small scale tech

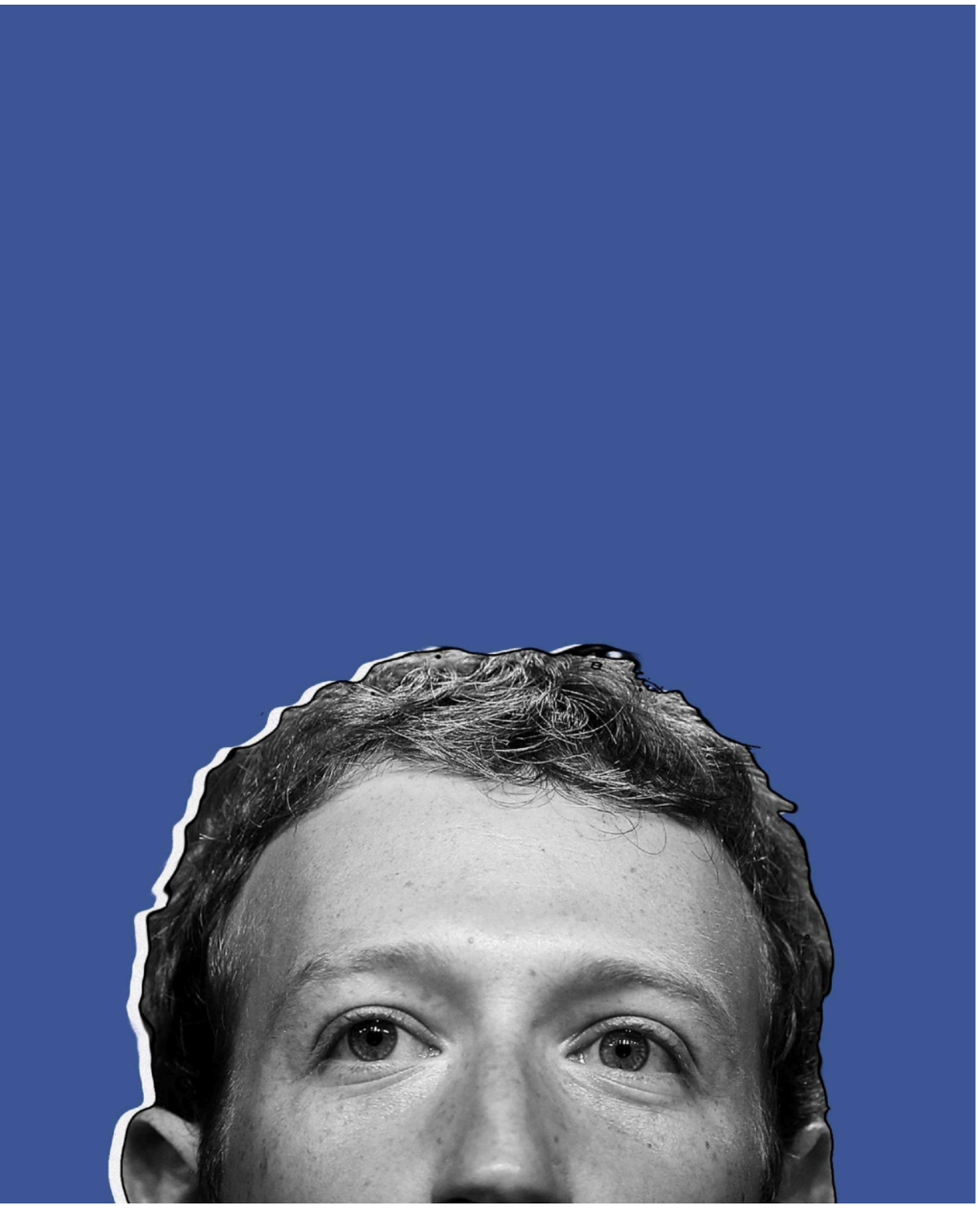
our modern era

Tech Giants, Once Seen as Saviors, Are Now Viewed as Threats

Leer en español

By **DAVID STREITFELD** OCT. 12, 2017

Facebook, Google and others positioned themselves as bettering the world. But their systems and tools have also been used to undermine democracy. Ali Asaei for The New York Times



How Facebook's Political Unit Enables the Dark Art of Digital Propaganda

Some of unit's clients stifle opposition, stoke extremism.

By **Lauren Etter**, **Vernon Silver**, and **Sarah Frier**

December 21, 2017, 2:00 AM PST

Prepare For A Fightback Against Big Tech

Roger Trapp, CONTRIBUTOR

FULL BIO

Opinions expressed by Forbes Contributors are their own.

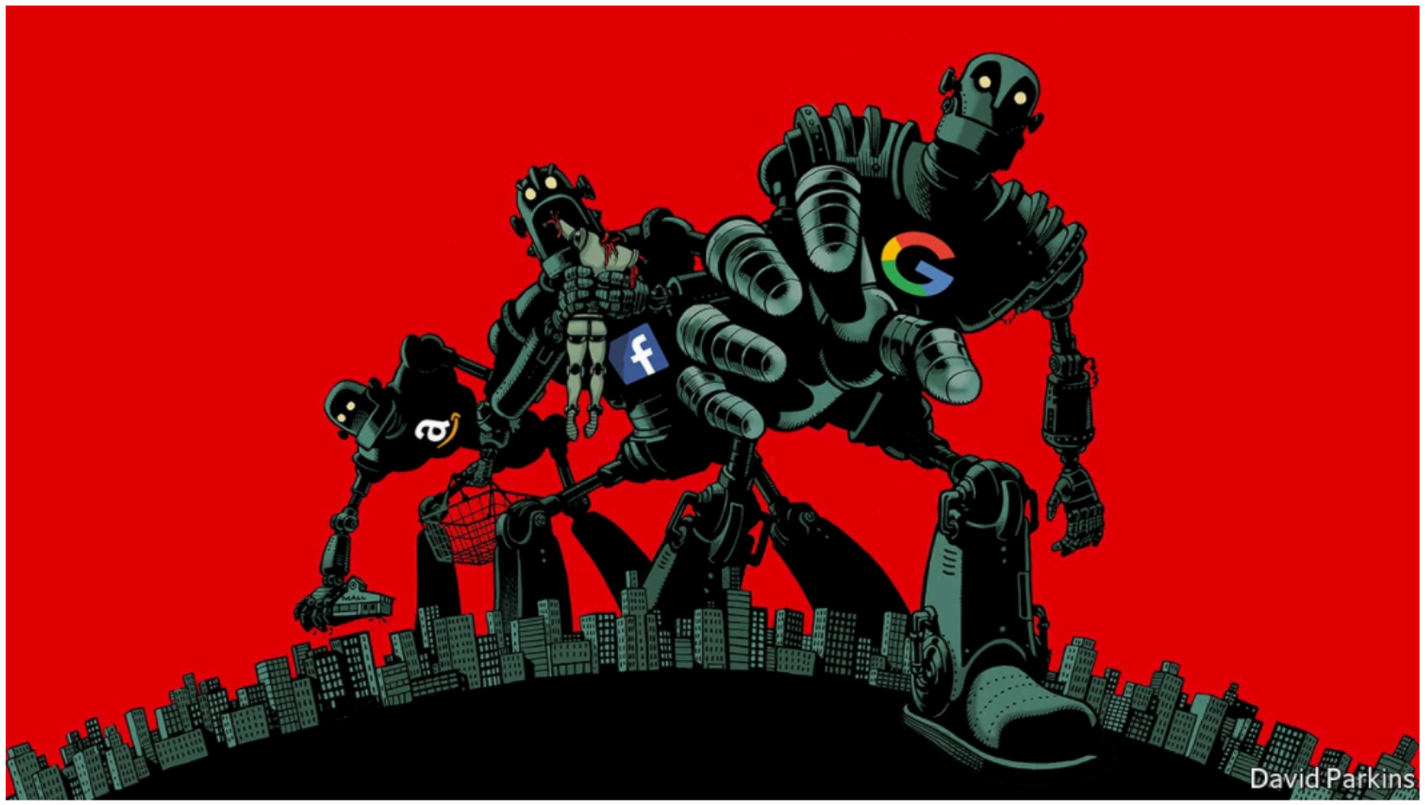
EU Commissioner of Competition Margrethe Vestager (JOHN THYS/AFP/Getty Images)

One of the key features of the past year has been the growing disquiet about the power and influence of Big Tech. While there is no disputing the wonders in terms of convenience and accessibility brought about by the likes of Facebook, Amazon, Apple and Google, there is also widespread concern that

Competition in the digital age

How to tame the tech titans

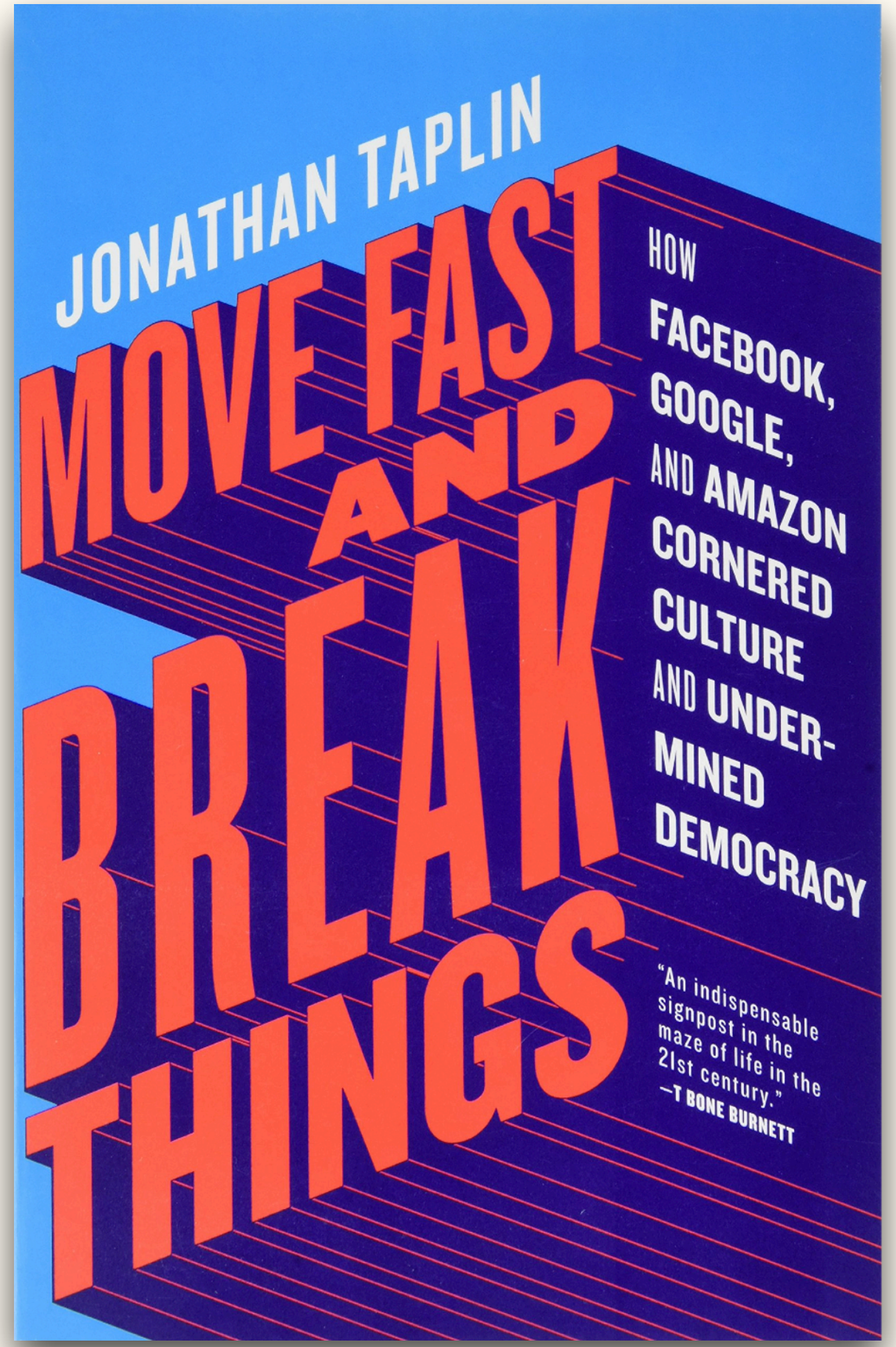
The dominance of Google, Facebook and Amazon is bad for consumers and competition



Print edition | Leaders ›

Jan 18th 2018

NOT long ago, being the boss of a big Western tech firm was a


JONATHAN TAPLIN
MOVE FAST AND BREAK THINGS
HOW FACEBOOK, GOOGLE, AND AMAZON CORNERED CULTURE AND UNDERMINED DEMOCRACY
"An indispensable signpost in the maze of life in the 21st century."
—T BONE BURNETT

Ralph Orlowski / Reuters

Could Facebook Be Tried for Human-Rights Abuses?

The legal path is murky.

INGRID BURRINGTON | DEC 20, 2017 | TECHNOLOGY

Is technology good or bad?

“Technology is neither good nor bad; nor is it neutral.”

–Melvin Kranzberg

RASSENAMT-SS

1

Deutsche Hollerith Maschinen Gesellschaft m.b.H., Berlin 12.6.42

Nr 5935/2

492

Public Health Response to a Nuclear Detonation

January 16, 2018 at 1:00 p.m. (ET)

While a nuclear detonation is unlikely, it would have devastating results and there would be limited time to take critical protection steps. Despite the fear surrounding such an event, planning and preparation can lessen

“The unleashed power of the atom bomb has changed everything except our modes of thinking, and thus we drift toward unparalleled catastrophes.”

–Albert Einstein

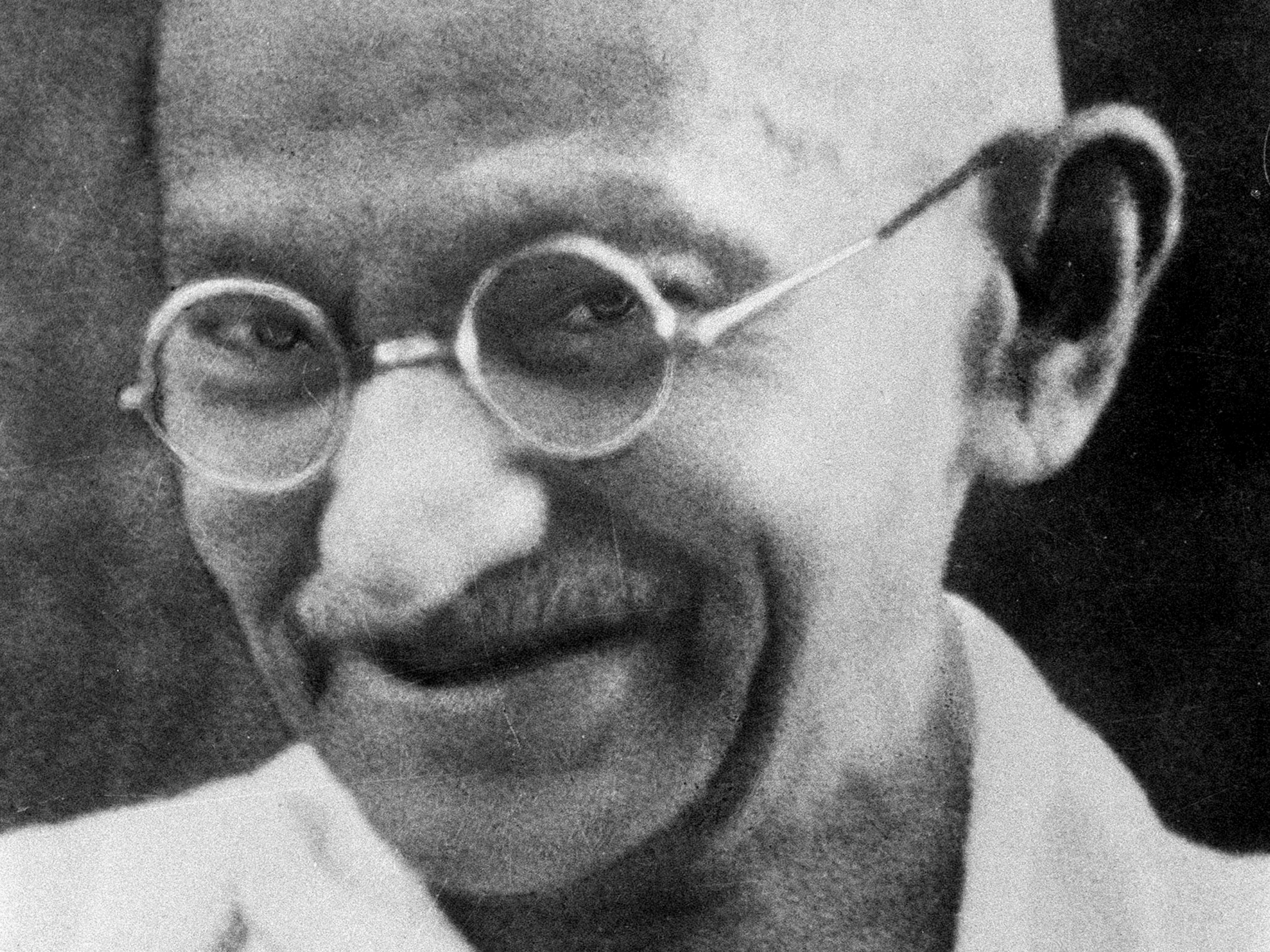
“We have guided missiles and misguided men.”

–Martin Luther King, Jr.

“In spite of the fantasies of hippies, we are certainly going to continue to live in a technological world. The question is a different one: is that workable?”

-Paul Goodman

theoretical frameworks



village industry

Industrialization on a mass scale will necessarily lead to passive or active exploitation of the villagers as the problems of competition and marketing come in. Therefore we have to concentrate on the village being self-contained, manufacturing mainly for use. Provided this character of the **village industry** is maintained, there would be no objection to villagers using even the modern machines and tools that they can make and can afford to use. Only they should not be used as a means of exploitation of others.

Mahatma Gandhi, "Harijan" (1936)

authoritarian and democratic technics

“My thesis, to put it bluntly, is that from late neolithic times in the Near East, right down to our own day, two technologies have recurrently existed side by side: one authoritarian, the other democratic, the first system-centered, immensely powerful, but inherently unstable, the other man-centered, relatively weak, but resourceful and durable.”

Lewis Mumford, “Authoritarian and Democratic Technics” (1964)

What I would call **democratic technics** is the small scale method of production, resting mainly on human skill and animal energy, but always, even when employing machines, remaining under the active direction of the craftsman or the farmer. This technology had limited horizons of achievement, but, just because of its wide diffusion and its modest demands, it had great powers of adaptation and recuperation.

Lewis Mumford, "Authoritarian and Democratic Technics" (1964)

Like the earliest form of **authoritarian technics**, this new technology is marvelously dynamic and productive: its power in every form tends to increase without limits, in quantities that defy assimilation and defeat control, whether we are thinking of the output of scientific knowledge or of industrial assembly lines. To maximize energy, speed, or automation, without reference to the complex conditions that sustain organic life, have become ends in themselves.

Lewis Mumford, "Authoritarian and Democratic Technics" (1964)

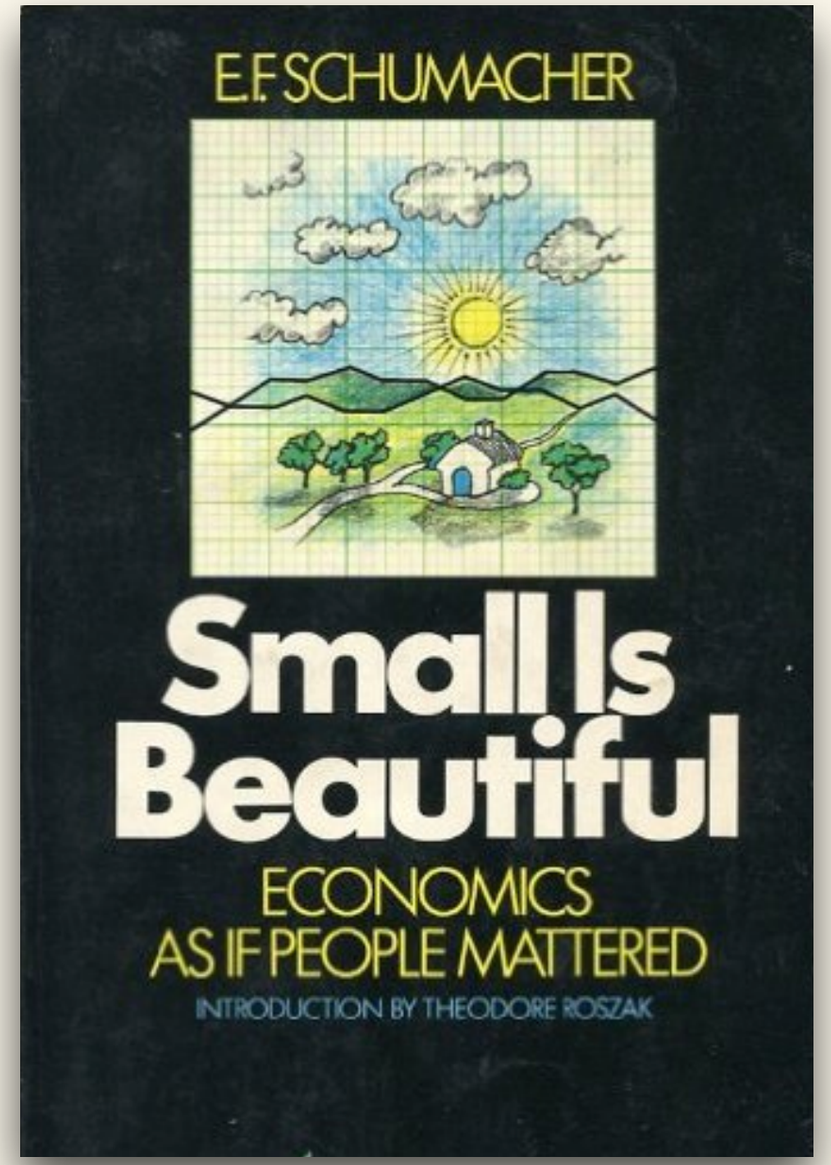
“The inventors of nuclear bombs, space rockets, and computers are the pyramid builders of our own age: psychologically inflated by a similar myth of unqualified power, boasting through their science of their increasing omnipotence, if not omniscience, moved by obsessions and compulsions no less irrational than those of earlier absolute systems: particularly the notion that the system itself must be expanded, at whatever eventual cost to life.”

Lewis Mumford, “Authoritarian and Democratic Technics” (1964)

“I trust that I have made it clear that the genuine advantages our scientifically based technics has brought can be preserved only if we cut the whole system back to a point at which it will permit human alternatives, human interventions, and human destinations for entirely different purposes from those of the system itself.”

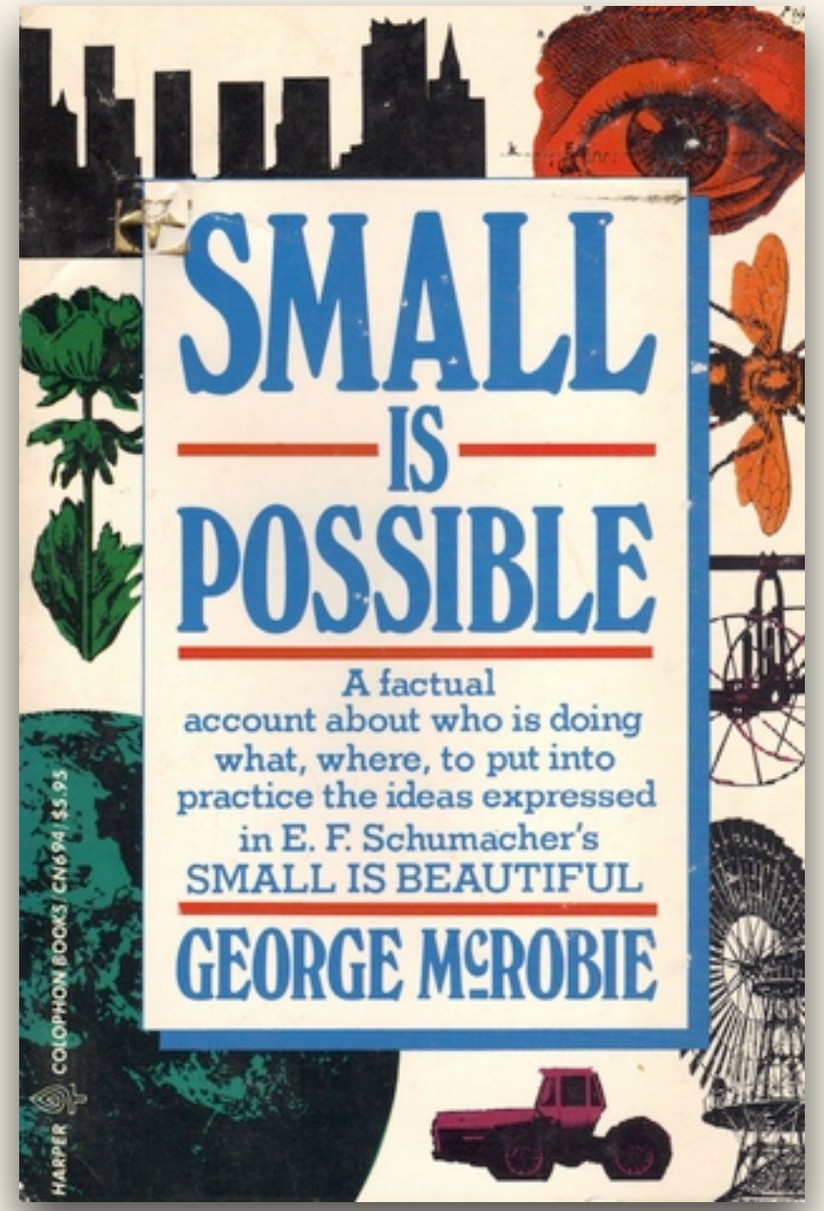
Lewis Mumford, “Authoritarian and Democratic Technics” (1964)

appropriate technology


E.F. SCHUMACHER
Small Is Beautiful
ECONOMICS AS IF PEOPLE MATTERED
INTRODUCTION BY THEODORE ROSZAK

While many theoreticians–who may or may not be too closely in touch with real life–are still engaging in the idolatry of large size, with practical people in the actually world there is a tremendous longing and striving to profit, if at all possible, from the convenience, humanity, and manageability of smallness.

E. F. Schumacher, "Small is Beautiful" (1973)


SMALL
IS
POSSIBLE
A factual
account about who is doing
what, where, to put into
practice the ideas expressed
in E. F. Schumacher's
SMALL IS BEAUTIFUL
GEORGE McROBIE
HARPER COLOPHON BOOKS / CN694 / $3.95

Our institutions are swarming with people who are wringing their hands about the overwhelming power of multinational companies. And at the same time applauding the technological development which makes production so complex and so colossally costly that only the multinational companies can carry it.

E. F. Schumacher, "Technology for a Democratic Society" (1977)

This is the predicament not only of the developing countries but also of our countries now. The middle way, which is also the democratic way that gives the little people some independence and what the young call ‘doing one’s own thing’: that is being destroyed. And therefore we have throughout the world this atmosphere of tension, even hatred.

E. F. Schumacher, “Technology for a Democratic Society” (1977)

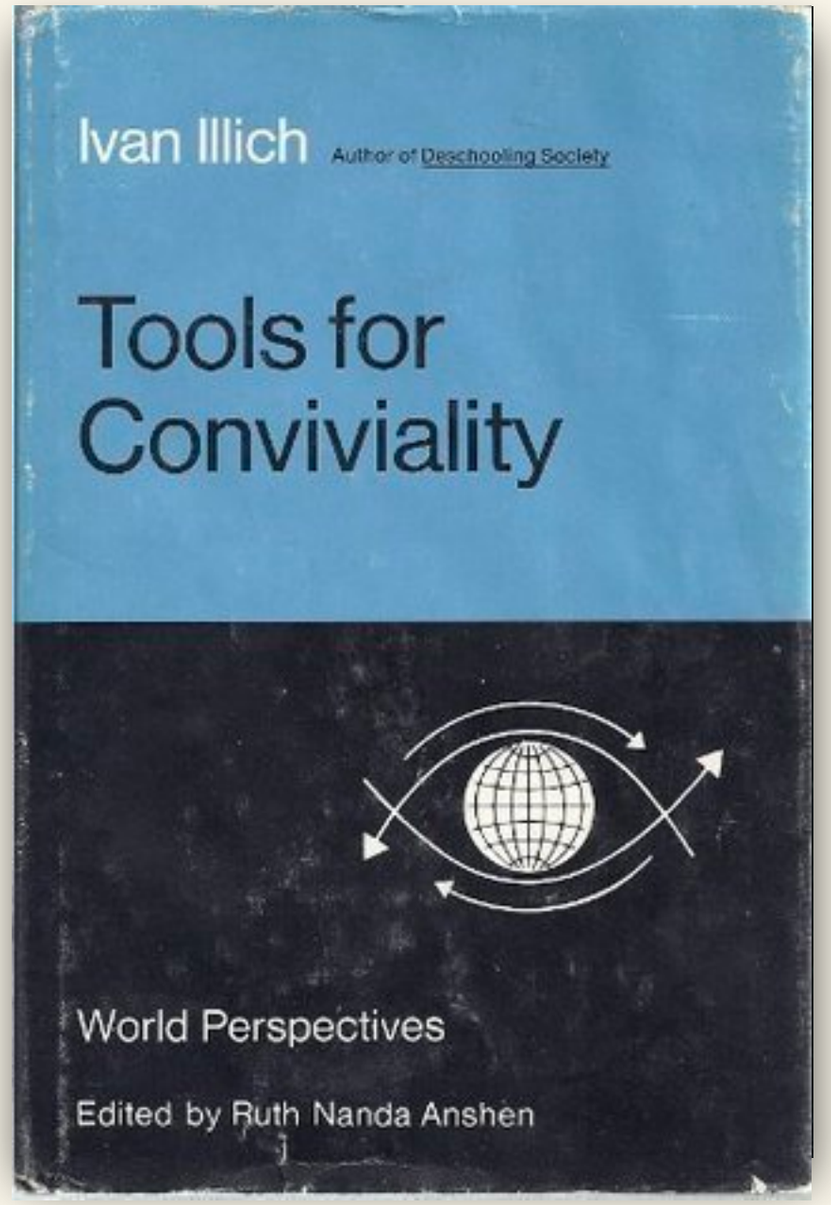
When I had asked myself this question, ‘What would be the appropriate technology for rural India or rural Latin America or maybe the city slums?’ I came to a very simple provisional answer. That technology would indeed be really much more intelligent, efficient, scientific if you like, than the very low level technology employed there, which kept them very poor. But it should be very, very much simpler, very much cheaper, very much easier to maintain, than the highly sophisticated technology of the modern West. In other words, it would be an **intermediate technology**, somewhere in between.

E. F. Schumacher, “Technology for a Democratic Society” (1977)

And then I realized that intermediate technology was not to be found. I realized that in terms of available technology, either it was very very low or it was very very high; but *the middle had disappeared.*

E. F. Schumacher, "Technology for a Democratic Society" (1977)

convivial tools


Ivan Illich
Author of Deschooling Society
Tools for Conviviality
World Perspectives
Edited by Ruth Nanda Anshen

[T]he vision of new possibilities requires only the recognition that scientific discoveries can be used in at least two opposite ways. The first leads to specialization of functions, institutionalization of values and centralization of power and turns people into the accessories of bureaucracies or machines.

The second enlarges the range of each person's competence, control, and initiative, limited only by other individuals' claims to an equal range of power and freedom.

Ivan Illich, "Tools for Conviviality" (1973)

Convivial tools are those which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision.

Industrial tools deny this possibility to those who use them and they allow their designers to determine the meaning and expectations of others. Most tools today cannot be used in a convivial fashion.

Ivan Illich, “Tools for Conviviality” (1973)

Tools foster conviviality to the extent to which they can be easily used, by anybody, as often or as seldom as desired, for the accomplishment of a purpose chosen by the user. The use of such tools by one person does not restrain another from using them equally. They do not require previous certification of the user. Their existence does not impose any obligation to use them. They allow the user to express his meaning in action.

Ivan Illich, “Tools for Conviviality” (1973)

What is fundamental to a convivial society is not the total absence of manipulative institutions and addictive goods and services, but the balance between those tools which create the specific demands they are specialized to satisfy and those complementary, enabling tools which foster self-realization.

Ivan Illich, “Tools for Conviviality” (1973)

political artifacts

The things we call "technologies" are ways of building order in our world. Many technical devices and systems important in everyday life contain possibilities for many different ways of ordering human activity. Consciously or not, deliberately or inadvertently, societies choose structures for technologies that influence how people are going to work, communicate, travel, consume, and so forth over a very long time. In the processes by which structuring decisions are made, different people are differently situated and possess unequal degrees of power as well as unequal levels of awareness.

Langdon Winner, “Do Artifacts Have Politics?” (1980)

Are the social conditions predicated said to be required by, or strongly compatible with, the workings of a given technical system? Are those conditions internal to that system or external to it (or both)?

Langdon Winner, “Do Artifacts Have Politics?” (1980)

Taking the most obvious example, the atom bomb is an inherently political artifact. As long as it exists at all, its lethal properties demand that it be controlled by a centralized, rigidly hierarchical chain of command closed to all influences that might make its workings unpredictable. The internal social system of the bomb must be authoritarian; there is no other way.

Langdon Winner, "Do Artifacts Have Politics?" (1980)

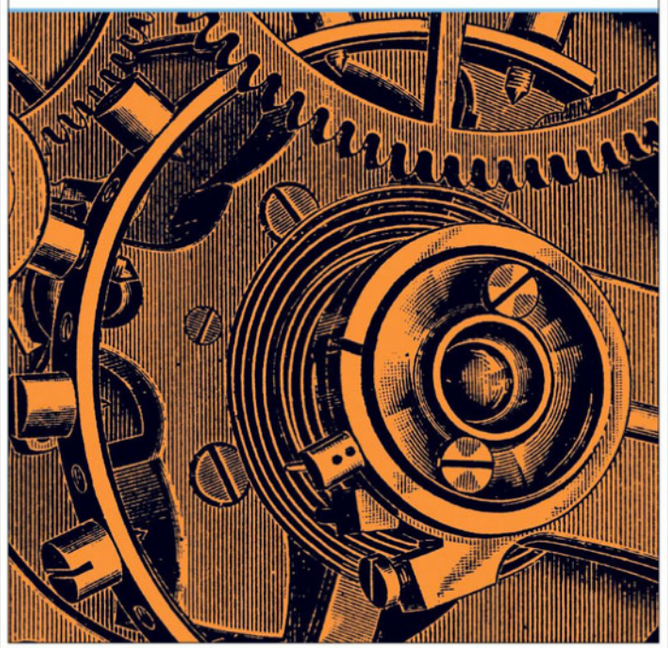
holistic technology

CBC MASSEY LECTURES

THE REAL WORLD OF TECHNOLOGY

Ursula M. Franklin

REVISED EDITION



The categories of holistic and prescriptive technologies involve distinctly different specializations and divisions of labour, and consequently they have very different social and political implications. Let me emphasize that we are not talking about *what* is being done but *how* it is being done.

Ursula Franklin, "The Real World of Technology" (1989)

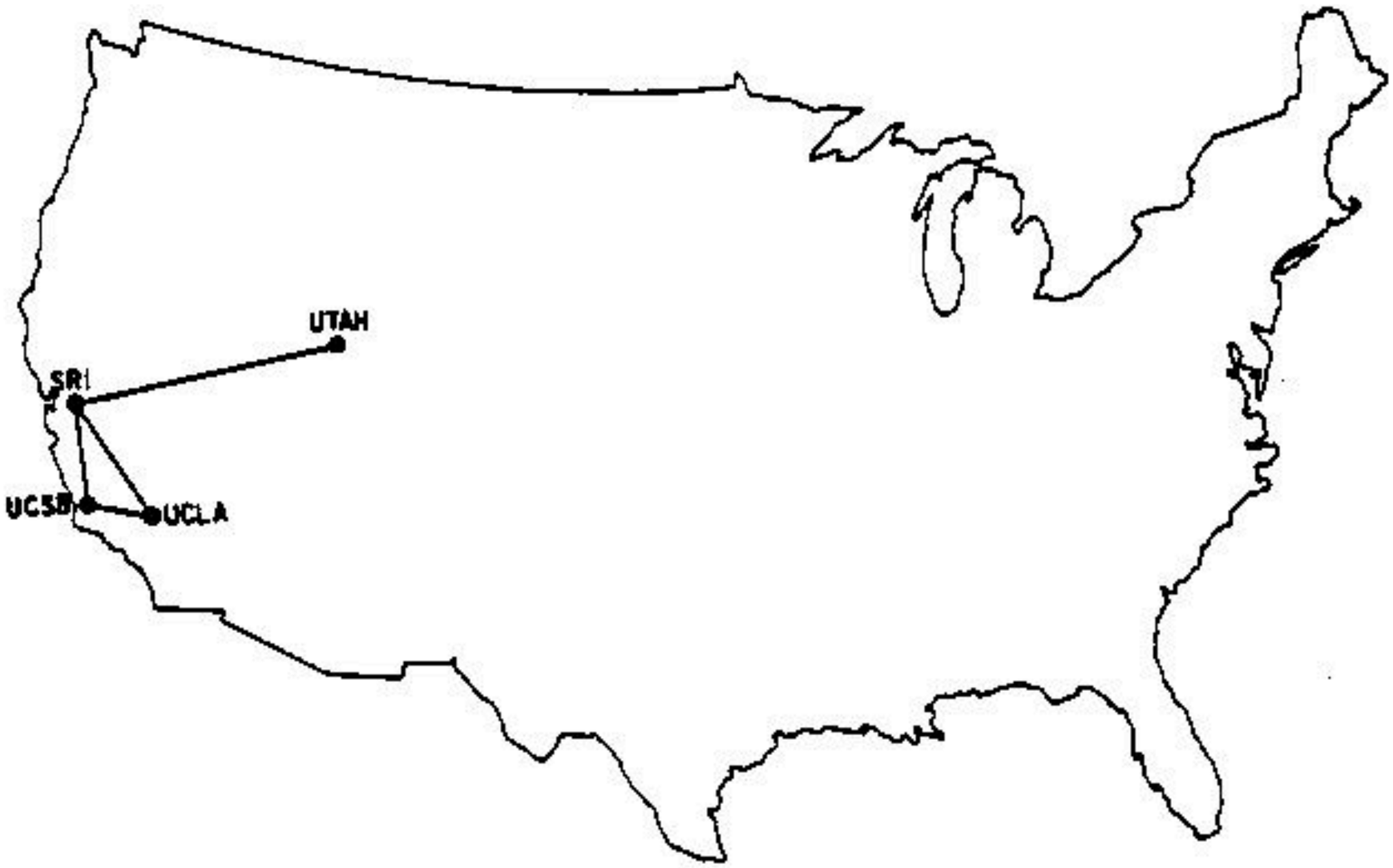
Holistic technologies are normally associated with the notion of craft. Artisans, be they potters, weavers, metal-smiths, or cooks, control the process of their own work from beginning to finish. Their hands and minds make situational decisions as the work proceeds, be it on the thickness of the pot, or the shape of the knife edge, or the doneness of the roast. These are decisions that only they can make while they are working.

Ursula Franklin, "The Real World of Technology" (1989)

The opposite is specialization by process; this I call **prescriptive technology**. It is based on a quite different division of labour. Here, the making or doing of something is broken down into clearly identifiable steps. Each step is carried out by a separate worker, or group of workers, who need to be familiar only with the skill of performing that one step.

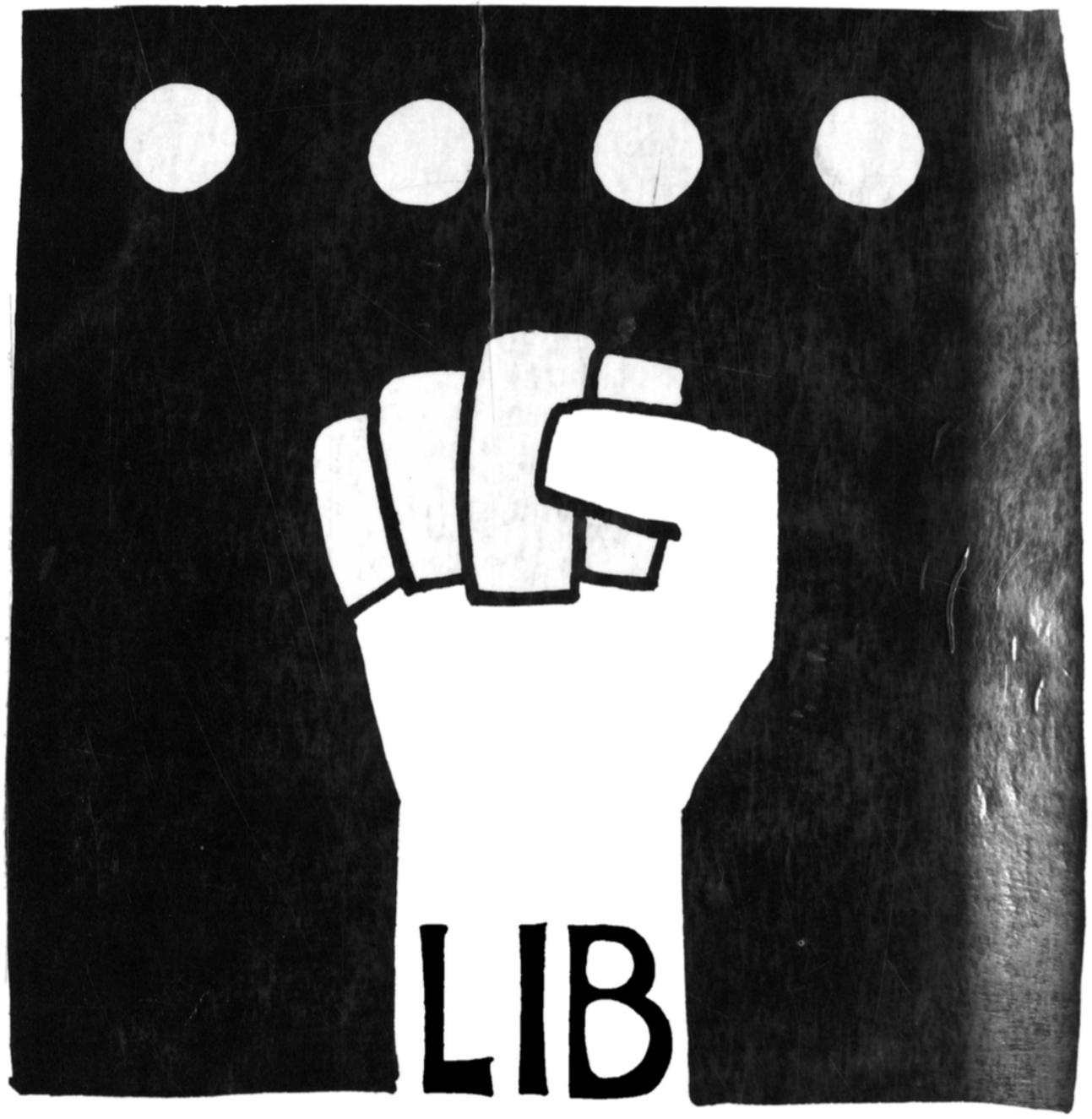
Ursula Franklin, "The Real World of Technology" (1989)

small scale networks


UTAH
SRI
UCSB
UCLA

You can and must understand computers NOW.

COMPUTER



INTERACTIVE SYSTEMS

Used to be that ordinary people had to deal with computers by filling out intricate forms, which were then translated into punch cards. The forms put things in weird categories (see "Coded-Down Data," p. 27.)

No longer.

Anyway, no longer necessary.

Computer systems can now give you action, excitement-- and explanations.

This is done through the magic of the TERMINAL. Terminals come in two conspicuous flavors (typewriter and screen or "boob tube") and also have two less-noticeable divisions ("Teletype" or "industry" versus "IBM type.")

Anyway, a terminal is something that allows a person and a computer to type at each other.

Now, computers are merely gadgets for twiddling information. They no more understand English, or human psychology, than puppies can read music. (See "Artificial Intelligence," p. 11-15) But the computer's program can, for instance, direct the computer to type out a simple question, and compare the user's answer with a simple set of alternatives. For example, suppose the user is visiting a hospital. A computer can sign him in without the abrasiveness of a receiving nurse, and with far more patience. The following might be a sample dialogue. (Here the computer types what's in caps, and the user's replies are in lower-case.)

```
DO YOU HAVE AN ACUTE PAIN?  (Y, N, DK)
     dk
YOUR ANSWER IS: DK FOR "DON'T KNOW."
     DOES THAT MEAN YOU'RE NOT SURE
     WHAT 'ACUTE' MEANS?  (ANSWER A)
     A PAIN COMES AND GOES? (ANSWER B)
     YOU HAVE A PAIN SORT OF ON THE
     BORDER?  (ANSWER C)
     c
IS THIS PAIN IN AN EXACT PLACE YOU
     CAN IDENTIFY? (Y,N,DK)
     y
```

An interactive system of this kind is called a conversational system, in that it "converses" with the user. The secret is that the alternatives in the computer program are few and carefully worked out beforehand: there are great pitfalls when there are too many alternatives, as when such conversational systems are used for teaching (see pp. BM 15-19).

Here is a straightforward example: a system I wish I had for balancing a checkbook. Note that the inner program for this conversational system could be written in any of the three languages presented later.

```
WHAT PROGRAM WOULD YOU LIKE TO RUN? ckbk
CHECKBOOK PROGRAM STARTS.
DO YOU WANT TO PROOF THE NEW STATEMENT FOR
     MARCH?  y
PLEASE LIST THE CHECKS THAT HAVE COME IN.
     231, 239, 240, 242, 244, 245.
SUM OF INCOMING CHECKS IS $345.72.  DO YOU
     WANT BREAKDOWN?  n
PRESUMABLY BANK IS CHARGING YOU .60 FOR
     SIX CHECKS.  ALSO MONTHLY CHARGE OF
     FIFTY CENTS (PLEASE CONFIRM).  y
ARE THERE ANY OTHER BANK CHARGES THIS
     MONTH?  n
ARE THE FOLLOWING DEPOSITS ON THIS STATE-
     MENT-- MARCH 1 SALARY, $854.00?  y
     GIFT FROM AUNT AGATHA, 14 MARCH,
     $25.00?  n
TOTAL ON STATEMENT SHOULD BE $1753.21.
     PLEASE CONFIRM.  y
YOUR CURRENT FLOAT IS $656.75.  DO YOU WANT
     BREAKDOWN?  y
```

In a conversational system the computer can helpfully lead the user on.

TERMINALS

A terminal is simply any device by which a person and a computer can type at each other.

Kids love terminals. This one is a video terminal or keyscope (see p. DM 108). It allows the computer to present textual or numeric information, play games with you, quiz you for information in a good-guy system, or whatever -- depending on the program, of course.

More expensive scopes (for computer displays) allow pictorial animation under the user's control (discussed throughout flip side). THE MAIN THING TO UNDERSTAND: what they do is decided by human beings, not "scientific principles." Human beings take note.

Types of available computer terminals are discussed in the next spread; more display terminals discussed p. DM 109

Below: a "bull pen" of terminals, all hooked up to the main computer of the

Motto 1 for the new era:

USING A COMPUTER SHOULD ALWAYS BE EASIER THAN NOT USING A COMPUTER.

Motto 2 for the new era:

THE NEW FRONTIER IN COMPUTERS IS CONCEPTUAL SIMPLICITY AND CLARITY.

People who delight in intricacy are going to have to learn some new tricks. Internal intricacy is fine, as long as the user doesn't have to deal with it.

Motto 3 for the new era (to computer people):

MAKING THINGS EASY IS HARD.

Motto 4 for the new era:

ANY SYSTEM FOR A SPECIFIC PURPOSE SHOULD BE TEACHABLE IN TEN MINUTES OR LESS.

Anyone who has been taught the use of some fixed-purpose computer system, such as an airline reservation system, may doubt this. But perhaps this book will clarify things somewhat.

A "GOOD-GUY SYSTEM"

is a conversational

computer system that is

CLEAR,

EASY TO USE,

AND FRIENDLY.

ANY MAN OF COMMON SENSE CAN DESIGN A COMPUTER SYSTEM FOR A PURPOSE IMPORTANT TO HIM: the data structure, forms of information, general operations, record-keeping, and responses to on-line users.

But for some reason this is generally kept a secret.

"JOE TURKEY USER"

A good friend of mine, Jordan Young, is a former R.E.S.I.S.T.O.R. (see p. 47) and now a systems programmer (see p. 45) on the mighty Dartmouth time-sharing system, DTSS. (See p. 45.)

Jordan tells me that one of the more important people at Dartmouth is a mythical individual named Joe Turkey User. This estimable personage knows hardly anything about computers, makes a lot of mistakes, thinks he understands what you tell him when he doesn't, tends to hit the wrong keys on the terminal, and in general tends

THE MOST IMPORTANT COMPUTER TERMS FOR THE '70s

Here are some phrases that will count in the new era of computing, when we will run into more and more computer systems set up for particular purposes.

on-line
: connected to a functioning computer. (Note that the computer may be in the typewriter or desk itself.) (As distinct from off-line, setting things up for processing later.)

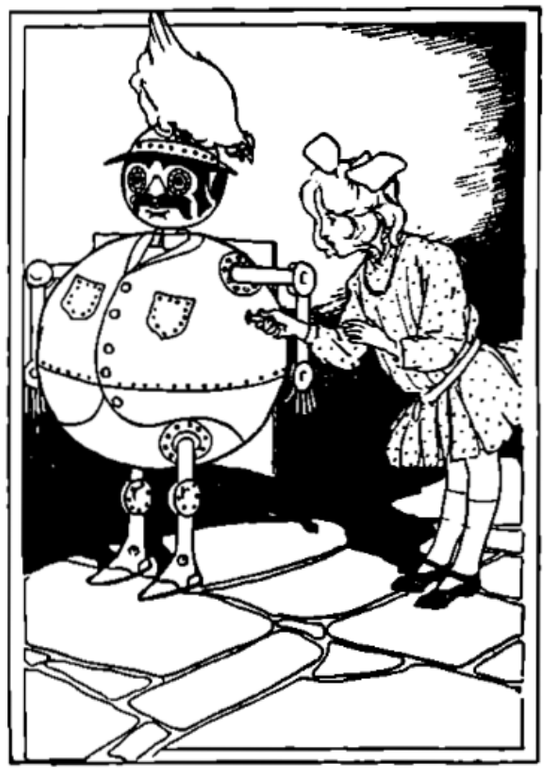
interactive
: not just connected, but responding to you. Interactive systems and programs can respond to your choices and requests, clarify what they want from you, etc.

remote
: referring to something far away, as distinct from local, right where you are. A computer can be either remote or local, e.g., on your desk.

front end (n.), front-end (adj.)
: whatever stands between you and a system. A front end can be the terminal in your office, for example. A front-end program is one which mediates between a user and some other system or program, perhaps collecting data for it by quizzing you.

dedicated
: set up for only one use. A big computer at a computing center has to have many uses; a little computer in your office can be dedicated. Dedicated computers are now hidden in all sorts of things: cash registers, for example (see "Microprocessors," p. 44).

turnkey (adj.)
: turned on with a key. Especially, turnkey systems, small computer systems that can just be turned on (key or not) and are fully set up, ready to run, programmed, etc.



real-time
: responding to events in the world as needed, without delays. Computer systems that control machinery, make airline reservations, predict the weather or respond to naive users are real-time. Systems that can catch up overnight are non-real-time.

"intelligent terminal"

THE
TOM SWIFT TERMINAL
or,
A CONVIVIAL CYBERNETIC DEVICE

LGC ENGINEERING
1807 Delaware St.
Berkeley, CA 94703

TABLE OF CONTENTS

2. APPROACH

a. CONVIVIALITY

Is the usefulness of a technology to people in direct proportion to its complexity?

Ivan Illich, writing in Tools for Conviviality, argues that not only is the social utility of technology not directly related to its complexity, but that increasing complexity may bring about decreasing social usefulness.

While the function performed by the technological device may be faster, more accurate, more "efficient" on a short-run basis, Illich argues, the instituions of specialistsrestricted access, "black box" non-repairable components, mystification and fragmentation of understanding which accompany the new tool usually negate most of the anticipated benefits of the device.

But is this symbiosis of tool and institution inevitable? Illich believes that it is not. He points out that technological tools and systems can be made "convivial" (as opposed to "industrial") in design so that the principles of operation and use are visible and can be understood, and the circumstances of operation are not built into the design but are subject to the ingenuity of the user.

We believe that even cybernetic electronics, held by some to be the epitome of mystifying technology, will yield to the application of convivial design. We have heard the industry jokes about the maintenance specialists who are shipped with large computer systems and know that not only are such jokes very nearly true, but that such subordination of man to machine signifies a potentially disastrous tendency of technological development.

In the hopes of trying out some initial convivial design criteria,

Steve —— 2/17/75

AMATEUR COMPUTER USERS GROUP

HOMEBREW COMPUTER CLUB . . . you name it.

Are you building your own computer? Terminal? T V Typewriter? I/O device? or some other digital black-magic box?

Or are you buying time on a time-sharing service?

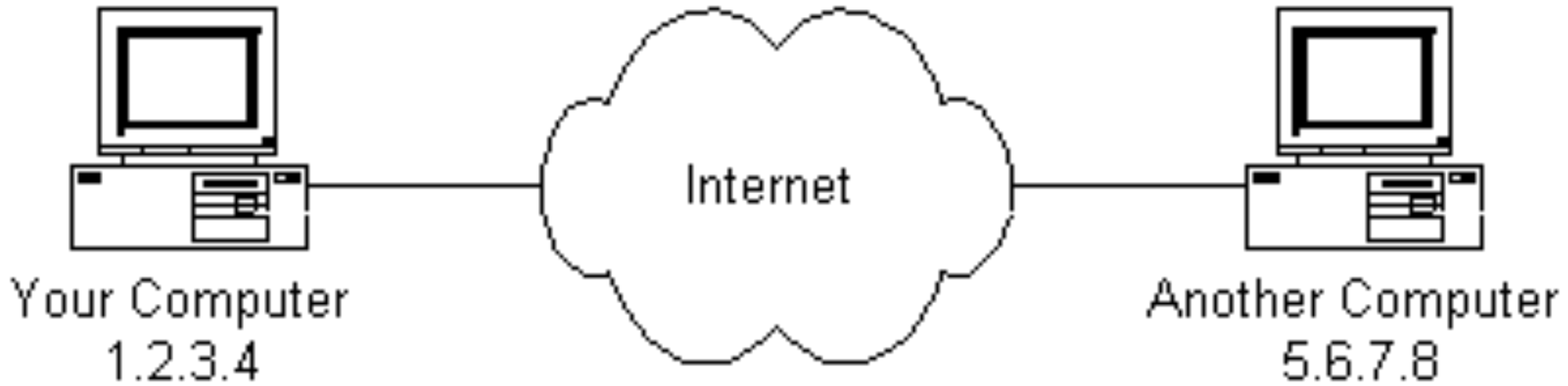
If so, you might like to come to a gathering of people with like-minded interests. Exchange information, swap ideas, talk shop, help work on a project, whatever . . .

We are getting together Wednesday nite, March 5th, 7 pm at the home of Gordon French 614 18th Ave., Menlo Park (near Marsh Road).

If you can't make it this time, drop us a card for the next meeting.

See ya there, Fred Moore

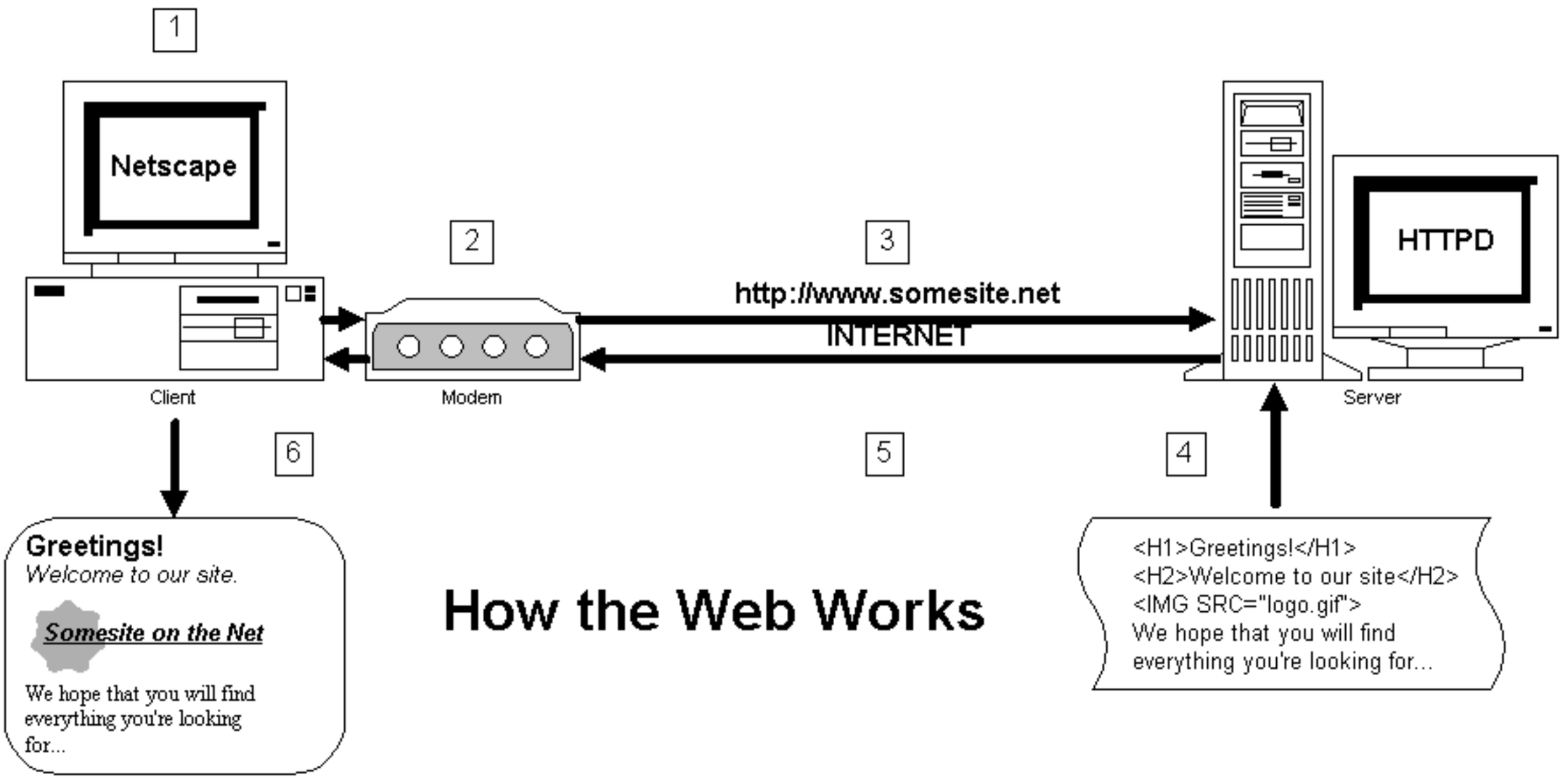
Hope you can come.
There will be other Altair builders there.


Internet
Your Computer
1.2.3.4
Another Computer
5.6.7.8

PROPRIETE CERN

PROPRIETE CERN

How the Web Works



“The fundamental thing (the Net does) is to overcome the advantages of economies of scale…so the big guys don’t rule.”

–Esther Dyson, 1994 

what happened?

“If I am right, we are now rapidly approaching a point at which, unless we radically alter our present course, our surviving democratic technics will be completely suppressed or supplanted, so that every residual autonomy will be wiped out, or will be permitted only as a playful device of government, like national balloting for already chosen leaders in totalitarian countries.”

Lewis Mumford, “Authoritarian and Democratic Technics”

While people, with an easy-going kind of logic, believe that fast transport and instantaneous communication open up a new dimension of freedom (which they do in some rather trivial respects), they overlook the fact that these achievements also tend to destroy freedom, by making everything extremely vulnerable and extremely insecure, unless conscious policies are developed and conscious action is taken to mitigate the destructive effects of these technological developments.

E. F. Schumacher, "Small is Beautiful"

Some of the symptoms of radical monopoly are reaching public awareness, above all the degree to which frustration grows faster than output in even the most highly developed countries and under whatever political regime.

What people have and what they are about to get are equally exasperating to them. Accelerating change has become both addictive and intolerable.

Ivan Illich, “Tools for Conviviality”

The viability of technology, like democracy, depends in the end on the practice of justice and on the enforcement of limits to power.

Ursula Franklin, “The Real World of Technology”

Langdon Winner
@langdonw

Following

Next stop Virtual Reality! All aboard? As more & more people flee politics, abandon in-person social relationships and withdraw into the digital realm, public life is colonized by oligarchs who gladly fill the vacuum and cash in. Coming in 2018 and beyond?

1:12 PM - 31 Dec 2017

so.

we build an alternative.

democratic technics

appropriate technology

convivial tools

holistic technology

□ Focused on local work and use, not import or export (Gandhi)
□ Affordable or buildable (Gandhi)
□ Tools are not used to exploit others (Gandhi)
□ Remains under the direction and control of the individual (Mumford, Franklin)
□ Allows for "human interventions" (Mumford)
□ Appropriate scale and complexity for the context of use (Schumacher)
□ Enhances individual ability, power, and freedom (Illich)
□ Does not diminish the ability, power, and freedom of others (Illich)
□ Can be used as seldom or as often as desired (Illich)
□ Does not require authoritarian social structures (Winner)
□ Is not strongly compatible with authoritarian social structures (Winner)
□ Reflects our principles in terms of justice, fairness, and equality (Franklin)
□ Doesn't overvalue efficiency (Franklin, Illich)
□ Understand and accept the environmental impact (Franklin)

artifacts have politics.

platforms have politics.


amazon
web services

web frameworks have politics.


React

altcloud

small scale

independent

immediate

low overhead

simple model

portable

let’s try it.