which, despite lying between the arts, have great resonance in the national culture.

Some of the most interesting recent artistic activity has taken place outside the art market and its forums. Collaborative and sometimes anonymous groups work in fashion, music, video, or performance, garnering admiration within the art world while somehow retaining their status as outsiders, perhaps due to their preference for theatrical, distribution-oriented modes. Maybe this is what Duchamp meant by his intriguing throwaway comment, late in life, that the artist of the future will be underground.



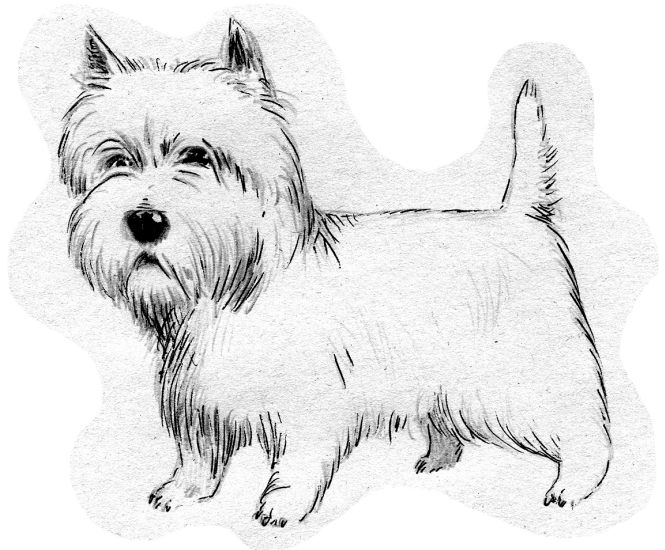
If distribution and public are so important, isn't this, in a sense, a debate about "public art"? It's a useful way to frame the discussion, but only if one underlines the historical deficiencies of that discourse, and acknowledges the fact that the public has changed.

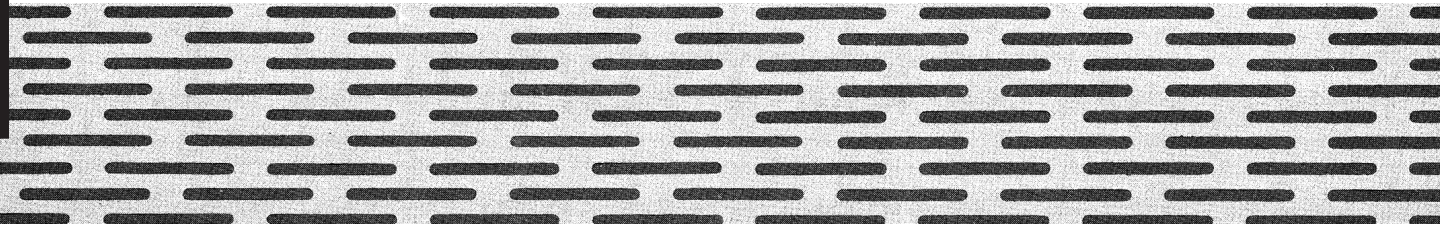
The discourse of public art has historically focused on ideals of universal access, but, rather than considering access in any practical terms, two goals have been pursued to the exclusion of others. First, the work must be free of charge (apparently economic considerations are primary in determining the divide between public and private). Often this bars any perceptible institutional frame that would normally confer the status of art, such as the museum, so the public artwork must broadly and unambiguously announce its own art status, a mandate for conservative forms. Second is the direct equation of publicness with shared physical space. But if this is the model, the successful work of public art will at best function as a site of pilgrimage, in which case it overlaps with architecture.

Puppy, after Jeff Koons. S. Price.

The problem is that situating the work at a singular point in space and time turns it, *a priori*, into a monument. What if it is instead dispersed and reproduced, its value approaching zero as its accessibility rises? We should recognize that collective experience is now based on simultaneous private experiences, distributed across the field of media culture, knit together by ongoing debate, publicity, promotion, and discussion. Publicness today has as much to do with sites of production and reproduction as it does with any supposed physical commons, so a popular album or website could be regarded as a more successful instance of public art than a monument tucked away in an urban plaza.

The album is available everywhere, since it employs the mechanisms of digital free market capitalism, history's most sophisticated distribution system to date. The monumental model of public art is invested in an anachronistic notion of communal appreciation transposed from the church to the museum to the outdoors, and this notion is received skeptically by an audience no longer so interested in direct communal experience. While instantiated in nominal public space, mass-market artistic production is usually consumed privately, as in the case of books, CDs, videotapes, and digital "content." Content producers are not interested in collectivity, they are interested in getting as close as possible to individuals. Perhaps an art distributed to the broadest possible public closes the circle, becoming a private art, as in the days of commissioned portraits. The analogy will only become more apt as digital distribution techniques allow for increasing customization to individual consumers.

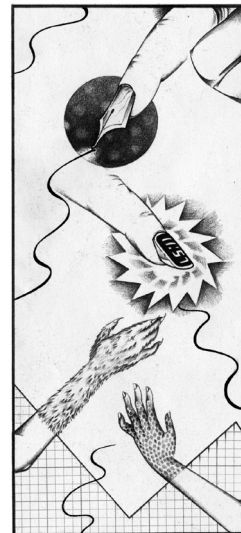




Ettore Sottsass. Lamiera. Pattern design, Memphis collection. 1983.

The monumentality of public art has been challenged before, most successfully by those for whom the term 'public' was a political rallying point. Public artists in the 1970s and 1980s took interventionist praxis into the social field, acting out of a sense of urgency based on the notion that there were social crises so pressing that artists could no longer hole up in the studio, but must directly engage with community and cultural identity. If we are to propose a new kind of public art, it is important to look beyond the purely ideological or instrumental function of art. As Art and Language noted, "radical artists produce articles and exhibitions about photos, capitalism, corruption, war, pestilence, trench foot and issues." Public policy, destined to be the terminal as-if strategy of the avant-garde! A self-annihilating nothing.

An art grounded in distributed media can be seen as a political art and an art of communicative action, not least because it is a reaction to the fact that the merging of art and life has been effected most successfully by the "consciousness industry". The field of culture is a public sphere and a site of struggle, and all of its manifestations are ideological. In *Public Sphere and Experience*, Oscar Negt and Alexander Kluge insist that each individual, no matter how passive a component of the capitalist consciousness industry, must be considered a producer (despite the fact that this role is denied them). Our task, they say, is to fashion "counter-productions." Kluge himself is an inspiration: acting as a filmmaker, lobbyist, fiction writer, and television producer, he has worked deep changes in the terrain of German media. An object disappears when it becomes a weapon.



Anonymous.

The problem arises when the constellation of critique, publicity, and discussion around the work is at least as charged as a primary experience of the work. Does one have an obligation to view the work first-hand? What happens when a more intimate, thoughtful, and enduring understanding comes from mediated representations of an exhibition, rather than from a direct experience of the work? Is it incumbent upon the consumer to bear witness, or can one's art experience derive from magazines, the Internet, books, and conversation? The ground for these questions has been cleared by two cultural tendencies that are more or less diametrically opposed: on the one hand, Conceptualism's historical dependence on documents and records; on the other hand, the popular archive's ever-sharpening knack for generating public discussion through secondary media. This does not simply mean the commercial cultural world, but a global media sphere which is, at least for now, open to the interventions of non-commercial, non-governmental actors working solely within channels of distributed media.

A good example of this last distinction is the phenomenon of the “Daniel Pearl Video,” as it’s come to be called. Even without the label PROPAGANDA, which CBS helpfully added to the excerpt they aired, it’s clear that the 2002 video is a complex document. Formally, it presents kidnapped American journalist Daniel Pearl, first as a mouthpiece for the views of his kidnapers, a Pakistani fundamentalist organization, and then, following his off-screen murder, as a cadaver, beheaded in order to underline the gravity of their political demands.



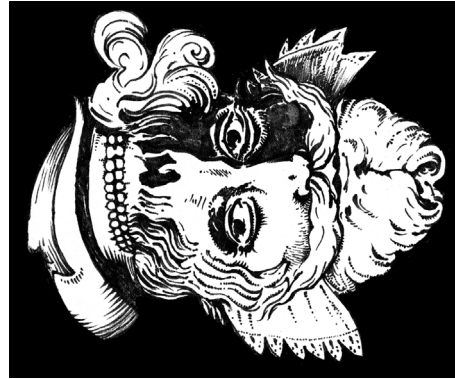
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Computer Technique Group. Cubic Kennedy. 1960s.

One of the video’s most striking aspects is not the grisly, though clinical, climax (which, in descriptions of the tape, has come to stand in for the entire content), but the slick production strategies, which seem to draw on American political campaign advertisements. It is not clear whether it was ever intended for TV broadcast. An apocryphal story indicates that a Saudi journalist found it on an Arabic-language website and turned it over to CBS, which promptly screened an excerpt, drawing heavy criticism. Somehow it found its way onto the Internet, where the FBI’s thwarted attempts at suppression only increased its notoriety: in the first months after its Internet release, “Daniel Pearl video,” “Pearl video,” and other variations on the phrase were among the terms most frequently submitted to Internet search engines. The work seems to be unavailable as a videocassette, so anyone able to locate it is likely to view a compressed data-stream transmitted from a hosting service in the Netherlands (in this sense, it may not be correct to call it “video”). One question is whether it has been *relegated* to the Internet, or in some way created by that technology. Does the piece count as “info-war” because of its nature as a proliferating computer file, or is it simply a video for broadcast, forced to assume digital form under political pressure? Unlike television, the net provides information only on demand, and much of the debate over this video concerns not the legality or morality of making it available, but whether or not one should choose to watch it—as if the act of viewing will in some way enlighten or contaminate. This is a charged document freely available in the public arena, yet the discussion around it, judging from numerous web forums, bulletin boards, and discussion groups, is usually debated by parties who have never seen it.

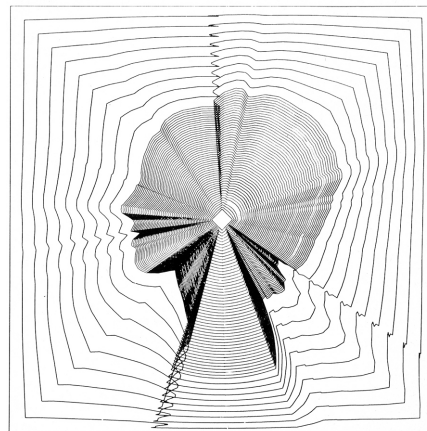
This example may be provocative, since the video's deplorable content is clearly bound up with its extraordinary routes of transmission and reception. It is evident, however, that terrorist organizations, alongside transnational corporate interests, are one of the more vigilantly opportunistic exploiters of "events, spasms, ructions that don't look like art and don't count as art, but are somehow electric, energy nodes, attractors, transmitters, conductors of new thinking, new subjectivity and action." A more conventional instance of successful use of the media-sphere by a non-market, non-government organization is Linux, the open-source computer operating system that won a controversial first prize at the digital art fair Ars Electronica. Linux was initially written by one person, programmer Linus Torvalds, who placed the code for this "radically incomplete" work on-line, inviting others to tinker, with the aim of polishing and perfecting the operating system. The Internet allows thousands of authors to simultaneously develop various parts of a work, and Linux has emerged as a popular and powerful operating system and a serious challenge to profit-driven giants like Microsoft, which recently filed with the US Securities and Exchange Commission to warn that its business model, based on control through licensing, is menaced by the open-source model. Collective authorship and complete decentralization ensure that the work is invulnerable to the usual corporate forms of attack and assimilation, whether enacted via legal, market, or technological routes (however, as Alex Galloway has pointed out, the structure of the World Wide Web should not itself be taken to be some rhizomatic utopia; it certainly would not be difficult for a government agency to hobble or even shut down the Web with a few simple commands).



After an anonymous cameo, circa 18th century. S. Price



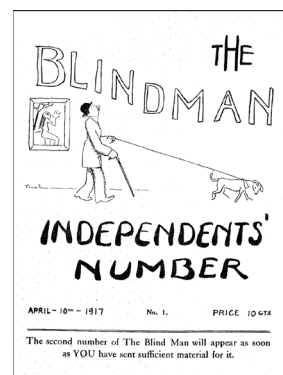
Both of these examples privilege the Internet as medium, mostly because of its function as a public site for storage and transmission of information. The notion of a mass archive is relatively new, and a notion which is probably philosophically opposed to the traditional understanding of what an archive is and how it functions, but it may be that, behind the veneer of user interfaces floating on its surface—which generate most of the work grouped under the rubric "web art"—the Internet approximates such a structure, or can at least be seen as a working model.



Computer Technique Group. Return to a Square. 1960s.

With more and more media readily available through this unruly archive, the task becomes one of packaging, producing, reframing, and distributing; a mode of production analogous not to the creation of material goods, but to the production of social contexts, using existing material. What a time you chose to be born!

An entire artistic program could be centered on the re-release of obsolete cultural artifacts, with or without modifications, regardless of intellectual property laws. An early example of this redemptive tendency is artist Harry Smith's obsessive 1952 *Anthology of American Folk Music*, which compiled forgotten recordings from early in the century. Closer to the present is my own collection of early video game soundtracks, in which audio data rescued by hackers and circulated on the web is transplanted to the old media of the compact-disc, where it gains resonance from the contexts of product and the song form: take what's free and sell it back in a new package. In another example, one can view the entire run of the 1970s arts magazine *Aspen*, republished on the artist-run site ubu.com, which regularly makes out-of-print works available as free digital files. All of these works emphasize the capacity for remembering, which Kluge sees as crucial in opposing "the assault of the present on the rest of time," and in organizing individual and collective learning and memory under an industrialist-capitalist temporality that works to fragment and valorize all experience. In these works, resistance is to be found at the moment of production, since it figures the moment of consumption as an act of re-use.



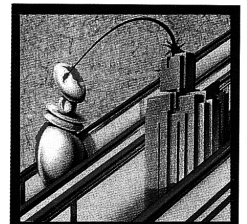
The Blind Man. 1917.

It's clear from these examples that the readymade still towers over artistic practice. But this is largely due to the fact that the strategy yielded a host of new opportunities for the commodity. Dan Graham identified the problem with the readymade: "instead of reducing gallery objects to the common level of the everyday object, this ironic gesture simply extended the reach of the gallery's exhibition territory." One must return to *Fountain*, the most notorious and most interesting of the readymades, to see that the gesture does not simply raise epistemological questions about the nature of art, but enacts the dispersion of objects into discourse. The power of the readymade is that no one needs to make the pilgrimage to see *Fountain*. As with Graham's magazine pieces, few people saw the original *Fountain* in 1917. Never exhibited, and lost or destroyed almost immediately, it was actually created through Duchamp's media manipulations—the Stieglitz photograph (a guarantee, a shortcut to history), the *Blind Man* magazine article—rather than through the creation-myth of his finger selecting it in the showroom, the status-conferring gesture to which the readymades are often reduced. In *Fountain*'s elegant model, the artwork does not occupy a single position in space and time; rather, it is a palimpsest of gestures, presentations, and positions. Distribution is a circuit of reading, and there is huge potential for subversion when dealing with the institutions that control definitions of cultural meaning. Duchamp distributed the notion of the fountain in such a way that it became one of art's primal scenes; it transubstantiated from a provocative objet d'art into, as Broodthaers defined his *Musée des Aigles*: "a situation, a system defined by objects, by inscriptions, by various activities..."

i'm in heaven when you file

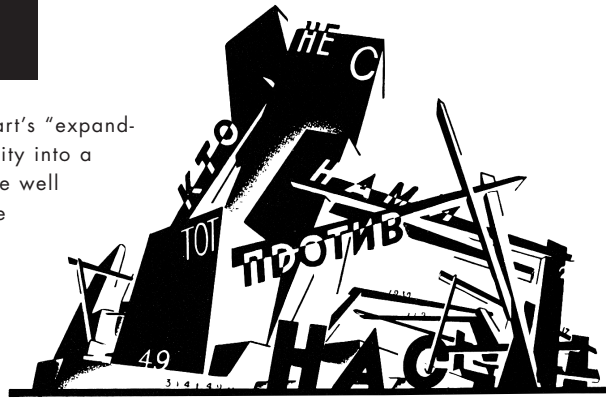
Hot on the heels of last year's Output compilation of Commodore 64 tunes comes *Game Heaven*, a collection of computer soundtracks from 1982-1987. This selection comes from across the board of home entertainment, culled from collections of internet files which have been hacked from ageing consoles and outmoded arcade machines before being traded by techno fetishists. Mercifully, the bulk of these tunes are rather easier on the ears than the psychosis-inducing Commodore collection; while sharing the same lo-fi aesthetic, the 19 tracks display a surprising level of invention and variation. The tracks have been compiled by the artist Seth Price, who is represented at the 2002 Whitney Biennial. Price was born and raised in Jerusalem's volatile West Bank but has lived and worked in New York since 1997. All the pieces on the CD are unlisted and uncredited, raising several issues pertinent to digital culture: the acknowledgement of authorship, the loss of information as systems become obsolete and the point at which commercially or mass produced work becomes artistically valid. "The genre represents unique limitations," Price explains. "Designed for adolescent boys intent on play, the tracks must be energetic, but not distracting; the consummate background music." Eight-bit muzak as art, anyone? JUSTIN QUIRK

Game Heaven is available at the Whitney Museum Bookshop, 945 Madison Avenue, New York (212 570 3676).



i-D Magazine. 2002.

The last thirty years have seen the transformation of art's "expanded field" from a stance of stubborn discursive ambiguity into a comfortable and compromised situation in which we're well accustomed to conceptual interventions, to art and the social, where the impulse to merge art and life has resulted in lifestyle art, a secure gallery practice that comments on contemporary media culture, or apes commercial production strategies, even as its arena gradually has become, in essence, a component of the securities market. This is the lumber of life.



Iakov Chernikhov. Constructive Theatrical Set. 1931.

This tendency is marked in the discourses of architecture and design. An echo of Public Art's cherished communal spaces persists in the art system's fondness for these modes, possibly because of the Utopian promise of their appeals to collective public experience. Their "criticality" comes from an engagement with broad social concerns. This is why Dan Graham's pavilions were initially so provocative, and the work of Daniel Buren, Michael Asher, and Gordon Matta-Clark before him: these were interventions into the social unconscious. These interventions have been guiding lights for art of the last decade, but in much the same way that quasi-bureaucratic administrative forms were taken up by the Conceptualists of the 1960s, design and architecture now could be called house styles of the neo-avant-garde. Their appearance often simply gestures toward a theoretically engaged position, such that a representation of space or structure is figured as an ipso facto critique of administered society and the social, while engagement with design codes is seen as a comment on advertising and the commodity. One must be careful not to blame the artists; architecture and design forms are all-too-easily packaged for resale as sculpture and painting. However, one can still slip through the cracks in the best possible way, and even in the largest institutions. Jorge Pardo's *Project*, an overhaul of Dia's ground floor which successfully repositioned the institution via broadly appealing design vernaculars, went largely unremarked in the art press, either because the piece was transparent to the extent of claiming the museum's bookstore

and exhibiting work by other artists, or because of a cynical incredulity that he gets away with calling this art.



Liam Gillick. Post Legislation Discussion Platform. 1998.



Ettore Sottsass. Design of a Roof to Discuss Under. 1973.

A similar strain of disbelief greeted the construction of his own house, produced for an exhibition with a good deal of the exhibitor's money. It seems that the avant-garde can still shock, if only on the level of economic valorization. This work does not simply address the codes of mass culture, it embraces these codes as form, in a possibly quixotic pursuit of an unmediated critique of cultural conventions.

An argument against art that addresses contemporary issues and topical culture rests on the virtue of slowness, often cast aside due to the urgency with which ones work must appear. Slowness works against all of our prevailing urges and requirements: it is a resistance to the contemporary mandate of speed. Moving *with* the times places you in a blind spot: if you're part of the general tenor, it's difficult to add a dissonant note. But the way in which media culture feeds on its own leavings indicates the paradoxical slowness of archived media, which, like a sleeper cell, will always rear its head at a later date. The rear-guard often has the upper hand, and sometimes *delay*, to use Duchamp's term, will return the investment with massive interest.



Michael Green. *From Zen and the Art of Macintosh*. 1986.

One question is whether everything remains always the same; whether it is in fact possible that by the age of fifty a person has seen all that has been and will ever be. In any case, must this person consult some picture or trinket to understand that identity is administered, power exploits, resistance is predetermined, all is hollow?

To recognize...the relative immutability of historically formed discursive artistic genres, institutional structures, and distribution forms as obstacles that are ultimately persistent (if not insurmountable) marks the most profound crisis for the artist identified with a model of avant-garde practice.

So the thread leads from Duchamp to Pop to Conceptualism, but beyond that we must turn our backs: a resignation, in contrast to Pop's affirmation and Conceptualism's interrogation. Such a project is an incomplete and perhaps futile proposition, and since one can only adopt the degree of precision appropriate to the subject, this essay is written in a provisional and exploratory spirit. Spirit. Spirit. An art that attempts to tackle the expanded field, encompassing arenas other than the standard gallery and art world-circuit, sounds utopian at best, and possibly naïve and undeveloped.

