

Withdrawal/Redaction Sheet

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
001. email	From: Albert Seferian To: JONES_R Re: LRM 5340 S982 National Information Infrastructure Act [Personal Information] [partial] (1 page)	08/19/1996	b(6)

COLLECTION:

Clinton Presidential Records
Automated Records Management System [Email]
Default ([Digital Divide...])
OA/Box Number: 1100000

FOLDER TITLE:

[04/07/1993 - 10/07/1998]

2019-0203-F

in722

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

Freedom of Information Act - [5 U.S.C. 552(b)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

ARMS Email System

RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: Jonathan P. Gill (GILL_J) (WHO)

CREATION DATE/TIME:07-APR-1993 20:15:00.00

SUBJECT: RE: IEEE: National Information Infrastructure

TO: Roger Hurwitz (1=US@*RFC-
822\RHU(A)REAGAN.AL.MIT.EDU@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:

Roger,
Thanks for the heads-up on the IEEE event.
For \$150 I'll stay in the OEOB.
Regards,
Jock

ARMS Email System
RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: Thomas G. Tate (1=US@*RFC-
822\TTATE(A)ESUSDA.GOV@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

CREATION DATE/TIME:05-MAY-1993 08:27:00.00

SUBJECT: ACE Special Interest Group - National Information Infrastructure (fwd)

TO: UNKNOWN (1=US@*RFC-
822\jgill(a)esusda.gov@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

CC: UNKNOWN (1=US@*RFC-
822\jpoley(a)esusda.gov@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:
RFC-822-Headers:
Received: from esusda.gov by sprintf.merit.edu (5.64/1123-1.0-X.500)
id AA08256; Wed, 5 May 93 08:16:10 -0400
Received: by esusda.gov (AIX 3.2/UCB 5.64/25-ccf)
id AA20784; Wed, 5 May 1993 08:16:15 -0400
X-Mailer: ELM [version 2.4 PL13]
Mime-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Content-Length: 5161

===== ATTACHMENT 1 =====
ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:05-MAY-1993 08:27:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:
J.Gill: Here is a Draft of the ACE meeting highlights from last week.
Please advise on suggested revisions and distribution wish.
We can set up distribution from here, and avoid the lengthy "who it is
getting sent to list" through our alias capability.
Will be delighted to do that from here if that is your wish.
Look forward to your feedback.
Tom Tate

Forwarded message:
> From ttate@esusda.gov Wed May 5 05:19:14 1993
> Subject: ACE Special Interest Group - National Information Infrastructure (fwd)
> To: gparham@esusda.gov (Greg Parham)
> Date: Wed, 5 May 1993 05:18:49 -0500 (EDT)
> Cc: ttate@esusda.gov (Thomas G. Tate)

> Content-Length: 4493

>

> Greg: Any suggestions on this before I send it?

> Tom Tate

>

> Forwarded message:

>> From ttate@esusda.gov Wed May 5 05:09:51 1993

>> From: Thomas G. Tate <ttate@esusda.gov>

>> Subject: ACE Special Interest Group - National Information Infrastructure

>> To: ttate@esusda.gov

>> Date: Wed, 5 May 1993 05:09:16 -0500 (EDT)

>> Content-Length: 3682

>>

>> May 4, 1993

>>

>> Subject: Formative meeting of Agriculture, Commerce and Education (ACE)

>> Special Interest Group on the National Information Infrastructure

>> (NII)

>>

>> To: Johathan P. Gill

>>

>> From: Tom Tate, Executive Secretary, ACE group

>>

>> On April 28, 1993, representatives from USDA, US Department of Commerce and

>> the US Department of Education met at USDA to explore opportunities for

>> interagency cooperation on the implementation of the National Information

>> Infrastructure (NII). Individuals attending the formative meeting:

>>

>> Janet Poley - USDA

>> Greg Parham - USDA

>> Tom Tate - USDA

>> Barb White - USDA

>>

>> John Schmidt - Commerce

>> Fred Long - Commerce

>> Dennis Conner - Commerce

>>

>> Richard Lallmang - Education

>> Mary Clare Gumbleton - Education

>>

>> Chris Casey - Senate

>>

>> The vision of the group is to improve the nations social, economic

>> and environmental performance through

>> improving access to the nation's information and educational assets and

>> resources.

>>

>> The group recommended three ideas:

>>

>> 1) ACE group should continue it's discussions to explore options and

>> alternatives and federal roles for implementing the national information

>> infrastructure.

>>

>> 2) Expand the ACE group to include other key actors in the NII arena.

>>

>> 3) ACE group should be connected via Internet Email and should strive to
 >> connect the cabinet officers in all of the U.S. Departments.

>>

>>

>> Issues raised during the groups discussions included:

>>

>> Interagency Coordination

>>

>> - Network between agencies

>> - Sharing information between agencies

>> - Identify linkages we need to cooperate on

>> - K-12 issues are being addressed lots of places outside Department
 >> of Education

>> - OSTP's role of linking Science and Education within the various departments

>> - Need for electronic communication between cabinet members

>> - alternatives interim: (Extension Service offers guest accounts)

>> - long term

>> - Update Inventory of broadcasting options

>> - Land based network

>> - VSAT at PBS stations

>> - PBS re-broadcast via cable companies

>> - Global school house concept - two way interaction between learners/experts

>> - Inventory of grant programs offering assistance

>> - Commerce - NTIA \$56-64 million

>> - Education - Star Schools

>> - Agriculture - Rural Electric Association

>> - Other?

>> - Inventory of demonstration plots current/proposed

>> - Iowa: fiber to 99 counties, every school district

>> - Inventory of legislation relevant to NII

>> - NII bill

>> - Educational Technology bill

>> - Improving access to government records and information

>> - Public Access

>> - Archiving

>> - Security

>> - Strategy for breaking down the barriers

>> - Education of top Departmental leaders

>> - Education for government workforce at all levels

>> - PBS town meetings for the general public

>> - NTIA type grants to departments for educational applications

>> - USDA's Ag*Sat for reaching targeted groups

>> - Congressional momentum building

>> - House Information Systems implementing Internet

>> - Senate: Some offices making use of Internet

>> - Inventory of educational broadcasts

>> - USDA has an on-line TV Guide

>> - Access to variety of Educational resources

>> - Eric, educational labs and OERI

>> - Access to NOAA information assets

>> - Strategy for reaching local communities

>> - Schools, libraries, learning centers, government out-reach offices

>> (USDA Extension Services have two way email access to computer

>> and data base networks in more than 2,000 counties. In some
>> cases, these links connect to exloaders that connect many.
>> additional individuals and organization in the community.
>>

>> Other agency contacts recommended for inclusion in the group:

>>

>> Energy - Norm Creasema{

>> Agriculture - Meg Offiet (sp?)

>>

>>

>>

>>

>>

>>

>>

>>

>

>

===== END ATTACHMENT 1 =====

ARMS Email System

RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: Jonathan P. Gill (GILL_J) (WHO)

CREATION DATE/TIME:05-MAY-1993 10:18:00.00

SUBJECT: RE: ACE Special Interest Group - National Information Infrastructure (fw

TO: Thomas G . Tate (1=US@*RFC-
822\Ttate(a)esusda.gov@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:

Tom,

REport looks good. It might work in concepts such as:

building a 'cooperative advantage'

supporting Community, Responcibility, Opportunity

Empowerment Zones? Enterprise Neighborhoods?

Interactive communications

Interactive citizen drop-in centers

Extending the 19th century investment in ES into the 21st century

Please read pages 20 - 21 of the 2/22/93 Technology for America's

Economic Growth -- President and VP have their names on it

Please send me a clean final and then send to the ACE list.

Regards,

Jock

ARMS Email System
RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: John C. Mallery (1=US@*RFC-822\JCMA(A)REAGAN.AI.MIT.EDU@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

CREATION DATE/TIME:09-JUL-1993 10:48:00.00

SUBJECT: National Information Infrastructure Act of 1993.

TO: UNKNOWN (1=US@*RFC-822\luthor.ai.mit.edu@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:
RFC-822-Headers:
Received: from life.ai.mit.edu by sprintf.merit.edu (5.64/1123-1.0-X.500)
id AA07084; Thu, 8 Jul 93 19:39:26 -0400
Received: from LEX-LUTHOR.AI.MIT.EDU by life.ai.mit.edu (4.1/AI-4.10) for
/PN=Jonathan.P.Gill/OU=Office_of_Media_Affairs/O=EOP/PRMD=GOV+EOP/ADMD=TELEMAIL/C=US/@sprint.
com id AA07297; Thu, 8 Jul 93 19:34:48 EDT
Received: from AI.MIT.EDU by LEX-LUTHOR.AI.MIT.EDU via INTERNET with SMTP id 145308; 8 Jul 1993
15:02:18-0400
Received: from CLINTON.AI.MIT.EDU by life.ai.mit.edu (4.1/AI-4.10) for futures@lex-luthor.ai.mit.edu id AA25236;
Thu, 8 Jul 93 15:01:51 EDT

===== ATTACHMENT 1 =====
ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:09-JUL-1993 10:48:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:
from:

Electronic Frontier Foundation
1001 G Street, N.W.
Suite 950 East
Washington, DC 20001
202/347-5400 voice
202/393-5509 fax

Our e-mail address will remain the same, eff@eff.org.

NREN Applications Bill Update

by Andrew Blau

In an earlier issue of EFFector (5.07), we described legislation introduced
by Congressman Rick Boucher to stimulate Internet applications in health

care, education, libraries, and for access to government information. On June 17, the bill, H.R. 1757, was marked-up by the Science Subcommittee, which Mr. Boucher chairs. ("Mark up" is the process by which a committee or subcommittee reviews a bill, adds amendments, and if passed, sends it on to the next stage in the legislative process.)

The bill that emerged reflects a number of important changes to the original H.R. 1757. Some of these changes reflect the Clinton Administration's input, others come from efforts to accommodate the Republican members of the Subcommittee, while still others reflect concerns of groups that would be affected by the legislation.

Major changes to HR 1757 as marked up

New name

The bill had originally been called the High Performance Computing and High Speed Networking Applications Act of 1993. Its new name is the National Information Infrastructure Act of 1993.

Emphasis on accessibility

H.R. 1757 had originally specified that applications developed under this program should be accessible by all persons in the United States. The new version expands on that by specifying throughout the bill's many provisions that applications must be accessible to people with disabilities; that training programs must include training for people with disabilities; and that public access points for networked information should include centers for people with disabilities.

Connections program to support *services,* not facilities

The connections program originally called for the creation of local networks connecting schools, libraries, and state and local governments. Now, the bill calls for the development of network services in local communities. The language clarifies that the money is to support the purchase of network services, not to build new facilities. Museums were also added to the list of local institutions under this program. The length of the Connections Program was cut from 5 years to 3 years (at which time it is likely to be reviewed).

Process for restricting use of test-bed networks modified

One of H.R. 1757's most controversial provisions had required that government supported test-bed networks could not be used for services that could be "provided satisfactorily" by commercial networks 18 months after the bill is enacted. Educators, the research community, librarians and others were concerned by the rigid timeline and feared that users would be

restricted from using the government supported NSFNet without any adequate alternative, or at substantially higher costs. The new provisions replace the fixed timeline with guidelines for determining when the cutover may happen and a process for determining it.

1) The bill outlines conditions by which "satisfactory availability" is to be determined: the determination "shall include consideration of geographic access to and affordability of service, and timeliness and technical performance standards in providing services." This responds to the concern that there be well-known standards "available" that take into consideration various conditions faced by users across the country.

2) The bill calls for a study to explore the issue and decide when commercial services are satisfactorily available, subject to the results of the study. The study is to be done by the Director of the Office of Science and Technology Policy (OSTP) in consultation with Federal agencies and departments supporting test bed networks. The study is due 6 months after the date of enactment of the legislation. This abandons the fixed, 18-month timeline and asks OSTP to make the determination according to the specified conditions.

3) The bill also includes an "escape" clause if conditions change. If the OSTP report announces a date for the cutover, but "for technical reasons" the cutover cannot be imposed on that date, the OSTP Director has the option of going back to Congress with a new date.

As a related matter, the bill includes renewed emphasis on using commercially available network services whenever possible, "to minimize Federal investment in network hardware and software."

Scope of Education section expanded

H.R. 1757 originally specified primary, secondary, and higher education as the beneficiaries of the education section. That has been broadened to include educational institutions at all levels, which adds pre-school or early childhood education and vocational/technical schools.

The new provisions also specify the inclusion of the Department of Education in the program.

Advisory Committee expanded; Public input process specified

The original H.R. 1757 modified the High Performance Computing Advisory Committee created by the High Performance Act of 1991 to expand its membership. The new provisions take additional steps to expand the committee to include library representatives, the computer hardware and computer software industries, and the publishing industry.

The new provisions also require that the Advisory Committee meet at least once a year to take oral and written testimony from the public on progress in implementing the network and applications plan, summarize the public input, and report it to OSTP Director.

Lastly, the bill first specified that Advisory Committee members were to be appointed by the President. The new provisions specify that the OSTP Director is to appoint them.

New attention to copyright issues

The bill as amended now includes greater attention to the copyright issues that electronic networks create. Specifically, the bill calls for general research to facilitate the management and protection of copyrighted information accessed via the Internet, and a means to identify electronically copyrighted works and electronically indicating whether permission to reproduce it has been granted.

Money: less of it and none of it is "new"

In an effort to keep this package within the parameters of the Administration's budget request, and in light of the budget deficit and the struggles to pass a budget package, the amount of money authorized in each section has been cut. The overall total was reduced from \$1.55 billion over five years to \$1.005 billion over that period.

A large portion of that total comes from the removal of the National Telecommunications and Information Administration (NTIA) from the program. NTIA is not under the Science Subcommittee's jurisdiction, and will be reauthorized by the committee that does have jurisdiction, the Energy and Commerce Committee, which is expected to authorize money for similar purposes.

The bill now also clarifies that all money authorized in it is from money already authorized for each agency. These provisions were added to clarify that the bill was not seeking to add over a billion dollars to the federal budget for these programs, but was authorizing agencies to spend the money they have on these applications.

Miscellaneous

The bill as reported out of the Subcommittee also calls for:

- o an emphasis on the development of "interconnected and interoperable information systems" rather than proprietary or stand-alone systems;
- o research into "the long-range social and ethical implications of applications of high-speed networking and high-performance computing"; and
- o new applications in clinical medicine, including drug development, technologies to monitor, evaluate and treat patients in nonclinical settings, and modeling of sociological populations affected disproportionately by selected diseases or disorders.

Finally, H.R. 1757 no longer includes the section that calls for a

coordinator for the networking and applications program nor a section specifying an Associate Director at OSTP to oversee Federal efforts to disseminate scientific and technical information.

The bill is now scheduled to come before the full Science, Space and Technology Committee on June 30 for a vote. It is not expected that additional major revisions will be made, but changes are always possible. Following the full Committee markup, the bill will be ready for consideration by the full House of Representatives once the Committee issues its report. No date for House consideration has been set.

===== END ATTACHMENT 1 =====

ARMS Email System

RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: John C. Mallery (1=US@*RFC-822\JCMA(A)REAGAN.AI.MIT.EDU@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

CREATION DATE/TIME:03-AUG-1993 05:50:00.00

SUBJECT: Online HR1757, The National Information Infrastructure Bill Wher

TO: UNKNOWN (1=US@*RFC-822\luthor.ai.mit.edu@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

READ: UNKNOWN

TEXT:

RFC-822-Headers:

Received: from life.ai.mit.edu by sprintf.merit.edu (5.64/1123-1.0-X.500)
id AA06579; Tue, 3 Aug 93 02:08:09 -0400

Received: from LEX-LUTHOR.AI.MIT.EDU by life.ai.mit.edu (4.1/AI-4.10) for
/PN=Jonathan.P.Gill/OU=Office_of_Media_Affairs/O=EOP/PRMD=GOV+EOP/ADMD=TELEMAIL/C=US/@sprint.
com id AA15162; Tue, 3 Aug 93 02:05:41 EDT

Received: from AI.MIT.EDU by LEX-LUTHOR.AI.MIT.EDU via INTERNET with SMTP id 160652; 2 Aug 1993
16:18:09-0400

Received: from CLINTON.AI.MIT.EDU by life.ai.mit.edu (4.1/AI-4.10) for futures@lex-luthor.ai.mit.edu id AA24925;
Mon, 2 Aug 93 16:17:54 EDT

===== ATTACHMENT 1 =====

ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:03-AUG-1993 05:50:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:

Date: Mon, 26 Jul 1993 17:05:25 CDT

From: Dave Banisar <cpsr@access.digex.net>

To: Multiple recipients of list GOVDOC-L <GOVDOC-L@PSUVM.PSU.EDU>

Subject: hr1757

The revised version of HR1757, the national information infrastructure bill introduced by Rep. Boucher is now available on the CPSR Internet Library. FTP/WAIS/GOPHER to cpsr.org /cpsr/nii/hr1757_july_1993.txt. if you do not have ftp/wais/gopher, email listserv@cpsr.org with the word "help" as the body of the text.

Dave Banisar
CPSR Washington Office

===== END ATTACHMENT 1 =====

ARMS Email System
RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: John C. Mallery (1=US@*RFC-822JCMA(A)REAGAN.AI.MIT.EDU@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

CREATION DATE/TIME:03-AUG-1993 05:50:00.00

SUBJECT: [paul@cni.org: National Information Infrastructure Act of 1993 (HR1757)

TO: UNKNOWN (1=US@*RFC-822\luthor.ai.mit.edu@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:

RFC-822-Headers:

Received: from life.ai.mit.edu by sprintf.merit.edu (5.64/1123-1.0-X.500)
id AA06585; Tue, 3 Aug 93 02:08:24 -0400

Received: from LEX-LUTHOR.AI.MIT.EDU by life.ai.mit.edu (4.1/AI-4.10) for
/PN=Jonathan.P.Gill/OU=Office_of_Media_Affairs/O=EOP/PRMD=GOV+EOP/ADMD=TELEMAIL/C=US/@sprint.
com id AA15169; Tue, 3 Aug 93 02:06:27 EDT

Received: from AI.MIT.EDU by LEX-LUTHOR.AI.MIT.EDU via INTERNET with SMTP id 160657; 2 Aug 1993
16:24:05-0400

Received: from CLINTON.AI.MIT.EDU by life.ai.mit.edu (4.1/AI-4.10) for futures@lex-luthor.ai.mit.edu id AA25048;
Mon, 2 Aug 93 16:23:19 EDT

Included-Msgs: <9307301317.AA01337@a.cni.org>,

The message of 30 Jul 1993 12:27 EDT from paul@cni.org,

The message of 30 Jul 1993 12:27 EDT from Paul Evan Peters

===== ATTACHMENT 1 =====

ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:03-AUG-1993 05:50:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:

Date: Fri, 30 Jul 1993 12:27 EDT

Comment: You are tuned to the Coalition's Information Station

Originator: cni-announce@cni.org

Errors-To: mailman@cni.org

Reply-To: cni-announce@cni.org

Sender: cni-announce@cni.org

Version: 5.5 -- Copyright (c) 1991/92, Anastasios Kotsikonas

From: Paul Evan Peters <paul@cni.org>

To: Multiple recipients of list <cni-announce@cni.org>

Subject: National Information Infrastructure Act of 1993 (HR1757) passes House

Dear cni-announce subscribers:

I write to give you the good news that H.R. 1757, "The National
Information Infrastructure Act of 1993," was passed by the U.S.

House of Representatives on Monday July 26 afternoon by a vote of 326 to 61 with 47 not voting.

I have attached a clipping from net-happenings (operated by the InterNIC) which itself is clipping from nren-discuss (operated by PSI) that gives a run-down on this happy development.

I have also attached information on you can find a copy of the text of H.R. 1757 on the Internet, something we owe to the Computer Professionals for Social Responsibility (CPSR).

Thank you for your expressions of support for this crucial piece of legislation. I am sure that these expressions made an important difference in how members of the House viewed and disposed this matter.

The ball is now in the Senate and it is called S. 4. I'll send along information about that game as soon some of the preliminary work on S. 4 has been completed.

Good news on a friday!/? Thanks again. Best.

Paul Evan Peters
Executive Director
Coalition for Networked Information
21 Dupont Circle
Washington, DC 20036
Voice: 202-286-5098
Fax: 202-872-0884
Internet: paul@cni.org

REPORT ON THE PASSAGE OF H.R. 1757

The House of Representatives voted on Monday (7/26) to approve HR 1757. Here's the basic vote breakdown:

CONGRESS: 103 SESSION: 1
ROLL CALL NUMBER: 365
VOTE DATE: 07-26-93 2:48 PM
RESULT: Passed
BILL-AMEND NO: H.R. 1757
SPONSOR: Boucher

QUESTION: On motion to suspend the rules and pass the bill, as amended

TITLE: to provide for a coordinated federal program to accelerate development and dissemination of applications of high performance computing and high-speed networking, and for other purposes

	Y	N	PRESENT	NOT VOTING
DEMOCRATIC	227	1	0	29

REPUBLICAN	98	60	0	18
OTHER	1	0	0	0
TOTAL	326	61	0	47

(To pass under "suspension of the rules," a bill must get the votes of two-thirds of the members present and voting.)

WHERE TO FIND THE TEXT OF H.R. 1757 ON THE INTERNET

The revised version of HR1757, the national information infrastructure bill introduced by Rep. Boucher is now available on the CPSR Internet Library. FTP/WAIS/GOPHER to cpsr.org /cpsr/nii/hr1757_july_1993.txt. if you do not have ftp/wais/gopher, email listserv@cpsr.org with the word "help" as the body of the text.

===== END ATTACHMENT 1 =====

ARMS Email System
RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: David Lytel (1=US@*RFC-822\DLYTEL(A)OSTP.EOP.GOV@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

CREATION DATE/TIME:04-AUG-1993 00:53:00.00

SUBJECT: Online HR1757, The National Information Infrastructure Bill Where to fin

TO: ACE (1=US@*RFC-822\ace-mg(a)esusda.gov@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:

RFC-822-Headers:

Received: from esusda.gov by sprintf.merit.edu (5.64/1123-1.0-X.500)

id AA06124; Tue, 3 Aug 93 18:20:44 -0400

Received: from [128.150.11.1] by esusda.gov with SMTP (AIX 3.2/UCB 5.64/26-cef)

id AA17319; Tue, 3 Aug 1993 18:18:28 -0400

Received: by notel.nsf.gov id AA28386

(5.65c/IDA-1.4.4 for ACE <ace-mg@esusda.gov>); Tue, 3 Aug 1993 18:22:11 -0400

Mime-Version: 1.0

Content-Type: TEXT/PLAIN; charset=US-ASCII

===== ATTACHMENT 1 =====

ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:04-AUG-1993 00:52:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:

FYI...

----- Forwarded message -----

Date: Mon, 2 Aug 1993 16:18-0400

From: "John C. Mallery" <jcma@reagan.ai.mit.edu>

To: futures@lex-luthor.ai.mit.edu

Subject: Online HR1757, The National Information Infrastructure Bill Where to find the Boucher bill online

Date: Mon, 26 Jul 1993 17:05:25 CDT

From: Dave Banisar <cpsr@access.digex.net>

To: Multiple recipients of list GOVDOC-L <GOVDOC-L@PSUVM.PSU.EDU>

Subject: hr1757

The revised version of HR1757, the national information infrastructure bill introduced by Rep. Boucher is now available on the CPSR Internet Library. FTP/WAIS/GOPHER to cpsr.org /cpsr/nii/hr1757_july_1993.txt. if you do not have ftp/wais/gopher, email listserv@cpsr.org with the word "help" as the body of the text.

Dave Banisar
CPSR Washington Office

===== END ATTACHMENT 1 =====

**Clinton Presidential Records
Automated Records Management System
[EMAIL] and Tape Restoration Project [Email]**

This is not a presidential record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

This marker identifies a responsive email, already made available within another collection.

Collection: 2007-0143-F

Bucket: Default

Creation Date: 1993-09-15

Subject: National Information Infrastructure Document
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Creator: Everett Dowd 1=US@*RFC-
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@MRX@EOPMRX DEFAULT

ARMS Email System

RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: John C. Mallery (1=US@*RFC-822\JCMA(A)REAGAN.AI.MIT.EDU@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)

CREATION DATE/TIME:10-JAN-1994 07:05:00.00

SUBJECT: National Information Infrastructure Advisory Council

TO: UNKNOWN (1=US@*RFC-822\luthor.ai.mit.edu@3=INTERNET@2=TELEMAIL@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TEXT:

URL: gopher://ntiaunix1.ntia.doc.gov/00/press/pradvcou.asc

FOR IMMEDIATE RELEASE: CONTACT CAROL L. HAMILTON
JANUARY 6, 1994 202-482-6001

U.S. SECRETARY OF COMMERCE RONALD H. BROWN ANNOUNCES MEMBERS OF NATIONAL INFORMATION INFRASTRUCTURE ADVISORY COUNCIL

NEW YORK CITY, NY (JANUARY 6) -- Secretary Ronald H. Brown, speaking before some 200 leaders of the communications industry, announced a 27-member National Information Infrastructure Advisory Council (see below).

At the same time, Brown unveiled the Clinton administration's plans to ensure a competitive environment for technological innovation that simultaneously will provide public access and universal service along the nation's "information superhighway."

Both President Clinton's Information Infrastructure Task Force, chaired by the Commerce Secretary, and the private sector advisory council, appointed by Brown, were created to facilitate public and private sector input to the Administration on how best to put the new infrastructure in place.

Together, the public-private partnership will serve as a forum to articulate, coordinate and implement the NII by developing comprehensive telecommunications and information policies to best meet the needs of both government and the private sector. These recommendations will ultimately lead to the removal of most judicial and legislative restrictions on all types of telecommunications companies.

The administration-supported National Information Infrastructure (NII) will be built by the private sector at an estimated cost of

between \$50 and \$100 billion over the next 10 years. The federal government is investing about \$1.2 billion a year to promote the development and deployment of the information technology needed for NII.

As envisioned by the Clinton administration, the NII will consist of thousands of interconnected, interoperable information networks; computer systems, televisions, fax machines, telephones and other 'information appliances'; software, information services and information data bases; and trained people who can build, maintain and operate these systems.

Suggesting that "in the 21st century, information will be the 'coin of the realm,'" Brown said "information will create new jobs and new markets, spur economic growth and increase competitiveness, and democratize information, giving all Americans access to the information they want and need." NII will ensure that in the future, all Americans will be able to get the information they need, where and when they need it, for an affordable price.

Members of the new 28-member advisory council follow:

1. Craig Fields, MCC
2. Mitch Kapor, Electronic Frontier Foundation
3. Bob Kahn, Corporation for National Research Initiatives
4. Delano Lewis, National Public Radio
5. Robert Johnson, Black Entertainment Television /
District Cablevision
6. Nathan Myhrvold, Microsoft Corp.
7. Susan Herman, Dept. of Telecommunications, City of Los Angeles
8. Bonnie Bracey, VA, elementary school teacher
9. Joan Smith, Oregon Public Utility Commission
10. Jane Smith Patterson, Advisor to the NC Governor
11. Toni Bearman, Library Sciences Dean, U. of Pittsburgh
12. James Houghton, Corning
13. George H. Heilmeier, Bellcore
14. Morton Bahr, Communications Workers of America
15. Edward McCracken, Silicon Graphics
16. Bert Roberts, MCI
17. Alex Mandl, AT&T
18. Stanley Hubbard, Hubbard Broadcasting
19. John Cooke, Disney Channel
20. Esther Dyson, Edventure
21. Haynes Griffin, Cellular Systems Inc.
22. John Sculley, Spectrum Information Technologies
23. Lynn Forester, FirstMark Holdings, International and TPI
Communications International
24. N.M. (Mac) Norton, Jr., Wright, Lindsey & Jennings
25. Vance Opperman, West Publishing
26. Deborah Kaplan, World Institute on Disability
27. Carol Fukunaga, Hawaii State Senator

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RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

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CREATION DATE/TIME:27-JAN-1994 19:08:00.00

SUBJECT: 1994-01-25 National Information Infrastructure: Key Issues (fwd)

TO: Dorotinsky (DOROTINSKY_W@A1@CD) (OMB)
READ: UNKNOWN

CC: Blickstein (BLICKSTEIN_J@A1@CD) (OMB)
READ: UNKNOWN

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Received: from netcom6.netcom.com by sprintf.merit.edu (5.64/1123-1.0-X.500)
id AA07311; Wed, 26 Jan 94 23:01:14 -0500
Received: from localhost by mail.netcom.com (8.6.4/SMI-4.1/Netcom)
id UAA09870; Wed, 26 Jan 1994 20:01:54 -0800
X-Mailer: ELM [version 2.4 PL23]
Mime-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Content-Length: 45159

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ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:27-JAN-1994 19:08:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:
Forwarded message:
From fairness@mainstream.com Wed Jan 26 00:36:06 1994
Date: Wed, 26 Jan 1994 00:22:20 -0500
Message-Id: <19940125214328.3.MAIL-SERVER@CLINTON.AL.MIT.EDU>
Errors-To: craig@Mainstream.com
Reply-To: fairness@Mainstream.com
Originator: fairness@mainstream.com
Sender: fairness@Mainstream.com
Precedence: bulk
From: The White House <75300.3115@compuserve.com>
To: mdost@netcom.com
Subject: 1994-01-25 National Information Infrastructure: Key Issues
X-Listprocessor-Version: 6.0b -- ListProcessor by Anastasios Kotsikonas
X-Comment: Fairness issues related to government

What It Takes To Make It Happen:
Key Issues For Applications Of The
National Information Infrastructure

Committee on Applications and Technology

Information Infrastructure Task Force

January 25, 1994

This paper is intended for public comment and discussion. Your comments can be sent to any of the following addresses:

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THE COMMITTEE ON APPLICATIONS AND TECHNOLOGY

This issue paper was prepared by the Committee on Applications and Technology of the Information Infrastructure Task Force (IITF) in support of the President's action plan for developing, in partnership with the private sector, an advanced information infrastructure for our country -- the National Information Infrastructure. The Committee is charged with coordinating Administration efforts:

- to develop, demonstrate, and promote applications of information technology in manufacturing, electronic commerce, education, health care, government services, libraries, and other areas, and
- to develop and recommend technology strategy and policy to accelerate the implementation of the NII.

The Committee works with the Subcommittee on High-Performance Computing and Communications and Information

Technology, which was established as part of the Federal

Coordinating Council for Science, Engineering and Technology to coordinate the development of new information technologies. The Committee on Applications and Technology also is responsible for implementing many of the recommendations of the Vice President's National Performance Review that pertain to information technology.

ABSTRACT

This paper highlights important issues that need to be addressed in the development, demonstration, and promotion of applications for the National Information Infrastructure (NII).

The paper is intended for three important audiences: the public, the committees and working groups of the Information Infrastructure Task Force (IITF), and other agencies and departments in our government.

The goal is to identify and describe the issues so they can be considered and discussed by these audiences, leading to their eventual resolution. Some of these issues, such as privacy, intellectual property rights, information security and the scalability of projects are already being addressed by the committees and working groups of the IITF. Others, such as user acceptance and organizational learning, still need to be addressed by the IITF in order to allow the private/government partnership to evolve and to work together to build and shape the National Information Infrastructure.

GLOSSARY

Term	Definition
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CTI	Critical Technologies Institute
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ED	Department of Education
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FCCSET	Federal Coordinating Council for Science, Engineering and Technology
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HHS	Health and Human Services
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HPCCIT	High-Performance Computing and Communications and Information Technology
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ISDN	Integrated Services Digital Network
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IITF	Information Infrastructure Task Force
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LOC	Library of Congress
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NII	National Information Infrastructure
-----	-------------------------------------

NIST	National Institute of Standards and Technology
------	---

NOAA	National Oceanic and Atmospheric
------	----------------------------------

Administration
NSTC National Science and Technology Council
OMB Office of Management and Budget

OSA Open Systems Architecture
PTO Patent and Trademark Office
TVA Tennessee Valley Authority
USDA United States Department of Agriculture
USPS United States Postal Service

ACKNOWLEDGMENTS

The following people have provided the time, effort and expertise to develop this paper on behalf of the Committee on Applications and Technology.

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KEY ISSUES FOR NII APPLICATIONS

The publication of the Agenda for Action on the National Information Infrastructure (NII)1 in September 1993 greatly heightened the level of public debate on information technology and social change.

That and other white papers, studies, and commentaries dramatically sketched a vision of the near future, in which a web of advanced communications networks and computers would bring vast amounts of information and greatly improved services to the homes of virtually every citizen - if we as a nation properly manage the technology.

With this paper, the Committee on Applications and Technology of the President's Information Infrastructure Task Force proposes a basic set of critical issues which our nation will face as the NII evolves. Our perspective in selecting these issues is that of applications that will use the NII.

The reasons for taking this perspective - indeed, for creating this Committee - are grounded in the unique role the Federal government plays in the development of the NII.

The National Information Infrastructure is not a cliff which suddenly confronts us, but rather a slope - and one society has been climbing since postal services and semaphore networks were established. An information infrastructure has been with us for a long time, continuously evolving with each new advance in communications technology. Why the sudden debate?

Change is coming much faster, and more thoroughly, than ever before. In our lifetimes we will see information technology bring more changes to more aspects of our daily lives than have been witnessed in the preceding century. Digital technology is merging

the functions of television sets, telephones, and computers. Fundamental changes are in store for us in the ways we work, learn, shop, communicate, entertain ourselves, and get health care and public services. And those are just the applications we can foresee.

Private industry will be responsible for virtually every major facet of the NII and the information marketplace it

creates. Private industry will build and manage the networks, provide the information tools and much of the information that travels the networks, and develop the many of the applications that use the networks.

But government remains a major participant in the NII. One reason is obvious - government policies are a major force in the information infrastructure. One of the principal goals of the Information Infrastructure Task Force is to develop and foster informed government policy that promotes our societal goals for the NII without unnecessarily hampering industry.

As Vice President Gore has observed, "Our goal is not to design the [information] market of the future. It is to provide the principles that shape that market. And it is to provide the rules governing this difficult transition to an open market for information. We are committed in that transition to protecting the availability, affordability and diversity of information and information technology as market forces replace regulations and judicial models that are simply no longer appropriate."²

Less obvious, however, is the fact that government plays a major role in the development of NII applications:

As one of the nation's biggest users of information technology, the government develops NII applications to speed and improve the delivery of its services. Examples include making social security payments by computer or disseminating census data.

Government research agencies play a national role in R&D for the information infrastructure. This research often includes the development of prototype applications as a proof of concept, or to help speed the development of useful applications by the private sector. Examples include work on advanced medical information applications, work on NII tools for educators, and research on advanced manufacturing applications using computer networks.

The Committee on Applications and Technology was created in part to provide a forum for discussing and coordinating the host of applications efforts across the Federal government. So pervasive is the NII and the issues it represents that virtually every department and function of government is involved.

The Committee's goal is to encourage Federal researchers working on NII applications to view their work in the greater context of the NII as a whole, and to:

- promote the sharing of information among Federal agencies developing NII applications;
- highlight opportunities for cooperative efforts between

Federal agencies and between government and industry;
and
promote discussion of critical technical and social
issues in the development of the NII that affect the
development and use of advanced NII applications.

Viewing the development of the NII from an applications
perspective is important for the lessons we learn about the
practical effects of complex issues such as intellectual property
rights, privacy, and equitable access. Building applications for

real users is a powerful tool for rooting out the bugs in the
system.

The Committee has selected seven major application areas for
initial study:

- libraries,
- education,
- manufacturing,
- electronic commerce and telecommuting,
- environmental monitoring,
- health care, and
- government services.

These are not all-inclusive, but they span a broad and useful
range of social objectives.

Viewing the NII from these seven application areas, we have
identified 16 issues for debate and resolution. For convenience
and clarity, we can group these issues by those that primarily
are concerned with people, the users of the NII; those concerned
with information, the commodity of the NII; those concerned with
software, hardware, and networks, the media of the NII; and those
concerned with financing the NII:

People issues:

- Providing equitable access to the NII
- User acceptance of NII applications
- Privacy safeguards
- User training
- "Organizational learning" of the new paradigms and
organizational structures needed to take maximum
advantage of the NII
- Private sector acceptance of government-developed
applications technology

Information issues:

- Intellectual property rights
- Information security
- Information access
- Information and data standards
- Information conversion from "old" storage to NII media

Software, hardware, and network issues:

- "User-friendly" hardware and software
- Interoperability standards
- Scalability

Finance issues:

- Cost and pricing

Funding

In the following sections we discuss these application areas and issues in greater detail. Note that this paper only provides descriptions of these issues as a stimulus to further debate. We by no means intend to imply that these are all the important issues. We also do not wish to imply that government should or ought to be involved in the resolution of every single one of these issues.

We welcome your comments.

THE APPLICATIONS PERSPECTIVE: A FRAMEWORK FOR ADDRESSING NII ISSUES

One of the important lessons of the "applications perspective" is the need to consider critical NII implementation issues in the context of the whole. Things are connected, interdependent. Issues tend to cut across several applications; applications tend to depend on several critical issues.

The applications perspective provides a framework for debating these issues. In the following analysis, we attempt to catalog how each issue affects the applications areas from our initial list, consider how important such issues may be in achieving the societal goals that each application supports, and identify missing issues.

The Committee on Applications and Technology includes representatives from most agencies that are involved in developing and using NII applications. The following discussions reflect hands-on experience.

The following table summarizes our initial analysis. In this table, designates an issue that is particularly important for the application area in question; designates an issue that is critical for the given application area. Note that most of these issues are cross-cutting and affect several applications areas. Some, however, appear to be particularly important for specific applications areas; in short, they are critical issues that have to be resolved for any progress to be made in those areas.

NII ISSUES AFFECTING SPECIFIC APPLICATION AREAS

ISSUES	Health	Environ-	Manufac-	Elect.
Gov.	Education	Libraries		

Care mental turing Comm. &
Services n s
Monitoring Telecom-
ng muting

People

Equitable Access

User Acceptance

Privacy

User Training

Organizational

Learning
Private Sector

Acceptance

Information
Intellectual Property

Information Security

Information Access

Information and Data

Standards
Information

Conversion

Software,
Hardware, &
Networks
User-Friendliness

Interoperability

Standards
Scalability

Other
Cost & Pricing

ISSUES THAT CUT ACROSS APPLICATIONS AREAS

We discuss cross-cutting issues in this section and critical issues in the section that follows.

PROVIDING EQUITABLE ACCESS

Providing equitable access is important for many of the applications areas considered. This issue includes access to other individuals and citizen groups via the NII as well as access to information. For health care, it is important that all medical providers (doctors, hospitals and clinics, for example) have access to health care information, and colleagues, on the NII. For education and for libraries, all teachers and students in K-12 schools and all public libraries - whether in urban, suburban or rural areas; whether in rich or in poor neighborhoods - need access to the educational and library services carried on the NII. All commercial establishments and all workers must have equal access to the opportunities for electronic commerce and telecommuting provided by the NII. Finally, all citizens must have equal access to government services provided over the NII.

USER ACCEPTANCE

User acceptance will be an important issue in NII, particularly in applications areas that extend computer-based information services to new groups of users who have been noticeably "computer-skeptical" in the past (e.g., shop floor workers and doctors) or who simply will not be inclined to learn obscure or non-intuitive rules simply to interact with computers. National jokes about the notorious difficulty of programming video recorders provide a cautionary parable in user acceptance.

PRIVACY

Privacy will be an important issue in those applications areas involving sensitive information about individuals or

organizations.³ This area includes health care (individual medical records), government services (income tax returns, for example), and education (grades of individual students or teacher evaluations, for example.)

While privacy concerns in these areas are easily appreciated, other less apparent areas are affected as well. For example, while library patrons increasingly accept materials in digital form accessed over networks, such acceptance is still far from universal. Some users are concerned that the use of electronic technology provides an easy way to monitor what people are reading and researching. Assurances that the kind of information people access in libraries is a private matter and protections for that privacy will be necessary to allay such concerns.

USER TRAINING

User training -- learning how to use the new technologies and applications -- will require new approaches in the workplace, the classroom, and the home. Understanding the user education and training requirements of advanced NII applications is a challenge in itself; for example, education may not take place in the traditional classroom. Given the public benefits of this learning, it is likely that the government will need to provide resources for both basic and applied research as well as providing financial assistance to those who provide education and training.

ORGANIZATIONAL LEARNING

Organizational learning closely parallels user acceptance and training. Many applications will involve the development of new paradigms for doing the job and will require re-engineering the business or mission (electronic commerce and telecommuting, or K-12 education, for example.)

New ways of functioning, distinctly different from current practices, will be required to achieve the greatest benefits from NII applications in many areas. These new ways -- for what constitutes the "classroom" in education, what goes on in it, and what is the role of the teacher; for what constitutes the workplace; and for the conduct of commerce -- will require a large degree of organizational learning. This learning will not always be easy to achieve: it will result in new roles and missions for many people; it will require retraining of individuals, some with professional and career skills learned over a lifetime, so that they will be more able make the transition to the workplaces of the Information Age.

PRIVATE-SECTOR ACCEPTANCE

OF GOVERNMENT TECHNOLOGY

Private-sector acceptance by service providers and vendors of the results of government-sponsored research is an important issue if the nation is to reap the benefits of the government's investment in new NII applications and services. Much of the NII technology that initially will be developed as part of government-

sponsored programs could later be adopted by the private sector if the needs of the private sector are properly integrated in the development stage. The success of a new applications generally requires substantial user involvement in planning, decision-making and development. In developing new technologies and accelerating the implementation of NII applications, the government must work closely with those who will eventually provide and vend NII applications to ensure compatibility, interoperability, and usability. This is especially true in health care, environmental monitoring, manufacturing, and electronic commerce and telecommuting, where the federal

government is promoting applications which will be offered primarily by the private sector.

INTELLECTUAL PROPERTY RIGHTS

Intellectual property rights is an important issue in those areas where individual intellectual creations (books, music, software) are accessible - and subject to copying - by many people via the NII. Libraries are the most obvious area where this is a concern, but other application areas such as education and government services also are involved. Ensuring that the creators of this material can be compensated for their work while still providing for public "fair use" under the proper circumstances will be a key determinant of the quality and availability of informational goods and materials through the NII.

INFORMATION SECURITY

Information security - which includes confidentiality, information integrity, and information authenticity⁴ - is an important issue in all of the applications areas considered here, in view of the many potential threats posed to the security of inter-linked information systems by malicious pranksters or criminals skilled in computer use. For example, it will be important in the health care area that individual medical records are not stolen or surreptitiously modified via the NII; it will be important in the manufacturing, electronic commerce, and telecommuting areas that proprietary information belonging to individual companies is adequately protected; and it will be important for environmental monitoring so that severe weather warnings and toxic release alerts are not compromised.

INFORMATION ACCESS, STORAGE, AND RETRIEVAL

Flexible and timely access to all of the information

resources

contained in the NII - the knowledge of what information is available,

where it is, and how to get it in a timely fashion and in a useful

form - is important. This access requires that the information not

only be available, but it must also be maintained and kept current.

Access to timely, useful information is especially important in applications areas such as manufacturing, libraries, and environmental

monitoring, where large quantities of data must be sorted, stored,

retrieved, and managed.

INFORMATION AND DATA STANDARDS

The development and implementation of standards for information and data are essential to ensuring that information passed from one point to another along the NII is complete,

unambiguous, and, most importantly, usable.⁵ While data standards are critical, the technical connectivity they enable is not enough. Without information standards, companies cannot exchange information in a useful manner. This is true at both the national and international level. One of the major challenges in this area is developing ways to define these standards so the same data can be used throughout the life cycle of the product, from design through retirement/recycling.

CONVERSION OF INFORMATION

Conversion of information from "old" storage media (books, drawings, and pictures, for example) to NII electronic storage media will be an important issue in all applications areas possessing a large legacy of pre-NII information. This area includes libraries (everything that has been written since the dawn of recorded history), health care (the existing medical records of patients), and government services (patents, for example). It may include other applications areas as well, although the importance of conversion fades as information ages in many areas, in distinct contrast to the situation in libraries.

USER-FRIENDLY HARDWARE AND SOFTWARE

User-friendly hardware and software always have been important

for mass applications of information technology. For NII applications,

such as those in health care or education, that are meant for use by

broad segments of society user-friendliness will be an important factor in user acceptance. But the impact of user-friendly systems

goes beyond simple convenience and marketing to serious questions of accuracy and reliability. User-hostile systems encourage mistakes in using applications, and errors in the information handled by the system.

INTEROPERABILITY STANDARDS

Interoperability standards are designed to ensure that information can be transferred between different networks, or different hardware and software systems, with accuracy, reliability and security - the system side of the information standards issue discussed above. Interoperability standards are important to virtually all NII applications, and critically important to those that must function across a range of disparate systems, in manufacturing, health care and education, for example.

There are many unresolved questions regarding interoperability standards, such as the best mechanism for developing good standards that will be widely accepted by NII users and vendors. In some areas, such as manufacturing, it is important that new standards be compatible with the large

existing base of installed systems and archived data. As with all standards-related issues, it will be important to develop standards that are flexible enough to adapt to future changes in technology and permit systems to upgrade at an affordable cost.

SCALABILITY

Scalability will be an issue in all NII applications that are developed initially as small pilot projects, later to be extended to widespread use. For example, in education, demonstrations of attractive technology applications have required highly skilled people, dedicated projects, and special funding. Scaling from a few demonstration schools to every school will require the application to perform as well with dramatically lower resources of skills and funding. Successful scale-up requires substantial user involvement in planning, decision-making and development of both the full scale systems and the pilot and demonstration forerunners. Similar problems face all seven of the applications areas considered here, but scaling will be particularly challenging for wide-spread application areas such as education, libraries, health care and manufacturing.

COST AND PRICING

Cost and pricing - how much a new application costs, how much the user is charged for the service, and who pays any difference between cost and price - will be key issues in nearly all NII applications areas.

Like information products and services generally, most NII applications will have high initial development costs and low replication or usage costs. As a result, it can be economically efficient as well as socially beneficial to maintain low prices

for applications to stimulate their use, so long as the operating costs for each new user are recovered. However this approach can result in prices that differ from the real costs and applications developers - both public and private - must recover their initial costs as well as the costs of serving users through some combination of higher prices or subsidies.

PUBLIC FUNDING

Closely related to costs and pricing issues are questions of how public funding should be used for the development and deployment of new applications. In some application areas, such as education, relatively large amounts of government assistance probably will be required to implement NII applications equitably, since funding to acquire new technology is limited in most school systems.

Just as potential NII applications exist in virtually every department of government, so calls for taxpayer assistance in the implementation of those applications will come from every quarter and constituency. How the limited Federal and state resources will be allocated - indeed, how those decisions will be made - are crucial questions for every level of government.

CRITICAL ISSUES IN KEY APPLICATION AREAS

The issues discussed above are all important to the success of NII activities developing and deploying applications in the application areas identified. In some of these areas, certain of the issues are critical. (These are identified by the in the table on page 6.) These critical issues, if not handled properly, could prevent successful development and deployment of the NII activities in question.

These critical issue/applications area combinations include:

PRIVACY IN HEALTH CARE

Privacy of personal data will be absolutely essential in health-care applications, a task complicated by the fact that many different parties - insurance companies and medical researchers, for example - will need automated access to at least some portions of individual patient data. The privacy of that data must be assured, and threats to that privacy exist today. In the automated health care information system envisaged in the Administration's proposed health care reform proposal and in the NII, the opportunities for violations of this privacy may be

vastly increased.

ORGANIZATIONAL LEARNING IN COMMERCE AND EDUCATION

In the early days of the development of the telephone, some observers noted that the new invention was so clearly useful that in the future every city would need to have one to bring news quickly to the citizenry. What they did not recognize was that the telephone brought with it a fundamental change in communication. Old, highly centralized systems and institutions developed to handle the post and telegraphy weren't appropriate for the new invention and couldn't use it to the best advantage.

The NII brings with it a fundamental change in how information moves and is handled. In the application areas of education and commerce in particular, this change will require new ways of functioning - distinctly different from current practices - to achieve the greatest benefits from the NII.

Restructuring systems and organizations to take maximum advantage of NII applications without impairing the effectiveness of the organization as a whole will require a large degree of learning and adaptation on the part of the institution. New ways of doing the job will be markedly different from past practices and may require significant investments in professional development and training because individuals (teachers for example) play key roles in these applications areas.

INFORMATION AND DATA STANDARDS IN MANUFACTURING

Manufacturing is driven by the need to produce high-quality, competitively priced goods, tailored to customers' needs, quickly. This cannot occur without the ability to exchange manufacturing information and data across activities inside and outside an organization in a timely and useful manner. Moreover, such advanced manufacturing applications as concurrent engineering and agile manufacturing cannot take place without the development and implementation of standards for the exchange of manufacturing information and data.

Already, US manufacturers and the federal government have begun the process to jointly create a standard for the exchange of product model information (STEP). Such a standard will give small and large manufacturers the ability to expand and integrate their operations and enable the introduction of advanced manufacturing applications such as concurrent engineering and agile manufacturing into the American workplace.

Additionally, for the NII to be a reality, communications data standards for interoperability must be established. Significant progress has been made in this area through efforts such as Open Systems Architecture (OSA) and the Integrated Services Digital Network (ISDN). As NII applications and technologies advance, the development, design, and implementation of interoperability standards will need to keep pace. This need is particularly acute in manufacturing and electronic commerce.

CONVERSION OF INFORMATION IN LIBRARIES AND ARCHIVES

The bulk of the material in our nation's libraries (e.g., 100 million items in the Library of Congress) is not in digital form. Without conversion of at least selected parts of these collections, they will never be accessible over the NII. Although the technologies for producing these conversions are in many cases available and constantly improving, the costs are not trivial and so the sources of funding for the digitization of non-commercial, non-entertainment materials and which materials should receive priority are open issues.⁶

WORK-IN-PROGRESS: IMPORTANT ISSUES ALREADY ADDRESSED BY THE IITF

The IITF already has noted and organized itself to address several of the important issues on our list. In particular, the Committee on Applications and Technology has formed a Technology Policy Working Group to address the issues of interoperability and scalability, and working groups have been formed as part of the Information Policy Committee and the Telecommunications

Policy Committee to address intellectual property rights, privacy, and universal access.

We strongly endorse these efforts. The balance of the issues present in this review include questions which cut across all areas of applications development, technology policy, information policy and telecommunications policy. We look forward to working with the Information Policy Committee and the Telecommunications Policy Committee to further explore and refine these issues.

NEXT STEPS AND FOLLOW THROUGH

For the IITF to follow through on the remainder of the issues identified in this paper requires at least two steps.

First, the IITF committees and interested individuals and groups from the private sector should review this paper and the issues we have presented to broaden our understanding and perspective. We welcome comments.

Next, the IITF should review the issues reported here, the framework for assessing the issues, and the comments from the private sector and the other committees to decide if its organization is adequately structured to address the key issues. For example, if the categorization of issues outlined here -

according to the components of the infrastructure: people, information, processes (software, especially applications), hardware and networks - is useful, we should consider whether our current IITF structure covering information, telecommunications, and applications and technology adequately addresses people and hardware.

Some steps are already being taken in this direction. A working group of the Committee on Applications and Technology has been formed to address technology policy issues, and the Committee has instituted a public issues discussion program as part of its regular meetings to facilitate a dialog on the issues outlined in this paper.

In closing, we would like to repeat and emphasize the point made earlier. In presenting this issues paper, the Committee on Applications and Technology intends only to describe an initial catalog of critical issues that must be addressed and resolved in the development of the NII. We see this is a starting point for discussion, and not a document to close off discussion of other issues.

Your comments on this paper can be sent to any of the following addresses:

Post: Committee on Applications and Technology
National Institute of Standards and Technology
Building 101, Room A1000
Gaithersburg, MD 20899
Phone: (301) 975-2667
FAX: (301) 216-0529
E-Mail: cat_exec@nist.gov

BIBLIOGRAPHY

Ameritech, Bell Atlantic, et. al., An "Infostructure" for All Americans: Creating Economic Growth in the 21st Century, April 1993.

Baer, Walter S., Government Investment in Telecommunications Infrastructure, RAND, October, 1993.

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Government Roles, An Issues Paper from ITAA, Arlington, VA, July 1993.

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Vice President Al Gore, From Red Tape to Results, Creating a Government that Works Better & Costs Less, Report of the National Performance Review, U.S. Government Printing Office, Washington, D.C., September 7, 1993.

Vision for a 21st Century Information Infrastructure, Council on Competitiveness, Washington, DC, May 1993.

1 The National Information Infrastructure: Agenda for Action, Information Infrastructure Task Force, Washington, D.C., September 15, 1993.

2Speech to the National Press Club, December 21, 1993.

3 Privacy deals with an assurance that no parties authorized access to the information make improper use of it.

4 Confidentiality of information is the assurance that no unauthorized parties have had improper access to the information. Information integrity is the assurance that the content of the information has not been altered. Information authenticity is the assurance that the authorship or source of the information is

as indicated.

5 For the purposes of this paper information standards could be thought of as addressing the question "what information do you need?" while data standards address the question "what form should you expect the information in?"

6 In the 15th century, after Gutenberg's invention of moveable type for printing, mankind faced a similar problem: converting the hand-lettered manuscripts in the libraries of that age to the printed page. At the time, this may have seemed like a major undertaking. Looking back at it today, when the volume of existing printed information - and the capacity for producing printed information - exceeds by many orders of magnitude the volume of hand-letter manuscripts that existed in 1440, it seems like a minor problem. Future ages, in which the volume of digital, multimedia information in library collections exceeds by many orders of magnitude the volume of current printed collections, may have a similar view of today's problem.

--

Michael C. Dost
725 17th Street, N.W.
Washington, DC 20503
(202) 395-4922

===== END ATTACHMENT 1 =====

ARMS Email System
RECORD TYPE: FEDERAL (RECONSTRUCTED EMAIL)

CREATOR: CAREY (STEVE CAREY@5=COMPMAIL@2=TELEMAIL@1=US@MRX@EOPMRX)
(DEFAULT)

CREATION DATE/TIME:27-MAY-1994 15:27:00.00

SUBJECT: Conference Annoucement on National Information Infrastructure

TO: UNKNOWN (1=US@*RFC-
822\iorgs(a)ivory.educom.edu@3=internet@2=telemail@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

TO: UNKNOWN (1=US@*RFC-
822\llorgs(a)ivory.educom.edu@3=internet@2=telemail@MRX@EOPMRX) (DEFAULT)
READ: UNKNOWN

CC: UNKNOWN (1=US@*RFC-822\s.carey(a)ieee.org@3=internet@2=telemail@MRX@EOPMRX)
(DEFAULT)
READ: UNKNOWN

TEXT:
RFC-822-Headers:
X400-Recipients: non-disclosure;;

===== ATTACHMENT 1 =====
ATT CREATOR: UNKNOWN (UNKNOWN)

ATT CREATION DATE/TIME:27-MAY-1994 15:27:00.00

ATT BODY PART TYPE: A

ATT SUBJECT:

ATT TEXT:
WPC>
**** CONFERENCE ANNOUNCEMENT ****

Dear Technology Leader:

The National Information Infrastructure (NII): What
will it be? How will it be used?

These questions flood the media daily. They have no pat
answers, only those which must progressively evolve. As
technologists, industrialists, and professionals, we can
influence this process.

Please join us in the decision-making process on this

timely topic at the annual Technology Policy Council symposium. It is scheduled to take place on June 29 and 30 at MITRE Corporation's Hayes building in McLean, Virginia, near Washington, DC, convenient to both National and Dulles Airports.

Top speakers from industry, government, and academia will focus, with you, on the interplay of the NII's capabilities and applications, since progress in both is essential to bring the NII to maturity. The meeting program is attached.

Our invitation is selective; we have screened IEEE's files for a particular cross section of technology leaders. We would like your personal input to the symposium's expected outcome of developing IEEE-USA policy recommendations to the government. If you are unable to attend, I ask that you pass along our invitation to another technology leader who can bring views on NII and contribute to this important development.

- 2 -

IEEE-USA is working for you on professional and technology policy issues. Space is limited at our National Information Infrastructure symposium. Please respond soon.

Sincerely,

Dr. Charles K. Alexander, Ph.D., P.E.
Chairman, United States Activities Board
and
IEEE Vice President, Professional Activities

Preliminary Program

Institute of Electrical and Electronics Engineers -
United States Activities

TECHNOLOGY POLICY COUNCIL 1994 SYMPOSIUM

"The NII: What Will It Be?
How Will It Be Used?"

Hayes Building
MITRE Corporation
7525 Colshire Drive
McLean, Virginia

June 29-30, 1994

Wednesday, June 29, 1994

8:00 am	Continental Breakfast
9:00	WELCOME Will Stackhouse, Chairman, IEEE-USA Technology Policy Council, & Chairman, IEEE-USA Committee on Communications & Information Policy (CCIP)
9:05	KEYNOTE ADDRESS U.S. Representative Rick Boucher, (D-Va), Chairman, Science Subcommittee, Committee on Science, Space & Technology
9:45	QUESTIONS & ANSWERS
10:00	Break

- 2 -

Wednesday, June 29, 1994 (cont.):

10:30 am - 12:00 Noon LOOKING BACK AND LOOKING AHEAD

Moderator: Michael M. Roberts,
Vice Chairman, Committee on
Communications & Information
Policy

Speakers:
Arati Prabhakar, Director, National
Institute of Standards & Technology

Brian Kahin, Director, Information
Infrastructure Project, Harvard
University

Robert Kahn, President, Corporation

for National Research Initiatives

QUESTIONS & ANSWERS

12:00 - 1:00 pm Lunch

1:00 - 3:00 pm CHALLENGES OF UNIVERSAL SERVICE

Moderator: Laurel Kaleda President, IEEE
Computer Society

Speakers:

Robert Pepper, Chief, Office of
Plans & Public Policy, Federal
Communications Commission

Jerry Berman, Executive Director,
Electronic Frontier Foundation

Eli Noam, Director, Columbia
Institute for Tele-Information,
Columbia University

Ward White, Vice President,
Government & Public Relations, U.S.
Telephone Association

QUESTIONS & ANSWERS

- 3 -

Wednesday, June 29, 1994 (cont.):

3:00 pm - 3:30 pm Break

3:30 - 5:30 OPPORTUNITIES AND OBSTACLES

Moderator: Stephen Weinstein, Vice
President, Technical Affairs,
IEEE Communications Society

Speakers:

Vinton Cerf, Vice President, MCI

Robert Lucky, Corporate Vice
President, Applied Research, Bell
Communications Research

Howard Frank, Special Assistant for
Networking, ARPA, DoD

Richard Green, President and CEO,
Cable Television Labs

QUESTIONS & ANSWERS

5:30 pm DEPART FOR RECEPTION & DINNER
The Marriott Tyson's Corner

6:00 - 10:00 Reception & Dinner

Speakers:

Larry Smarr, Director, National
Center for Supercomputer
Applications

- 4 -

Thursday, June 30, 1994

7:00 am Continental Breakfast

8:00 STRETCHING THE APPLICATIONS TOWARD THE
CAPABILITIES

Moderator: Nahum Gershon, IEEE-USA
Aerospace R&D Policy Committee

Speakers:

8:30 Libraries:
Donald A. Lindberg, Director,
National Coordination Office
for High Performance Computing
& Communications, & Director,
National Library of Medicine

9:00 Manufacturing:
Eugene S. Meieran, Fellow,
Technology/Manufacturing
Engineering, Intel Corporation

9:30 Health Care:
Michael McDonald, President,
Windom Health Enterprises

10:00 Break

10:30 Education:
Barry M. Horowitz, President &

CEO, The MITRE Corporation

11:00 Entertainment:
Richard J. Stumpf, Senior Vice
President for Engineering &
Development, Universal City
Studios

11:30 Panel & Audience Discussion

12:15 pm Michael Nelson, Senior Policy
Analyst, White House Office of
Science & Technology Policy

1:00 CLOSING **Lunch Available in Cafeteria **

IEEE-USA TECHNOLOGY POLICY COUNCIL 1994 SYMPOSIUM

"The NII: What Will It Be?
How Will It Be Used?"

Hayes Building
MITRE Corporation
7525 Colshire Drive
McLean, Virginia 22102

June 29-30, 1994

REGISTRATION FEE: \$ 150.00
(make payable to IEEE)

MAIL CHECK & FORM TO: Mr. Steve Carey
IEEE-USA
1828 L Street, N.W.
Suite 1202
Washington, D.C. 20036

PLACE: MITRE Corporation
Hayes Building
7525 Colshire Drive
McLean, Virginia 22102

ACCOMMODATIONS: Hotel rooms have been reserved for \$99
(single) at: Tysons Marriott Hotel,

8028 Leesburg Pike, Vienna, VA 22182,
(703) 734-3200.

Please reserve by June 8.

IEEE-USA TECHNOLOGY POLICY COUNCIL 1994 SYMPOSIUM

"The NII: What Will It Be?
How Will It Be Used?"

Hayes Building
MITRE Corporation
7525 Colshire Drive
McLean, Virginia 22102

June 29-30, 1994

REGISTRATION FORM

Name:

Title:

Organization:

Mail Address:

Telephone #:

Fax #:

E-mail:

Please return completed form with \$ 150.00 registration fee
payable to "IEEE" to:

Mr. Steve Carey
IEEE-USA
1828 L Street, N.W., Suite 1202
Washington, DC 20036
(202) 785-001

===== END ATTACHMENT 1 =====

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
001. email	From: Albert Seferian To: JONES_R Re: LRM 5340 S982 National Information Infrastructure Act [Personal Information] [partial] (1 page)	08/19/1996	b(6)

COLLECTION:

Clinton Presidential Records
Automated Records Management System [Email]
Default ([Digital Divide...])
OA/Box Number: 1100000

FOLDER TITLE:

[04/07/1993 - 10/07/1998]

2019-0203-F

jn722

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

ARMS Email System

RECORD TYPE: FEDERAL (NOTES MAIL)

CREATOR: Albert Seferian (CN=Albert Seferian/OU=OMB/O=EOP [OMB])

CREATION DATE/TIME:19-AUG-1996 10:55:55.00

SUBJECT: LRM 5340 S982 National Information Infrastructure Act

TO: JONES_R (JONES_R @ A1 @ CD @ LNGTWY [EOP]) (OA)

READ:UNKNOWN

CC: Debra L. Williams (CN=Debra L. Williams/OU=OMB/O=EOP @ EOP [OMB])

READ:UNKNOWN

CC: Robert B. Rideout (CN=Robert B. Rideout/OU=OMB/O=EOP @ EOP [OMB])

READ:UNKNOWN

TEXT:

No comment.

[001]

Ron - Claire Jacobi [(b)(6)]. Please send anything regarding her EXOP accounts to me, and anything on Postal to Doug McCormick.

Thanks.

ARMS Email System

RECORD TYPE: FEDERAL (NOTES MAIL)

CREATOR: ciocouncil.support@GSA.GOV (ciocouncil.support@GSA.GOV [UNKNOWN])

CREATION DATE/TIME:26-JUN-1997 22:25:25.00

SUBJECT: National Information Infrastructure

TO: CIO-COUNCIL@WWW.GSA.GOV (CIO-COUNCIL@WWW.GSA.GOV [UNKNOWN])

READ:UNKNOWN

TEXT:

NOTE TO THE CIO COUNCIL

FROM: Jasmeet Seehra

RE: Paper on Options for Promoting Privacy on the National Information
Infrastructure

Please be aware that OMB has extended the period for public comment on this paper by two weeks. Comments are now due by July 11, 1997, to Maya Bernstein at OMB at bernstein_m@al.eop.gov or fax 202-395-5167. The paper can be found on the public section of the CIO Council homepage. Please contact Ms. Bernstein at 202-395-4816 with any further questions.

ARMS Email System

RECORD TYPE: FEDERAL (NOTES MAIL)

CREATOR: BBracey <BBracey@AOL.COM> (BBracey <BBracey@AOL.COM> [UNKNOWN])

CREATION DATE/TIME:21-APR-1998 20:27:49.00

SUBJECT: Re: equity issues and the academic digital divide- solutions?We know the problem

TO: UPFORGRABS-L@CDINET.COM (UPFORGRABS-L@CDINET.COM [UNKNOWN])

READ:UNKNOWN

TEXT:

We all know that there is a digital divide..the economic digital divide
cited

in www.rand.org, and this one that affects those who attend our colleges.

What

is to be done? This is a good time to share ideas. One factor is the
preparation and knowledge of the teaching force. www.nfie.org Teachers Take
Charge of their Learning.

DIGITAL DIVIDE... we have forever been creating problems

"American Indian youth used to have to leave the reservation to attend a
school which did not honor their culture. That was more than a digital
divide.Even today, there are Indian areas which are redlined.. no telephone
service exists for them."

** Education ** Perhaps the professor can help us out, his area of the
world

is in leadership for teacher training.It is wonderful, that there are new
educational infrastructures, helping to define and solve educational
problems

from different perspectives. Vouchers for agents of change to some
universities might create some of the modeling that is needed for
transformational change.

Title: Undergraduate Education is Lacking, Report Finds

Source: New York Times (A12)

<<http://www.nytimes.com/yr/mo/day/news/national/undergrads-report.html>>

Author: Karen W. Arenson

Issue: Education

Description: According to 'an unusually candid' report from the Carnegie
Foundation for the Advancement of Teaching, the acclaimed research
universities of the United States are "shortchanging" their undergraduate
students, particularly freshman. The report, by a 11-member commission
whose

members included officials of research universities, said that more
university undergraduate classes are being taught by graduate assistants
and

universities failed to provide students with "a coherent body of knowledge"
by the time they graduated. The report says that there is a "longstanding
division between research and teaching that should be ended and that
universities should involve undergraduates in research beginning in the

freshman year." "What we need to do is create a culture of inquirers, rather than a culture of receivers," said Shirley Strum Kenny, the president of the State Univ. of New York at Stony Brook and chairwoman of the commission that wrote the report. The report titled, "Reinventing Undergraduate Education: A Blueprint for America's Research Universities," is scheduled to be released today.

This in addition to the www.ncate.org This is just a SMALL byte...

Some schools of education are in the vanguard of introducing technology into teacher preparation. Many are featured in this report. Yet most schools of education have not yet fully integrated technology into their programs for preparing teachers. There is a long road ahead.

Two million new teachers will be hired over the next decade. Will these new teachers be comfortable and skilled in using technology? What will it take to transform schools of education so that faculty feel comfortable e-mailing students, using listserves for projects and instruction, and introducing candidates to software that enhances instruction? As technology moves from the periphery to the center in P-12 schools, so must it move from the periphery to the center in teacher preparation.

This report is the culmination of a year of deliberations by NCATE's Task Force on Technology and Teacher Education. NCATE commissioned the task force to help guide the development and implementation of technology expectations for teacher candidates and for accredited schools of education, and to guide the organization's use of technology in the accreditation process.

It is impossible to deny the tremendous effect rapid technological growth has had on our society. This explosion of new technologies has changed the way we live - from the way we do business to the way we communicate with each other. Technological advancements are also affecting the way we teach and learn.

The business world demands that our schools prepare educated workers who can use technology effectively in the global marketplace. The president and vice president of the United States, governors, state legislatures, and other policy-making groups are increasingly convinced that technology is a central

element of educational reform and improved student learning.

New skills needed in the workplace are catalysts that spur technology use in the classroom. Computer to student ratios have declined steadily from 50:1 in 1985 to 20:1 in 1990 to an estimated 9:1 in 1997, affecting traditional classroom practice and even the culture of the schools.

****What about the digital divide in teacher training as well?
Who gets the BEST teachers?Why?
How can the universities assist the learning communities, poor and rich?
What best practices can they share?Fortunately, or unfortunately the schools with computers may also have teachers who don't know how to use them, and do not invest in teaching teachers to use the hardware that is purchased for them.The communities seem to do better work in CTC's than the schools do because of the time and interest factor. The community projects are an investment as the schools should be in the community.

There are many ways to promote the familiarity of teachers with technology. One possibility is to tie pay scales not to the advanced degrees teachers acquire but to the completion of courses designed explicitly to upgrade professional skills.

Another possibility is to create a new kind of educational professional skilled in educational technologies. Such a person could work with individual teachers to integrate technology into classrooms and fully use its interactive and networking capabilities.

One of the most powerful methods of professional development is to establish explicit links between teachers and organizations outside schools such as corporations, universities, nonprofit institutions, and federal laboratories. For example, teachers can be paired with corresponding professionals in the broader community: science teachers with scientists, English teachers with writers, social studies teachers with historians and museum curators. Teachers involved in these partnerships can then act as resource teachers for their colleagues.

As American education begins to move toward a new model of school, the education of teachers must undergo a fundamental shift-toward a model that treats the lifelong education of teachers with the same importance as the education of students. Teachers must be given time to travel to meetings and share information with colleagues. They must have the authority to structure

their classrooms in ways that allow them to meet high standards and simultaneously address the individual needs of their students. And as true professionals, they deserve the technological support that professionals need to do their jobs.
<http://www.nap.edu/readingroom/books/techgap/investing.html>

Copyright Notice: This article is protected under copyright law. The right to disseminate this article is also protected under copyright law.

The copyright law permits copying of materials for personal use under the protection of fair use.

The copyright law also permits the copying of recent materials for the "teachable moment." This allows copying for educational purposes.

Also, the courts generally interpret copyright protection by economic criteria. If the copying of a material reduces revenues to the copyright holder, the court usually decides in favor of the plaintiff; if the copying doesn't effect or increases the revenues, the court usually decides on behalf of the defendant.

It is our judgment that occasional copying of a newspaper article does not reduce revenues to the publisher and can actually create more demand for a newspaper by attracting readership. An excerpt provides free advertising for the publisher.

Thus, under fair use, teachable moment, and economic criteria we selectively convey this copyrighted material to others.

Bonnie Bracey, Teacher in Residence
Randolph Elementary School
1306 S. Quincy Street,
Arlington, Va 22204
National Information Infrastructure Task Force Outreach

To join the Up for Grabs discussion list, email the following command in the body of a message to listserv@cdinet.com:
subscribe upforgrabs-l YourFirstName YourLastName

If at any time you would like to leave the Up for Grabs discussion list, email the following command in the body of a message to listserv@cdinet.com:
signoff upforgrabs-l

If you have any problems with the listserv or any questions about the postings, please direct them to benton@benton.org.

ARMS Email System
RECORD TYPE: FEDERAL (NOTES MAIL)

CREATOR: "Jorge R. Schement" <jrs18@PSU.EDU> ("Jorge R. Schement" <jrs18@PSU.EDU> [UNKNOWN])

CREATION DATE/TIME: 7-OCT-1998 15:14:07.00

SUBJECT: Re: Digital Divide PBS Series

TO: UPFORGRABS-L@CDINET.COM (UPFORGRABS-L@CDINET.COM [UNKNOWN])
READ:UNKNOWN

TEXT:
David,

I attach some research papers that might be of interest to you. Good luck.
--Jorge

>I would like to thank the participants of this list for the recent posts
>on
>technology and education. I am the Executive Producer for an upcoming PBS
>series entitled "The Digital Divide." This series looks at how digital
>technology is exacerbating
>historic social differences among young people in the United States. This
>four-part series examines the role of digital technology in widening
>economic,
>educational, racial and gender differences among American students.
>
>Digital technology can be a force for positive change, of that there is no
>doubt. But it can also be a divisive phenomena, widening social gaps
>between
>haves and have nots as never before. Many people on this list have already
>been a great help to the series, providing interviews and background
>materials. If anyone on this list would like to contribute their
>perspective
>on this subject, please contact me through Studio Miramar
>(smiramar@aol.com).
>Please mark it to my attention. I also read this list daily.
>
>Thanks,
>David Bolt

>*****

>
>To join Benton's Up For Grabs Discussion Forum (which also
>includes the daily Headlines service), send email to:
>listserv@cdinet.com
>In the body of the message, type only:
>subscribe upforgrabs-L YourFirstName YourLastName
>
>To unsubscribe, send email to:
>listserv@cdinet.com
>In the body of the message, type only:

>signoff upforgrabs-L
>
>If you have any problems with the service, please direct them to
>benton@benton.org

- 1998 TPRC Paper - Minorities&IT - Home Media Draft - Paper Telecomm.Policy-----

Jorge Reina Schement
Co-Director, Institute for Information Policy
Professor of Communications and Information Policy
208A Carnegie Bldg.
Penn State University
University Park, PA 16802

814-865-3066 office
814-863-6119 fax
jrs18@psu.edu
http://www.psu.edu/dept/comm/faculty/fac_list/schement.html

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D69]MAIL464384180.226 to ASCII,
The following is a HEX DUMP:

===== END ATTACHMENT 1 =====

===== ATTACHMENT 2 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D69]MAIL455384181.226 to ASCII,
The following is a HEX DUMP:

===== END ATTACHMENT 2 =====

===== ATTACHMENT 3 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D69]MAIL406384182.226 to ASCII,
The following is a HEX DUMP:

===== END ATTACHMENT 3 =====

===== ATTACHMENT 4 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D69]MAIL426384183.226 to ASCII,
The following is a HEX DUMP:

===== END ATTACHMENT 4 =====

DRAFT

The Persistent Gap in Telecommunications: Toward Hypotheses and Answers

by

Jorge Reina Schement
Co-Director, Institute for Information Policy
Professor of Communications and Information Policy
College of Communications
208A Carnegie Bldg.
Penn State University
University Park, PA 16802

814-865-3066 office
814-863-6119 fax
jrs18@psu.edu
http://www.psu.edu/dept/comm/faculty/fac_list/schement.html

Scott C. Forbes
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Institute for Information Policy
College of Communications
208A Carnegie Bldg.
Penn State University
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814-863-6779 fax
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This paper is currently under consideration for inclusion in a dedicated issue of *The Information Society*.

I swear to the Lord,
I still can't see,
Why Democracy means,
Everybody but me.

-- Langston Hughes¹

Does this gap in access to technology matter? You bet it does. How can you look for a job without a phone? How can an employer call you for an interview? How can you demonstrate that you have the skills to compete if you don't know which side of a diskette goes in first?

--William E. Kennard²

Langston Hughes plaintive lament strikes at the heart of the intention of democracy. Democracy's ideal – sovereignty and inclusion – thrives or withers on democracy's reality. To argue that a democracy can exist when its reality excludes individuals, who are nevertheless bound by its laws, is to claim a democracy in the making, or at worst to live an enduring hypocrisy. For the most part, Americans have claimed a democracy in the making, as they have struggled for the last 200 years to establish genuine participation for all citizens. Indeed, we tacitly acknowledge that for democracy to live up to its ideal, it must include all of its members from the core to the periphery. The key to the struggle and the promise has been and continues to be participation.

In the Information Age, universal access to communications technology is the primary policy tool for enabling citizens to participate in those economic, political, and social activities fundamental to a good society. Therefore, FCC Chairman William E. Kennard's questions engage far more than a concern for opportunities available to African-Americans or Latinos. Kennard is addressing the promise of democracy, just as Langston Hughes addressed the shame of its blindness.

¹ Langston Hughes (1943) "The black man speaks," in *Jim crow's last stand*.

² William Kennard, Chairman of the Federal Communications Commission, Speech to the National Urban League, Philadelphia, PA, August 3, 1998.

In this paper, we concentrate on observed information technology diffusion gaps between white Americans on the one hand, and African-Americans and Latinos on the other. We ask, "Why does there persist a gap in access to information technologies and telecommunications networks between the nation's majority whites and minority African-Americans and Latinos?" Our purpose is to address this question and to propose directions for arriving at an answer.

Some Caveats

This paper will focus on the household penetration of information technologies and services, specifically: radio, television, telephone, cable, personal computers, and Internet access. We will not discuss the admittedly important issues surrounding the delivery of universal service to libraries and schools, nor the gaps in equity of education that may result from differential levels of institutional access. Policy questions pertaining to libraries, schools, and the e-rate more properly belong within a discussion of the necessary development of an institutional infrastructure to match the growth of the technological information infrastructure; and, therefore, stand beyond the scope of this paper. Such policy issues center on institution building and the proper application of government resources -- both fiscal and political -- to an institution-oriented concept of universal service.

By contrast, the question of household access to information resources stems from expectations of the nation's economic and democratic potential as originally expressed at the beginning of the 20th century, and continues within that context into the 21st century -- that is, from a concept of Universal Service meant to empower the individual.

The Threat of Gaps in Access and the Value of a Concept of Universal Service

Universal service provides three levels of value to American society: political, economic, and social. In so doing, Universal Service provides a direct tool for closing access gaps; thereby, furthering the goal of participation.

The Political Value of Universal Service

Democracy requires an informed and involved citizenry; yet this is possible only if its citizens have access to information about their government and the opportunity to participate in political discourse. Once one accepts the premise of the Declaration of Independence -- that governments derive 'their just power from the consent of the governed' -- it follows that the governed must have full freedom of expression, in order to exercise their right to consent

There are, then, two dimensions of political participation -- reception and distribution. On the reception side, citizens are better able to make informed contributions and to receive the benefits of the political process when they have heard a variety of opinions, especially when they have heard their favored opinions challenged in the marketplace of ideas. On the distribution side, citizens also benefit when individuals are able to communicate and to engage in political dialogue beyond the confines of their immediate communities. Only then, can democratic discourse transcend the walls of localness and the stifling of popular debate that occurs when only elites have access to the national channels of communication. Thus, the many possible avenues for democratic participation are so important that telecommunications policies must dedicate themselves to protect, facilitate, and expand democratic discourse.

The Economic Value of Universal Service

In the information age, information networks distribute economic goods and services, and add value to transactions. Networks carry information that becomes input to other products or decisions. Consequently, the economic benefits of an interconnected information infrastructure accrue to the individuals on that network, to the network owners; and, therefore, to society as a whole. For without basic communications service a person is more likely to become an economic burden on society. A person is less likely

to get a job when a potential employer cannot reach that person by telephone, and the person and their family suffer. The unemployed are also less likely to be taxpayers and more likely to receive social welfare payments.

When the number of people on a network grows, so too does the network's functionality and potential customer base. A network is most valuable to owners, service suppliers and service recipients when as many people as possible connect to a network, all other factors being equal. As a new infrastructure develops, it will only reach its full potential when the maximum number of entrepreneurs is attracted by the participation on the network of the maximum number of people. And as the United States further transforms itself into an economy that creates and shares information, maximizing access to the interconnected information infrastructure carrying that information becomes crucial for businesses and individuals. To that end, universal service is the mechanism for maximizing access because Americans should be empowered economically by their telecommunications systems.

The Social Value of Universal Service

At the cusp of the 21st century, it seems reasonable to argue that access to an interconnected information infrastructure is crucial, since individuals need access to information for self-development, for help in developing and maintaining social relationships, and for the benefits that come from those relationships.

Admittedly, the range of information provided by the basic infrastructure is quite broad, encompassing the mundane and the critical. For that reason, access to communication services offers benefits in a broad cultural sense. If the nation wants to encourage the sense of shared values and mutual responsibility that comes from social interaction, then maximum access to communication networks becomes a necessity. Social interaction forms a part of the socialization process through which society seeks to engender loyalty to itself and to its public values. We define ourselves not in isolation but through contact with others. Therefore, the network is an essential ingredient for overcoming social

fragmentation and, consequently, for enabling participation in community.

Communication creates society; and, in essence, the network creates the weave.

Universal service, then, is an operational benchmark on the way to the greater goals of, political participation, economic development, and social empowerment. Americans should experience benefits that can save lives, create jobs, and give every citizen the chance to pursue the full spectrum of life. In an information society, the network holds us together.

Gaps in the Lessons of History

The literature on telecommunications gaps is small. Of the hundreds of studies concerned with universal service, only a few address telephone penetration and its social causes. Until the late 1980s the weight of opinion on households without telephones seems to have been that existing subsidy programs adequately included all those that could reasonably be connected.³ Thus, for the century of telephone service, little or no thought was given to those left off of the net. Only in the period immediately after the break-up of AT&T did some voices focus on the social dynamics of those without telephone service and point to poverty related factors as causes of phonelessness.⁴ These studies

³ See Booker, E. (1986). Lifeline and the low income customer: Who is ultimately responsible? *Telephony*, 210(20), 116-132. Dordick, H. S. (1990). The origins of universal service. *Telecommunications Policy*, 14(3), 223-238. Dordick, H. S., & Fife, M. D. (1991). Universal service in post-divestiture USA. *Telecommunications Policy*, 15(2), 119-128. Gilbert, P. (1987). *Universal service on hold: A national survey of telephone service among low income households* No. US Public Interest Research Group. Hills, J. (1989). Universal service: Liberalization and privatization of telecommunications. *Telecommunications Policy*, 13(2), 129-144.

⁴ See Perl, L. J. (1983). *Residential demand for telephone service 1983* No. 1). National Economic Research Associates, Inc. for the Central Services organization, Inc. of the Bell Operating Companies. Hausman, J., Tardiff, T., & Belinfante, A. (1993). The effects of the breakup of AT&T on telephone penetration in the united states. *The American Economic Review*, 83(2), 178-184. Schement, J. R. (1994). *Beyond universal service: Characteristics of americans without telephones, 1980-1993* Communications Policy Working paper No. 1. Benton Foundation. Schement, Jorge Reina [1998] "Thorough americans: Minorities and the new media," *Investing in Diversity: Advancing Opportunities for Minorities and the Media*. Aspen Institute Publication, Washington DC, 87-124. Schement, Jorge Reina, Belinfante, Alex, and Povich, Laurance [1997]. "Trends in telephone penetration in the united states 1984-1994." In E. M. Noam & A. J. Wolfson (Eds.), *Globalism and Localism in telecommunications*, (pp. 167-201). Amsterdam, The Netherlands: Elsevier. Mueller, Milton, and Schement, Jorge Reina [1996] "Universal Service from the Bottom Up: A Study of Telephone Penetration in Camden, New Jersey," *The Information Society*. Vol. 12, 273-292. Schement, Jorge Reina [1995] "Beyond universal service: Characteristics of americans without

constitute the empirical source of the call to rethink universal service accomplishments in light of the emergence of a new information infrastructure. Finally, recent research indicates that those at the margins of society are particularly vulnerable to isolation and its socioeconomic consequences as a result of lacking access to a telephone.⁵ However, while some of these studies -- two most recently from the government -- point to and describe the gap in telephone penetration between the majority and minorities, there is almost nothing that points to causes of the gap.⁶

Under these circumstances, an analysis of historical gaps can be instructive. The spread of some earlier information technologies indicates that gaps can be temporary.

In 1925, 10% of all households owned radios (see Figure A). By 1930, ownership stood at 46%. Ten years later, in the throes of the Depression, Americans still managed to increase ownership of radios to 82% of all households. They bought radios at an astonishing rate, especially when one considers that the Depression forced personal expenditures on information goods and services to drop from 4.4% of all personal expenditures in 1930 to 3.5% in 1935, not recovering the 1930 level until 1945.⁷ Despite

telephones, 1980-1993," *Telecommunications Policy*. Vol. 19, No. 6, 477-485. Williams, F., & Hadden, S. (1991). *On the prospects for redefining universal service: From connectivity to content* Policy Research Project: The University of Texas at Austin. Williams, F., & Hadden, S. (1992). *On the prospects for redefining universal service: From connectivity to content*. *Information and Behavior*, 4, 49-63.

⁵ See Schement, Jorge Reina [1998] "Thorough americans: Minorities and the new media," *Investing in Diversity: Advancing Opportunities for Minorities and the Media*. Aspen Institute Publication, Washington DC, 87-124. Schement, Jorge Reina, Belinfante, Alex, and Povich, Laurance [1997]. "Trends in telephone penetration in the united states 1984-1994." In E. M. Noam & A. J. Wolfson (Eds.), *Globalism and Localism in telecommunications*, (pp. 167-201). Amsterdam, The Netherlands: Elsevier. Schement, Jorge Reina [1995] "Beyond universal service: Characteristics of americans without telephones, 1980-1993," *Telecommunications Policy*. Vol. 19, No. 6, 477-485.

⁶ (1995) *Falling Through the Net: A Survey of the 'Have Nots' in Rural and Urban America* National Telecommunications And Information Administration, U.S. Bureau Of The Census, U.S. Department Of Commerce, Washington DC. (1998) *Falling Through The Net II: New Data On The Digital Divide*. National Telecommunications And Information Administration, U.S. Bureau Of The Census, U.S. Department Of Commerce, Washington DC.

⁷Series E 135-166, G 416-469 (1975). *Historical statistics of the united states, colonial times to 1970*. Washington DC: GPO. Table 708, 738 (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 676 (1987). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census.

these obstacles, radio achieved virtual saturation by 1950. Radio's astonishing growth masks the existence of a gap that might have existed between the majority and minorities. If there ever was a gap, and given what we know of subsequent gaps there is every reason to believe that a radio gap existed, that gap closed by 1950 so that nearly every household had a radio as they still do today.

In that year, 1950, less than one household in ten owned a television. However, fifteen years later, less than one household in ten remained without a TV. Television's complete adoption took less time than radio. Yet in this case, we have evidence of a gap during the period of television's diffusion (See Figure B.). During the first seven years of the diffusion of television, lower income groups lagged behind wealthier groups. The wealthiest quartile led the way so that by 1956 this group had reached 90% penetration. Nevertheless, by 1970, television had reached a saturation level close to that of radio (though never equal to radio the one truly ubiquitous medium). Again, as with radio, a gap closed.

The third information technology of the era, the telephone, presents a stark contrast. From 1878, with the establishment of the first practical exchange, 80 years passed before 3 out of 4 households boasted a telephone.⁸ And, though the adoption of radio sets proved immune to the Depression, telephone penetration dipped in correlation with personal expenditures. Telephones reached saturation by 1970, with 93% of households slowly advancing to 94% in the twenty years since.⁹

The key to the contrast lies in the nature of the exchange. Radio and Television constitute goods, while the telephone constitutes a service. Telephone services require a decision to pay a monthly fee, and the building of an infrastructure in order for the connection to function. For households on the margin, the payment structure of telephone

⁸Brooks, J. (1975). *Telephone: The first hundred years*. New York: Harper & Row, p. 65.

⁹Belinfante, A. (1993, July). Telephone subscribership in the United States. (CC Docket No. 87-339). Federal Communications Commission.

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service means a hard choice every month. And, as recent research suggests, that choice may result in the rejection of telephone service in favor of other purchases deemed more essential.¹⁰ By comparison, the one time cost characteristic of radio and TV (allowing them to circulate second and third hand) facilitated rapid diffusion, obstructed the backslide experienced by the telephone during the Depression, and closed whatever gaps might have existed during radio and television's early diffusion (See Figure A.). Telephone's gap still exists 120 years later. The lesson is that information goods have tended to diffuse more rapidly than information services. Thus, those gaps that may have existed in the initial distribution of radio and television closed, while the gap for telephone service did not.

Demographics of the Telephone Gap in Detail

A review of the factors contributing to nonsubscribership, indicates that the households without phones comprise multiple but overlapping groups.

- ◆ Phone penetration in the suburbs is roughly 4.6% higher than in the central cities, and 4.1% higher than in households outside of MSAs. Moreover, since 1984, the biggest increases in penetration have been in non metropolitan areas (not in MSAs) -- 89.2% to 92.5%.¹¹ African-Americans and Latinos tend to live in urban areas, so would seem to be affected negatively by the "urban handicap."
- ◆ Income makes a difference. Households receiving energy assistance, food stamps, school lunch programs, welfare, and/or public assistance tend to have lower telephone

¹⁰ Horrigan, J., & Rhodes, L. (1995). The evolution of telephone service in Texas : Working Paper, LBJ School of Public Affairs. Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey. The Information Society, 12, 273-292. Schement, J. R., Belinfante, A., & Povich, L. (1997). Trends in telephone penetration in the United States 1984-1994. In E. M. Noam & A. J. Wolfson (Eds.), Globalism and Localism in telecommunications, (pp. 167-201). Amsterdam, The Netherlands: Elsevier.

¹¹ Between 1985 and 1986, the Census changed definitions for "MSA status not identifiable." Many of those households were moved into "City status in MSA not identifiable." But this does not change the overall tendency.

penetration rates, as much as 20 points below the national average.¹² Since minorities are more likely to have incomes below the national median, they will also experience the effects of income on telephone service with greater intensity than the population as a whole.

- ◆ Housing characteristics also influence telephone penetration. For families in multiple unit housings, and in rental housing, telephone penetration is lower, 84.4% for occupants of rental housing. Here too minorities are more likely to experience these conditions, especially given their propensity for urban dwelling.
- ◆ Women experience phonelessness in inordinate numbers. The Census category, "Single Civilian Female with Children" has the second lowest telephone penetration (82.6%), exceeded only by the homeless. In addition, this category has shown little improvement, 80.1% in 1984 to 82.6% in 1993. Here it would seem that African-American women may be over represented, thus contributing to the gap.
- ◆ Youth suffers as well. Younger households -- whites, blacks, and Latinos -- suffer lower telephone penetration levels than do households headed by older people. In November 1983, telephone penetration in black households headed by 15-24 year olds stood at 49.9% (these households being headed by women, for the most part). By 1988, penetration had risen to 65.6%, an increase of 31%. Between 1988 and 1992, the penetration curve flattened, and then turned up slightly in 1994 (74.6%). In white households headed by 15-24 year olds the 1983 level was 76.6%; in 1994, penetration stood at 86.3%. Telephone penetration among young Hispanic households began at 71.9% in 1988 and fluctuated to 73.9% in 1991, after which a significant increase took place evening out at around 77% in 1994. There is clearly a gap visible here, but it is confounded by age.

¹² Schement, Jorge Reina, Belinfante, Alex, and Povich, Laurance [1997]. "Trends in telephone penetration in the united states 1984-1994." In E. M. Noam & A. J. Wolfson (Eds.), Globalism and Localism in telecommunications, (pp. 167-201). Amsterdam, The Netherlands: Elsevier.

- ◆ Finally, unemployment directly affects telephone penetration. All groups experienced lower penetration among the unemployed: whites – 89.9%; African-Americans – 77.9%; Latinos – 85.6%.¹³ Yet here too we see a ten point spread between whites and African-Americans. While it is reasonable to surmise that African-Americans are hit harder by unemployment, it is equally reasonable to surmise that unemployment does not stand alone as a factor.

In general, we can say that income affects access to telephone service, but not as a simple function. We can note that households receiving any kind of government assistance fall below national telephone penetration levels. Likewise, women heads of households with children fare poorly. The unemployed suffer inordinate loss of telephone service. And through it all, minorities, especially African-Americans, fall to the bottom of nearly all categories. In short, these six contributing factors illustrate the interwoven complexity of access to a technology most people think of as simple.

The phoneless do not constitute a homogeneous group. Any individual without a phone is likely to fall into several of the above groups. To that extent, understanding the causes of low telephone penetration for any one group requires parsing out multiple contributing factors, something that is virtually impossible with our current statistics.

Ethnicity and the Telephone Gap

Minority household penetration rates consistently rank eight to ten percentage points lower than their white counterparts. In 1984, shortly after AT&T's modified final judgment, the gap between white and minority households was approximately 13%. Fifteen years later, white households have a national average telephone penetration rate

¹³ Schement, Jorge Reina, Belinfante, Alex, and Povich, Laurance [1997]. "Trends in telephone penetration in the united states 1984-1994." In E. M. Noam & A. J. Wolfson (Eds.), Globalism and Localism in telecommunications, (pp. 167-201). Amsterdam, The Netherlands: Elsevier.

of 95%, approximately 8% higher than the Black and Hispanic rates of 86.9% and 86.7%, respectively.¹⁴

Differentials also exist between African-Americans and Latinos. For example, according in 1990, African-American renter occupied housing units (OHUs) in Pennsylvania with median incomes below the poverty line experience a telephone penetration rate of 84% while the penetration rate for Hispanics in similar circumstances is 72%—startlingly low numbers considering that in 1990 PA had among the highest telephone penetration rate in the nation at 97.1%. In nearby Delaware, a state with a high telephone penetration (95.7%), the magnitude of this gap is reversed: Hispanics have a 62% penetration rate and Blacks contend with a 55% penetration rate.¹⁵

Native American households, particularly those on reservations and trust lands, experience the widest gap between their levels of telephone penetration and both the white and national penetration averages. The two states with the largest numbers of Native Americans—Oklahoma and Arizona—rank in the bottom quintile of overall state telephone penetration. The 314 US reservations and trust lands have an average telephone penetration rate of 46.6%—less than half the national average. Native Americans in the Southwest suffer particular hardship (Figure 7). For instance, the Navajo Reservation and accompanying Trust Lands in AZ, NM, and UT suffer an astounding telephone penetration rate of 18.4%. That is, 4 of 5 American Indians in these territories do not have a phone. On the 48 reservations with 500 or more American Indian households, only six had telephone penetration levels above 75%—none exceeded 85%.¹⁶

Example: Los Angeles, CA

¹⁴ Belinfante, Alexander (1998) "Telephone subscribership in the United States." Federal Communications Commission, Washington DC.

¹⁵ 1990 Census Summary Tape File 3.

¹⁶ (1995) *Housing of American Indians on Reservations—Equipment and Fuels*. U.S. Bureau of the Census' statistical brief, Washington DC.

According to 1990 Census data, nearly 36,000 renter-OHUs in Los Angeles did not have telephones. The telephone penetration rates for the OHUs below the poverty line for renters were:

WHITE	93%
BLACK	87%
NATIVE AMERICAN	81%
ASIAN	96%
HISPANIC	83%

Using 1998 Current Population Survey data, telephone penetration rates follow a predictable pattern when organized by ethnicity: White and Asian individuals were at or above the overall average rate, while Black, Hispanic, and Native American individuals trailed behind (See Table 1). Surprisingly, American Indians who lived in an owner-occupied home had a telephone penetration rate of 100%, but the sample size of 26 individuals could be the dominant factor in that rate and none were on reservations.

Table 1: Telephone Penetration Rates by Tenure and Race - 1998					
	White	Black	Hispanic	Asian	Native American
Owner	96.6%	94.7%	93.7%	97.8%	100%
Renter	89.5%	85.9%	86.0%	95.1%	80.7%
Source: April 1998 Current Population Survey					

Ethnicity clearly influences access to telephone service; nearly every bit of evidence presented so far has been touched by ethnicity. Nevertheless, as the above examples of Pennsylvania and Delaware demonstrate, ethnicity's influence does not manifest itself in a straightforward manner. There appear to be intervening factors that work in both directions. That is, ethnicity seems to influence unemployment, income, youth, and gender; but all of these factors also appear to influence the significance of ethnicity. Add to this the implicit influence of geography.

Geography and the Telephone Gap

A review of state data on total telephone penetration rates makes evident that penetration rates vary dramatically from state to state. At one end stand Nebraska and Pennsylvania with all time highs of 97.1%, and at the other end of the range resides New Mexico with a telephone penetration rate of 88.1%.¹⁷ The variation in the experiences of the states leads us to suggest that geography might also influence telephone penetration.

However, taking this approach poses problems. We have as yet not been able to access data that allows us to correlate ethnicity and telephone penetration by geographic unit. That is, we can get data on telephone penetration by state, but have not found data on penetration by ethnicity by state. We're still looking.

In the absence of direct analysis, we are pursuing indirect approaches to the question. The first approach compares telephone penetration by tenure. In 1990, there were approximately 90 million occupied housing units (OHUs) in the US, 60 million of which were owner-occupied. The average telephone penetration rate of owner-OHUs was 97.81% while for renters 89.28%—a difference of 8.53%. To put this in context, if each person living in the 4.8 million nationwide OHUs without a telephone service suddenly joined America Online, the subscriber base of the nation's largest Internet Service Provider would nearly double overnight.¹⁸

The 3.5 million renter-OHUs without telephones account for 75% of all OHUs without telephones. One fourth of US counties experience a renter OHU penetration below 80%, thus leaving over 800,000 renter-occupied housing units without telephones in those states. In just ten counties, 548,703 renter-occupied housing units are without phones. In California, New York, and Texas alone, 950,000 renter OHUs without phones—nearly 3 million people, assuming that 2.62 people live in a housing unit. In California, Los Angeles County listed nearly 90,000 renter-OHUs without telephones.

¹⁷ Table 2. Belinfante, Alexander (1998) Telephone Subscribership In The United States. Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission. Released: January 1998.

¹⁸ (1997) *Estimates of Housing Units and Households*. US Bureau of the Census, Washington DC. July.

An examination of three states with relatively high penetration rates, California (94.3%), New York (94.2%), and Pennsylvania (97.1%), illustrates the potential importance of geography as an explanation for ethnicity in the telephone gap.¹⁹ The data in the following tables (Tables 2, 3, and 4) represents owner occupied housing units. Since those who own their own homes are most likely to have a telephone, the differences between the majority and minorities should be minimized. Therefore, OHUs present a strong test for the uniform existence of a telephone gap. In California counties where data is available, the differences between African-Americans (labeled "blacks" in the Census) and whites vary in the extreme. Yuba county has a gap of 37.24%, while nearby Sacramento county shows almost no difference. Furthermore, five of the counties measured indicate higher telephone penetration rates among African-American households.

New York exhibits a range similar to California's. In New York's upstate Jefferson county white households with telephones outscore black households by 41 percentage points; whereas in western Genesee county the difference between the two groups barely passes two percent.

Much the same can be observed in Pennsylvania. York county in the southern tier shows a spread of 12.5 percentage points, African-Americans lagging behind whites. However, Mercer county in the northern tier shows African-American households leading white households by 1.21%.

Geography may also confound the influence of income. Policy makers and researchers generally consider income the determining factor in telephone penetration levels. However, there may be a closer relationship between telephone penetration and median household incomes for states with lower median household incomes than in states of greater affluence. If the top ten states in telephone penetration are compared with the top

¹⁹ Table 2. Belinfante, Alexander (1998) Telephone Subscribership In The United States. Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission. Released: January 1998.

ten states in household median income, only 3 will be found on both lists (Table 5). Furthermore, if the bottom ten states in telephone penetration are compared with the bottom ten states in household median income, only 5 will be found on both lists (Table 6). Poorer states do have a tendency to have lower levels of telephone penetration, but the relationship is nowhere clear-cut.

What the element of geography seems to say is that the persistence of the telephone penetration gap between the majority and minorities at the national level gives way to significant variations when one focuses down to the level of the counties. Indeed, the county data is important because it also illustrates variations in the gap even within the same state, presumably with its uniform Public Utility Commission regulations. In other words, the conditions of the gap seem to vary from state to state and within states; thereby, pointing to influences that are local and possibly cultural.²⁰

Other Gaps

While it is true that people are flocking to personal computers and Internet service, current research indicates that ethnic minorities have yet to reach the penetration levels attained by whites; and, it may be, that the gap has grown in the last few years. At present, whites are twice as likely to own a personal computer as are African-Americans or Latinos—40% compared to approximately 20%.²¹ Since personal computers are a newer technology and have not yet had the time to “diffuse” into households, it is not surprising that this penetration gap is more pronounced than the overall gap in telephone penetration. Yet between the first and second *Falling Through the Net* reports (1995, 1998), the gap between whites and African-Americans has grown to 21.5%, up nearly

²⁰ We have recently hypothesized that mobile home ownership among whites might contribute to the telephone gap because it would award whites an advantage in demonstrating assets even though their income might be low. However, when we examined California's Los Angeles, Orange, San Bernardino, and Riverside counties – among the foremost in the nation for mobile home ownership – we encountered little or no differences between whites and African-Americans. Without new evidence, we consider this hypothesis falsified.

²¹ *Falling Through the Net II: New Data on the Digital Divide*, National Telecommunications and Information Administration, 1998, <http://www.ntia.doc.gov/ntiahome/net2/falling.html>, Chart 12.

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5%; while the white/Latino gap is now at 21.4%, up nearly 7%.²² Online penetration rates seem to follow a similar pattern: about 20% of White households are online, while about 10% of African-American and Latino households are connected to the Internet.

A recent survey conducted by the Tomas Rivera Policy Institute of the Claremont Colleges, concentrated primarily on the lack of Latino household PC penetration.²³ Although finding that 31% of all Latinos nationally have yet to use a computer, its overall results were far more encouraging: Latinos had an online penetration rate of about 30%, continue to outpace all other ethnic groups in acquiring new users, and have doubled the number of computers in their homes in the last four years. In addition, Latinos are joining online services faster than the national average (See Table 7.).

Table 7

Rate of Growth of PC Ownership 1994-1998 ²⁴	
All US Households:	65%
Latino Households:	130%

This survey also highlighted the importance of education and income. Approximately 77% of Latino households connected to the Internet also had some college education, compared to 15% for unconnected households. Over 63% of Latino households with incomes above \$75,000 are connected to the Internet. Moreover, this tendency appears to parallel the role of income in creating temporary gaps during the diffusion of television.

In fact, median income levels of online users are significantly above the national average. Between 50% and 70% of online users have a median household income above \$50,000.

²² *Falling Through the Net II: New Data on the Digital Divide*, National Telecommunications and Information Administration, 1998, <http://www.ntia.doc.gov/ntiahome/net2/falling.html>, Chart 14, 15.

²³ *Closing the Digital Divide*, Tomas Rivera Policy Institute, 1998.

²⁴ *Closing the Digital Divide*, Tomas Rivera Policy Institute, 1998.

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The average median income level for online users is about \$60,000.²⁵ While these numbers indicate that PCs and Internet services are still largely the domain of the affluent, decreasing PC ownership costs and stable one-price monthly Internet connection fees will likely encourage diffusion of these two technologies across income ranges.²⁶

Yet there does not appear to be a strong relationship between PC penetration and median household income. Table 8 lists the 10 states possessing a PC penetration level at or above the national average (40%); and lists the states with the 10 highest household median income levels.²⁷ Only four states appear in both columns for top household PC penetration and median income: Alaska, Colorado, Maryland, and New Hampshire. Table 9 lists the 10 states possessing a PC penetration level at or below the national average (40%); and lists the states with the 10 lowest household median income levels. Seven states appear in both columns for lowest household PC penetration and median income: Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, South Carolina, and West Virginia.

Because education interacts with income in affecting PC purchases, minorities with historically lower rates of education and income are likely to lag in their adoption of PCs. Still, the example of Latinos and PC adoption points to a parallel with the fleeting gap in TV diffusion, rather than the persistent gap in telephone penetration. PC purchases are likely to be led by wealthier, educated households to be followed by less wealthy but educationally oriented households. Thus, we suggest that the "PC gap" is temporary as

²⁵ source: Pulse--Consumer Profiles: Changing in a High Tech World, Vol, 5, Issue 3, June 1998, CTAM., Closing the Digital Divide, Tomas Rivera Policy Institute, 1998, MediaMark CyberStats, Spring 1998 at www.mediamark.com, NetRatings, Inc. news release December 8, 1997 available at www.netratings.com/newsDec_8.htm.

²⁶ For instance, few computers sold in the retail market cost less than \$1,000 in 1996. Yet by 1997, sub \$1,000 PCs constituted 48.4% of retail PC sales, up from 1.2% in 1996. Computers over \$2,000 now constitute less than 8% of retail PC sales. J. Kirchner, "PC Prices: How Long Can They Go?", PC Magazine Online, March 10, 1998 at <http://www.zdnet.com/pcmag/issues/1705/283015.htm> and "Expensive PCs Face Challenge" by Todd Wasserman, Computer Retail Week using International Data Corporation (IDC) data, June 15, 1998.

²⁷ Penetration levels were taken from Falling Through the Net II. Percentages of 39% and above were included, to eliminate any possible omissions due to rounding.

was the "TV gap." What remains unclear is the rate at which PCs will be adopted, and the final saturation level in household penetration.

Some Conclusions and Speculations

- ◆ Ethnicity appears to be a characteristic in most of the gaps identified in this paper. It appears over and over, yet does not stand out clearly and apart from other identified factors.
- ◆ The factors seemingly present and contributing to the gaps identified here intermix in ways that make parsing them out nearly impossible given the statistical data available. For this reason, it seems highly probable that an individual is affected by multiple factors that may converge and tip the scales against telephone subscribership. Minorities may well be inordinately affected by multiple factors.
- ◆ Not all gaps persist. In the case of the radio and the television, whatever gaps existing during the early period of diffusion closed with the approach of saturation. What ties these two media together is their exchange in the marketplace as goods with a simple purchase structure. There are some indications that same may hold for PCs.
- ◆ Geography appears to influence the existence of the telephone gap. Even within a state, large variations emerge across counties. This finding indicates that local circumstances may be the most important contributors to the existence of gaps, the telephone gap in particular.

The existence of gaps – the telephone gap in particular – should trouble anyone concerned for the future of participatory democracy in the Information Age. Full-fledged access in the 21st Century means at least a telephone in the home and a computer with Internet access. Those without telephones lack effective participation in rapidly expanding digital Internet communities. If historical telephone penetration gaps cross over into the personal computer and Internet-user populations, it is quite possible that a

persistent and ethnicity-centered gap between the information have and have nots will emerge, much to the detriment of an integrated society. Ironically, the telephone has rapidly become the weak link in the information technology chain: it is the "necessary but not sufficient" technology of the modern home.

If we wish to solve the mystery of the gaps, we will have to look beyond the data that has guided us in the past. We must go below national data to data specifically describing conditions at the levels of the states, counties, and perhaps even Census blocks. And, when we do this, we are likely to find a complex array of factors more particular to localities than to the country as a whole. All the while, we should remind ourselves to avoid thinking of all gaps as sharing the same characteristics.

For Langston Hughes' lamentation to become history, we will have to dedicate ourselves more diligently than ever to probing the meaning of these gaps – and to solving them. Thus, challenges raised by Larry Irving and William Kennard ring loudly because the consequences stand starkly on the horizon.

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Table 2: Telephone Penetration of Owned Occupied Housing Units by Ethnicity for Selected Counties in California, 1990.

County	White	Black	Difference
Yuba	95.57%	58.33%	37.24%
San Luis Obispo	96.24%	70.73%	25.51%
Yolo	96.45%	80.70%	15.75%
Madera	94.63%	82.43%	12.19%
Imperial	86.91%	76.53%	10.38%
Merced	97.56%	88.89%	8.67%
San Mateo	98.54%	91.58%	6.96%
Monterey	98.67%	92.75%	5.92%
Santa Clara	98.38%	92.54%	5.84%
Tulare	94.55%	91.20%	3.35%
Contra Costa	97.71%	95.33%	2.38%
San Francisco	99.02%	97.04%	1.98%
Los Angeles	97.34%	96.02%	1.32%
Orange	98.60%	97.32%	1.28%
Alameda	97.27%	96.19%	1.08%
San Bernardino	93.29%	92.92%	0.37%
Riverside	95.66%	95.42%	0.24%
Kings	92.42%	92.31%	0.11%
Solano	96.68%	96.66%	0.02%
Sacramento	96.99%	97.05%	-0.05%
San Diego	97.18%	97.24%	-0.06%
Kern	92.96%	93.73%	-0.77%
Fresno	94.99%	97.24%	-2.25%
San Joaquin	95.39%	97.90%	-2.52%

Compiled from Table 71. (1993) 1990 Census of Housing. Detailed Housing Characteristics: California, US Department of Commerce, Economics and Statistics Administration, Bureau of the Census.

Table 3: Telephone Penetration of Owned Occupied Housing Units by Ethnicity for Selected Counties in New York, 1990.

County	White	Black	Difference
Jefferson	91.29%	50.00%	41.29%
Greene	96.05%	69.23%	26.81%
Columbia	96.31%	73.68%	22.62%
Schenectady	97.40%	83.33%	14.07%
New York	98.13%	86.93%	11.20%
Niagara	97.33%	87.76%	9.57%
Suffolk	98.39%	89.88%	8.51%
Westchester	99.45%	90.99%	8.46%
Richmond	98.78%	90.40%	8.38%
Kings	96.53%	88.59%	7.94%
Wayne	93.31%	85.90%	7.41%
Orange	97.63%	90.97%	6.66%
Nassau	98.98%	93.09%	5.89%
Monroe	98.87%	93.90%	4.97%
Albany	98.30%	93.33%	4.97%
Erie	97.83%	92.95%	4.89%
Onondaga	98.27%	93.81%	4.46%
Bronx	94.91%	91.04%	3.87%
Queens	98.12%	95.44%	2.69%
Genesee	96.64%	94.29%	2.35%

Compiled from Table 71. (1993) 1990 Census of Housing, Detailed Housing Characteristics: New York, US Department of Commerce, Economics and Statistics Administration, Bureau of the Census.

Table 4: Telephone Penetration of Owned Occupied Housing Units by Ethnicity for Selected Counties in Pennsylvania, 1990.

County	White	Black	Difference
York	95.35%	82.86%	12.50%
Delaware	98.38%	90.52%	7.85%
Montgomery	98.62%	91.22%	7.40%
Fayette	94.56%	88.30%	6.27%
Dauphin	98.56%	93.33%	5.23%
Philadelphia	95.57%	91.00%	4.57%
Berks	96.41%	92.44%	3.96%
Washington	97.43%	93.53%	3.90%
Westmoreland	97.38%	94.44%	2.94%
Lancaster	83.13%	80.39%	2.73%
Erie	93.15%	91.22%	1.93%
Chester	96.40%	96.24%	0.15%
Beaver	97.23%	97.42%	-0.19%
Mercer	92.32%	93.53%	-1.21%

Compiled from Table 71. (1993) 1990 Census of Housing, Detailed Housing Characteristics: Pennsylvania, US Department of Commerce, Economics and Statistics Administration, Bureau of the Census.

Table 5: Top 10 State Telephone Penetration Levels and State Median Income, 1990's

Top Ten States in Telephone Penetration	Telephone Penetration		Top Ten States in Household Median Income	Household Median Income
Pennsylvania	97%		Alaska	\$47,954
Nebraska	97%		New Jersey	\$43,924
Minnesota	97%		Hawaii	\$42,851
Utah	97%		Maryland	\$41,041
Iowa	97%		Wisconsin	\$40,955
New Hampshire	97%		Colorado	\$40,706
Wisconsin	96%		Connecticut	\$40,243
Maine	96%		New Hampshire	\$39,171
Colorado	96%		Massachusetts	\$38,574
Washington	96%		Illinois	\$38,071

Compiled from: Table 2. Belinfante, Alexander (1998) Telephone Subscribership In The United States. Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission. Released: January 1998. (1997). Statistical abstract of the united states: 1991. Washington DC: Bureau of the Census.

Table 6: Bottom 10 State Telephone Penetration Levels and State Median Income, 1990's

Bottom Ten States in Telephone Penetration	Telephone Penetration		Bottom Ten States in Household Median Income	Household Median Income
Illinois	92%		South Carolina	\$29,071
Georgia	92%		Tennessee	\$29,015
Arizona	92%		Louisiana	\$27,949
Oklahoma	91%		Montana	\$27,757
Texas	91%		Mississippi	\$26,538
Louisiana	91%		Oklahoma	\$26,311
Washington DC	91%		New Mexico	\$25,991
Arkansas	90%		Alabama	\$25,991
Mississippi	89%		Arkansas	\$25,814
New Mexico	88%		West Virginia	\$24,880

Compiled from: Table 2. Belinfante, Alexander (1998) Telephone Subscribership In The United States. Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission. Released: January 1998. (1997). Statistical abstract of the united states: 1991. Washington DC: Bureau of the Census.

Table 8: Top 18 State PC Penetration Levels and State Median Income, 1990's

Top Ten States in PC Penetration	Household PC Penetration²⁸		Top Ten States in Household Median Income	Household Median Income²⁹
Alaska	55%		Alaska	\$47,954
Utah	53%		New Jersey	\$43,924
Colorado	52%		Hawaii	\$42,851
New Hampshire	50%		Maryland	\$41,041
Vermont	47%		Wisconsin	\$40,955
Washington	46%		Colorado	\$40,706
Idaho	44%		Connecticut	\$40,243
Maryland	44%		New Hampshire	\$39,171
Virginia	44%		Massachusetts	\$38,574
California	43%		Illinois	\$38,071

Compiled from: Table 2. Belinfante, Alexander (1998) Telephone Subscribership In The United States. Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission. Released: January 1998. (1997). Statistical abstract of the united states: 1991. Washington DC: Bureau of the Census.

²⁸ Belinfante, Alexander GET CITE

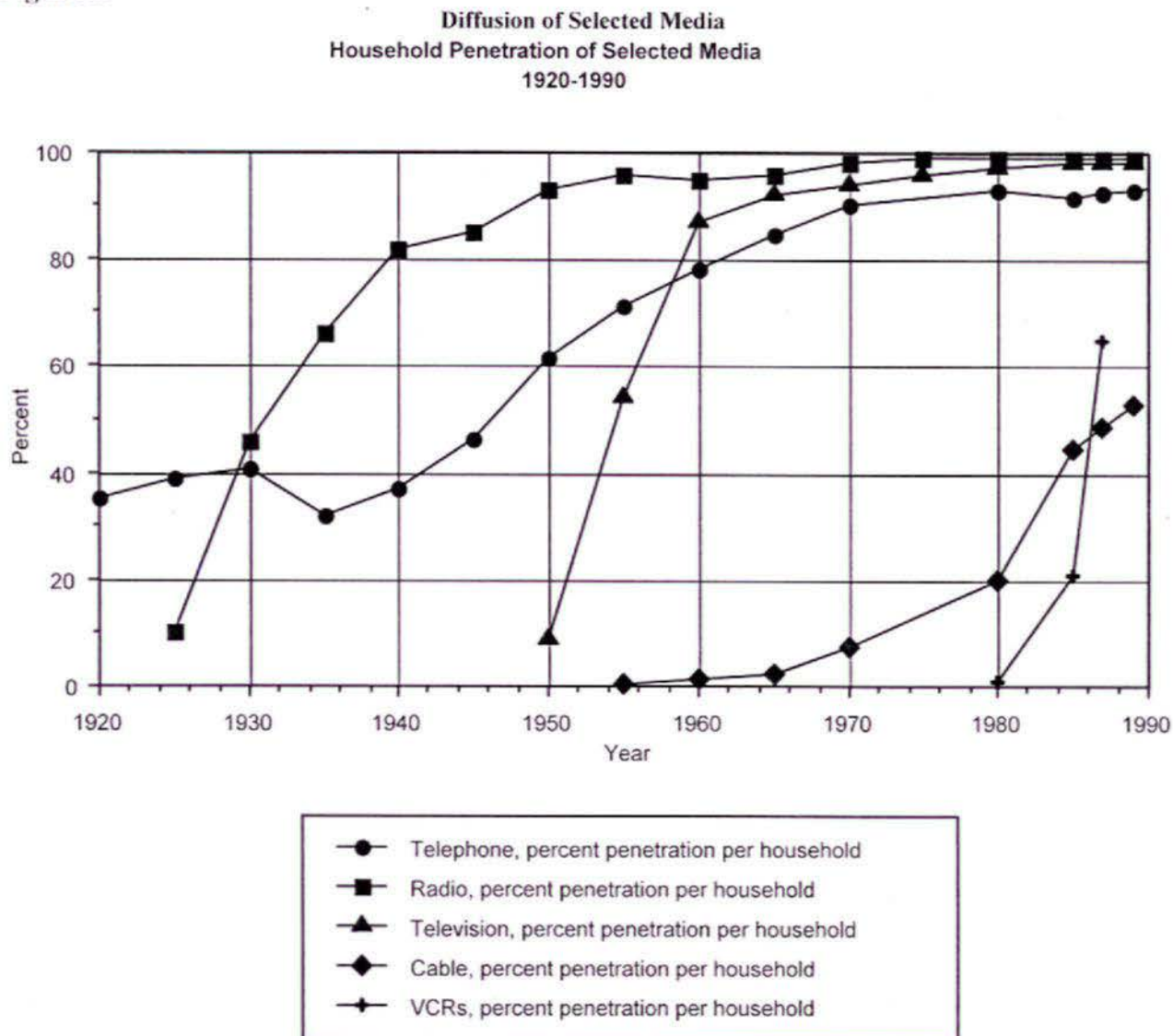
²⁹ 1997 Statistical Abstract of the United States, GET CITE

Table 9: Top 10 Lowest State PC Penetration Levels and State Median Income, 1990's

Bottom Ten States in PC Penetration	Household PC Penetration		Bottom Ten States in Household Median Income	Household Median Income
New York	32%		South Carolina	\$29,071
South Carolina	31%		Tennessee	\$29,015
North Carolina	30%		Louisiana	\$27,949
Kentucky	30%		Montana	\$27,757
Oklahoma	30%		Mississippi	\$26,538
Alabama	29%		Oklahoma	\$26,311
Louisiana	25%		New Mexico	\$25,991
Arkansas	24%		Alabama	\$25,991
West Virginia	24%		Arkansas	\$25,814
Mississippi	21%		West Virginia	\$24,880

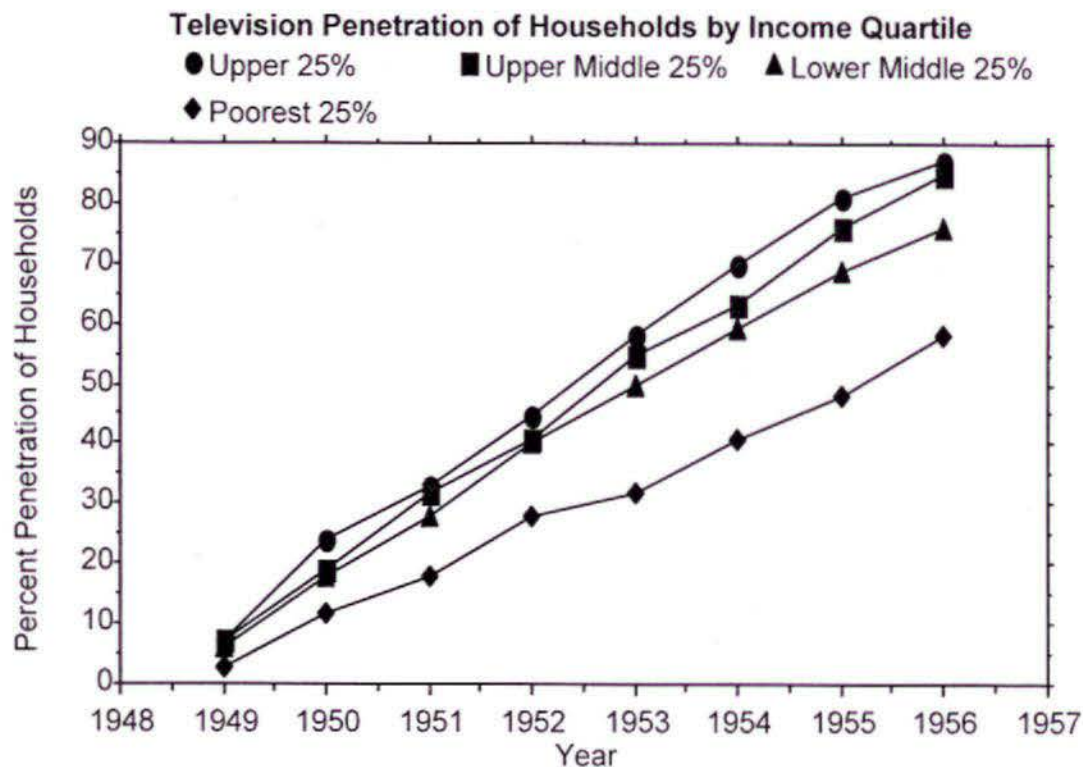
Compiled from: Table 2. Belinfante, Alexander (1998) Telephone Subscribership In The United States. Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission. Released: January 1998. (1997). Statistical abstract of the united states: 1991. Washington DC: Bureau of the Census.

Figure A

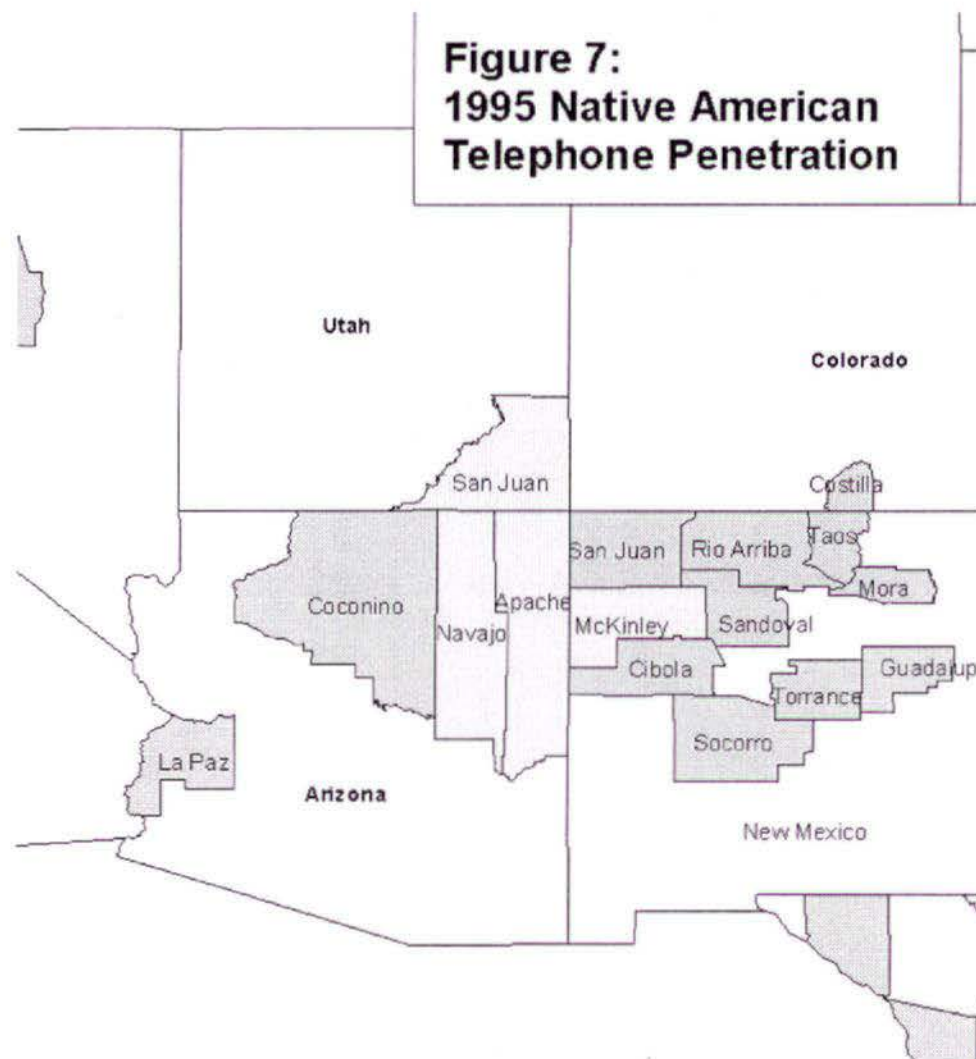


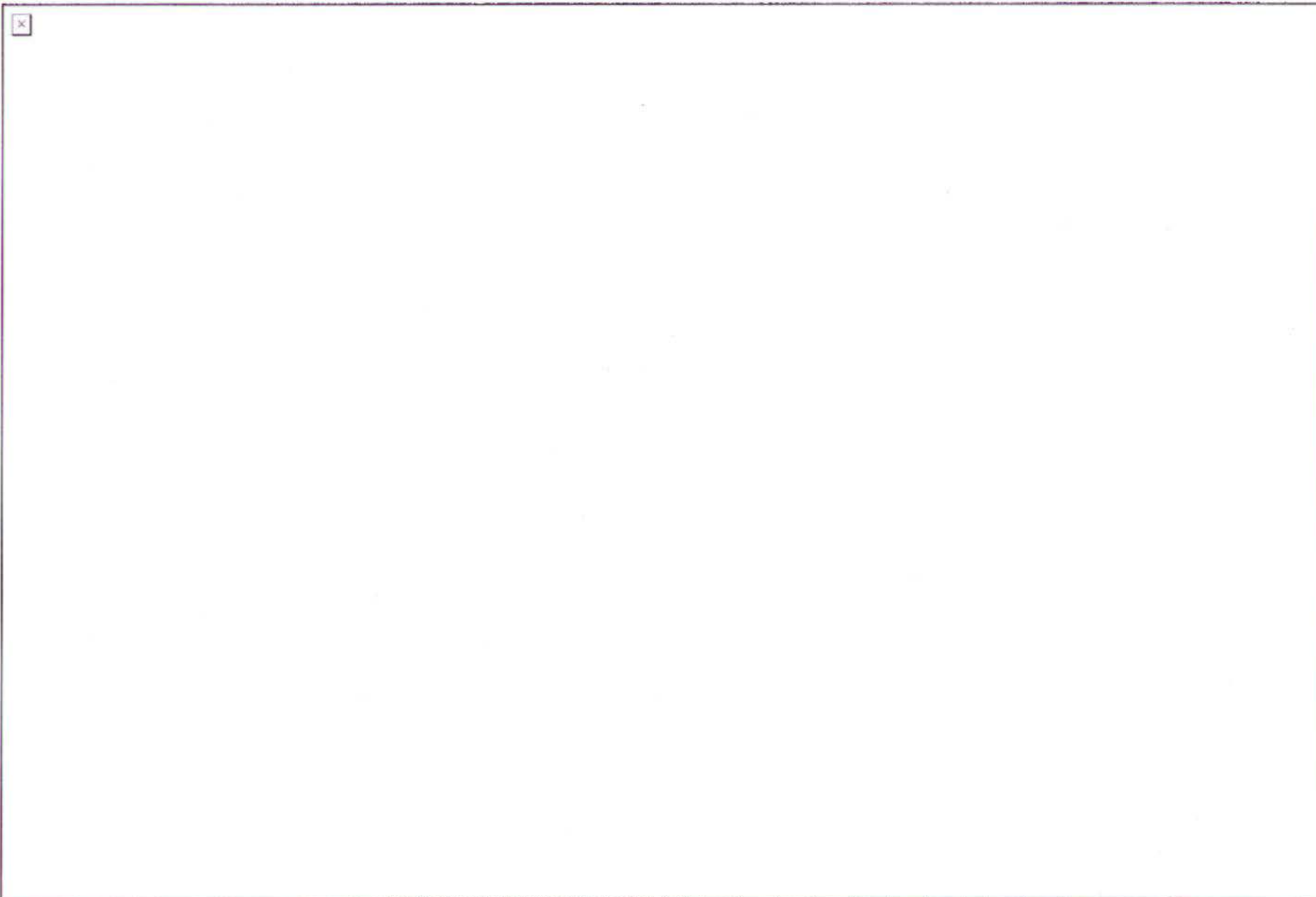
Compiled from Series R 1-12. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 956. (1981). *Statistical abstract: 1981*. Washington, D.C.: U.S. Bureau of the Census. Table 884. (1992). *Statistical abstract: 1992*. Washington, D.C.: U.S. Bureau of the Census. Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission.

Figure B



Compiled from Wilbur Schramm (1960). *Mass Communications*. Urbana: University of Illinois Press, p. 108.





Draft

Thorough Americans: Minorities and the New Media

by

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You cannot become thorough Americans if you think of yourselves in groups. America does not consist of groups. A man who thinks of himself as belonging to a particular national group in America has not yet become an American.
--Woodrow Wilson¹

As the global expansion of Indian and Chinese restaurants suggests, xenophobia is directed against foreign people, not foreign cultural imports.
--E. J. Hobsbawm²

In America, assimilation, diversity, and identity mix uneasily. They are themes as old as the Republic, as fresh as the latest wave of immigrants, and perpetually in debate over the conditions of entry into the mainstream of American society. Here is Woodrow Wilson, a year away from his election, a twentieth century progressive, and Europe's hope to build a peace from a war begun by ethnic violence, insisting on a homogeneous Americanism with no room for variation even though his admonition against "groups" acknowledges their persistence within the social fabric.³ His demand rings of Pat Buchanan in the 1996 Republican primary race, with his vision of a pure America blocking "José" at the border.⁴ Here too is Professor Hobsbawm capturing the irony of the ease with which external cultures flow through the marketplace yet encounter hard

¹ Speech, 10 May 1915, Philadelphia, PA.

² Lecture to the American Anthropological Association (published in *Anthropology Today*, Feb. 1992).

³ On June 28, 1914, Archduke Francis Ferdinand, the heir apparent to the Austro-Hungarian throne, was assassinated in Sarajevo by a Serbian nationalist who set off the first horrendous war of a century of horrendous wars. Woodrow Wilson finally broke the deadlock of the "war to end all wars," though he was unable to settle the ferment that began it all in the Balkans. At home, Wilson kindled admiration among legions of liberals and even inspired some to name their children after him, among them the parents of Woodrow Wilson Guthrie who quickly nicknamed him Woody.

⁴ Throughout his campaign, Pat Buchanan referred to "José" as the stereotypic Mexican supposedly crossing the border in the millions, overburdening the welfare system and lowering wages. Buchanan led the Republican candidates during the early months of the primaries. He stirred support among those Americans who resonate to a combination of populist and nativist themes. In fact, so strongly did Buchanan come on initially, that he caused other Republican candidates to adopt some of his rhetoric; and, even the Democrats, in a kind of rediscovery of their roots, took up the more populist of his themes.

JR Schement
4/5/2022 [autodate]

resistance when they come wrapped around people. The country that spends more on tortilla chips than it does on potato chips remains ambiguous about Mexican immigrants.

In the age of information, this old debate takes on a new twist and poses an opportunity for achieving a renegotiated balance between cultural standardization and ethnic diversity. Americans of all ethnicities are rushing to furnish their homes with an ever increasing array of devices for communicating, receiving, and processing huge quantities of information; and doing so through diverse media across multitudes of channels (The characteristic American home resembles a multiplex theater.). Information exchanges that once took place in the town square, in the meeting hall, in the neighborhood tavern, or on the sidewalk, now more often occur in the study or in the bedroom. The locus of communication and participation is shifting from the public sphere to the private sphere.⁵

For minorities, public space has always been contested terrain. In the bad old days of segregation, African-Americans confronted severe limits placed on their access to the institutions of participation. At the height of the *Jim Crow* era, even their money wasn't good enough; African-Americans were barred from stores where white patrons objected to their presence.⁶ And, until the civil rights movement achieved its gains, African-Americans, Asian-Americans, and Latinos, faced some constraints on their public participation.⁷ Now, a generation after George Wallace stood on the steps of the Alabama state capital and shrieked, "Segregation now! Segregation tomorrow! Segregation forever!," the ability of minorities to participate in the public sphere has been transformed.⁸ Not only have laws sought to ban discrimination from the public sphere,

⁵ For more on the social dimensions of the information age, see: Dordick, H. S. (1988). *The emerging information societies*. In J. R. Schement & L. Lievrouw (Eds.), *Competing visions, complex realities: Social aspects of the information society* (pp. 13-22). Norwood, NJ: Ablex. Mosco, V. (1989). *The pay-per-view society: Computers and communication in the information age*. Norwood, NJ: Ablex. Postman, N. (1985). *Amusing ourselves to death: Public discourse in the age of show business*. New York: Penguin. Schement, J. R., & Curtis, T. (1995). *Tendencies and tensions of the information age*. New Brunswick, NJ: Transaction.

⁶ In this paper, I use the label "white" because it is commonly understood, but I do so with misgivings. As a nation, we have no general terminology to describe those Americans who are of European descent and derive their cultural identification from European ethnic groups. Colloquially, we say *whites*; and, in the Southwest, we say *Anglos*. To an extent, *Anglos* contributes some clarification because it functions as an ethnic category, rather than as a racial category. Still, *Anglo* does not hold common currency throughout the rest of the nation; and so, in the never ending negotiation of language, we are left with *white*, for now.

⁷ Let us be clear that it was African-Americans who bore the brunt of segregation. However, Asian-Americans, Latinos, and women, also experienced institutionalized barriers in the 1950s and '60s.

⁸ Wallace uttered these words as part of his inaugural address, delivered on 14 January 1963, in Montgomery, Alabama. Wallace's speech writer, Asa Carter, was a Ku Klux

but the availability of consumer electronics opens the possibility of entering the public sphere from the relative security of the private sphere. For minorities who still experience informal resentment to their public presence, information technologies offer the potential to circumvent the public sphere. Thus, the focus of this paper, the question of minorities and the new media, carries implications for the broader social dynamics of the information age.⁹

Themes Contributing to a Resurgent Interest in Minorities and the New Media.

Among marketing executives, interest in ethnic consumption patterns has been building up for several decades. Now, a combination of technological, economic, and demographic forces will push minorities into greater visibility as desirable segments of larger markets.

First, new information technologies allow the identification of smaller more targeted segments of markets, causing minority market segments to loom relatively large. For example, in the Los Angeles radio market, the station with the largest audience is KLAX, a Spanish-language station with a *Rancho* format; competition among English-language stations has forced them to choose targeted formats that draw smaller audiences. As entertainment corporations seek more tightly segmented media markets, less differentiated minority segments will remain large (at least for the time being).¹⁰ Consequently, their proportionate size confers a new economic power that will attract even more interest from marketers.

Second, the growing economic power of minorities magnifies Hobsbawm's observation. Non stereotypic European faces abound on television commercials, especially when contrasted with the TV characters of previous decades. Prime-time network schedules include programs with African-American characters. Popular music is perpetually indebted to African-American and Afro-Latin-Caribbean rhythms. And, where large ethnic populations concentrate, commercial media embrace ethnic themes. Yet, while corporations converge on newly appreciated ethnic markets, their growing visibility unleashes cultural and political resistance. Anti affirmative action propositions, anti immigration legislation, and the English only Constitutional amendment have arrived

Klansman who went on to have literary success under the name of Forrest Carter. One of his books, *Gone to Texas*, was made into a film by Clint Eastwood.

⁹ When I first outlined this project, I expected that it would be difficult to find media penetration and use data on Native Americans and Asian-Americans of the same level of detail as data available for African-Americans and Latinos. After months of searching, I uncovered very little data on Native Americans and Asian-Americans that can be compared directly to the other two groups. That is not to say that nothing exists, merely that I did not find it. As a partial remedy, I include anecdotal information where relevant, but it does not compensate. As a matter of professional pride, I am disappointed and struck by the little that we know about ourselves as a nation of peoples.

on the national stage at the same time that ethnic minorities are gaining recognition as profitable markets.

Third, the emergence of a new information infrastructure (NII) offers opportunities for breaking through old barriers. Whereas, the recognition of minorities as important new media markets constitutes a kind of social gain, the "participation" that results tends towards consumption and passivity -- to participate as a television audience, one needs only to sit, watch, and then buy. Now come the new interactive media. The user directs the flow of information and determines content. In effect, the convergence of computers and the Internet offers the prospect of voice to an extent not possible through traditional mass media. Yet, the access of minorities to that new infrastructure remains limited; even so, the potential of the new channels is so great that this alone would merit an analysis of minorities in the information age.

Fourth, significant demographic changes are underway that will alter the size and presence of minority groups. In the 21st century, minority groups' population growth rates will transform familiar terrain. Latinos and Asian-Americans are rapidly increasing in population, while African-American and Native-American populations grow at lesser rates. Some time in the first decades of the next century, Latinos will become the largest of the four ethnic groups. And, as their presence grows, an old question will resurface. What is race and what is ethnicity?

Race Versus Ethnicity

The question derives from the tendency of Americans to use the two concepts synonymously. Yet the two concepts contain divergent implications with significance for how groups are identified. For example, are Jews a race or an ethnic group, or a religion comprising multiple ethnic groups? Are black Americans a race or an ethnic group? And what about Latinos/Hispanics; are they a race that is both black and white? Does it make sense to consider Americans of Cuban descent in the same ethnic group with Americans of Mexican descent? If so, what should we call this "ethnic group?" These questions give an inkling of the confusion generated by the tendency to conflate race and ethnicity.¹¹

¹¹ In the Census, black is the operant term for African-American, and is a racial category, while Hispanic is an ethnic category. Therefore, some blacks are also Hispanics, and some Hispanics are also whites. Apparently, staffers at the Census Bureau have no qualms about mixing category types (like apples and oranges). Moreover, though the use of the term *black* by the census has currency within policy circles, *African-American* has gained popularity within that ethnic community. Similarly, *Hispanic* was adopted by the Census Bureau prior to the 1970 Census. Within the cultural communities encompassed by the category "Hispanic," self descriptors in circulation include *Latino*, *Mexican-American*, *Chicano*, *Cuban*, and *Puerto Rican*; and, in the West, Latinos refer to whites as Anglos, an ethnic nomenclature now accepted by the Los Angeles Times. As a matter of acknowledgment of the importance of self-descriptive terms, I will use the following: African-American, Latino, Asian-American, and Native American, and white, fully

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Americans find it easy to think in terms of races. After all, images of race, with their evocations of grades of skin color, are embedded in the roots of the Republic; and offer, as they always have, an easy means test to allocate individuals. Yet, in practice, categories of race serve only to restrict the minority group in question. For example, in America a girl with one black grandparent, is considered black -- not white -- especially if her skin color is easily noticed. Furthermore, no allowance is made for the mixture of cultures that produced her personal identity. In other words, defining an individual by race is something that "whites" do to "blacks." Thus, race as a category comes packaged in racism since it provides the dominant group with language that can easily exclude and stereotype an individual. In practice, racism diminishes members of the oppressed group by labeling them as one indistinguishable mass, with social status below that of the dominant group. Categories of race, even those used by the Census Bureau, lead to racism.

Ethnicity is another matter, since culture cannot be forced. Indeed, all Americans are ethnics. Every American can tell something of his or her cultural heritage, whether it came arrived on the *Mayflower* with its "First Families," the American brig *Creole* with its cargo of slaves, or the *SS Westphalia* with its manifest of Poles, Slavs, and Russian Jews. Similarly, Native Americans identify themselves by tribal connection.

In fact, ethnicity is about identity. While race confers identity externally -- whites define African-Americans as black, regardless of their shade of skin color or preponderance of "white" genetic makeup -- ethnicity confers identity internally. James Baldwin captured this essence during the first stirrings of the Civil Rights movement in an address to college students: "We cannot discuss the state of our minorities until we first have some sense of what we are, who we are, what our goals are, and what we take life to be. The question is not what we can do now for the hypothetical Mexican, the hypothetical Negro. The question is what we really want out of life, for ourselves, what we think is real."¹² Each individual forms an identity that is grounded in the culture of

recognizing that they constitute conventions with contradictions. However, where specific Census terms are invoked by the presentation of data, I will stick with them.

¹² At Kalamazoo college, 1960, published in *Nobody Knows My Name*, 1961. James Baldwin was born in New York City in 1924. His works dealing with African Americans and relations between the races have entered the American canon, including: *Go Tell It on the Mountain* (1953); *Just Above My Head* (1979); essay collections, such as *Notes of a Native Son* (1955); plays; and short stories. Apropos to the question of ethnicity, Baldwin wrote,

"An identity would seem to be arrived at by the way in which the person faces and uses his experience." --*The Price of the Ticket*, "No Name in the Street" (1985, but first published in 1972);

"It is only in his music, which Americans are able to admire because a protective sentimentality limits their understanding of it, that the Negro in America has been able to tell his story." --*Partisan Review* (Nov.-Dec. 1951);

childhood. Then, throughout life, we renegotiate that culture and its meaning for our singularity. We are forever confronting the challenge, "Who am I?" That is why understanding ethnicity is so important. Individuals shape themselves through ethnicity; whereas, they have an identity forced upon them by racism. Ethnicity produces art, literature, and music; race keeps people in their places.

Thus, the question "What's in a name?" carries profound implications. In Shakespeare's famous disquisition on love and identity, a name alone obstructs Juliet from achieving her heart's desire; language and identity underscore her tragedy.¹³ Indeed, when it comes to self definition, we perceive our ethnicity and identity through name and language; and, moreover, others do too. It should come as no surprise that naming is a constant process and that as ethnic groups seek a niche within the quilt of American society, they repeatedly renegotiate their public identity. From *negro*, to *nigger*, to *Sambo*, to *Colored*, to *Negro*, to *black*, to *African-American*, mainstream Americans have sought to define African-Americans just as African-Americans have sought to define themselves.¹⁴

None of these ethnic categories are mutually exclusive, since mixing began almost from the moment of first contact (John Rolfe's marriage to Pocahontas being the most celebrated of initial unions.).¹⁵ The mixing of ethnicities constitutes the fact of

and a possible admonition to the author, "When one begins to live by habit and by quotation, one has begun to stop living." --*The Price of the Ticket*, "White Racism or World Community?," reprinted from *Ecumenical Review* (Oct. 1968).

¹³ Juliet: 'Tis but thy name that is my enemy;
Thou art thyself, though not a Montague.
What's Montague? it is nor hand, nor foot,
Nor arm, nor face, nor any other part
Belonging to a man. O! be some other name:
What's in a name? that which we call a rose
By any other name would smell as sweet;
So Romeo would, were he not Romeo call'd,
Retain that dear perfection which he owes
Without that title. Romeo, doff thy name;
And for thy name, which is no part of thee,
Take all myself. --*Romeo and Juliet* [1595 – 1596], act II, sc. ii, l. 43.

¹⁴ Race and language have an old affinity. To *denigrate* is literally to "blacken." From the Latin *denigrare* "blacken," a compound verb, *de* (to intensify) and *niger* "black." Both literal and metaphoric uses have been active in English for at least 400 years, a comment on their utility. *Negro*, another derivative of *niger*, came into English via the Spanish *negro*. See, Ayto, J. (1990). *Dictionary of word origins*. New York: Arcade Publishing. and, Onions, C. T. (Ed.). (1966). *The oxford dictionary of english etymology*. Oxford, UK: Clarendon Press.

¹⁵ Pocahontas, born Matoaka in or around 1595. She was most probably a young girl at the time of her mythological defense of John Smith. She was "captured" by the English,

American culture where a child learns to ask, "What are we?" ("we" being the child's family); and where a father responds, "We're Mexican and Italian on my side, and Irish and German on your mom's" (as in the case of my son). When a father mixes the ethnicities of both parents in order to explain a child's heritage, he acknowledges the fuzzy boundaries of ethnicity. For most Americans, the formation of identity requires the recognition of multiple ethnicities; but, also, the fact that personal identity is not simply an equal blend of cultural inheritance, but a consequence of experience where one culture may have contributed the primary influence.¹⁶ As minority populations grow and intermarry, the intersection of ethnicity and identity re-emerges as a major theme in understanding the American experience. For like those Irish and Italian families that intermarried at the borders of their cultures in cities like Boston and Brooklyn, the offspring do not find themselves partaking equally from both cultures; but, instead, more deeply immersed in the sensibilities of the culture that dominates in the home.¹⁷

Indeed, the negotiation of group identity compels mainstream Americans as much as it does minority group members. Though popular conventions imply that Americans don't need a group identity once they have assimilated, language proves otherwise, sometimes with irony. In the 19th century, Americans of English ancestry referred to themselves as *Native Americans*, while they referred to the aboriginal peoples as *Indians*. "Native American" served those white descendants of colonial Europeans by allowing them to distinguish themselves from the newly arrived Irish, who were not considered "white."¹⁸ In the 20th century, "Native Americans" became "Real Americans" (including

converted to Christianity and baptized Rebecca. She married John Rolfe, colonist and planter, accompanying him to England where she was presented to the King and Queen. She gave birth to a son and died in 1617 of Smallpox before she could return to Virginia. The Pocahontas story survives because it is an important origin myth in the secular cosmogony that explained the formation of the new nation. See Mossiker, Frances, (1976) *Pocahontas: The Life and the Legend*. New York: Knopf. And, Woodward, Grace Steele, (1969) *Pocahontas*. Norman, OK: Oklahoma. We Americans are not alone in selecting the union of a European with a native as an origin myth. In Mexican mythology, Cortez' consort, Doña Marina (also known more darkly as La Malinche), plays an important role in explaining the destiny of the new country.

¹⁶ "What nationality are you?" I grew up being asked this question, and I hear my students at Penn State and Rutgers asking the '90s versions of the same question. In the northeast, nationality continues to function as an important signifier, at least among descendants of European immigrants. However, *nationality* does not capture the component of culture as does *ethnicity*. For that reason, I use ethnicity in this paper.

¹⁷ I am particularly sensitive on this point; for, though my father is Italian (he would say Sicilian), I grew up speaking Spanish in a home defined by Mexican culture. Notions of hard and fast ethnic boundaries make this story hard to tell; however, when we acknowledge that ethnic boundaries are never fixed, the story takes on a more natural context.

¹⁸ See, Ignatiev, Noel (1995) *How the Irish became white*. New York: Routledge.

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many of the previously "non-white" Irish); whereas, "Indians" more often refer to themselves by the name of their own ethnic group, while non natives now refer to them as "Native Americans." As labels come to serve new purposes, the names change. If all of this is confusing, it is simply because America is such a vast and complex society. Americans, like people everywhere, form their identities through groups and feel the need to label themselves, just as much as they feel the need to label the groups with which they come into contact.

In the calculus of modern media, ethnicity has emerged as a potent determinant for organizing market segments. Thus, in recent years, the nation's ethnic/demographic terrain has attracted renewed interest. However, the demographic terrain of the 21st century will differ in significant ways from that of the 20th.

The New Demographics

The four ethnic groups whose status as minorities has characterized the second half of the 20th century will continue to be so identified in the 21st, but changing in population sizes.

Whereas, total U.S. population seems likely to grow from a quarter billion people (262,755,000,000) to a third billion (335,050,000,000) by the year 2025, minorities will increase as a portion of the total population; in some states, achieving significant numbers. However, beyond these gross figures, the picture becomes more complicated as separating race from ethnicity produces differing population projections. (See tables 1 & 2.) For example, in the typical race based projection of population, the Census Bureau projects the total U.S. population by race in the year 2025 to be: 78.3% white (including Latinos, most of whom are considered white by the Census); 14.2 black; 1.0 Native American; 6.6% Asian-American (In a conceptual hold-over from the colonial era, the Census Bureau euphemizes the color distinctions in which Americans of that era believed -- white, black, red, yellow.).¹⁹ However, when Americans are asked to identify themselves by ethnicities, a different distribution emerges. Total U.S. population by ethnicity in the year 2025 is projected to be: 62.4 white; 17.6% Hispanic; 13.0% African-American; 0.8% Native American; 6.2% Asian-American.²⁰ (See also Tables 3-6.)

¹⁹ Tables 1 & 2 list groups according to the official Census Bureau labels. Ironically, neither the Census Bureau nor colonial Americans acknowledged a "brown" race; that color distinction entered American colloquial speech later as a result of British race distinctions in India. Today, the label "brown" serves to identify other "non whites" in some political discourses, much as the term "coloured" functions in South Africa.

²⁰ Yet even here, the distinctions are muddy since the Census persists in labeling black and white within ethnic categories. And now, the Census Bureau is considering a category that will surely obfuscate ethnic identity further. The *1996 National Content Survey on Race and Hispanic Origin Questions* has introduced the category "Multiracial" as a way of distinguishing those Americans who perceive themselves to be members of several races. The Survey reports that about one percent of those surveyed listed themselves as multiracial. There are indications that the multiracial category may have

Counting counts; both sets of numbers indicate the general trend in population change, but projecting race makes it difficult to draw valid comparisons between groups, while ethnic categories create the basis for greater consistency. (Even so, the problem of acknowledging ethnic groups as Census categories will remain so long as the Census persists in mixing racial with ethnic categories.) Broken out by the major ethnic groups in Table 2, the growth rates of the five groups offer a window on the demographic profile of the 21st century. The Census predicts that Asian-Americans will experience the highest population growth rate, 204% from 1990 to 2020; the current population of 7.5 million will grow to 22.7 million. The Hispanic population will grow at the second fastest rate, 129% in the same three decades; however, total Hispanic population will reach 51.1 million from its current 22.3 million. These growth rates for both Asian-Americans and Hispanics are based on expectations of significant immigration flows. However, in the case of Hispanics, a young population will produce echoes well into the next century. The current median age for Hispanics, 26.2, **should** rise to 29.4 by 2020 (compared to 42.7 for whites); that is, even though the median age for the entire national population **should** rise, a younger overall Hispanic population means that a larger percentage of Hispanics will be in the primary child bearing years (See Tables 2 and 3.).

Native-Americans and African-Americans (*Black, Not Hispanic*; in the Census) will experience much lower population growth rates. The Native-American population will increase by 49.6%, though their representation in the total population will still fall below 1% in the year 2020 (.8%, or 2.7 million people). African-Americans will experience a similar population growth rate, 48.9%; however, they will begin with a 1990 population of 31.5 million and reach 43.5 million in 2020 (See Table 2). In both groups, immigration is expected to be negligible. In addition, with higher median ages than Hispanics, Native-Americans and African-Americans will produce offspring at a slower rate (See Table 3).

The white population (*White, Not Hispanic*; in the Census) will experience the lowest population growth rate of the five groups. The 1990 population of 193.5 million will grow to 209.1 million, a growth rate of 22.1% (See Tables 2 and 3). As a factor, white immigration is likely to continue well into the 21st century, if not throughout; however, the overall large population size of this group produces a scale effect, making it possible to accept millions of white immigrants without resulting in a large increase to the total population. More telling is median age. From 1990 to 2020, median of age will increase from 36.6 to 42.7. Not only does the white population begin with the highest median age of all five groups, but it will also experience the largest median age increase. By 2020, the median age of the white population will reach the upper limit of the child bearing years, **before dropping again as the Baby Boomers die**. With their lower median ages, Asian-Americans and Latinos will make themselves felt in urban schools,

produced a decline in the proportion of persons identified as *Asian and Pacific Islander*. However, there are also indications that Hispanics reacted negatively to the new category because an increased proportion reported themselves as white. As the Census Bureau moves to more mixing of racial and ethnic categories, the results are likely to produce more confusion as to who is who in America.

(<http://www.census.gov/population/www/socdemo/96natcontentsurvey.html>)

and the tensions felt today between urban versus suburban-rural cleavages will intensify as the cities become increasingly identified with ethnic minorities.

It seems fairly certain that the 21st century population of the United States will differ markedly from the population encountered by adult Americans living today. Whereas, today, whites comprise roughly three-fourths of the total population, they will comprise two-thirds in 2020, and presumably less into the second half of the next century. Still, two-thirds will not make whites a national minority, contrary to the alarms raised by some race-baiting politicians. More likely, the social terrain will change unevenly. Urban areas will undergo the greatest changes, since African-Americans, Asian-Americans, and Hispanics are already urban populations. The growth rates of these populations will be felt in concentrated numbers throughout most of America's cities, though not uniformly.

For example, if one takes the growth index in Table 3 as a multiplier and applies it to project the populations of urban centers like New York and Los Angeles in 2020, a demographic image of 21st century cities emerges (Table 5).²¹ In New York, whites will likely comprise 50% of the total population of the metropolitan area, with Latinos forming the single largest ethnic group at 22% followed by African-Americans at 18% and Asian-Americans at 9% (Native Americans are likely to consist of less than half of one percent.). By contrast, Los Angeles will most likely present a different profile with Latinos as the largest group (40%) trailed by whites at 32%; Asian-Americans will comprise 15%, African-Americans 7%, and Native Americans a visible 5%. However, even with these divergent profiles, both cities will be more visibly ethnic than they are even today. Furthermore, if present patterns persist, both metropolitan areas will experience an unevenness of population distribution as some neighborhoods become Asian-American or African-American, while others remain or become mostly white. A truly mixed neighborhood will continue to be a rarity. The point is that as American cities reflect increases in these ethnic populations they will not do so uniformly. Rather, New York will differ from Los Angeles and Los Angeles will differ from Chicago so that they will take on distinctive cultural identities. Perhaps the cities of the 21st century with their large ethnic populations will share a resemblance with the immigrant cities of the late 19th century.

To an extent, demography is destiny. Thus, population change alone will produce consequences for the ways in which Americans perceive themselves. Yet population consists of just one level of understanding.

The Information Society

²¹ Applying growth indexes constructed for national populations to smaller populations is a risky venture. Even if the growth rate of a population remains fairly constant for three decades (between 1990 and 2020), we would not expect the growth rate to necessarily remain the same for any two cities; after all, the growth rate of the Mexican-American population of San Antonio might grow more rapidly than that of Chicago because of San Antonio's proximity to the Mexican border. Still, as an exercise, these projections give us an idea of how the growth of ethnic populations may affect the distinct urban cultures of different American cities.

Demographic changes alone would compel us to consider the reshaping of American society, if we were not also driven by the throes of a second transformation. In the same decades that witnessed this shift in the population of the U.S., Americans have begun to work in occupations where they manipulate information as the main activity of their work, and experience high personal consumption of information, along with increased interconnectedness. In fact, throughout the 20th century, Americans have acquired a host of devices for communicating, receiving, and processing information. Today, these media environments constitute an indispensable part of life in the information society -- so much so that they now typify American society.²²

The information society comes out of a long term evolution triggered by the relationship between capitalism and industrialization, and facilitated by the ways in which we imagine information.²³ As a historical force, the information society has transformed the economy, the workplace, and the private sphere. The resulting technologies have extended our abilities to connect to each other and to create realities beyond the physical. Now, our exploitation of these possibilities poses new dilemmas for citizens' rights, for information as property, and for the protection of privacy. The new dimensions of information and communication challenge us to consider the nature of literacy and condition of information poverty. Finally, the information society reframes the timeless challenge of democracy by daring government to consider anew the basic rights of participation, and access, that undergird democracy.

Surely, the waxing of the information society will shift and twist the social fabric of the twenty-first century, quite apart from any demographic movements underway. That we must face each separately and together, I consider our great challenge as an American people. Where, then, lies the intersection? To find it, we must begin with a plain old medium -- the telephone.

²² For a discussion of these tendencies, see Schement, J. R., & Curtis, T. (1995). Tendencies and tensions of the information age. New Brunswick, NJ: Transaction. But for a sense of the complexities and controversies, see also Beniger, J. R. (1986). The control revolution. Cambridge, MA: Harvard University Press. Buckland, M. K. (1991). Information as thing. Journal of the American Society for Information Science, 42(5), 351-360. Machlup, F. (1962). The production and distribution of knowledge in the United States. Princeton, NJ: Princeton University Press. Salvaggio, J. (1989). The Information Society. New York: Lawrence Erlbaum. Schement, J. R. (1990). Porat, bell, and the information society reconsidered: The growth of information work in the early twentieth century. Information Processing and Management, 26(4), 449-465. Williams, F. (1982). The communications revolution. Beverly Hills, CA: Sage.

²³ Schement, J. R., & Curtis, T. (1995). Tendencies and tensions of the information age. New Brunswick, NJ: Transaction, chapter 7.

Telephone Penetration

Telephone penetration deserves special attention because it constitutes the access point to many of the new services, such as e-mail and the Internet, associated with the new technologies. Moreover, since lack of telephone service obstructs job searching, access to public health and safety services, and results in social isolation, household telephone penetration represents an important measure of participation in the information age. If someone lives without a television or a radio, their choice might be interpreted as a kind of consumer rebellion, or the adoption of a Bohemian lifestyle. But when a person lacks access to a telephone, he or she is functionally cut off. Telephone service acts as one's passport to the economy, to social networks, and to political discourse. Therefore, a population's socio-economic potential can be measured by the availability of telephone service in its households.

Figure 1 shows the persistent gap between white households and those of African-Americans and Latinos. Over the years, and regardless of federal policy regimes, African-Americans and Latinos have lagged behind whites. What is puzzling is that the gap holds up even when one examines households within the same income range (See Table 8.).²⁴ Furthermore, though unemployed individuals are less likely to have a phone in the home, unemployed blacks and Hispanics show lower penetration levels than do unemployed whites (See Table 9.). Conversely, African-Americans and Latinos consume "intelligent network" features at a much higher rate than do whites; indeed, members of these two minority groups spend more on all types of enhanced communications services.²⁵ So if income is not producing the gap, then what is? And, might there be a connection between the gap in telephone penetration and the consumption pattern for enhanced services? At present, we have no generally accepted explanations.

In the case of Native Americans, data are harder to come by because few telephone statistics target them. Nevertheless, we can derive some insights from an unpublished exploratory study conducted by Steve Schilling of the National Exchange Carriers Association. In an effort to better understand the impact of poverty on telephone penetration, Schilling searched the 1990 Census tapes and identified the 100 zipcodes with the lowest household income. To his surprise, he found native Americans comprising 88.5% of the population in those zipcodes. Further analysis tempered his surprise when he found most of them to be in the southwest and parts of the country with large reservations. However, those of us following his analysis were stunned to find that only 25.7% of the households in those zipcodes have telephones. To be fair, the population size of the zipcodes in question is not large, only 44,252 households with a population that probably does not exceed 120,000. Nevertheless, such widespread

²⁴ Schement, J. R. (1995). Beyond universal service: Characteristics of americans without telephones, 1980-1993. Telecommunications Policy, 19(6), 477-485.

²⁵ Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey. The Information Society, 12, 273-292. PNR Associates (1994). Spending and saving on communications services by minorities : Philadelphia: PNR Associates.

disconnectedness must result in extreme isolation for those affected Native American communities.

Schilling's exploration demonstrates one more reality of the information age in America. Aggregate national statistics do not provide a complete picture. While a telephone penetration rate of more than ninety percent seems like a respectable accomplishment for a large country; the isolation of Native Americans on reservations in the southwest stands in stark contrast to the interconnectedness enjoyed by other Americans. Geographically, telephone penetration varies considerably from town to town (See Table 10.). And, even within the population encompassed by the Census category *Hispanic*, penetration levels vary by cultural group. Cuban-Americans enjoy telephone penetration levels comparable to the national average (93.3%); whereas, Mexican-Americans (80.8%) and Puerto Ricans (75.8%) lag behind (See Table 11.). That is why we should concern ourselves with access to the information infrastructure. Isolation is not distributed randomly; rather, it is concentrated in certain groups so that they suffer its consequences with intensity.

Usage of Other Media

In the modern American home, information technology can be found throughout. Once confined to the telephone alcove in the hall and the radio console in the living room, we now design our homes around the devices we use to receive, process, and send information. We celebrate the richness of the information technology available to us; however, the devil is in the details, as the following discussion illustrates.²⁶

Cable television is to the latter decades of the 20th century what the telephone represented to the first decades. Both technologies constitute services whereby the user rents the service.²⁷ However, unlike the telephone where African-Americans and Latinos

²⁶ To propose that much can be learned about a phenomenon from its specific aspects places the object of this essay within an old tradition. "Men who wish to know about the world must learn about it in its particular details." Heraclitus (c. 535-c. 475 B.C.), *Herakleitos and Diogenes*, pt. 1, fragment 3 (tr. by Guy Davenport, 1976).

²⁷ Both spread steadily over a long period of time. Cable has taken over 40 years to reach its current level of household penetration (66%, see Table 12.), while telephone penetration (approximately 93%) has hardly increased since 1970. (For a span-of-time perspective, keep in mind that the first telephone exchange opened for business in 1877.) By contrast, radio, television, and VCRs experienced explosive growth. In 1925, 10% of all households owned radios (see Figure 5). By 1940, having suffered the privations of the Depression, Americans still managed to increase ownership of radios to 82% of all households. Less than one household in ten owned TVs in 1950; fifteen years later, less than one household in ten remained without a TV. In 20 years, VCR ownership grew from less than 1% of households to more than 85%. Series E 135-166, G 416-469 (1975). *Historical statistics of the united states, colonial times to 1970*. Washington DC: GPO. Table 708, 738 (1981). *Statistical abstract of the united states: 1981*. Washington

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have lagged behind whites, cable distribution shows no significant differences in household penetration (Table 13). The differences appear in premium channel subscription and use patterns. African-Americans subscribe to premium cable at nearly twice the rate of white households (45% to 26%), while Latino households fall in-between (35%). Twenty-two percent of HBO's subscriber base comes from African-American households, amounting to 42% of all African-American homes.²⁸ African-Americans order pay-per-view programs at twice the rates of whites, with Latinos again in-between. Moreover, 70% of African-American cable households subscribe to a pay service, compared to about half that for all other households.²⁹ African-American consumer behavior is even more striking when seen from the perspective of education and family income. In general, the higher the level of education and family income, the greater the likelihood of a household subscription to cable services.³⁰ That African-Americans (and Latinos), who experience lower levels of educational attainment and family income than whites, consume premium services at higher rates implies that minorities value cable differently. It certainly seems that cable plays a different role in the information environments of African-American and Latino households.³¹

Viewing choices also diverge. African-Americans watch 75 hours of television per week, as against 40 hours for the rest of the population. They spend 13% more time watching TV during prime-time, but they spend a whopping 90% more time watching TV

DC: U.S. Bureau of the Census. Table 676 (1987). Statistical abstract of the united states: 1988. Washington DC: Bureau of the Census. See also, Statistical abstract: 1992. Washington, D.C.: The Bureau.

But why should cable and the telephone diffuse at a much slower rate than radio, TV, and the VCR? For a fuller discussion of the causes of diffusion rates for these media, see Schement, J. R. (1994). Divergence amid convergence: The evolving information environment in the home. Annual Review of the Institute for Information Studies, The Aspen Institute. 135-160.

²⁸ Statistics on pay TV subscriptions supplied by Joe Lawson, Vice President of Affiliates Marketing Department, Black Entertainment Television Inc. Data are current for the last quarter of 1996.

²⁹ Joe Lawson, Vice President of Affiliates Marketing Department, Black Entertainment Television Inc., for last quarter of 1996

³⁰ One minor exception. Households where the head has some college education are more likely to subscribe to premium channels than households where the head is a college graduate. See Table 13.

³¹ Milton Mueller and I found this to be the case in African-American households in Camden, New Jersey. There, cable served more functions in the culture of the home than simply entertainment. Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey. The Information Society, 12, 273-292.

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during late night hours.³² Few programs make both group's top 10 prime-time list. Of prime-time programs offered in the spring of 1996, only one, Monday Night Football, ranked with whites *and* African-Americans (Table 14). Perhaps not surprisingly, most programs popular among African-American audiences feature African-American characters, while programs popular with whites feature white characters. (But do programs aimed at African-Americans -- or whites -- reflect cultural themes of relevance? One hesitates to make any claims of cultural relevance for prime-time TV. Still, a perusal of the surviving programs listed in Table 14 reinforces the interpretation that each column captures distinct cultural nuances.) If African-Americans are seeking to see themselves and their experiences reflected in programming, then subscribing to cable makes sense, since finding entertainment programming with African-American characters on cable channels is far more likely than on the broadcast networks alone.

Video games, VCRs, and Camcorders, constitute add-on equipment for the electronic cottage, especially if there are children about. In households where videos are played often, 52% have children present; in households that own video cameras, 41% have children present (Table 15). Plus, the recording of TV programs along with the playing of video games more often occur in households where children are present. And, if one keeps in mind that only 35% of households have children under 18, these statistics indicate a concentration of video related activities in homes with children.³³ This tendency carries added significance for minority households. The higher incidence of ownership of camcorders and playing of videos among Latino households correlates with the younger median age of Latino households (Table 2). That African-American households more often report playing video game systems may reflect the importance of the TV set as the main game technology of the home (versus the personal computer), while the preference for recording TV programs may represent time shifting in households that stay up late.

Americans have been converting their homes into marketplaces ever since Sears & Roebuck published their first catalogue.³⁴ And, women continue to lead the way, just as they did 150 years ago. In particular, women are more likely to watch the Home Shopping Channel (HSC), and slightly more likely to purchase products from it and from

³² BJK&E Group (February 1996) "TV viewing among blacks."

³³ Source: U.S. Bureau of the Census, *Current Population Reports*, P20-447, and earlier reports; and unpublished data.

³⁴ Sears and Montgomery Ward pioneered the catalogue in the 19th century, long before the arrival of the information society. Rural families saw the kitchen table as a place for making numerous consumption decisions; and it was they who pioneered the cultural shift that advanced the market from the public sphere to the private sphere. However, even in the heyday of those catalogues, and for most of the 20th century, the home was considered a secondary place of consumption. The home did not become the scene of major retail transactions until the 1970s. See Schement, J. R. (1994). Divergence amid convergence: The evolving information environment in the home. *Annual Review of the Institute for Information Studies*, 135-160. Schement, J. R., & Curtis, T. (1995). *Tendencies and tensions of the information age*. New Brunswick, NJ: Transaction.

TV infomercials (Table 16). Yet, here again, ethnic differences prevail; African-Americans and Latinos watch and buy more often than whites. However, in this instance, unlike cable subscriptions, education and family income appear to be contributing factors. Individuals without a high school education report watching HSC twice as often as those with a graduate education (36% versus 19%). Family income correlates in the same direction, though with less intensity; 24% of households with a family income of \$50,000 plus report watching HSC, as opposed to 34% of households with a family income of less than \$20,000.³⁵ African-Americans and Latinos who have, on the average, less education and family income than do whites, exhibit greater participation in televised home shopping -- far more watching and somewhat more purchasing, especially among Latinos.³⁶

Televised shopping is old media. The Home Shopping Channel simply connects the telephone to television's penchant for displaying goods, something TV has been doing since its inception. Still, consummating the transaction via telephone (a technique pioneered by New York City grocers in the 1920s) ushered in the era of electronic commerce. The use of Automatic Teller Machines (ATMs), and of electronic bill payments via the telephone, represent the arrival of genuine electronic transactions (Table 17). Not surprisingly, education and family income predict involvement. More education and higher family income correlate positively with ATM use and electronic bill payment, with little differentiation among ethnic groups. The same is true for ATM card use when broken out by ethnicity. However, in the case of electronic bill payment, 13% of African-Americans report paying bills electronically, more than for whites (10%) and Latinos (9%). This difference is hard to interpret. Three percentage points do not constitute unequivocal significance, so this may simply be an artifact of the poll. If there is a nugget of actuality in the three point spread, then it contrasts with the consistency of the data for ATM card use. On the other hand, African-Americans do spend more on new features for both telephone and cable than do whites, and this would support the opportunity for a higher use of electronic bill payment.³⁷ Yet, Latinos also spend more

³⁵ As a point of reference, 28.6% of all households earned \$50,000 plus, while 31.9% of all households earned \$20,000 or less, in 1993, the last year available in the Statistical Abstract. Those distributions change by ethnic group. Of households earning \$50,000 or more: whites, 30.4%; African-Americans, 13%; Latinos, 24.2%. All three groups have increased the percentage of households in this category since 1970. Of households earning less than \$20,000: whites, 29.4; African-Americans, 50.3; Latinos, 43.2. Fewer white households fall into this category than they did in 1970, but more African-American and Latino households fall into this category -- especially African-American households. See Table 723, *U.S. Bureau of the Census, Current Population Reports*, P60-188.

³⁶ I found no consistent data to compare against telephone shopping or Internet shopping. Presumably, these media would be used more by white households.

³⁷ Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey. *The Information Society*, 12, 273-292. PNR Associates (1994). *Spending and saving on communications services by minorities* : Philadelphia: PNR Associates.

on new features, but their incidence of use of electronic bill payments is virtually the same as for whites. So, is there reason to suspect that African-Americans might be leading the way toward electronic bill payment? The answer would be "probably not," if this finding represented the only instance of distinct African-American consumption of media. But because so many separate patterns do exist, we should consider the possibility.

Now, we come to personal computer ownership and use, the penultimate symbol of the information age. The basics hold as they have for most of the media so far discussed (Table 18). Wealthier, more educated people (especially men) are more likely to own PCs, five times more so than those in the lowest categories. However, there are intriguing exceptions. After college graduates (24%), the group most likely to report using home PCs everyday is individuals without a high school diploma (20%). In the "uses home PCs occasionally" category, women (41%) do so more than men (32%), and households with a family income of \$20,000 to \$29,000 report occasional use more often than any other income level. The apparent disagreement with the overall education and income data may result from the tendency of firms to outsource data entry tasks. This might explain the convergence of women and low income households as occasional users, but it does not necessarily account for the high everyday home PC use among respondents with a sub high school education.³⁸ Among ethnic groups, there is variation as well. Whites are more likely to have a PC in the home (32%), nearly twice the level of African-Americans (18%). However, Latinos report 28% of households with PCs. Why should there be such a difference between African-American and Latino households, since they closely resemble each other in educational attainment and family income?³⁹ One statistic stands out. Latinos report more everyday home PC use (26%) than either of the other groups (whites, 19%; African-Americans, 16%). If there is a link, it might be to everyday PC users with less than a high school education. Since 53% of Latinos lack a high school diploma, they might constitute the bulk of the home data entry workers

³⁸ My colleagues offered counter hypotheses, which I present with no judgment and in no particular order: a) teenage hackers who haven't graduated from high school are extensive users of home PCs; b) Less educated respondents do not really know what a PC is and so might answer the question inaccurately; c) respondents over estimate PC ownership and use because the computer has become such a powerful symbol that respondents would rather lie than be thought of as backward; d) the sample of households in some of these categories is so small that statistical errors can easily creep in.

³⁹ Median household income for African-Americans was \$19,533 in 1993; for Latinos, it was \$22, 886; for whites, it was \$32,960. Seventy-three percent of African-Americans were high school graduates in 1994; compared to only 47% for Mexican-Americans, and 60% for Puerto Ricans. Eighty-one percent of whites completed high school. See: Table 724 (1995) *U.S. Bureau of the Census, Current Population Reports*, P60-188. Table 239 (1995) *U.S. Bureau of the Census, U.S. Census of Population, U.S. Summary, PC80-1-C1 and Current Population Reports* P20-455, P20-459, P20-462, P20-465RV, P20-475.

hypothesized above.⁴⁰ Otherwise, the composite image is one of a major access gap, between whites and African-Americans, surrounded by intriguing exceptions.

No easy picture of minorities' uses of media emerges from these tables. In general, however, the following inferences hold up. First, whites, African-Americans and Latinos construct information environments in their homes that suit their needs but do not necessarily mirror each other. For example, as channel capacity for cable increases and more programs become available, each group will seek out programs that reflect characteristics of its identity. Second, ethnic groups are heavy users of media and early adopters of products such as enhanced telephone services and pay-per-view. In effect, they subsidize the early growth of new service networks, as well as those users (mostly whites) who adopt later. Third, African-Americans and Latinos continue to lag behind whites in access to the NII through the telephone and the PC. The NII's benefits of increased participation in the economy and body politic leave significant portions of African-American and Latino populations marginalized because of their lack of access (with the one notable exception of Latino PC use). Fourth, extensive media use among all groups tends to facilitate consumption patterns that assimilate them into mainstream American commercial culture. There is plenty here to confound those who see whites, African-Americans and Latinos as part of one big audience, and there is plenty here to confound those who see minorities as marginalized victims. If anything, both African-Americans and Latinos show themselves as active consumers of media. Their decisions indicate a recognition of specific needs and of the ability to construct distinct information environments in their homes.

Some Challenges for a Changing Society

What can we expect of the 21st century? We will look at ourselves as a people and once more see an altered image. Our cities will pulse, but to rhythms now heard faintly. Los Angeles, Chicago, and New York, will orchestrate the "information century," but their population rifts will be noted more for their contrasts than for their similarities. Latinos, African-Americans, and Asian-Americans will infuse the tempos of the cities; whites will set the cadence in the countryside.

Once again, we will assimilate without homogenizing. Indeed, the information society will facilitate such an outcome. Majority and minorities will come together in a vast national information marketplace where they will consume many divergent forms and content, but where they will follow one set of economic rules. Assimilation will take place within America's most powerful cultural norm -- capitalism.⁴¹ However, unlike the

⁴⁰ See Tables, 238, 239, 240, 241 (1995) U.S. Bureau of the Census, U.S. Census of Population, U.S. Summary, PC80-1-C1 and Current Population Reports P20-455, P20-459, P20-462, P20-465RV, P20-479.

⁴¹ The idea that America assimilates through commercialism is not new. For the best exposition of this thesis, see the last two chapters of Michael Schudson's influential work, *Advertising, the uneasy persuasion: Its dubious impact on american society*. New York: Basic Books.

city crucibles of the beginning of the 20th century, in the 21st, the arena of assimilation will be located in the home. There, individuals of all ethnicities will construct personal information environments, from which to access, process, distribute, and consume information. But if this becomes the sole channel of assimilation, it will produce a deeply flawed society. Thus, the first challenge of the 21st century is to re-imagine what it means to be American.

If we want to understand the experiences and actions of minorities in building their household information environments, we will have to come to terms with ethnicity. That is, African-American's media choices and uses derive from circumstances they experience and tastes they have learned as members of a coherent culture. Accepting the richness of African-American culture will lead to understanding it on its own terms, something impossible when the basis for interaction is skin color. Moreover, unlike skin color, cultures have porous boundaries, which allow for sharing and borrowing -- America's great asset. Here, then is the second challenge: to embrace the information society through the windows of those expanding and arriving cultures that are reinterpreting America.

In a sense this essay is about gaps: gaps in access to technologies; gaps in patterns of subscriptions to services; and gaps in content choices. Examined separately, they vary from curiosities to puzzles; but, taken together, they point to profound differences in choices and consequences. At this point, it is hard to predict with confidence that African-Americans and Latinos will participate fully in the new information infrastructure; and, consequently, how they will find voice in the processes of democracy now emerging through the NII. The more household information environments vary from each other, the harder it is for voices to intersect. If the 21st century brings with it communication networks that are active in linking the members but deficient in connecting one network to another, then national discourse will suffer to everyone's peril. Thus, the third challenge: to link the networks so that one may hear and be heard beyond the comfort of one's affinities.

That is why Woodrow Wilson misunderstood the nature of American society; we do not solely live our lives as individuals. We live as members of groups and networks, beginning with our families, stretching through the affiliations of youth, and embedding ourselves in the structures of adulthood. The most powerful are those from which we construct our identities. And, of those identity givers, perhaps the most perplexing for Americans is ethnicity because it seems to conflict with becoming American. Yet for all of Wilson's exhortations to leave behind ethnicity, it remains as a persistent theme in American society. If there is one certainty that can be asserted from the many questions posed by this essay, it is this: that ethnicity will persist as a theme in the history of the 21st century.

Figure 1

Telephone penetration by ethnicity



Compiled from Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics No. CC Docket No. 80-286). Federal Communications Commission.

Table 1

Estimated Resident Population of the United States 1995-2025: Part I (All population figures are in thousands; all age figures are in years.)							
	1995	2000	2005	2010	2015	2020	2025
ALL GROUPS							
Population	262,755	274,634	285,981	297,716	310,134	322,742	335,050
Percent of tot.	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Median age	34.3	35.7	36.6	37.2	37.3	37.6	38.0
WHITE							
Population	218,085	225,532	232,463	239,588	247,193	254,887	262,227
Percent of tot.	83.0	82.1	81.3	80.5	79.7	79.0	78.3
Median age	35.3	36.9	38.1	38.9	39.1	39.3	39.7
BLACK							
Population	33,141	35,454	37,734	40,109	42,586	45,075	47,539
Percent of tot.	12.6	12.9	13.2	13.5	13.7	14.0	14.2
Median age	29.2	29.9	30.4	30.7	31.1	31.6	32.2
NATIVE AMERICAN, ESKIMO, & ALEUT							
Population	2,242	2,402	2,572	2,754	2,941	3,129	3,319
Percent of tot.	0.9	0.9	0.9	0.9	0.9	1.0	1.0
Median age	26.8	27.6	27.9	28.5	29.3	30.1	30.4
ASIAN/PACIFIC ISLANDER							
Population	9,287	11,245	13,212	15,265	17,413	19,651	21,965
Percent of tot.	3.5	4.1	4.6	5.1	5.6	6.1	6.6
Median age	30.4	31.4	32.1	32.3	32.7	33.1	33.5

Note: The projections in this table rely on population growth rate projections of the middle series, rather than growth rate projections that assume maximum growth or minimum growth.

Compiled from: *U.S. Census Bureau*, <http://www.census.gov/population/estimate-extract/nation/intfile3-1.txt>.

Table 2

Estimated Resident Population of the United States 1995-2025: Part II (All population figures are in thousands; all age figures are in years.)							
	1995	2000	2005	2010	2015	2020	2025
HISPANIC ORIGIN							
Population	26,994	31,366	36,057	41,139	46,705	52,652	58,930
Percent of tot.	10.3	11.4	12.6	13.8	15.1	16.3	17.6
Median age	26.2	27.0	27.3	27.7	28.1	28.8	29.4
WHITE, NOT HISPANIC							
Population	193,523	197,061	199,802	202,390	205,019	207,393	209,117
Percent of tot.	73.7	71.8	69.9	68.0	66.1	64.3	62.4
Median age	36.6	38.4	40.0	41.0	41.8	42.1	42.7
BLACK, NOT HISPANIC							
Population	31,591	33,568	35,485	37,466	39,512	41,538	43,511
Percent of tot.	12.0	12.2	12.4	12.6	12.7	12.9	13.0
Median age	29.3	30.0	30.6	30.9	31.4	31.8	32.4
NATIVE AMERICAN, ESKIMO, & ALEUT, NOT HISPANIC							
Population	1,931	2,054	2,183	2,320	2,461	2,601	2,744
Percent of tot.	0.7	0.7	0.8	0.8	0.8	0.8	0.8
Median age	27.3	28.0	28.3	28.8	29.4	30.1	30.3
ASIAN/PACIFIC ISLANDER, NOT HISPANIC							
Population	8,715	10,584	12,454	14,402	16,437	18,557	20,748
Percent of tot.	3.3	3.9	4.4	4.8	5.3	5.7	6.2
Median age	30.7	31.6	32.4	32.6	33.0	33.3	33.7

Note: The projections in this table rely on population growth rate projections of the middle series, rather than growth rate projections that assume maximum growth or minimum growth.

Compiled from: *U.S. Census Bureau*, <http://www.census.gov/population/estimate-extract/nation/intfile3-1.txt>.

Table 3

Estimated U.S. Population Projections and Growth Index 1990 to 2020 (Numbers in Thousands)						
	1990	1996	2000	2010	2020	Growth Index
Asian-Americans	7,458	9,756	12,125	17,191	22,658	203.81%
Blacks	30,483	33,117	35,469	40,224	45,408	48.96%
Hispanics	22,354	26,798	31,166	40,525	51,217	129.12%
Native Americans	2,065	2,226	2,379	2,719	3,090	49.64%
Whites	208,704	218,334	226,267	240,297	254,791	22.10%

Compiled from: Russell, C. (1996). The official guide to racial and ethnic diversity: Asians, blacks, hispanics, native americans and whites. Ithaca, NY: New Strategist Publications, Inc. pp. 50, 149, 274, 363, and 451. *Bureau of the Census, Population Projections for States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2020, Current Population Reports, P25-1111, 1994.*

Table 4

Selected Ethnic Populations of Six United States Metropolitan Statistical Areas 1992 (Percentages are of Total Population for Each Urban Center)				
	Asian- Americans	African- Americans	Latinos	Native Americans
Chicago	258,000 3.1%	1,564,000 19.0%	898,000 10.9%	16,480 0.2%
Los Angeles	1,339,000 9.2%	1,230,000 8.5%	4,779,000 32.9%	87,000 0.60%
Miami	44,702 1.4%	591,000 18.5%	1,062,000 33.3%	6,386 0.2%
New York	898,000 4.6%	3,439,000 17.8%	2,843,000 14.7%	48,000 0.20%
Philadelphia	119,000 2.0%	1,083,000 18.4%	224,000 3.8%	11,786 0.2%
San Francisco	927,000 14.8%	538,000 8.6%	970,000 15.5%	41,000 0.7%

Note: Chicago area encompasses Chicago/Gary/Kenosha, IL-IN-WI.
Los Angeles area encompasses Los Angeles/Riverside/Orange County, CA.
Miami area encompasses Miami/Fort Lauderdale, FL.
New York area encompasses New York/Northern New Jersey/Long Island, NY-NJ-CT-PA
Philadelphia area encompasses Philadelphia/Wilmington/Atlantic City, PA-NJ-DE-MD.
San Francisco area encompasses San Francisco/Oakland/San Jose, CA.

Compiled from: Russell, C. (1996). The official guide to racial and ethnic diversity: Asians, blacks, hispanics, native americans and whites. Ithaca, NY: New Strategist Publications, Inc., pages 64, 157, 288, 373, 576. *Bureau of the Census*, Statistical Abstract of the United States 1993.

Table 5

Projected Ethnic Populations of Six United States Urban Centers 2020 (Percentages are of Total Population for Each Urban Center)					
	Asian- Americans	African- Americans	Latinos	Native Americans	Whites
Chicago (11,909,000)	784,000 6.5%	2,330,000 19.5%	2,056,000 17.2%	24,000 0.2%	6,715,000 56.3%
Los Angeles (26,809,000)	4,070,000 15.2%	1,833,000 6.8%	10,943,000 40.8%	1,305,000 4.8%	8,658,000 32.2%
Miami (5,275,000)	136,000 2.5%	881,000 16.7%	2,431,000 46.1%	10,000 0.1%	1,817,000 34.4%
New York (29,214,000)	2,729,000 9.3%	5,124,000 17.5%	6,510,000 22.2%	72,000 0.3%	14,779,000 50.6%
Philadelphia (7,940,000)	361,000 4.5%	1,614,000 20.3%	512,000 6.4%	18,000 0.2%	5,435,000 68.4%
San Francisco (10,511,000)	2,818,000 26.8%	802,000 7.6%	2,221,000 21.1%	62,000 0.5%	4,608,000 43.8%

Note: Chicago area encompasses Chicago/Gary/Kenosha, IL-IN-WI.
Los Angeles area encompasses Los Angeles/Riverside/Orange County, CA.
Miami area encompasses Miami/Fort Lauderdale, FL.
New York area encompasses New York/Northern New Jersey/Long Island, NY-NJ-CT-PA.
Philadelphia area encompasses Philadelphia/Wilmington/Atlantic City, PA-NJ-DE-MD.
San Francisco area encompasses San Francisco/Oakland/San Jose, CA.

Compiled on the basis of the growth index in Table 3. Percentages do not add up to 100% because of rounding.

Table 6

States with the Largest Latino Populations: Estimated Populations 1995-2020					
	1995	2000	2010	2020	Percentage Change 1995-2020
California	9,143,000	10,584,000	13,775,000	17,489,000	91.30%
Texas	5,260,000	6,173,000	8,094,000	10,302,000	95.90%
New York	2,372,000	2,498,000	2,750,000	3,031,000	27.80%
Florida	1,948,000	2,333,000	3,202,000	4,173,000	114.20%
Illinois	1,086,000	1,264,000	1,643,000	2,076,000	91.20%

Compiled from: Russell, C. (1996). The official guide to racial and ethnic diversity: Asians, blacks, hispanics, native americans and whites. Ithaca, NY: New Strategist Publications, Inc., pages 282-283.
Bureau of the Census, Population Projections for States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2020, Current Population Reports, P25-1111, 1994.

Table 7

Top Five Non-English Languages Spoken Within United States Households 1990 (Persons 5 Years or Older)					
	Total	Very Well	Well	Not Well	Not At All
Spanish	17,339,172	9,033,407	3,804,792	3,040,828	1,460,145
French	1,702,706	1,226,043	318,409	149,505	8,749
German	1,547,099	1,161,127	284,809	96,804	4,359
Italian	1,308,648	874,032	283,354	134,114	17,148
Chinese	1,249,213	496,277	379,720	264,240	108,976

Source: *Statistical Abstracts of the United States*

<http://www.census.gov/p...emo/language/table5.dat>

Table 8

Telephone Penetration by Household Income Level (March 1993)			
Household Income (in thousands)	Percentage of White Households with Telephones	Percentage of Black Households with Telephones	Percentage of Hispanic Households with Telephones
Under 5000	79.5	63.8	65.9
5.0-7.49	85.0	74.3	70.2
7.5-9.9	88.7	85.4	72.4
10.0-12.49	90.6	80.4	75.3
12.5-14.9	91.4	85.4	81.0
15.0-19.9	93.7	88.3	85.4
20.0-24.9	96.1	90.3	90.4
25.0-29.9	97.5	91.7	89.0
30.0-34.9	98.8	93.2	95.0
35.0-39.9	98.9	95.5	96.2
40.0-49.9	99.4	99.2	99.0
50.0-59.9	99.5	99.4	99.6
60.0-74.9	99.9	99.2	97.3
75.0	99.5	100.0	98.9

Compiled from: Table 1.1, Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics No. CC Docket No. 80-286). Federal Communications Commission.

Table 9

Percentage of Adults with a Telephone by Labor Force Status (March 1991)				
Year	Total Percentage of Unemployed Adults with a Telephone	Percentage of White Unemployed Adults with a Telephone	Percentage of Black Unemployed Adults with a Telephone	Percentage of Hispanic Unemployed Adults with a Telephone
1991	86.6	87.9	81.0	76.8

Compiled from: Table 1.6 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics No. CC Docket No. 80-286). Federal Communications Commission.

Table 10

Households with Telephones for Selected Cities (March 1988)	
Primary Metropolitan Statistical Areas	Percentage of Households with Telephones
Biloxi, MS	81.4
Boise, ID	90.1
Corpus Christi, TX	84.0
Danbury, CT	100.0
Erie, PA	96.3
Gary, IN	90.6
Hartford, CT	95.8
Jersey City, NJ	80.0
Little Rock, AR	86.7
Lubbock, TX	83.0
Mobile, AL	86.4
New Bedford, MA	89.1
Orlando, FL	90.6
Salem, OR	89.1
Shreveport, LA	94.5
Sioux City, IA	83.3
Springfield, IL	88.0
Wheeling, WV	77.0

Compiled from Table 9, Belinfante, A. (1989). Telephone penetration and household family characteristics No. CC Docket No. 87-339). Federal Communications Commission.

Table 11

Telephone Availability Among Latino Households 1994 (Expressed as a Percent)							
	Total US	Total Latinos	Mexican	Puerto Rican	Cuban	Cen & South Am.	Other Latinos
Avail. in house	92.2	81.6	80.8	75.8	93.3	83.8	83.8
Avail	2.4	3.7	3.8	4.6	2.0	3.6	3.1
Not avail	5.4	14.7	15.3	19.7	4.7	12.6	13.1

Available: Respondents who claimed access to a telephone outside of their own household.

Compiled from: *U.S. Census Bureau*.
http://www.census.gov/population/socdemo/hispanic/tab_h94.txt

Table 12

Household Penetration of Selected Information Technologies	
	Percent
Basic Cable TV	67
Premium Cable	27
Satellite Dish	5
VCR	88
Personal Computer	40
Modem	17
CD ROM Drive	18
Fax Machine	13
ATM card	48

Compiled From:

Technology in the American Home, Times Mirror Center for The People & The Press, May 1994, Washington, DC.

Cable Television Developments, (Spring 1996) Vol. 20, No. 1.

Video Week, (January 8, 1996) Vol. 17, No. 8.

Video Week, (March 11, 1996) Vol. 17, No. 11.

Video Week, (August 26, 1996) Vol. 17, No. 35.

TV Digest, (November 25, 1996) Vol. 36, No. 48.

Satellite Week, (July 22, 1996) Vol. 18, No. 30.

TV Ownership and Home Technology, (Spring 1996) Statistical Research, Inc. Westfield, NJ.

Table 13

CABLE SUBSCRIBERS 1994 (expressed as percentages of total households)				
	Cable TV	Premium Channels	Pay-per-view available	Ordered from pay-per-view
Total	64	28	51	15
Sex				
Male	65	29	55	16
Female	63	27	48	14
Race/Ethnicity				
White	64	26	51	13
Black	62	45	56	27
Hispanic	66	35	56	21
Education				
College Grad +	67	26	55	15
Some college	67	31	54	15
H.S. grad	62	27	50	16
< H.S.	57	28	44	13
Family Income				
\$50,000 +	75	38	64	19
\$30-49K	63	27	51	15
\$20-29K	58	26	50	14
<\$20K	55	22	42	12

Source: *Technology in the American Home*, Times Mirror Center for The People & The Press, May 1994, Washington, DC.

Table 14

Top Ten Prime-Time Programs, February 1996	
Top Ten Programs Among African- Americans	Top Ten Programs Among Whites
New York Undercover	E.R.
Living Single	Seinfeld
In the House	Friends
Crew	Caroline in the City
Fresh Prince	Single Guy
Martin	Home Improvement
Family Matters	Monday Night Football
Monday Night Football	NYPD Blue
Monday Movie	Coach
Preston Episodes	Frasier

Compiled From:

BJK&E (February 1996) "TV viewing among blacks."

Data also supplied by Joe Lawson, Vice President of Affiliates Marketing Department,
Black Entertainment Television Inc.

Table 15

VCRs, Video Games, and Cameras (expressed as percentages of total households)				
	Often plays videos	Often records TV programs	Often plays video game system	Owns video camera
Total	36	20	5	28
Sex				
Male	36	18	6	30
Female	36	21	3	27
Race/Ethnicity				
White	36	19	4	29
Black	36	24	10	21
Hispanic	45	18	3	38
Education				
College Grad +	34	21	3	35
Some college	41	24	5	30
H.S. grad	38	19	4	28
< H.S.	28	12	7	20
Family Income				
\$50,000 +	42	22	5	48
\$30-49K	43	22	3	32
\$20-29K	41	22	5	22
<\$20K	28	16	6	13
Presence of Children				
Kids	52	21	7	41
No kids	26	19	3	20

Source: *Technology in the American Home*, Times Mirror Center for The People & The Press, May 1994, Washington, DC.

Table 16

Home Shopping (expressed as percentages of total households)			
	Watched Home Shopping Channel	Purchased from HSC	Purchased from Infomercial
Total	29	10	12
Gender			
Male	26	8	10
Female	31	12	14
Race/Ethnicity			
White	26	10	12
Black	47	12	14
Hispanic	41	15	17
Education			
College Grad +	19	7	13
Some college	25	12	13
H.S. grad	33	12	11
< H.S.	36	7	13
Family Income			
\$50,000 +	24	11	13
\$30-49K	31	14	14
\$20-29K	27	9	10
<\$20K	34	6	10

Source: Technology in the American Home, Times Mirror Center for The People & The Press, May 1994, Washington, DC.

Table 17

ATM Cards and Electronic Banking (expressed as percentages of total households)			
	Has ATM Card	Never Used ATM Card	Uses Electronic Billing (Among Bill Payers)
Total	47	54	10
Gender			
Male	51	51	9
Female	44	57	11
Race/Ethnicity			
White	47	55	10
Black	49	52	13
Hispanic	48	53	9
Education			
Coll. Grad	66	36	16
Some coll.	57	44	16
H.S. grad	39	62	8
< H.S.	25	76	na
Income			
\$50,000 +	64	38	15
\$30-49K	60	42	13
\$20-29K	45	55	10
<\$20K	30	71	7

Source: *Technology in the American Home*, Times Mirror Center for The People & The Press, May 1994, Washington, DC.

Table 18

Personal Computer Ownership and Use (expressed as percentages of total households)							
	Has a Personal Computer in Home		Uses Home PC (Among Households with a PC)				
	Yes	No	Every Day	Most Days	Occasionally	Rarely	No/Never
Total	31	69	19	23	36	7	15
Gender							
Male	35	65	26	24	32	6	13
Female	27	73	12	22	41	8	17
Race/Ethnicity							
White	32	68	19	24	36	7	14
Black	18	82	16	16	34	4	30
Hispanic	28	72	26	21	35	6	12
Education							
Coll. Grad	55	45	24	29	33	5	10
Some coll.	39	61	17	22	39	9	13
H.S. grad	20	80	14	17	38	8	24
< H.S.	11	89	20	19	38	5	18
Income							
\$50,000 +	56	44	23	25	33	7	11
\$30-49K	34	66	17	28	35	6	14
\$20-29K	23	77	17	12	47	2	22
<\$20K	11	89	16	22	34	5	23

Source: *Technology in the American Home*, Times Mirror Center for The People & The Press, May 1994, Washington, DC.

Note: 1997 PC Household Penetration is closer to 40%. *Video Week*, (January 8, 1996) Vol. 17, No. 8.

Draft

Divergence Amid Convergence: The Evolving Information Environment of the Home

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Suppose that by the twenty-first century every human on earth who has a wrist-mounted communications device can be in contact with any other human via a satellite communications network; that home television has over 100 channels, many of them interactive; that most home appliances are programmable or controllable by our voice; that most mail is sent electronically; that small discs for our home players can hold many thousands of pages of textual information; that an electronic network makes available a university education for anyone willing to pursue it; and that we can join our communities for work, play, education, health care, or inspiration electronically? What then? --Frederick Williams¹

On the Saturday afternoon of the future while the children play *Star Wars* on the screen, the head of the household may be immersed in sport. He watches one game on the big screen while a printer at his side spatters news of other games. With his keyboard he can request the results of other games to be displayed on the screen. He can freeze a frame of the televised play at any moment and examine it. --James Martin²

¹Williams, F. (1982). *The communications revolution*. Beverly Hills, CA: Sage, p. 268.

²Martin, J. (1981). *Telematic society: A challenge for tomorrow*. New York: Prentice-Hall, pp. 121-122.

How do we adapt our private lives to the information society? Living, as we do, in a culture that reveres technology, most Americans imagine the information society as a parade of newly developed technologies enriching the quality of life at home. So strong is this assumption, that it sets the baseline for popular expectations of what the information society has to offer. Williams' view of the future where a computerized nerve center frees the individual of many reasons to leave home is typical; and Martin's scenario, where the latest television technologies deliver a sports fan's fantasy -- access to every game played everywhere -- is a regular story line in the popular media. Indeed, in the 20th century's last decade, neither these predictions nor the homes they imply seem so strange. We have largely assimilated their images and expectations. Yet they only make sense because they carry within them a set of cultural assumptions that we take for granted.

Both scenarios imply a kind progress resulting from new inventions of machine technology. They make sense because Americans embrace an optimistic technological determinism that anticipates new technologies in the belief that they will elevate the quality of life.³ Each describes a personal environment dense with channels for receiving information. But neither hints at how the individual will cope with the flow into the home, nor does either scenario suggest whether information will arrive in some intelligible context or as so many fragments. In the first scenario, the individual, emerges as an information seeking professional actively charting a course through the technological landscape of the information society. But in the second description, we imagine a sedentary male (in a rather traditional household) encircled by technology for consuming sports information and seemingly buffered from the rest of his family. The

³Technological determinism is the belief that changes in technology drive changes in society. See for example, David, P. A. (1986). Understanding the economics of QWERTY: The necessity of history. In W. N. Parker (Eds.), *Economic history and the modern economist* (pp. 30-49). Basil Blackwell Inc. Heilbroner, R. L. (1967). Do machines make history? *Technology and Culture*, 8(3), 335-345. Winner, L. (1977). *Autonomous technology: Technics-out-of-control as a theme in political thought*. Cambridge, MA: MIT Press.

message is that information choices express domestic life styles in much the same way as does the purchase of a house or wardrobe. Differences in patterns of information use serve to distinguish one from one's peers, and so become the basis for defining oneself as an individual unique from the rest. Clothes no longer suffice to make the man. Information consumption has become the new basis for defining the individual.

The purpose of this chapter is to review the state of information technology in the home; but, more so, to identify some of the social forces that have contributed to the evolution of the household as a media environment. My intent is to go beyond a description of devices and services to an exploration of the long-term influences which have shaped the information environment of the home.

Information as a Domestic Good

To ask what kinds of information Americans "consume" makes some sense in a consumer culture but it misrepresents the nature of information. After all, the reading of a newspaper produces no deterioration in the information itself, even though the value of the information may decrease as it loses its timeliness for the reader. However, the measure of value derives from the user, not from the information. In addition, the paper itself degrades with use and time, but this constitutes consumption of the medium or package not of the information. Neither of these consequences cause "exhaustion" or "depletion" of the information, nor match the experience of consuming material goods like food or clothing.⁴ Yet the concept of "consumption" is an appropriate one because patterns of information consumption bear similarities to patterns for consuming material goods. Consumers master the evaluation, purchase, replacement, and display of information exactly as they do for other goods. Plus, they purchase many information

⁴Of course, information may be lost. One of the seminal documents of the information age, the original organization chart drawn up by Daniel C. McCallum for the New York and Erie Railroad has been lost to history. When a record no longer exists, and no human remembers, then information is irretrievable.

goods in the same markets in which they purchase material goods. Over the course of the 20th century, the confluence of culture and capitalism has encouraged Americans to adapt themselves to the peculiarities of information consumption .

This confluence can best be observed in the home. In most American households, the television schedule anchors the range of potential evening activities and set the limits of information consumption. A 50 channel system makes available 400 half hour programs in the course of a 4 hour evening. However, programs arrive in a totally fragmented way, with the content from one showing no apparent connection to the next. Moreover, if the watcher has lingering interest in a subject, there is no way to continue once the program ends. In the course of a long evening, an individual might watch 6 to 8 independent programs interlaced among 100 to 180 distinct commercials. Actual time spent varies. Working individuals spend roughly two hours per day watching TV, while non working or older viewers spend more time in front of the set.⁵ On the verge of an interactive future, the total television experience is dictated externally, with minimal participation required of the viewer.

Time spent with television and the range of television- VCR-cable possibilities illustrates the central facts of domestic information consumption. First, the makeup of households varies enormously -- from a collection of individuals (sometimes just one individual) to a traditional family unit. Second, all households integrate imported content with acquired technology. A brief review of the makeup of the household illustrates the multitude of experiences and provides an entry into the information environment.

The concept of the household belies the variety of the American experience. There are 95.7 million households in the United States. 52.5 million, or 55%, are traditional in the sense of a married couple constituting the core. Nearly 8 million (12%) are headed by women. Of all households, the census counts 7.7 million (8%) as African

⁵Kubey, R., & Csikszentmihalyi, M. (1990). *Television and the quality of life: How viewing shapes everyday experiences*. Hillsdale, NJ: Lawrence Erlbaum, pp. 70-75.

American, plus another 5.2 million (5.5%) as Latino.⁶ A further 25% contain solitary individuals, totaling 24 million single person households. Furthermore, few of these characteristics are mutually exclusive; and, when considered along with the possible combinations of intermingling variables that contribute to the range of social characteristics of households, one can see that America looks more like a quilt than a whole cloth.⁷

The decline of the traditional family structure has long been lamented, and, in the last forty years, connected with television. From its first bloom at the 1939 New York world's fair, critics wondered whether television eroded American morality, values, and taste. Parents fretted over their children's viewing habits and asked if TV expanded knowledge or spread ignorance. Others wondered whether steady ingestion of TV fare might cause premature loss of innocence or even lead to criminal tendencies. The more psychologically oriented hypothesized that television might cause abnormal behavior such as viewing addiction or withdrawal from social interactions.⁸ Many parents accused television of ruining the eyes of their children. Ironically, what goes for television also goes for other domestic media. Indeed, domestic media have always served as a lightening rod for parental fears.

⁶What's in a name? A lot. In the Census, black is the operant term for African-American, and is a racial category, while Hispanic is an ethnic category. Therefore, some blacks are also Hispanics, and some Hispanics are also whites. In addition, it should be noted that the use of the term black by the census has validity within policy circles while African-American has gained popularity within that community. Similarly, Hispanic reflects the adoption of that term by the Census. Within the cultural communities encompassed by the category "Hispanic," self descriptors such as Latino, Mexican-American, Chicano, Cuban, and Puerto Rican, have currency. My point is that one should exert caution when interpreting these categories. They are not mutually exclusive, nor do they capture monolithic communities. At best, the externally imposed categories are tenuously valid. Only the self descriptors -- however much they change -- have consistent validity, since they capture the self-expressed identity of the various ethnic groups.

⁷Tables 65, 66, 67. (1993). *Statistical abstract of the united states: 1993*. Washington DC: Bureau of the Census. Statistics are for 1992.

⁸Schramm, W., Lyle, J., & Parker, E. B. (1961). *Television in the lives of our children*. Stanford, CA: Stanford University, pp. 1-10.

However, it is the tendency toward the individualization of the household that offers greater potential for understanding the information environment in the home. The two salient facts are that: 1) the number of persons per household has fallen consistently throughout the 20th century (Figure 1); and, 2) the number of single person households has risen (Figure 2).⁹ Both of these developments have occurred at a time when Americans have increased the numbers of information devices in their homes. And, it seems likely that the connection goes beyond coincidence. Individuals living alone tend to be high users of media; plus, the biggest increases in household individualization have taken place since 1975, the period when the largest numbers of media have entered homes. The more people live alone, the more media serve as companions. The more media become available, the more living alone becomes attractive as an alternative life style.

Figure 3 gives a visual glimpse of the profound transformation of the home by the new media that became available starting in the 1970s but swelling to a crescendo in the '80s.¹⁰ The overarching image is one of increasing abundance. American homes are now furnished with much more than phones, stereos, radios, and TVs. Household interiors contain video games, compact disc players, VCRs, remote controls, camcorders, PCs, modems, fax machines, answering machines, home security systems, and home satellite

⁹What is a household? According to the Bureau of the Census, "A household includes the related family members and all the unrelated persons, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit, or a group of unrelated persons sharing a housing unit as partners, is also counted as a household. ... The figures for number of households are not strictly comparable from year to year. In general the definitions of household for 1790, 1900, 1930, 1940, 1950, 1960, and 1970 are similar. Very minor differences result from the fact that in 1950, 1960, and 1970, housing units with 5 or more lodgers were excluded from the count of households, whereas in 1930 and 1940, housing units with 11 lodgers or more were excluded, and in 1790 and in 1900, no precise definition of the maximum allowable number of lodgers was made." (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO, p. 6. Here, I use "household" to refer to the individuals living together in one housing unit; whereas, I use "home" to refer to the dwelling.

¹⁰In this essay, I prefer the term "media" to the increasingly popular "technology." When discussing those devices for the processing of information that can be found in many homes, the term "technology" is indeed appropriate. However, "technology" excludes some important domestic channels for transmitting information, such as newspapers, or books -- channels that are essential to an understanding of the information environment of the home. Media is the more inclusive term and is so used here.

receivers. Also, old media continue to evolve; the phonograph has become a stereo, the television is also a monitor, and the telephone is but one of several keyboards present in the home. Added to the density of the media environment is the tendency to own multiples. At least when it comes to the electronic media, consumers continue to follow a long tendency to add to their existing media environments (Figure 4).

Growing density of material devices has also paralleled increases in amounts of domestic time spent with media. Until the '90s, television viewing increased (Table 1). But with the introduction of new media into homes, some tradeoffs in behavior are taking place. For example, while 28% percent of the adult population watches 3 or more hours of TV on an average day, only 20% do so if they own a computer, and that number drops to 16% of the computer user also owns a modem. By contrast, computer users with modems spend 60 minutes per day reading on average, while non computer users expend 47 minutes on reading. And, computer users tend to score higher on political knowledge.¹¹ What used to be a fairly homogeneous audience is now breaking up into smaller population groupings that actively use combinations of media. These new fragments, or market segments to advertisers, have become enormously complex, since so many media mixes are now possible.

One growing fragment deserves note. Millions are now working at home because the time honored tradition of self-employment has combined with a push by corporations to hold down costs by exporting work. The result is that some Americans have converted their homes into centers of production while others split work time between home and office. Eighteen percent of the working population is self-employed for some of the time. Another 27% work at home for a portion of their work time; and, of this group, 40% use a computer at home, while 13% use a fax machine.¹² A reinvention of the home is

¹¹Kohut, A. (1994). Technology in the american household Times Mirror Center for the People and the Press, p. 5, 7.

¹²Kohut, pp. 9, 10.

underway that transcends the introduction of media to the home for purposes of domestic convenience and leisure.

Such a use of the home and of media is possible due to the remarkable convergence taking place among information technologies. Fifteen years ago an individual relied on slow mail or voice-to-voice telephone, in order to send a message. Now the possibilities encroach on each other for attention. There are: faxes -- telephonic print; e-mail -- asynchronous electronic written letters; diskettes -- asynchronous electronic written or visual messages; CD ROMS -- other asynchronous electronic written or visual messages; and, voice mail -- asynchronous oral letters. Plus, this is one narrow example. Multimedia services that were once confined to a specific medium are either available now or soon to be.

The picture that emerges is one of a home increasingly dense with information devices as new ones are added every year or so. Yet, however popular, that image is misleading. Americans are transforming their homes by doing more than adding new media; they are also displacing old media. Figure 4 gives some idea of the historical consequences of introducing new media. As the number of radios, televisions, and VCRs has increased per household, newspapers have suffered a gradual decline. On the other hand, the interactions among the devices introduced in homes in the 1980s is too recent to draw conclusive inferences. Thus, the historical data is of value because we can see interaction over time. Moreover, the processes of interaction remain the same, so that we can safely infer that displacement among media will occur as the new media of the '80s find their niches.

However, a closer examination of figure 3 indicates that we are not moving toward a new homogeneity. For one thing, diffusion rates vary. VCRs, CDs, and answering machines have diffused quite rapidly (although they have not approached the diffusion rates for radio and television). By contrast, cable, security systems, and satellite receivers have diffused at a slower pace. Finally, projected saturation rates for media

differ. Video games are associated with children and likely to reach saturation rates at a level close to the percentage of households with children (70%).¹³ Camcorders are also associated with children, or at least parents with small children, so that the saturation level is likely to be lower than for a universal medium like radio. What is clear is that projecting the saturation level for any medium is difficult. In the case of camcorders, it is further complicated by the fact that they are much more likely to be found in high income households than in low income households; 48% of households with incomes of \$50,000 or above own camcorders versus 13% of households earning \$20,000 or less.¹⁴ So, while all American households own some of the same media, and all are moving toward including more media with devices owned in multiples, they are not all moving toward owning the same media. The domestic terrain of the future will contain significant differences in media ownership between those of high income and those of low income.

Finally, it seems likely that nearly all time spent at home will fall within view or earshot of some media. With the arrival of new interactive technologies, some households will use televisions like computers while others will use computers like televisions. In still other households, the center of the household universe will be occupied by a system which melds the characteristics of both but is not easily recognizable as either one or the other. If the home is dominated by interactive technologies, the members will probably become more proactive in their consumption of media (conceivably following the model proposed by Williams in the introductory quote). Negotiating daily life already consists of coping with a blur of messages; and, in the new interactive environment, this tendency will intensify. Messages will continue to arrive in a highly fragmented mode, sometimes simultaneously, each independent of the other and competing for the individual's attention.

¹³Kohut, p. 42. Table 70. (1993). *Statistical abstract of the united states: 1993*. Washington DC: Bureau of the Census. Statistics are for 1992.

¹⁴Kohut, p. 43.

The lessons of history

The 20th century marks the move by Americans toward the consumption of information goods. The integration of national markets for material goods set the stage for the availability of information goods [and services] and their inclusion in the consumer culture appearing in the early decades of the century.¹⁵

Americans exhibited a tremendous appetite for media from the start. In 1925, 10% of all households owned radios (see Figure 5). By 1930, ownership stood at 46%. Ten years later, having suffered the privations of the Depression, Americans still managed to increase ownership of radios to 82% of all households. They bought radios at an astonishing rate, especially when one considers that the Depression forced personal expenditures on information goods and services to drop from 4.4% of all personal expenditures in 1930 to 3.5% in 1935, not recovering the 1930 level until 1945.¹⁶ In addition, radio technology of the time meant that when Americans decided to purchase a radio many of them bought an expensive piece of furniture. Despite these obstacles, radio achieved virtual saturation by 1950, just in time for the arrival of the next wave -- television. Less than one household in ten owned TVs in 1950. However, fifteen years later, less than one household in ten remained without a TV. Television's complete

¹⁵See, for example, Beniger, J. R. (1986). *The control revolution*. Cambridge, MA: Harvard University Press. Dordick, H. S. (1988). The emerging information societies. In J. R. Schement & L. Lievrouw (Eds.), *Competing visions, complex realities: Social aspects of the information society*. (pp. 13-22). Norwood, NJ: Ablex. Schement, J. R. (1989). The origins of the information society in the united states: Competing visions. In J. Salvaggio (Eds.), *The information society*. (pp. 29-50). New York: Lawrence Erlbaum. Schiller, H. I. (1988). Old foundations for a new (information) age. In J. R. Schement & L. Lievrouw (Eds.), *Competing visions, complex realities: Social aspects of the information society*. (pp. 23-31). Norwood, NJ: Ablex.

¹⁶Series E 135-166, G 416-469 (1975). *Historical statistics of the united states, colonial times to 1970*. Washington DC: GPO. Table 708, 738 (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 676 (1987). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census.

adoption took less time than radio. When they first came on the market, purchases of radio and television sets [and VCRs] represented significant first-time costs. But as demand rose, technology advanced, and economies of scale took hold, prices dropped so that most households in the 1990s own, on the average, 5 radios and 2 TV sets.

The diffusion of information services present a somewhat different pattern. Cable, for example, emphasizes a different set of choices. Unlike radio and TV, the decision to purchase cable services means continuous payments. Plus, an extensive wired infrastructure must exist prior to the delivery of services. Not surprisingly, the diffusion curve for cable looks less steep. But as with radio, cable penetration grew even through the sharp recession of 1982-83; and, by 1989, 53% of all households subscribed to cable services. Telephone services are similar in that they require the decision to pay a monthly fee, and the building of an infrastructure in order for the connection to function. Moreover, in contrast to cable, the telephone infrastructure was built from scratch. So the adoption curve for the telephone looks more gradual. From 1878, when George W. Coy established the first practical exchange, 80 years passed before 3 out of 4 households boasted a telephone.¹⁷ Though the adoption of radio sets proved immune to the Depression, telephone penetration dipped in correlation with personal expenditures. Telephones reached saturation by 1970, with 93% of households slowly advancing to 94% in the twenty years since.¹⁸ But for households on the margin, the payment structure of telephone service means a hard choice every month. The 6% of households without telephone service have become a serious policy issue as the switched telephone network underpins the computer-based technology for the next generation of enhancements. Those off of the net now are likely to remain off in the new information infrastructure. Therefore, the one time cost characteristic of Radio and TV (allowing them to circulate

¹⁷Brooks, J. (1975). *Telephone: The first hundred years*. New York: Harper & Row, p. 65.

¹⁸Belinfante, A. (1993, July). Telephone subscribership in the United States. (CC Docket No. 87-339). Federal Communications Commission.

second and third hand) forms the core of the media environment for everyone (99% for radio, 98% for TV).¹⁹

Figure 6 depicts the one major counter-current to the tendency toward more dense personal media environments. Like the telephone, daily newspaper circulation fell along with personal expenditures during the Depression. Circulation climbed as Americans recovered economically; so, in 1950, for example, when 9% of Americans owned televisions, daily newspapers circulated at a rate of 514 per 1,000 adults -- virtual saturation if one accepts a figure of 2 adults per household in that year. But once television took off, newspaper circulation fell again. Throughout the '50s, as TV ownership climbed, the dailies faltered. By 1970, the year of television's complete penetration, newspaper circulation sank to 459 per 1,000. It never recovered. As of 1985, circulation had dwindled to an all time low of 356 per 1,000. A simple extrapolation of the curve indicates a future of lower circulation and readership. (The social problem of course is that newspapers provide more detailed information of current events than does television, even with the advent of all-news cable channels. By spurning newspapers, Americans abandon a source of information in depth for sources of more simplistic information like television and radio.)

Figure 7 describes conditions of two other media that have fared enigmatically as Americans elaborated their domestic media environments. Motion picture theater attendance generally rose from 1925 to 1945, the golden age of Hollywood. If anything, the Depression years stimulated theater attendance as audiences sought some escape from the monotony of poverty. But the combination of television and the new family life styles of returning World War II veterans, knocked movie theater attendance into a 30 year decline. The curve indicates a turning away from public entertainment in favor of

¹⁹Series R 1-12. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 956. (1981). *Statistical abstract: 1981*. Washington, D.C.: U.S. Bureau of the Census. Table 884. (1992). *Statistical abstract: 1992*. Washington, D.C.: U.S. Bureau of the Census. Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission.

entertainment in the home; but more than that, it reflects the decline of public life and the dominance of the private sphere. Where once theaters and movies were synonymous, movies began to appear on TV; and, in the '80s, VCRs converted the home into a movie theater.

The diffusion curves in figure 5 indicate the astonishing speed with which Americans ushered in radio and TV. From then on, the social environment of the home centered on television; and, as cable and VCRs expanded TV's possibilities, they crowded out the daily newspaper. Still, newspapers led the way in one important dimension. The economic support structure of the radio and television industries built on the relationship between advertising and newspapers.

The pervasiveness of this order meant that Americans reorganized themselves into a consumer audience for mediated messages; and, despite predictions to the contrary, they quickly accepted the system of advertising-marketing as the context for radio and later television. Today, Americans willingly contribute marketing information requested by advertisers and corporations. In effect, they have tacitly agreed to deliver themselves, as a commodity to be sold by media executives to advertisers.²⁰ That Americans continue to be comfortable with this arrangement explains some of the ease with which they have adapted to the increasing demands made by media on their disposable income.

One last tribute to radio. Even before television eclipsed newspapers, radio led the way. It altered social patterns within the home by presenting a source of continuous messages requiring directed attention and by inducing the families to rearrange their living rooms around the set. Before radio, the phonograph introduced home entertainment where the technology became the focus of recreation. But, whereas the

²⁰The first to recognize this seeming contradiction was Dallas Smythe. He understood that the exploitation of consumers occurred with their consent. See Smythe, D., W. (1977). Communications: Blindspot of western marxism. *Canadian Journal of Social and Political Theory*(Fall), 1-27. Smythe, D. (1981). *Dependency road: Communication, capitalism consciousness, and Canada*. Norwood, NJ: Ablex.

operator and the supply of cylinders (later discs) set the cadence of the phonograph, radio supplied sounds endlessly. In their turn, TV, VCRs, and cable exploited the environment originally created by radio. So, though we often associate television with a revolution in American lifestyles, the revolution began with radio. In fact, TV, VCRs, and cable are better thought of as enhancement technologies for radio. Their rapid rates of diffusion reflect the ease with which people added them on. And, the fact that individuals easily understood the potential advantages of each new medium speaks to a cultural adaptation accomplished by the introduction of radio. Today's living room barely resembles the parlor; and yet, this seeming discontinuity belies the enduring enthusiasm for media with which Americans continue to collect their gadgets, devices, and appliances.

One Information Society, Many Realities

Surveying the media explosion of the 1980s, it is clear, if there was any lingering doubt, that Americans embrace information technologies as necessities for modern living. But it should be equally clear that the likelihood of a universal media environment is low and that individual uses will vary. Gender, ethnicity, and social class affect the circumstances of work and leisure; and, therefore, influence media environments accordingly. Yet, no matter one's social standing, the media environment, once created, imposes some common experiences.

In most cases, the individual opens a window to an avalanche of messages. A torrent of potential information spews into the filter of personal attention. The few messages that are actually focused upon can still overwhelm an individual; and, of those, fewer still are internalized. From the receiver's perspective the price of building a dense media environment is information overload, meaning that by far most messages are lost. Moreover, once the media environment is built, this outcome becomes inevitable -- the denser the media environment, the more lost messages. The human brain might appear as

a severe bottleneck to an information scientist, but the loss of most messages seems of little concern to Americans as they enthusiastically expand their media environments. If a motivating logic exists for most individuals, it goes something like this:

An increase in the number of information channels =>
An increase in the number of messages =>
An increase in the amount of new information =>
An increase in the amount of knowledge =>
An increase in perceived welfare.

Given the above reasoning, few Americans would argue that they are worse off for living in ever denser mediated environments. Besides, the strategy of inclusion appeals to the American sensibility that more is better. Yet coping with the modern avalanche of messages requires a break with traditional logic. In order to function while awash in messages, people intuitively develop a strategy of exclusion. They erect mental blinders to most messages and sift the remainder, often attending to several channels simultaneously. Remarkably, this new strategy seems understood at a basic level. In fact, few people become immobilized when confronting a dense media environment. For the most part, Americans have made a smooth transition from a strategy of information inclusion to one of information exclusion. They required no formal training, not even passing the skill informally from parent to child, although, admittedly, cases exist to the contrary. So, for example, when managers must make deadline decisions, information overload hinders efficiency. In general, however, the following logic appears increasingly common in the information society, especially in the home:

An increase in the number of information channels =>
An increase in the number of messages =>
An increase in filtering behavior =>
A decrease in messages received =>
A limited increase in the amount of new information =>
A limited increase in the amount of knowledge =>
An increase in perceived welfare.

It seems likely that the two logics co-exist. The old logic serves as an ideological umbrella. It says, "more information is better," and so individuals continue to expand their media environments. In addition, it serves to accommodate us to the information society by cueing us to the importance of information. At the same time, the new logic, which says "selective attention is best," is rapidly becoming our algorithm for actually coping with the waves of messages we face everyday.

What kinds of information do individuals actually receive? For most, the media environment does not create an atmosphere like the one predicted by Williams. Rather than rationally accessing the information most appropriate to the decisions facing the user, the typical household media environment probably comes closer to the model described by Martin -- super entertainment presented as capitalist realism. That observation leads newspaper columnists, social critics, and academics to wonder, "Can such a climate provide information of use for successfully negotiating daily life?" The answer usually boils down to an exasperated critique of a culture dominated by the lowest common denominator. But this is not a simple question; for, depending on the specific individual, the "Oprah Winfrey Show" may contain more useful information than the "McNeil/Lehrer News Hour."

The reality is that people increase their levels of personal knowledge from all media and from all genres.²¹ Neither the critic nor the individual can predict whether a particular message or genre will contain more or less useful information, although we all approach new information with expectations. For these reasons, the strategy of exclusion

²¹See, for example, Comstock, G., Chaffee, S., Katzman, N., McCombs, M., & Roberts, D. (1978). *Television and human behavior*. New York: Columbia University. Davison, W. P., Boylan, J., & Yu, T. C. (1976). *Mass media: Systems and effects*. New York: Praeger. Dorr, A. (1986). *Television and children: A special medium for a special audience*. Beverly Hills, CA: Sage. Katz, E., Blumler, J., & Gurevitch, M. (1974). Uses of mass communication by the individual. In W. P. Davidson & F. T. C. Yu (Eds.), *Mass communication research: Major issues and future directions* (pp. 11-35). New York: Praeger. Wartella, E. (Ed.). (1979). *Children communicating: Media and development of thought, speech, and understanding*. Beverly Hills, CA: Sage. Webster, J. (1986). The television audience/The new media environment. *Journal of Communication*, 36(3), 77-91.

almost necessarily contains an inherent element of irrationality. Prior to its reception, no one can predict which message will be of greater use. Therefore, on what basis can one decide which to exclude and which to receive? The answer is none, and all. Since no single algorithm can provide the best tactic for all needs, a strategy of trial and error works best when combined with the maximally dense media environment possible from one's resources; and, interestingly, this is what people seem to do.

Underlying forces -- Window, Refuge, Market, Workplace

There is more to media environments than technology. To imagine that the emerging information climate in the home results from new technologies, whereby Americans simply absorb each new wave of media, fails to take into account the strong undercurrents that shape the culture. The transformation that began with the telephone and continues to shape the American home reflects far more than a long line of inventions. It is these undercurrents, these social movements, these impulses, that, when understood, place the information age within the context of the national experience.

At the center of the rise of a household media environment is the shift in emphasis from public life to private life, a shift which intensified the demand for media in the home and the willingness to invest in it. In the early decades of the century, leisure revolved around public institutions like the tavern and the village square. But after World War II, entertainment increasingly took place in the privacy of the home. The ethos of industrial work culture with its emphasis on the nuclear family made the home a natural focal point for interactions; and, with the home as the focus of domestic life, it made sense to invest in a radio in the '20s, a TV in the '50s, a VCR in the '80s, a CD

player in the '80s, and a PC for cruising the internet in the '90s.²² However, no tendency goes unchecked. Private life will never displace public life entirely; even so, the tendency toward emphasizing home life will continue to grow, and, therefore, to warrant even more expenditures on electronic furnishings.

In the latter part of the century especially, individualism and fragmentation characterize the social dynamics of households. The decline in the sum total of household members and the multiplication of single person households means that the cohesiveness of the family system no longer holds in growing numbers of living situations. In households with small children, media are often employed as baby-sitters. Older children request and receive the technology necessary to play video games and listen to music, while parents invest in systems allowing the children to play and listen without encroaching on the parent's use of media. The fragmentation which began when parent's of the 1940s bought a second radio to place in the children's bedroom spreads through the walkman and the boom box. Even when a household consists of just one parent and one child, there exists demand for multiple devices and parallel media systems. For single person households, similar motivations prevail. The person living alone tends to consume information in order to supplement human interactions. One radio and one television does not suffice since company is needed in the bedroom as well as in the living room. And, with no one else to buy for, a solitary individual can indulge his or her tastes for large CD, video, and/or computer game collections. For that matter, interactive media will probably gain their earliest adherence among singles, since they have more discretionary time. Cruising the Internet is an ideal activity when there is no competition for attention from a spouse or child. (As I write this, my 20 month old son has just crawled in and out of my lap, thereby threatening the existence of this file, and my wife has requested that I keep an ear out for the kitchen timer.) So, whatever the

²²It makes sense in a less obvious way to think of a "focus" of domestic life since focus is the Latin word for hearth.

makeup of the household, pressures induced by individualism and fragmentation contribute to greater demand for media. As long as these pressures wax, domestic media environments will go from dense to denser.

The demand for media can be further explained by the continuing images Americans hold of their homes. Americans expect the home to serve as a window -- which explains the continued appetite for media and information -- but they also expect the home to serve as a refuge -- which explains the appeal of home-based services that substitute for public transactions. The two images are contradictory, yet serve the purposes of a society with an expanding private sphere. Through the window, members of the household maintain connectedness with events in the larger world, with present and future jobs, and with significant others. Its capacity to focus the nation has astounded observers -- from FDR's inaugural address, through the televised murder of Lee Harvey Oswald, to live coverage of the bombing of Baghdad. In the '90s, the window is rapidly becoming a node. Still, the desire for a refuge persists.²³ It touches the national nerve because Americans perceive themselves living in a hostile society. Fear of random crime and fear of one's neighbors induces the retreat into the private sphere, so that, for many, the boundary between public and private is not a friendly zone. Ironically, this same fear contributes to the drive to enhance domestic media environments. For if the home is the last refuge from a hostile society, then the media environment functions as a watch tower, and an exceptionally useful one at that. Even so, I don't claim that fear is the primary cause of the expansion in home media that we are witnessing. The desire to supplant public transactions probably ranks higher on the priority list of most Americans. The use of the television, the phone, and the mails, for

²³Refuge is a conflicted term at the end of the 20th century. For women who suffer abuse from their spouses, and for children who fear their parents, the home is a torture chamber rather than a refuge. My use of the term in this essay does not mean to diminish this pathology of our society. I use "refuge" here to elicit the expectations Americans bring to the ideal of the home. Regardless of what actually happens in domestic space, it is the ideal of the home that guides the motivation to create a media environment capable of seeing into the public sphere while keeping the public sphere at arms length.

home shopping, medical service coordination, bill payment, and accessing governmental services, attests to rising importance of the private sphere as the locus of important activities. My point is that the tension between the ideals of the home as window and refuge is consequential and exposes an unrecognized undercurrent influencing the media culture of the home.²⁴

Converting the home into a window has brought consumer culture into the living room and established the home as a significant marketplace. To be sure, the home has long been a marketplace. Once Montgomery Ward, and Sears, pioneered the catalogue in the 19th century, rural families saw the kitchen table as a place for making numerous consumption decisions. But even in the heyday of those catalogues, and for most of the 20th century, the home was considered a secondary place of consumption in the eyes of most of its members. The public sphere retained its magnetism as the locus of consumer culture. After World War II, when families trekked to the suburbs, malls replaced downtown and plate-glass store fronts replaced the ornate portals of the family-owned department stores. Still, consumer culture remained fixed beyond the home. The reinvention of the telephone and the niche catalogue changed all of that. Evolving from simple order placement at the local deli, the convergence of new and old information technologies promises to bring so many purchasing possibilities into the home that Williams' and Martin's scenarios will look primitive (though no one is yet willing to predict the withering away of public shopping with its potential for social contact).

²⁴The tension between window and refuge also implies a threat to privacy, although the question of privacy goes beyond the scope of this essay. The sale and resale of databases containing information on individuals has become a central commodity in the information economy that adds a new dimension of social control to the marketplace. Often gathered passively without the subject's knowledge, the presence of this information may also constitute an assault on privacy. Thus, it should not be surprising to find observers of the information society asking how much control over this valuable commodity an individual deserves plus wondering whether there should be limits placed the kind of information gathered and on the gatherers. That Americans have converted their homes into windows suggests that they are willing to tolerate some intrusion. That they expect their homes to function as a refuge suggests that they seek to protect their privacy. As they pursue both ends of this contradiction, they deepen one of the fundamental tensions of the information age. Once thought of as the right to be left alone, privacy is now thought of as the control of information about oneself.

Furthermore, it is tempting to explain this transformation as stemming from the direct impact of technology; however, the emergence of a consumer culture in the United States goes beyond technology. Its essence is bound up with the significance we attribute to material possessions, and the value we place on individualistic desires.²⁵ Retreat from public life has redirected the focus of consumer culture into the home; and, with that new alignment, there exists a danger. The home as market-window offers so many opportunities to avoid the shoving and nastiness associated with shopping in public, that home consumers may also avoid getting to know their fellow citizens. The siege mentality facilitated by taking the home window seriously may thus contribute to more rigidity on political positions and less empathy for other groups. Personal convenience will be gained at the expense of public consensus. If so, it will be a high price to pay for home shopping.

Tied to consumption is production. By converting the home into a node, Americans fuse the workplace to the home as much as the marketplace. Of the 34% of Americans who work at home, 40% use a computer and constitute the core of a growing group of telecommuters.²⁶ The public image of telecommuters stresses themes of self determination -- savvy information age entrepreneurs who have taken control of their lives. However, the reality is more complex. Firms push employees to convert their homes into offices in order to cut down overhead costs by transferring those costs to their

²⁵The implications of a culture of consumption go beyond the scope of this essay, but they have attracted commentary from some of the greatest thinkers of the century. Here is Erich Fromm. "In our culture ... consuming is essentially the satisfaction of artificially stimulated fantasies, a fantasy performance alienated from our concrete selves. ... We are surrounded by things of whose nature and origin we know nothing. The telephone, radio, phonograph, and all other complicated machines are almost as mysterious to us as they would be to a man from a primitive culture; we know how to use them, that is, we know which button to turn, but we do not know on what principle they function. ... We consume, as we produce, without any concrete relatedness to the objects with which we deal; we live in a world of things, and our only connection with them is that we know how to manipulate or to consume them." Fromm, E. (1955). *The sane society*. New York: Holt, Rinehart and Winston, p. 122. For a more recent view, see Fox, R. W., & Lears, T. J. J. (Ed.). (1983). *The culture of consumption: critical essays in american history, 1880-1980*. New York: Pantheon.

²⁶Kohut, p. 53.

employees. When linked to part time employment, telecommuting also becomes a tactic allowing firms to avoid paying for employee benefits. Even so, telecommuting also exerts a pull. Many people like the independence that comes from converting the home into a place of employment; whereby, they can exploit the refuge potential of the home to avoid the time and supervisory constraints of the office.²⁷ Thus, there can be no doubt that telecommuting made possible by the convergence of information technologies has already set a new standard for defining the home.

What is less visible is that, within this new orientation, leisure as a concept poses problems. Clearly, leisure will continue to exist as an ideal. But for telecommuters and others like them it will come enveloped in a flow of work and non work activities more seamless than those experienced by workers where the locus of labor is outside the home. So, when work forms the salient feature of a person's domestic environment, it may be more appropriate to assume that if they are not at leisure they must be at work. Under circumstances like these, work and leisure are likely to take on the characteristics of a digital switch -- at work, at leisure, at work, at leisure -- with the telecommuter moving back and forth continuously. Consequently, the tension between refuge and window will be further complicated by fuzzy boundaries between work and leisure, boundaries made fuzzy because the activities of work permeate the home. Window, refuge, market, and workplace -- all four functions motivate the exploitation of media and can be conceived as forces both centrifugal and centripetal, as illustrated in figure 8. As tele-professionals and their individualistic work-home environments increase in numbers, values associated with their circumstances will influence American culture. Fuzzy boundaries will become the established pattern of public and private life, while the older fixed boundaries will further retreat toward the periphery.

²⁷The promise is not without perils. Telecommuters can avoid the office but not the office politics. For a fuller discussion of the counter-currents of telecommuting, see Kraut, R. E. (1987). Technology and the Transformation of White-Collar Work. Hillsdale, NJ: Lawrence Erlbaum Associates.

**Automated Records Management System
Hex-Dump Conversion**

An essay on a subject of this nature can only address the sparsest of themes. Much more can be said about the social currents reflected in the domestic media environment. Still, this brief review should dispel the notion that the changing media environment in the home is a simple effect caused by the driving engine of technology. The home has always been a social environment first; therefore, if one wishes to understand it, one must grapple with its social themes. The themes that once formed the old boundaries -- between work and home, between public and private life, between labor and leisure -- no longer appear so clear or so fixed. The lack of clarity stems, in part, from a century long pattern of increased information consumption, during which Americans melded work and home, public and private life, labor and leisure by building a media environment in the home. In so doing, they have evolved new media use behaviors for negotiating simultaneous messages through multiple channels; while, in the background, the convergence of information technologies has served as the great facilitator. Still, convergence has not meant homogeneity. Instead, the plethora of products pouring onto the market will lead to greater disparities in household experiences as income differences influence the ability to participate in the new information infrastructure. That this prospect concerns policy makers is evident in the continuing debate regarding the gap between the information haves and have-nots. It is, perhaps, the most important debate of the information age; for, though convergence of technologies has ushered in the new era, divergence of experiences will define its promise.

Tables and Figures

Table 1

Hours Watching TV (per TV home)

Year	TV watching, average daily hours per TV household (I)	TV watching, average daily hours per TV household (II)
1950	4:35	4.6
1955	4:51	4.9
1960	5:06	5.1
1965	5:29	5.5
1970	5:56	5.9
1975	6:07	6.1
1980	6:36	6.3
1985	7:10	7.1
1990	6:53	

I. Television Bureau of Advertising. Research Dept. (1991). *Trends in viewing*. New York: The Bureau. (Daily I and Weekly)

II. U.S. Bureau of the Census. (1981 & 1986). *Statistical Abstract: 1981, 1987*. Washington, D.C.: The Bureau. (Daily II)

Figure 1



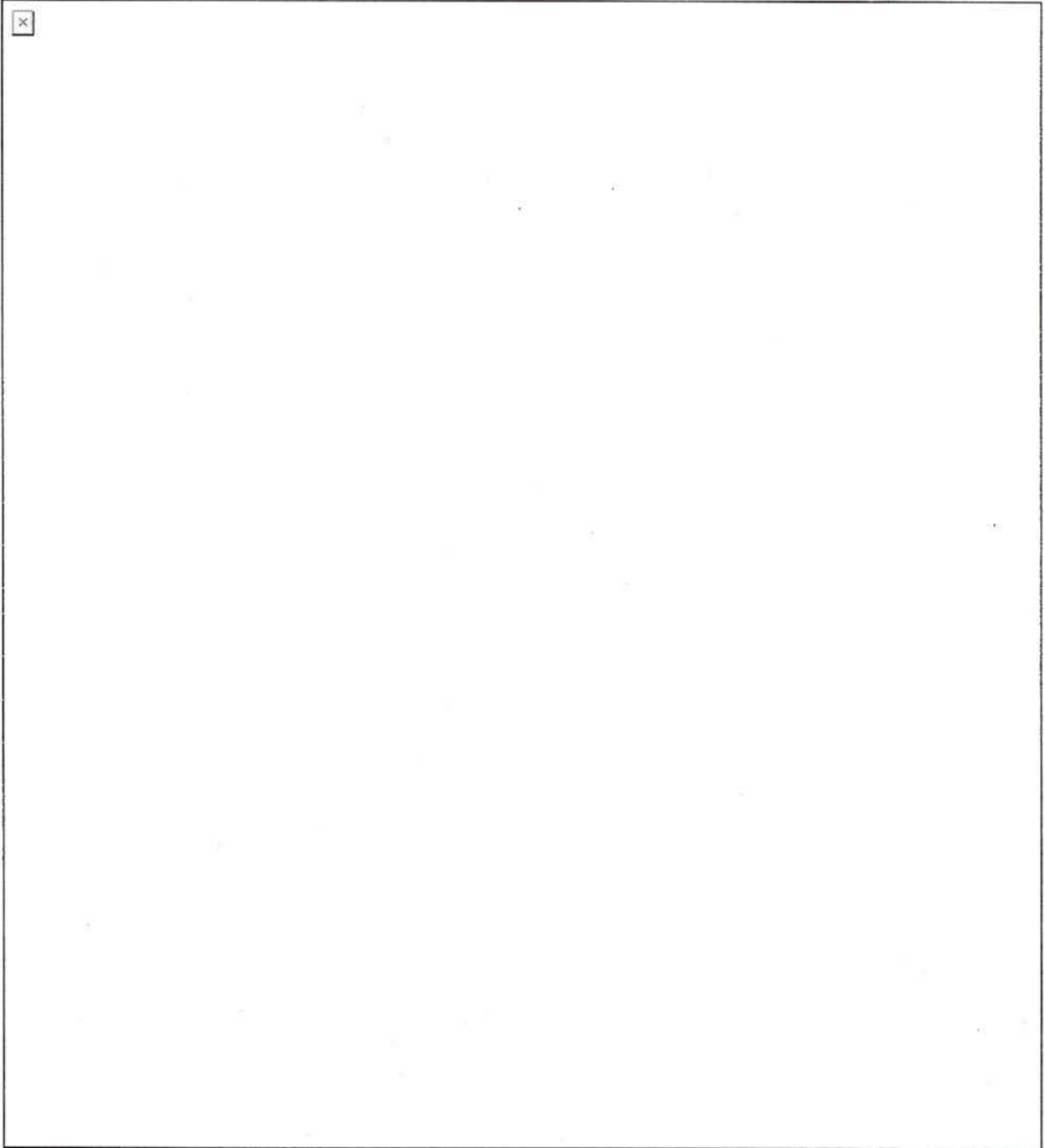
Compiled from: Table Series G 495-581. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. (1991) *Statistical abstract of the united states: 1991*. Washington DC: Bureau of the Census.

Figure 2



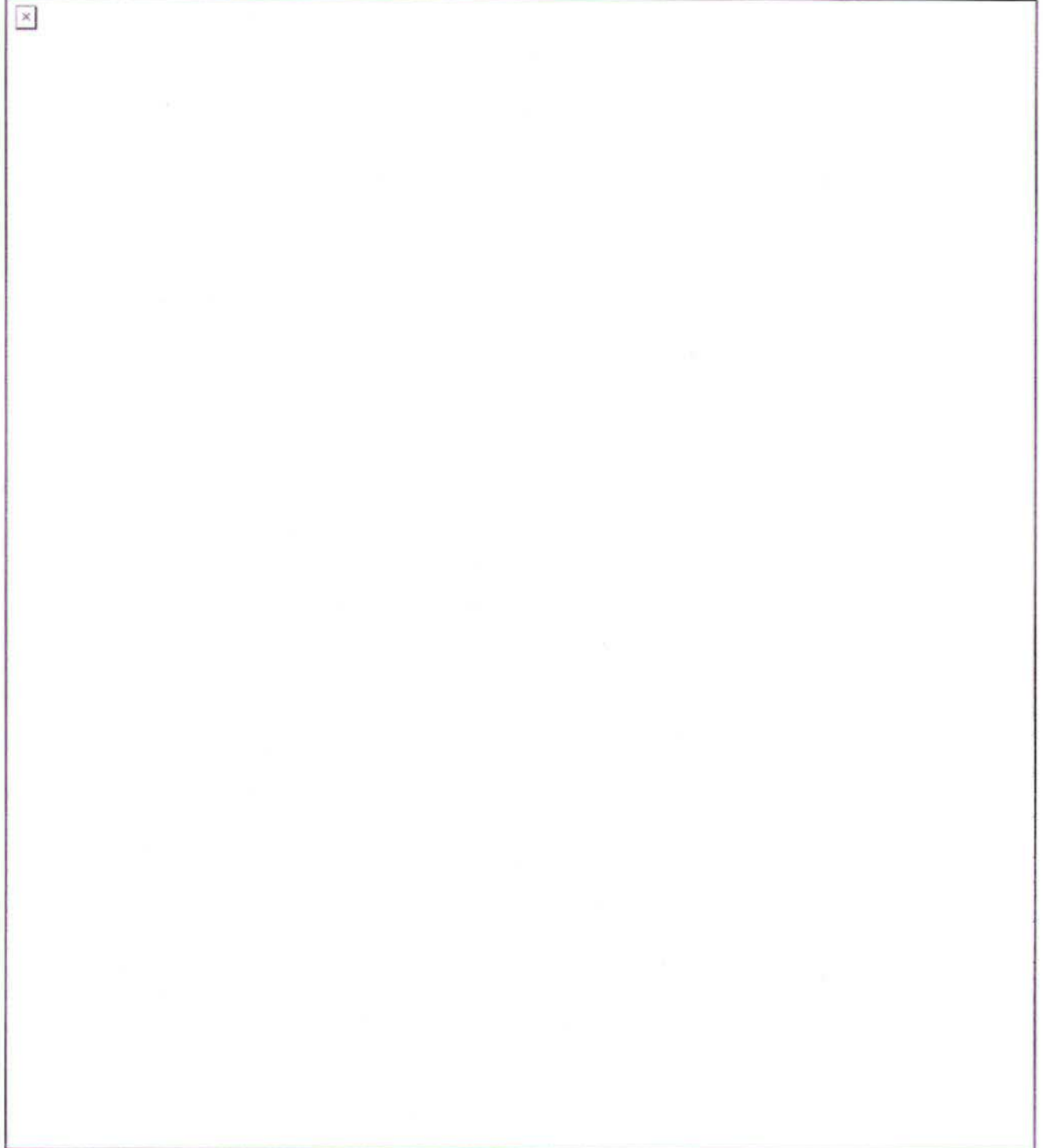
Compiled from: Series A 288-319, 335-349. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 60. (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 56. (1988). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census. Table 55. (1990). *Statistical abstract of the united states: 1990*. Washington DC: Bureau of the Census. Table 2. (1991). *Statistical abstract of the united states: 1991*. Washington DC: Bureau of the Census.

Figure 3



Compiled from: Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission. Electronic Industries Association. (1984-90, 1992). *The U.S. Consumer Electronics Industry Annual Review*. Washington, D.C.: The Association. Electronic Industries Association. (1992). *Electronic market data book*. 1992 ed. Washington, D.C.: The Association. Television Bureau of Advertising. Research Dept. (1991). *TV & Cable Factbook* No. 60, 1992. U.S. Bureau of the Census. (1986, 1990, 1991, 1992). *Statistical abstract*. Washington, D.C.: The Bureau.

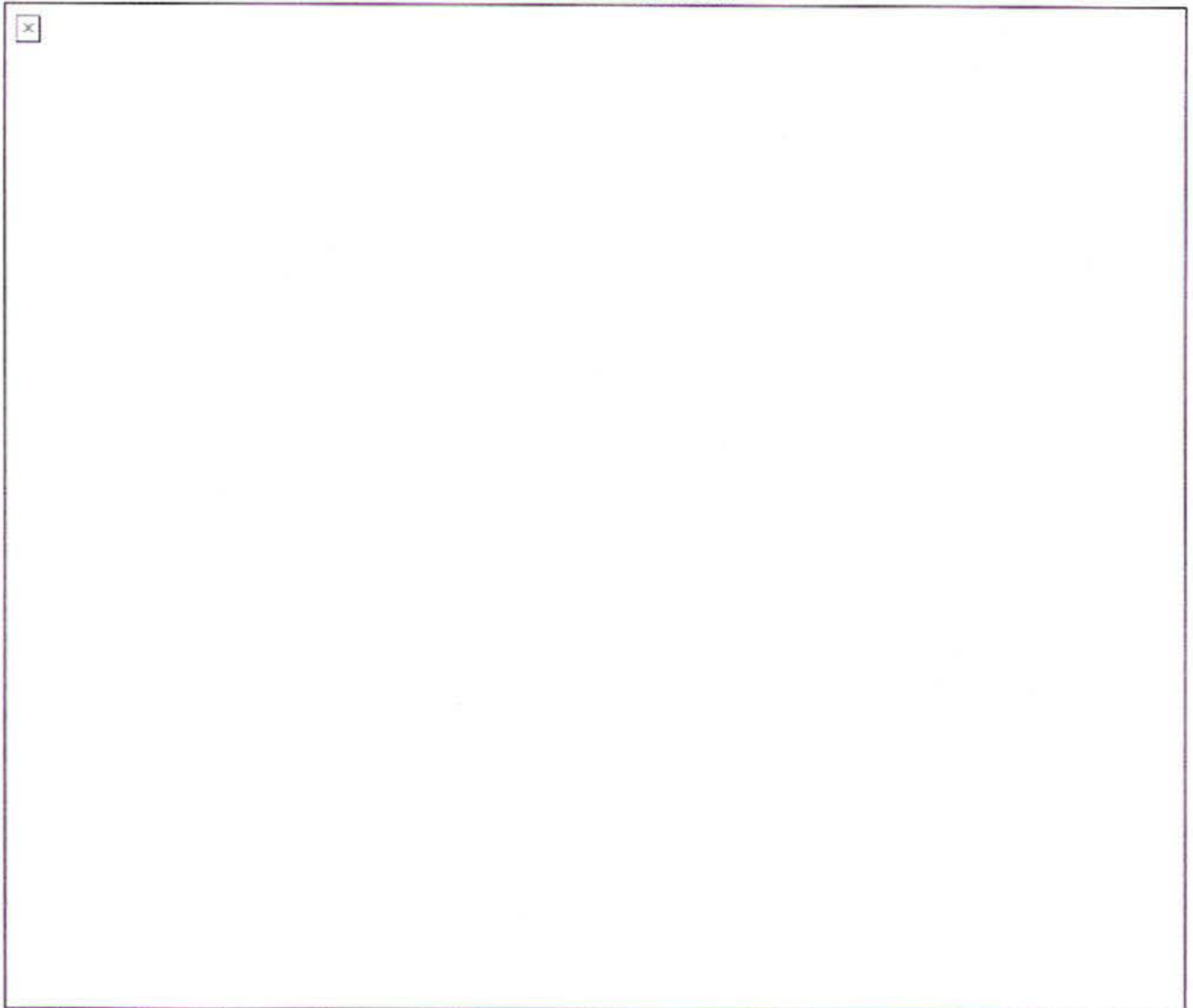
Figure 4



Compiled from: U.S. Bureau of the Census. (1981). *Statistical abstract: 1981*. Washington, D.C.: The Bureau. U.S. Bureau of the Census. (1991). *Statistical abstract: 1991* Washington, D.C.: The Bureau. Trends in Media, 1991. U.S. Bureau of Census. (1975). *Historical statistics of the United States: colonial times to 1970*. (Bicentennial ed.) Washington, D.C.: The Bureau. *TV & Cable Factbook*, no. 60 (1992).

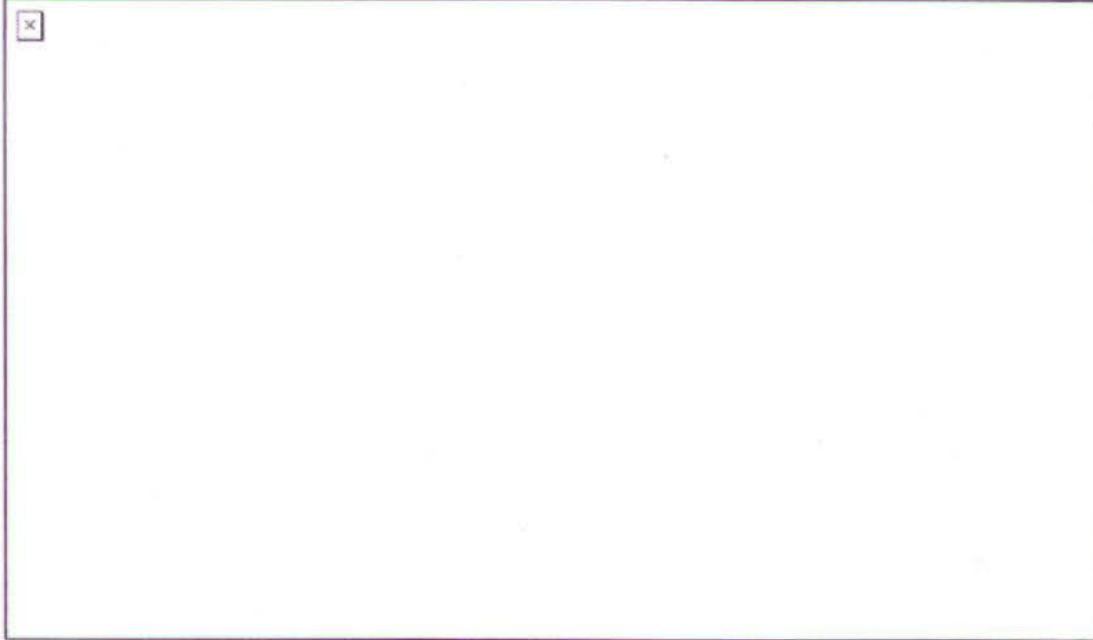
Figure 5

Diffusion of Selected Media



Compiled from Series R 1-12. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 956. (1981). *Statistical abstract: 1981*. Washington, D.C.: U.S. Bureau of the Census. Table 884. (1992). *Statistical abstract: 1992*. Washington, D.C.: U.S. Bureau of the Census. Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission.

Figure 6

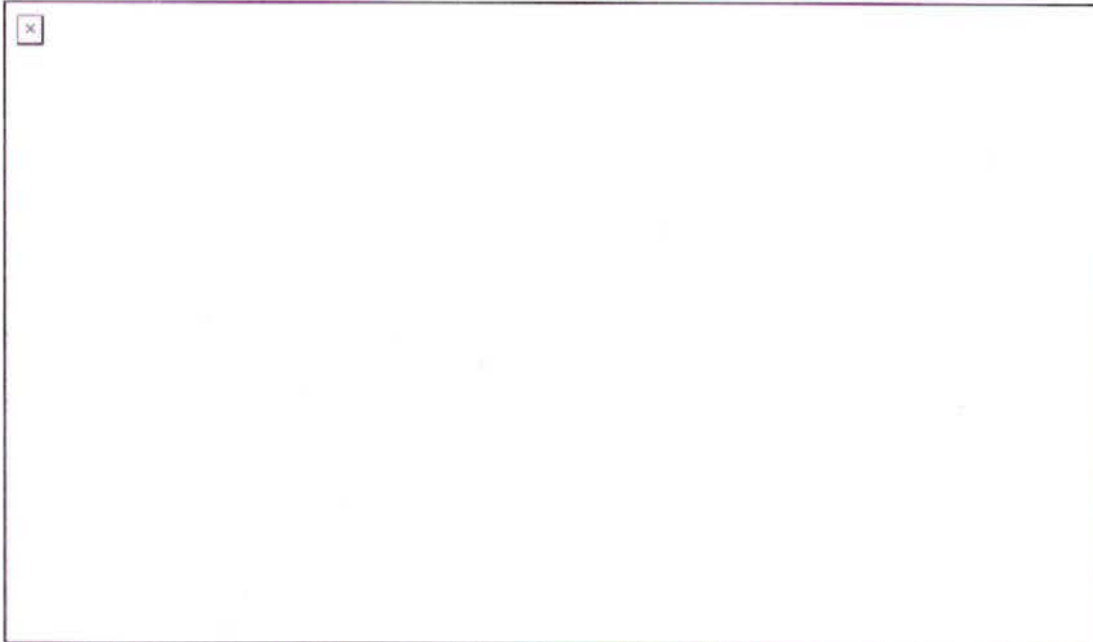


Compiled from Series A 29-42, R 224-231 (1975). *Historical statistics of the united states, colonial times to 1970*. Washington DC: GPO. Tables 13, 878 (1987). Statistical abstract of the united states: 1988 Washington DC: Bureau of the Census.

Note: Adult population includes individuals 18 years of age and over.

Figure 7

Admissions to Motion Picture Theaters, and Purchases of Books and Maps, as
a Percent of Total Personal Consumption Expenditures for Recreation: 1921-
1986



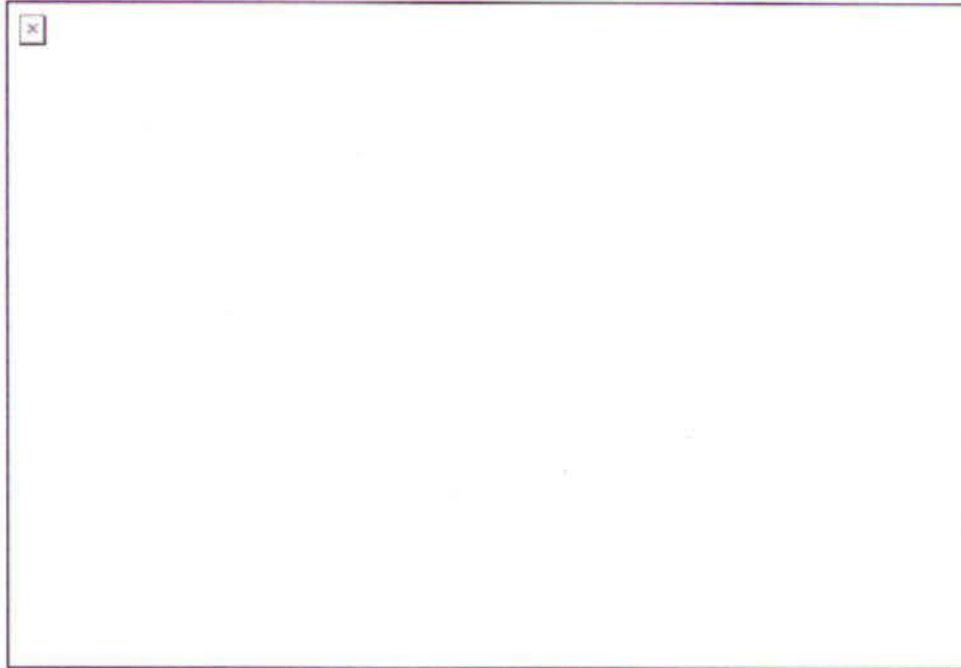
Compiled from: Series H 878-893 (1975). *Historical statistics of the United States, colonial times to 1970*. (Bicentennial Ed. ed.). Washington DC: GPO. Table 396 (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 363 (1987). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census.

Note 1: The Bureau of the Census combines books and maps. No consistent figures for books alone were found, though it is reasonable to assume that books make up the large bulk of this category.

Note 2: percentages for 1970-1987 reflect revisions to Personal Consumption Expenditure categories introduced in 1981.

Figure 8

The Four Basic Functions for the Use of media in the Home



**Beyond Universal Service: Characteristics of Americans Without
Telephones, 1980-1993**

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I. Introduction

In a utopian information society, all individuals will read and write with sophistication; helpful technological environments will abound; and, the information necessary for full democratic and economic participation will be accessible to all citizens. Whether pegged to the computer, or the information super highway, some version of this utopian vision exerts great pull on the popular imagination; it does so because it promises a better life. Furthermore, some version of that same vision lurks within the policy imagination as well. But since policy exists in the real world, utopia's call must be translated. It is this necessity that leads information policymakers to focus on a foundation policy that establishes the expected level of social participation for the information infrastructure as it develops. For most of the 20th century, that foundation information policy has been universal service. As it came to be understood in the 1950s, it offered to all the opportunity to communicate by telephone from their homes.¹ Now, as a new information infrastructure emerges, the fundamental question of who shall have access to the network is once again on the policy agenda. Yet, while most of the participants in this discussion are focused on the technological fog that enshrouds the future, the old question of who does not have telephone service remains unsettled.

The purpose of this paper is to explore the characteristics of Americans who lack home telephone service. The paper draws on F.C.C. and Census data. It covers the period 1980-1993, thereby encompassing the distribution of telephone service before and after the break up of AT&T. More specifically, I focus on the elderly, the poor, women and children, Blacks and Hispanics, rural Americans, and, renters and home owners, as groups who are particularly affected by the lack of telephone service. I suggest that the members of these groups who lack telephone service exhibit both singular and overlapping characteristics. Thus, their lack of telephone service constitutes a challenge to

policy makers, above and beyond the economic issues usually associated with universal service. The stakes are high, for ultimately their continued existence at the margins of telephone service contributes to their isolation from the mainstream of the evolving information society. The paper concludes with a brief discussion of policy alternatives that might lead to higher levels of participation, by Americans.

A review of the available literature indicates several themes that have come to be seen as received wisdom in policy discourse. First, the current telephone penetration rate per household is approximately 94% and generally regarded as evidence of the success of longterm universal service policy.² While some concern exists for those who are left out, the weight of opinion seems to be that existing subsidy programs perform adequately to include all those that can reasonably be connected.³ More recently, some voices have begun to call for a redefinition of universal service in light of the changing technological environment and the emergence of a new information infrastructure.⁴

But regardless of point of view, all telecommunications researchers accept the assumption that the telephone represents functional membership in the information society. For example, if someone lives without a television or a radio, their choice might be interpreted as rebellion, even the adoption of a Bohemian lifestyle. But when a person lives without a telephone, then he or she is truly isolated. Consequently, nearly all policy researchers agree that the remaining 6% of households without telephone service (estimated at 5.8 million households, and 15.3 million individuals) represents an excessive number of Americans.⁵

A probe into the social circumstances surrounding the absence of a telephone in the home offers a view of American society not easily visible, yet critical to our understanding of the progress of the Information Age. In the

following section, I present findings that partially clarify the picture and challenge some of the conventional wisdom.

II. Some findings with respect to Americans who lack telephone service.

General Observations

Of all American households, an estimated 94% have telephones. An additional 1.3% have a phone available or near by. However, 4.5% (roughly 4.4 million households and approximately 11.6 million individuals) have no phone available.⁶ Still despite the recession, the percentage of households without telephone service has dropped to 5.8%, or 5.7 million households.⁷

The Elderly

Conventional wisdom holds that the elderly are at special risk because American society does not care as well for them as do comparable European nations. Yet, when it comes to telephone service, the elderly fair better than younger parents with children. At all income levels, retired persons achieved the national average or better for access to telephone service. Only for those receiving Supplemental Security Income did penetration of telephones fall between 79.7% and 84.9%.⁸

The Effects of Low Income

Income predicts telephone penetration for most groups [as evidenced above by differences in penetration between the elderly poor and the elderly who are better off]. When households are examined according to income measures, the disparities become clearer (See Tables 1, 2).

Thirty-one percent of all families receiving food stamps have no telephones; and, when households on food stamps contain four or more persons, about one-third do not have telephones.⁹ It seems likely that in the first shock of unemployment, many families give up telephone service, because in households on food stamps for 1 month, 35.9% do without phones. Yet though families recover some of their equilibrium once they adjust to living on food stamps, only a few regain telephone service; of households receiving food stamps for 12 months or more, 30.6% remain without phone service.¹⁰ The recession has seen families ranging from farm workers to middle managers on food stamps and the effect on telephone penetration appears widespread.

When telephone penetration is viewed through the lens of welfare assistance, a similar pattern emerges. Of households receiving public assistance, 34.7% lack telephones; whereas, of households on welfare, 27.9% lack telephones.¹¹ The penetration rate drops even further for households completely dependent on public assistance; 43.5% of these households lack phones.¹²

A third measure of poverty is the extent to which households receive energy assistance from the local utility company. When households receive energy assistance, 21.4% lack telephones.¹³

A fourth, but far less direct, measure of income can be derived by comparing those who rent homes versus those who own homes. Whereas, only 2.2% of home owners live without telephones, 10.7% of renters go without telephone service.¹⁴ Furthermore, of those in public housing, 21.7% are without

phones.¹⁵ Finally, Americans living in hotel rooms or boarding houses have the least access of all; 40.2% live without telephones.¹⁶ To be sure, many renters, especially those living in large buildings, have access to public phones. Conditions for using them may vary, but the presence of public phones allows some interconnectedness particularly where phone companies offer services like voice mail to the phoneless. Nevertheless, renters of all kinds are less likely to have a telephone; and, thus, are more likely to encounter the constraints of phonelessness.

Indeed, the vulnerability of telephone service is underscored historically. The decision to give up telephone service when a family encounters economic hardship parallels household decisions made during the depression when telephone penetration declined significantly in the first half of the 1930s (see Figure 1). Thus, it does not follow that those without telephone service constitute some kind of hard-core underclass for whom no policies can provide assistance. Telephone penetration is directly correlated with income; and, though income is not the only contributing variable, a family's ability to stay above the poverty line significantly increases its chances of staying connected to the telephone network.

If the positive effect of income is obvious, it still calls for reiteration. In those households receiving income from interest, dividends, rents, and/or estates, telephone penetration averaged between 97.3% and 98.7%.¹⁷

The income threshold seems to be around \$20,000. Households with incomes above \$20,000 have telephone penetration at the national average or above. But once a family fails to earn at least \$20,000, then the rate of telephone penetration begins to drop off.¹⁸ About 50 million households earn below \$20,000; they constitute 55% of the total number of households in the U.S.¹⁹

Women and Children

If a woman heads a household, the negative effects of income are intensified. Telephone penetration for households headed by women, living at or below the poverty line and with children, is around 50%. But even above the poverty line, families with small children headed by women suffer low telephone penetration rates: with 5 or more children under the age of 12 -- 22% lack phones; with 4 or more children under the age of 9 -- 25.6%; with 3 or more children under the age of 6 -- 22.2%; and, with 3 or more children under the age of 5 -- 25.1%.²⁰ The more children in a household, the less likely it is to have a telephone. By contrast, in households with no one under 18, only 6.0% lack phones.

Here is an example where children suffer indirectly. The presence of small children affects income which, for many families, elevates the telephone to the status of a luxury; and, since families with young children can ill afford isolation, the levels of penetration presented above are unacceptably low by any yardstick. For the poorest households with large families the lack of telephone service means that they are impaired when seeking public assistance for which they qualify, and particularly isolated in cases of emergencies.²¹

Aggregate national data offer a macro view of uneven telephone penetration. From a micro angle, interviews conducted with a small number of young single women heads of households with children suggests that isolation goes up qualitatively with the loss of a telephone.²² When kin do not live close enough for casual visits, the telephone serves as the chief medium for keeping in touch. But with telephone service gone, interviewees spoke with close relatives as little as once every two months. Furthermore, on occasions when a relative came to visit, the likelihood of finding someone at home was unpredictable. If the loss of telephone service coincided with dependence on an unreliable automobile, mothers with children became reluctant to visit more distant

relatives, or to take jobs at a distance from home. On occasions when notes were left with neighbors, the delivery of those notes was unpredictable. Thus, a combination of physical immobility and severed communications leads to serious isolation from family, the primary source of support and help, but also from employment opportunities.

Blacks and Hispanics

Although Blacks and Hispanics have experienced the largest increases in penetration during the decade, they remain far behind Whites (Figure 2).²³ The percentage of White households without telephones is 8 to 10 percentage points lower than Black and Hispanic households in all categories of household size. Lowest penetration for White households occurs among single person households with 5.9% doing without phones. That is, for all household sizes, Whites are at or above the national average for telephone penetration.²⁴

Not surprisingly, the employed fare better than the unemployed; but here again race and ethnicity make a difference. Whereas, in 1993, 9.5% of unemployed whites did without telephones in the home, nontelephone households jumped to 20% for unemployed blacks, and 15.3% for unemployed Hispanics.²⁵

Figure 3 shows that blacks and Hispanics experience lower telephone penetration than whites. After all, we might speculate that such a finding is not surprising since blacks and Hispanics average lower incomes than whites. But such a speculation would be misleading. Table 3 demonstrates that blacks and Hispanics have lower telephone penetration levels than whites, even when they share the same level of income. That is, at all levels of income below 40,000

dollars, whites have higher levels of telephone penetration. Thus, though income is well established as a contributing variable to telephone ownership, race and ethnicity appear to confound the effects of income.

Why shouldn't blacks, Hispanics, and whites, at the same level of income, also experience the same level of telephone penetration? We can accept that racism insinuates itself throughout American society; but telecommunications appears technologically neutral, and so this finding is especially troubling. For now, no hypothesis can be proposed with any confidence.²⁶ Yet we should pursue an answer with determination. Otherwise, the worthwhile goal of universal service, along with the exemplary efforts of the telephone companies, stand under a cloud.

Rural Americans

Farmers have succeeded in keeping up with the national average, though isolated communities lag behind. Among farm households, 5.1% lack telephones -- slightly better than the national average.²⁷ However, in America's smaller communities, those with populations between 50,000 and 250,000, the percentage of households without telephones rises to 7.3%; and it is even higher (9.9%) for those living in communities outside of any metropolitan statistical area.²⁸ Nevertheless, there may be mitigating factors. Radio communications are common in parts of the southwest and these may be used to substitute for telephone service. Also, in large extended rural families with close ties, each nuclear family may not feel the need for a phone -- especially where the cost of service is high.²⁹

III. Emergent Themes

The findings synthesized here mark particular questions for further study and deliberation.

First, if income constitutes such a strong effect on telephone penetration, how can it be mitigated, in order to bring onto the net those affected by low income? Few can be surprised that those marginalized from telephone service are also the poorest Americans. What demands attention is the persistence of the margin. Telephone penetration surpassed the 90% mark for households in 1970.³⁰ In the ensuing 24 years, penetration has inched up 4 percentage points; whereas, in the previous 24 years, penetration grew by 39 percentage points. Clearly, there are difficulties involved in reducing the last 10%; however, without further efforts to push penetration further, those at the margin will face insurmountable isolation.

Second, the vulnerability of women with small children goes beyond simple income effects; how can they be protected so that they and their children do not suffer the compounding effects of isolation and insecurity? It is not an overstatement to assert that the lack of a telephone poses a special risk to a household with small children headed by a woman. Information policy makers should consider the vulnerability children of sufficient urgency to warrant a targeted universal service policy.

Third, race and ethnicity present a serious challenge to information policy makers -- is there racism in telecommunications? This question would appear irrelevant to universal service were it not for the data on differences in penetration among whites, blacks, and Hispanics, when income is held constant. What is clear is that the social reality of racism in the United States can also find reflection in the telecommunications environment; therefore, we should be prepared to consider the possibility that the racism which taints American society

may also thwart the goal of universal service. But much is unclear, and what makes the finding of differential telephone access so disquieting is that there is no indication that any of the telephone companies have pursued discriminatory practices with their clientele -- quite the contrary. Yet, in the absence of a smoking gun, we are still left with existing conditions that are unacceptable -- race should not be a factor in telephone access. That we are faced with an anomalous finding calls for more research aimed at uncovering the relationship between race/ethnicity and telephone access. In the meantime, policy thinkers should consider targeted remedies aimed at bringing more blacks and Hispanics onto the net.

The 4.4 million households without telephones in America defy any single characterization beyond the lack of phone service. What we can say with certainty is that a complex interplay of factors keeps groups at the margin of the information infrastructure. Thus, the focus of subsequent research is clear. To gain a deeper understanding of the causes and consequences of phonelessness, we will have to pursue research at more detailed levels of analysis than the national data presented here. Therefore, the questions asked in this paper should be taken as a call for candor and action -- candor because the groups at the margin merit special concern, and action because universal service will not advance without new targeted policies. Universal service remains the unattained goal.

IV. Universal Service as the essence of American Information Policy.

In its simplest terms, universal service is the concept which holds that everyone should have the opportunity to interconnect with whomever they wish at a reasonable cost. In principle, this has meant access to a telephone; and, for most

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of the 20th century, the idea that every American should enjoy moderately priced telephone service has defined both the telecommunications environment, and citizens' rights within it. In fact, so powerful is this belief, that its essence permeates information policy thinking. Less understood are the underlying assumptions.

Universal service derives its significance from a promise rooted in the nature of the political system. All Americans are assured equal access to basic channels of communication because the citizens of a democracy need to be able to communicate, in order to avail themselves of the information necessary to make reasoned political choices. And, given the communication orientation embedded in that conception of democracy articulated by the founding fathers, the pledge of equal access is not only logical, but absolutely necessary to the conduct of a free and open society.

To that end, the telephone, and universal service, have contributed to the vision of the information society as a democratic society. No wonder, that prophets of the information age call for a new universal service. As new applications have transformed the telephone, it makes perfect sense to reconsider the original idea of universal service. Furthermore, new technologies, in and of themselves, offer new potentials; so, for a concept, like universal service, which has always been technologically dependent, the inventions of the last 30 years invite speculation. This is especially true for the catalytic role played by the computer. Now, with the coming of the "information super highway," a new concept of universal service is necessary.

In the information society, one must be informed in order to function successfully, and that means more than a phone connection. For, though telephonic interconnectedness oiled the spread of industrial society, by itself it cannot deliver the promise of the information society. For example, if democratic discourse is to be encouraged in the new environment, then citizens

need the answers to their questions, and they must have access to information in digestible form. Similarly, if citizens are to avoid a surveillance state, or a surveillance economy, then limits must be placed on government's and business's access to information about individuals, while individuals will need access to information gathered about themselves. Also, in order to fully participate in the information economy as both consumers and producers, Americans must have the opportunity to avail themselves of lifelong learning. In short, though the immediate impetus for redefining universal service may have come from a desire to keep up with technological advances, the rationale should stem from an obligation to seek the goals of democratic participation and economic growth, no matter how contradictory they might be in any given instance.

But to take the concept of universal service beyond simple interconnectedness presents challenges. If, for example, a redefined universal service is to stress information, then which information needs should be met? On its surface, this is an unanswerable question, because each person's information needs are idiosyncratic and subjective. So, if any solution can be found, it should not attempt a direct answer; moreover, it must keep in mind that citizens are active information seekers. Consequently, one approach is to specify spheres of obligation, by differentiating public needs from personal needs. A universal service oriented thusly obligates government to meet the demands of the public sphere, while facilitating the opportunities inherent in the private sphere. In the public sphere, citizens need access to, and the knowledge of how to use, government services. Moreover, they should have access to channels of communication which provide a public voice. In the private sphere, individuals should enjoy the opportunity to make intelligent economic decisions, and to maintain their privacy. More broadly stated, an informed and participating citizenry is the necessary condition to approach the ideal of a participatory

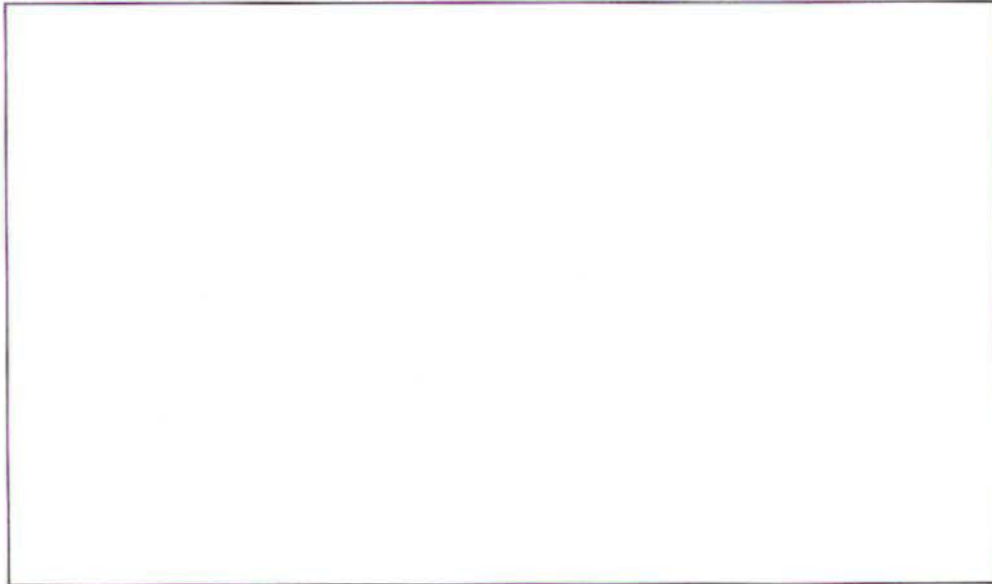
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democracy; whereas, an informed and economically capable public is a necessary condition for meeting the goal of a fair and open market economy.

That said, a concept of universal service derived from these considerations is not without difficulties. After all, conceptual boundaries are never clear in real life; and, in America the boundary between the public and private spheres runs through contested terrain. But that may be an advantage, since the territory is well known and a socio-legal tradition already exists to show the way. Secondly, there is still no answer to the question of which information needs are to be met. However, there needn't be; the individualistic nature of the question guarantees that this will be a continuing issue for public discussion. But if that discourse is to grow and lead the way to an Information Age of enhanced opportunities, then the redefinition of universal service must lead the way. Its fundamental importance to the progress of the information society must be recognized.

So important is universal service to the shape of the information society, that it might better be understood as an information bill of rights. In pursuit of a democratic society, we might ultimately ask ourselves, what rights to information, and protections from information, belong to all Americans, regardless of their wealth, position, or language? If we direct our energies to answering that question, it should become evident that universal service is not really a single policy to be written by a government agency. Rather it is the guiding principle of the information society; and, as such, also a tension -- always debated, always tested, always pursued.

Figure 1: Diffusion of the Telephone



Compiled from Series H 878-893, R 93-105, R 1-12 (1975). Historical statistics of the united states, colonial times to 1970 Washington DC: GPO. Table 363, 878, 951 (1987). Statistical abstract of the united states: 1988 Washington DC: Bureau of the Census. Table 914 (1989). Statistical abstract of the united states: 1990. Washington DC: Bureau of the Census.

Figure 2: Telephone penetration by ethnicity



Compiled from Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics No. CC Docket No. 80-286). Federal Communications Commission.

Table 1: Telephone Penetration by Household Income Percentile Ranking as of march 1988 [Those in the 0-5% rank are the poorest, while those in the 95-100% rank are the wealthiest.]

Household Income by Percentile Ranking from lowest percentile to highest	Percentage of households with Telephones
0 - 5	72.4
5 - 10	80.8
10 - 15	84.0
15 - 20	86.3
20 - 25	89.5
25 - 30	90.0
30 - 35	91.0
35 - 40	92.2
40 - 45	93.9
45 - 50	96.7
50 - 55	96.2
55 - 60	97.0
60 - 65	97.3
65 - 70	98.1
70 - 75	97.8
75 - 80	98.5
80 - 85	99.0
85 - 90	99.2
90 - 95	99.5
95 - 100	99.3
Mean	92.9

Compiled from Table 26, Belinfante, A. (1989). Telephone penetration and household family characteristics No. CC Docket No. 87-339). Federal Communications Commission. (Note: See Table 27 for translation of percentile rankings into income amounts.)

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Table 2: Telephone Penetration 1983-1993

Year	Households with Telephones as percent	White Households with Telephones as percent	Black Households with Telephones as percent	Hispanic Households with Telephones as percent	Households without Telephones as percent	Househo without Telephor in Millio
1983	92.4	93.1	78.8	80.7	8.6	7.
1984	91.8	93.3	80.1	80.7	8.2	7.
1985	91.8	93.3	80.1	81.2	8.2	7.
1986	92.2	93.6	82.0	81.5	7.8	6.
1987	92.5	93.9	82.2	82.1	7.5	6.
1988	92.9	94.2	82.7	82.6	7.1	6.
1989	93.0	94.4	83.2	81.9	7.0	6.
1990	93.3	94.6	83.8	81.8	6.7	6.
1991	93.6	95.0	84.1	82.7	6.4	6.

Compiled from Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report:
Telephone penetration and household family characteristics No. CC Docket No.
80-286). Federal Communications Commission. (Figures for 1983 compiled in
November, all other figures compiled in March.)

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**Table 3: Telephone Penetration by Household Income Level and Ethnicity
as of March 1993**

Household Income [in thousands]	Percentage of White Households with Telephones	Percentage of Black Households with Telephones	Percentage of Hispanic Households with Telephones
Under 5000	79.5	63.8	65.9
5.0-7.49	85.0	74.3	70.2
7.5-9.9	88.7	85.4	72.4
10.0-12.49	90.6	80.4	75.3
12.5-14.9	91.4	85.4	81.0
15.0-19.9	93.7	88.3	85.4
20.0-24.9	96.1	90.3	90.4
25.0-29.9	97.5	91.7	89.0
30.0-34.9	98.8	93.2	95.0
35.0-39.9	98.9	95.5	96.2
40.0-49.9	99.4	99.2	99.0
50.0-59.9	99.5	99.4	99.6
60.0-74.9	99.9	99.2	97.3
75.0	99.5	100.0	98.9

Compiled from Table 1.1, Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics No. CC Docket No. 80-286). Federal Communications Commission.

Footnotes

¹Mueller, M. L. (1993). Universal service in telephone history: A reconstruction. Telecommunications Policy, 12(July), pp. 352-369.

²There is a statistically significant difference between the Current Population Survey of the Bureau of the Census which gives a figure of 93.3% penetration, versus the 1990 Census which gives a figure of 94.8%. The differences result from the questions asked by each survey. We have chosen 94% as an interpolated estimate. See Belinfante, A. (1993, December). Telephone subscribership in the united states. Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division, p. 2.

³Dordick, H. S., & Fife, M. D. (1991). Universal service in post-divestiture USA. Telecommunications Policy, 15(2), 119-128. Gilbert, P. (1987). Universal service on hold: A national survey of telephone service among low income households. Washington, DC: U.S. Public Interest Research Group. Reinking, R. D. (1985). Lifeline telephone service is a reasonable utility classification. Public Utilities Fortnightly, 116:2, pp. 33-37.

⁴Williams, F., & Hadden, S. (1991). On the prospects for redefining universal service: From connectivity to content Policy Research Project: The University of Texas at Austin. Williams, F., & Hadden, S. (1992). On the prospects for redefining universal service: From connectivity to content. Information and Behavior, 4, 49-63.

⁵We arrived at the figure of 15.3 million individuals by multiplying the number of households (5.8 million) by 2.64, the average number of individuals per household in the United States according to the 1990 census.

⁶Belinfante, A. (1993, December). Telephone subscribership in the united states. Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division. As a point of comparison, 11.6 million is equal to the combined populations of Denmark and Switzerland. Table 1374, (1993). Statistical abstract of the united states: 1993. Washington DC: Bureau of the Census.

⁷Belinfante, A. (1993, July). Telephone subscribership in the United States. (No. CC Docket No. 87-339). Federal Communications Commission. We caution against taking these changes in single percentage points as completely accurate, though they represent the best that can be done statistically. A small rise or decrease in penetration may reflect measurement as much as actual change.

⁸Tables 46, 47. Belinfante, A. (1989). Telephone penetration and household family characteristics No. CC Docket No. 87-339). Federal Communications Commission.

⁹Table 32. Belinfante, A. (1989).

¹⁰Table 32. Belinfante, A. (1989).

¹¹Extrapolated from Table 48. Belinfante, A. (1989).

¹²Table 85. Belinfante, A. (1989).

¹³Tables 36, 37. Belinfante, A. (1989).

¹⁴Table 12.1. (1990) Census of Population and Housing Summary. U.S. Bureau of the Census: Washington DC.

¹⁵ Tables 17, 18. Belinfante, A. (1989).

¹⁶Table 16. Belinfante, A. 1989).

¹⁷Table 49, 50. Belinfante, A. (1989).

¹⁸Table 43. Belinfante, A. (1989).

¹⁹49,961,676. Table 27, Belinfante, A. (1989). Telephone penetration and household family characteristics No. CC Docket No. 87-339). Federal Communications Commission.

²⁰Table 65, 66, 67, 68. Belinfante, A. (1989).

²¹Table 22, Belinfante, A. 1989).

²²Eleven women were interviewed in California, New Jersey, and Texas, in 1985, 1987, and 1992. Each subject was interviewed from three to five times in sessions ranging from 1.5 hours to 3 hours. Yet though the small number

interviewed imposes constraints upon the generalizability of the findings, it is notable that all of the subjects echoed similar themes.

²³Blacks and Hispanics are grouped together in this article because they are linked in the policy discourse involving telephone penetration and universal service. However, it should be noted that, in the Census, black is a racial category while Hispanic is an ethnic category. Therefore, some blacks are also Hispanics, and some Hispanics are also whites. In addition, it should be noted that the use of the term Hispanic reflects the adoption of that term by the Census. Within the cultural communities encompassed by the category "Hispanic," self descriptors such as Latino, Mexican-American, Chicano, Cuban, and Puerto Rican, have greater currency. My point is that one should exert caution when interpreting these categories. They are not mutually exclusive, nor do they capture a monolithic community. At best, these externally imposed categories are tenuously valid. Only the self descriptors have consistent validity, since they capture the self-expressed identity of the various ethnic groups.

²⁴Table 8.1, 9.1. Belinfante, A. (1993, December). Telephone subscribership in the united states. Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division.

²⁵Table 10.1. Belinfante, A. (1993).

²⁶Recent anecdotal evidence collected in Southern California and New Jersey suggest some possible explanations. Some California-based citizens' groups charge that local phone companies, in this case GTE and PacBell, do not market as aggressively to poor African-American and Latino populations as they do to comparable Anglo populations. There is as yet no proof of this, nor does this charge establish a kind of telecommunications redlining. In New Jersey, as part

of a project supported by Bell Atlantic, interviews with heads of households lacking telephones in inner city Camden suggest that some households may intentionally reject phone service as a strategy to protect children from the unwanted influences of gangs (The project is directed by Milton Mueller and the author.). Interestingly, these same households select cable over telephone service in order to make the home a more entertaining place for their kids.

²⁷Table 15. Belinfante, A. (1989). Farm households constitutes a category in the census and the Current Population Survey. Subsistence farmers do not usually fall into this category.

²⁸Table 13. Belinfante, A. (1989).

²⁹Anecdotes collected by the Laurance Povich of the Industry Analysis Division of the Common Carrier Bureau of the Federal Communications Commission suggest this possibility. Native American communities have very low penetration rates and this may be a contributing factor.

³⁰Series R 1-12. (1975). Historical statistics of the United States, colonial times to 1970 (Bicentennial Ed. ed.). Washington DC: GPO.