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Crisis of scientific communication: Fact or Fiction?

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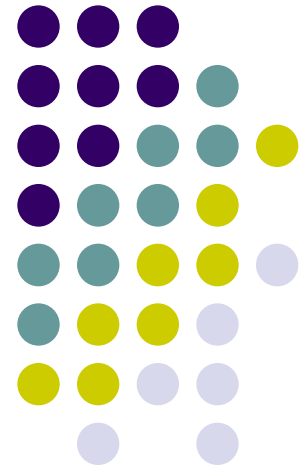
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Crisis of scientific communication; fact or fiction?

R. Hanka
Univ. of Cambridge





Crisis, what crisis ?

- Can we still cope with the rate new knowledge is growing?
- Is it all really worth knowing?
- Aren't we keeping more and more to ourselves rather than sharing it?
- Aren't we loosing something we used to take for granted?.

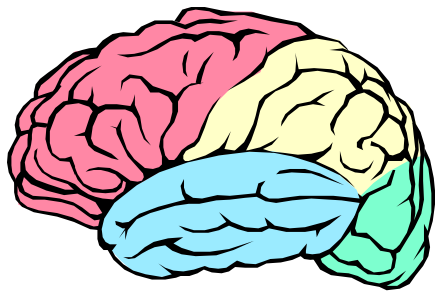


**Can we still cope with the rate
new knowledge is growing?**



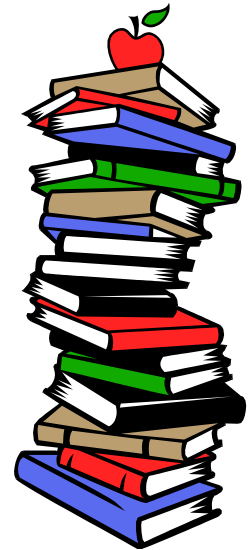
The problem

Different rate of expansion of:



our intellectual abilities

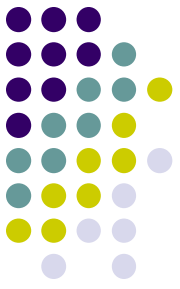
knowledge.



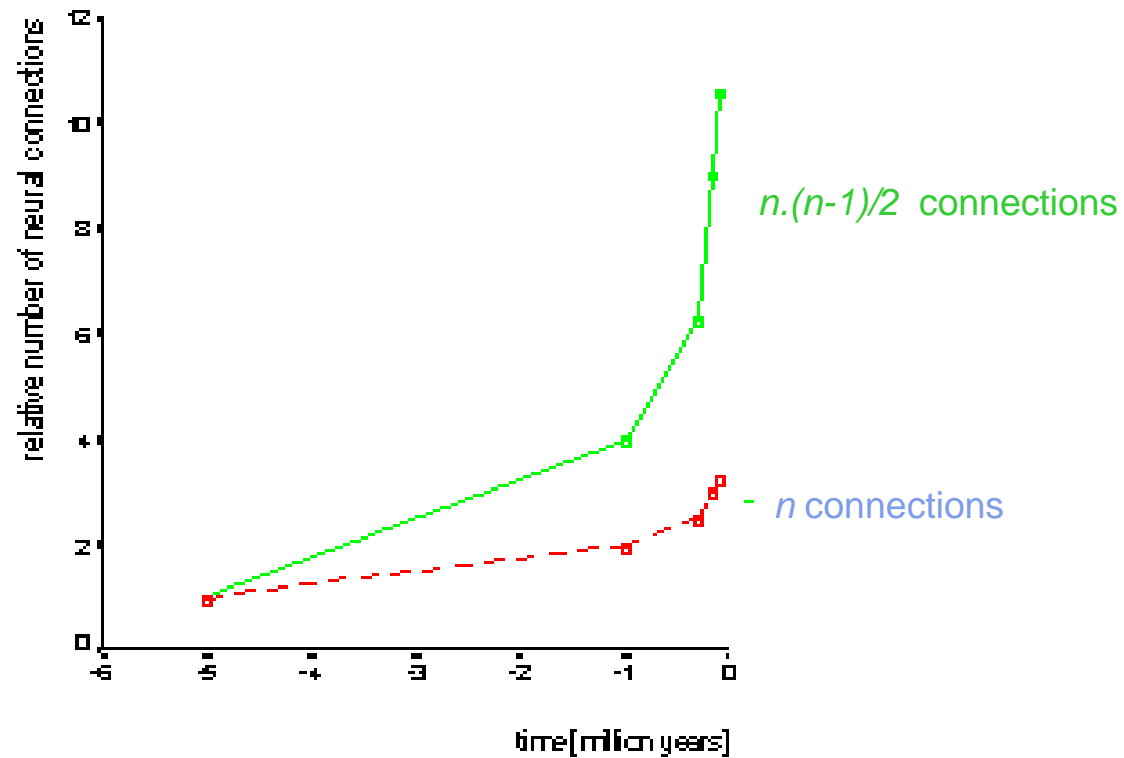


Human Intellectual Abilities

- Over last 5 million years brain volume increased from 400cm^3 to $1,400\text{cm}^3$.
- Today 10^{11} neurons and 10^{14} synapses.
- Between n and $n.(n-1)/2$ connections.



Brain capacity



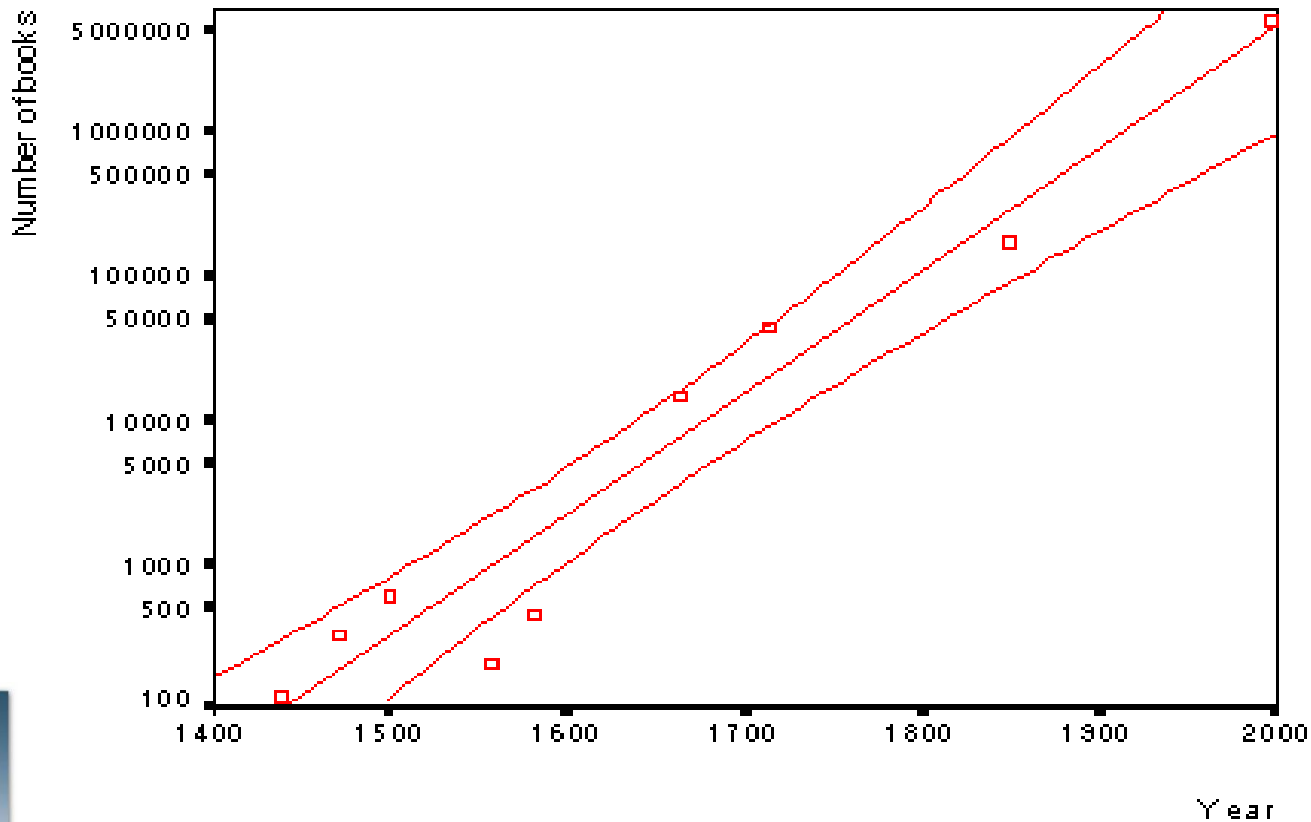
doubling every 1.5 to 3 million years.

Human knowledge



- impossible to measure objectively
- number of books in the Cambridge University Library used as a measure.

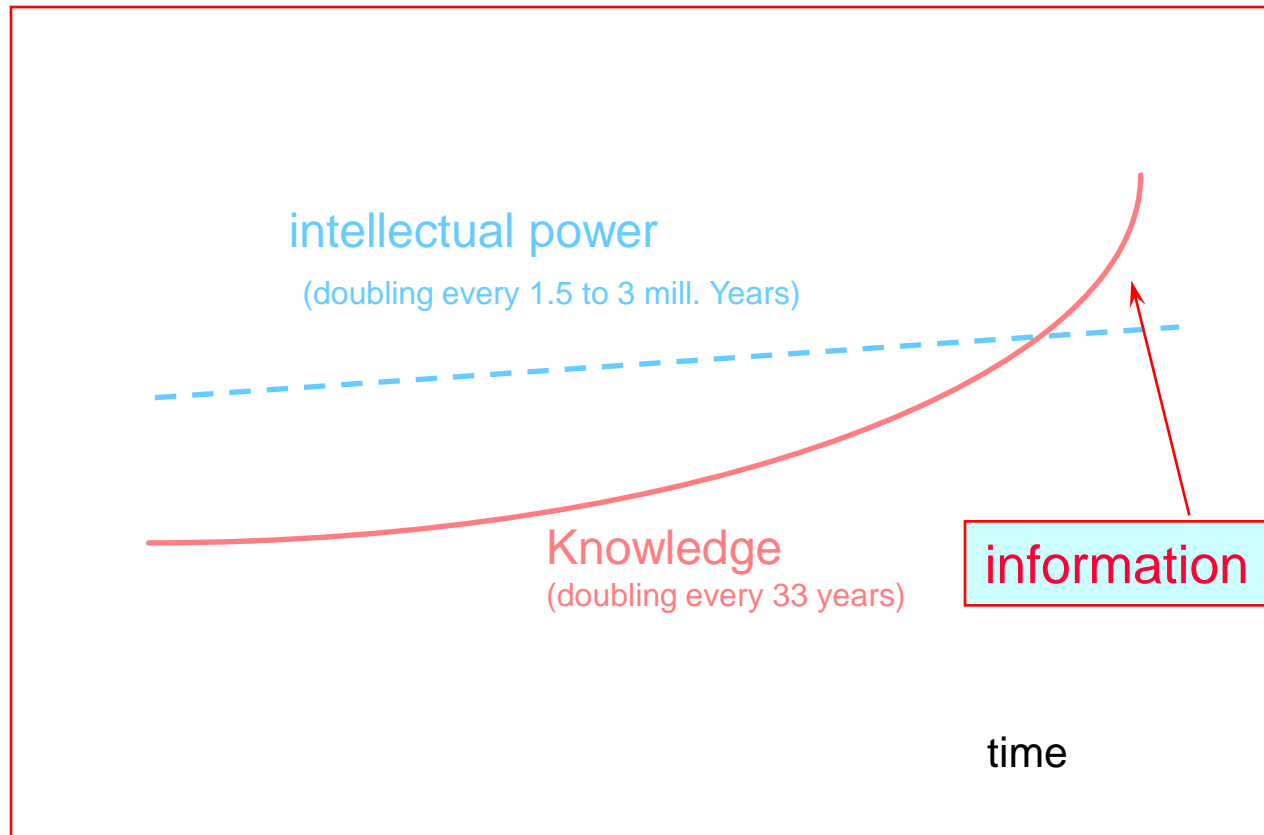
Books in the Cambridge University Library



doubling every 33 years !.



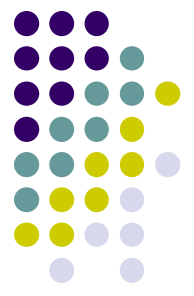
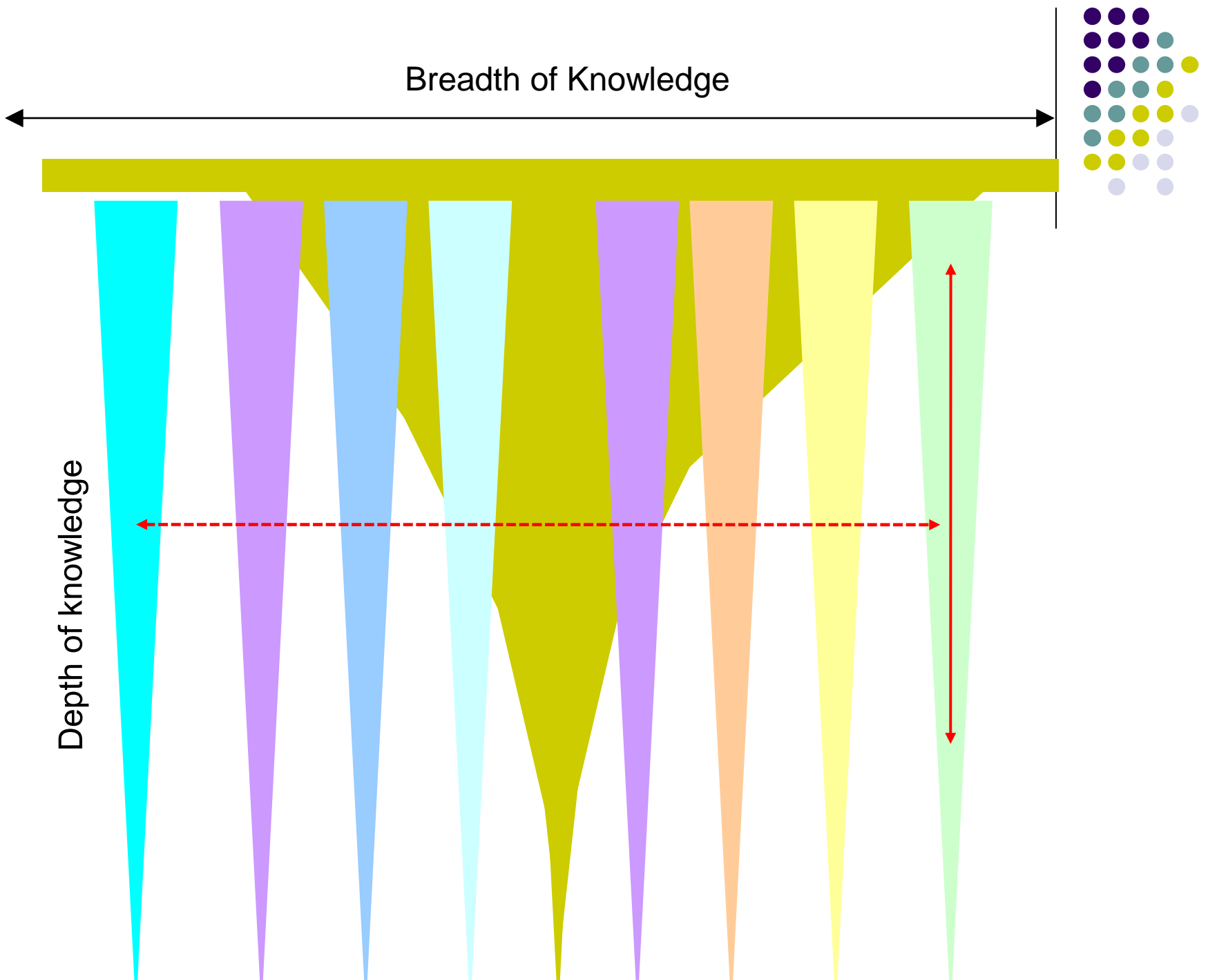
Expansion of knowledge and intellect



Information Overload



- 15th century
 - polymath
- 18th century
 - scientist knew all there was to know in his field
- 20th century
 - specialisation
- 21st century
 - narrow specialisation.

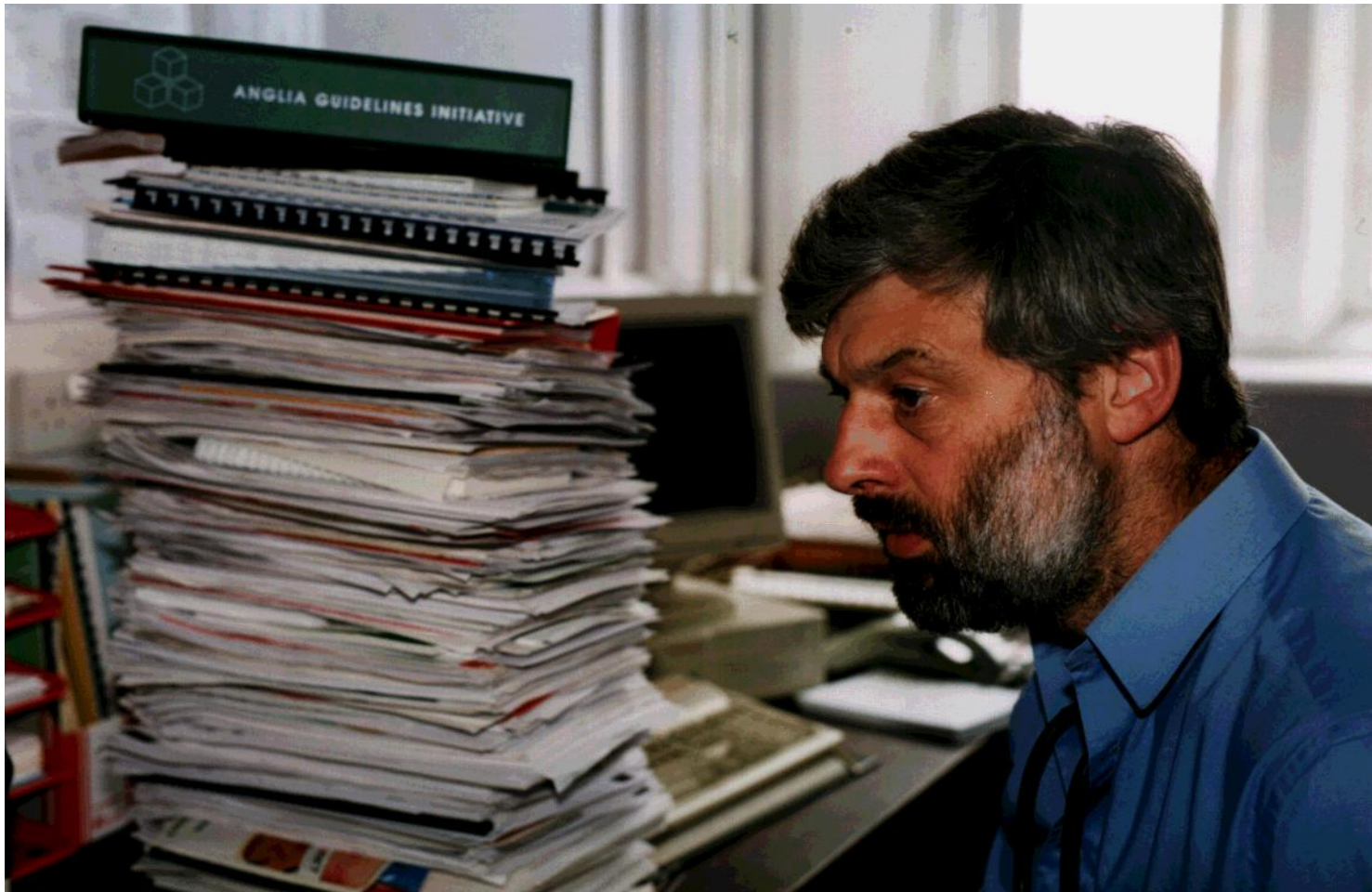


Crisis of communication



- Knowledge \neq information
- Overwhelmed with information
- Difficult to find required information
- Difficult to assess quality of the information found.

The Size of the Problem



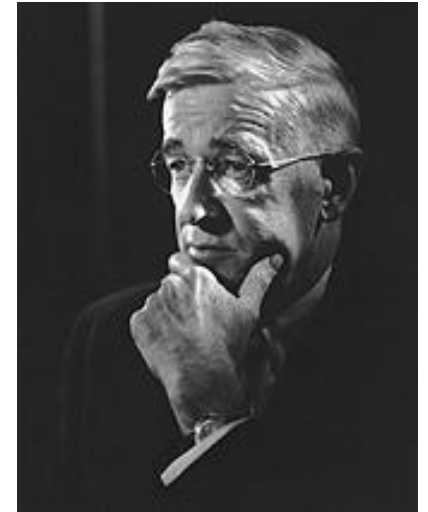


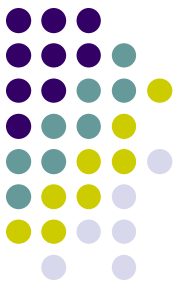
- Decision to pursue information depends on the
 1. Urgency.
 2. Expectation that a definitive answer can be found.

Vannevar Bush *“As We May Think”* (1945)

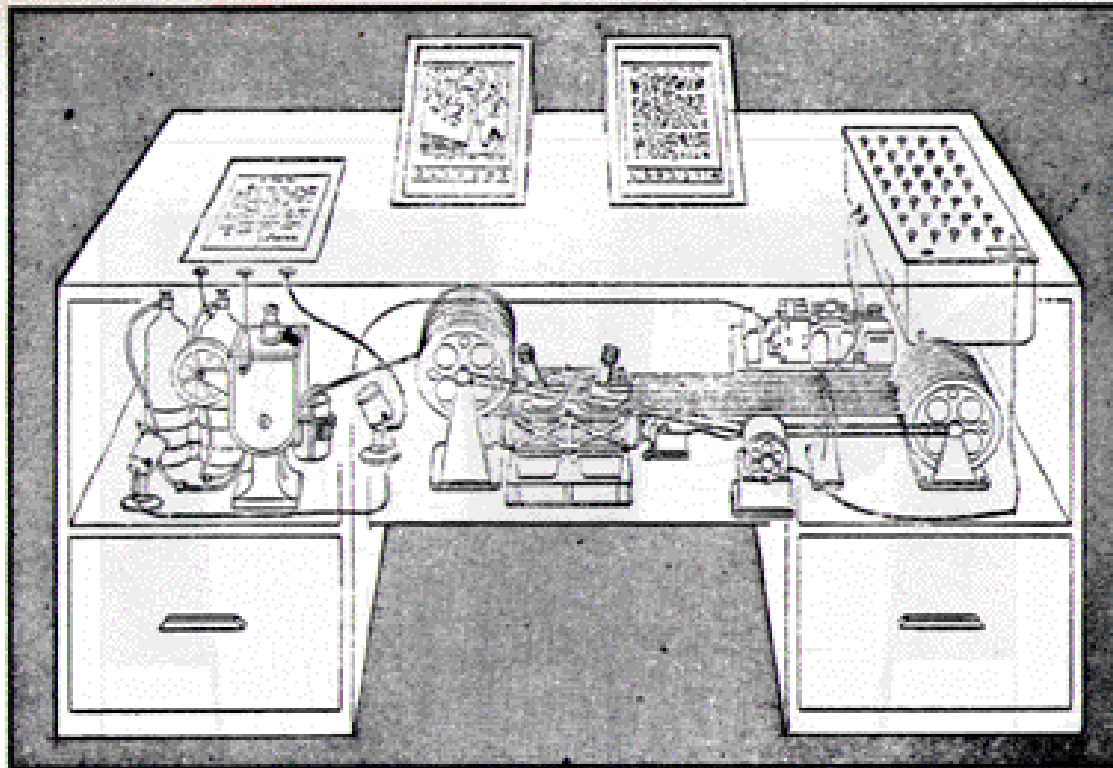


- Personal Library (vertical books)
- Trails (horizontal hypertext)
- Updateable
- With annotations.





Memex



Memex in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference (*LIFE* 19(11), p. 123).



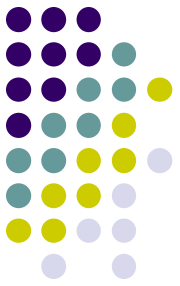


Is it all really worth knowing?

Internet



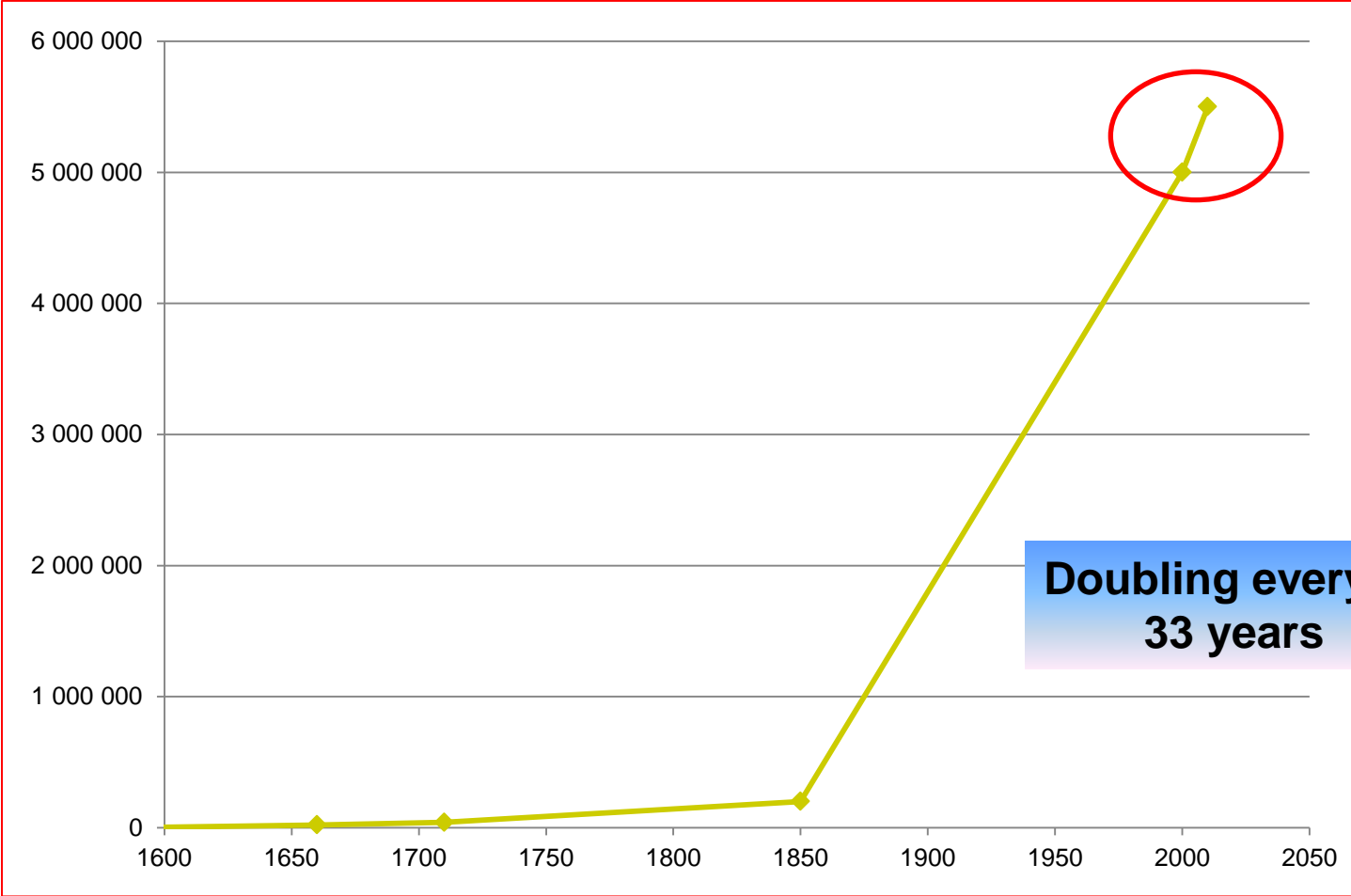
- Information 'pollution'
- Haphazard collection of information
- No structured navigation
- Searches resulting in '64,000' hits
- Long access times
- Is it all really reliable?.



"On the Internet, nobody knows you're a dog."

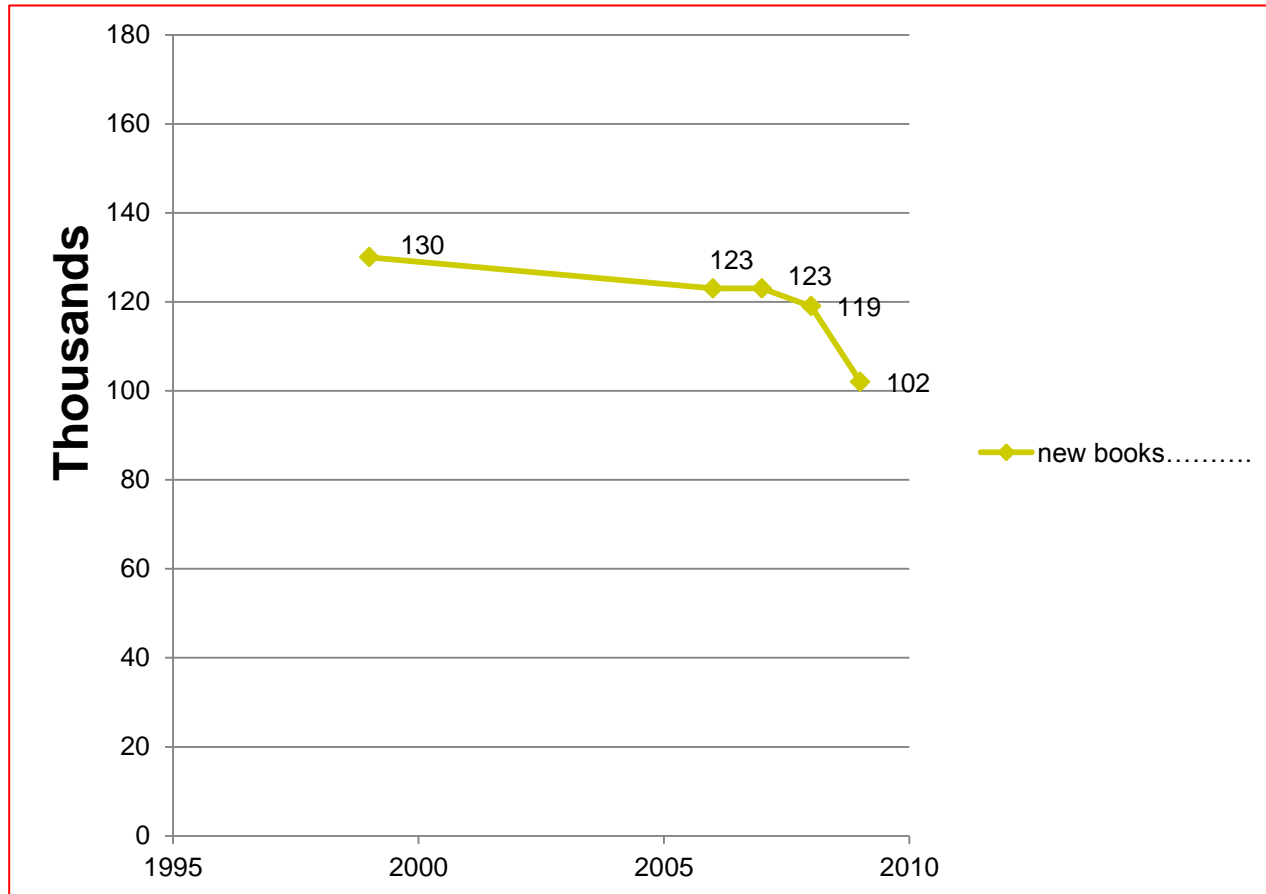


Books in the Cambridge University Library



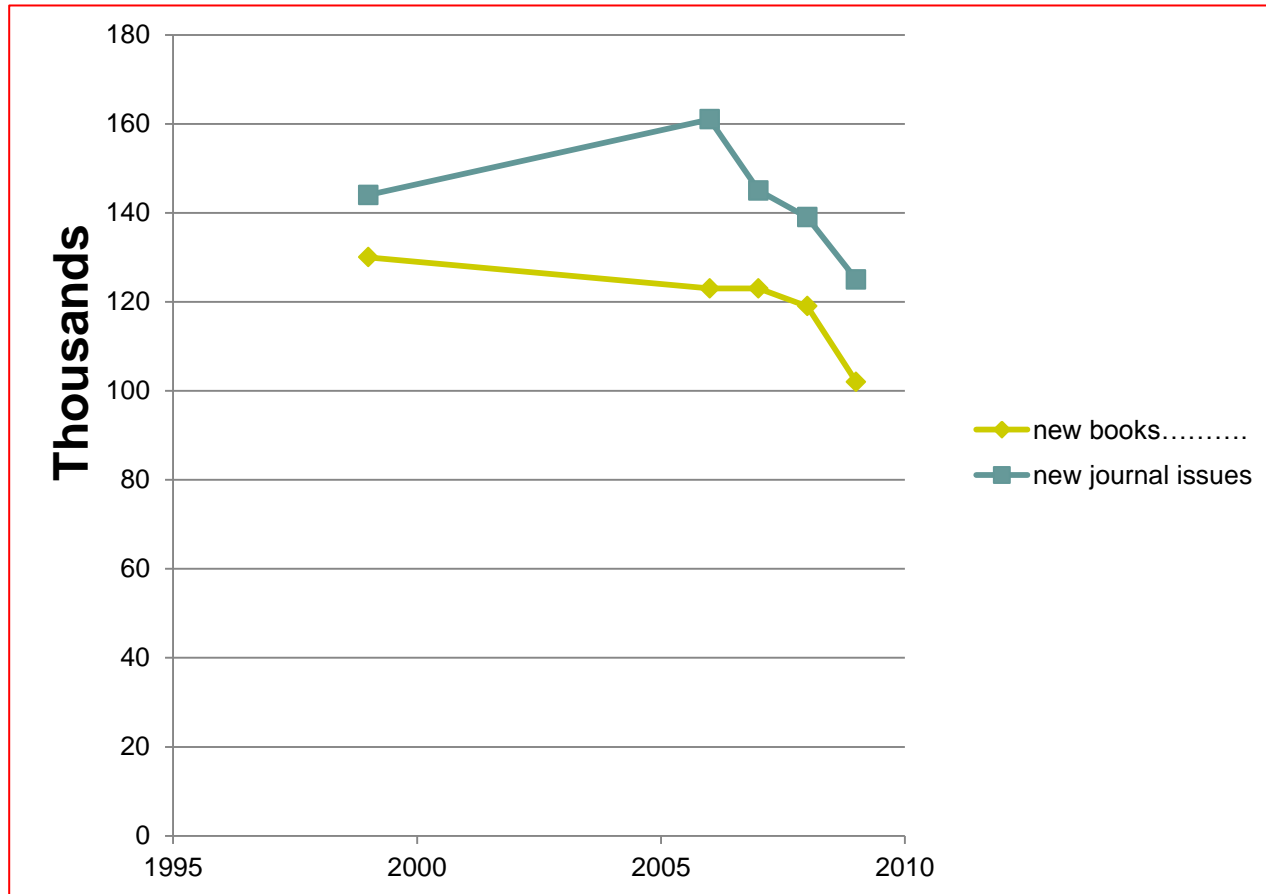


New acquisitions





New acquisitions





Aren't we keeping more and more to ourselves rather than sharing it?

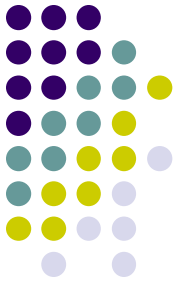
LIST OF SUBSCRIBERS.
New Haven District Telephone Company.

OFFICE 219 CHAPEL STREET.

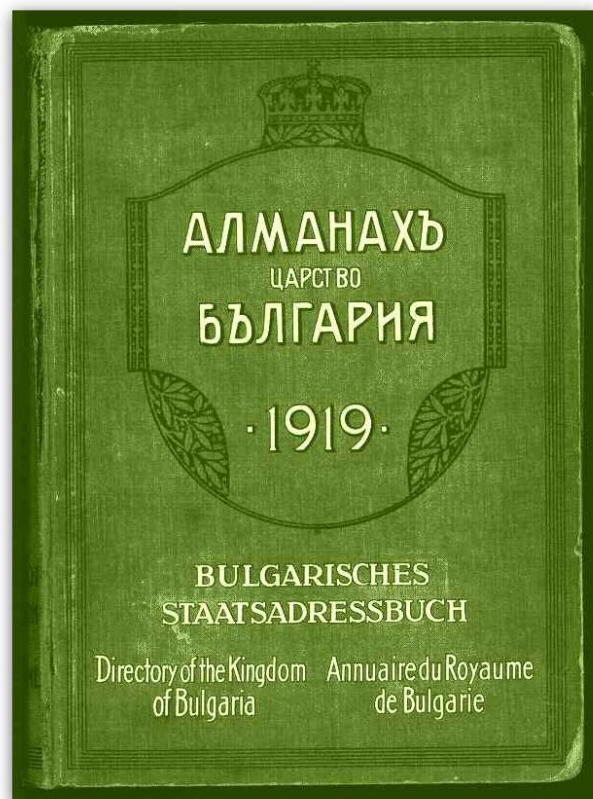
February 21, 1878.

<i>Residences.</i>	<i>Stores, Factories, &c.</i>
Rev. JOHN E. TODD.	O. A. DORMAN.
J. B. CARRINGTON.	STONE & CHIDSEY.
H. B. BIGELOW.	NEW HAVEN FLOUR CO. State St.
C. W. SCRANTON.	" " " " Cong. ave.
GEORGE W. COY.	" " " " Grand St.
G. L. FERRIS.	" " " " Fair Haven.
H. P. FROST.	ENGLISH & MERSICK.
M. F. TYLER.	NEW HAVEN FOLDING CHAIR CO.
I. H. BROMLEY.	H. HOOKER & CO.
GEO. K. THOMPSON.	W. A. ENSIGN & SON.
WALTER LEWIS.	H. B. BIGELOW & CO.
	C. COWLES & CO.
<i>Physicians.</i>	C. S. MERSICK & CO.
Dr. E. L. R. THOMPSON.	SPENCER & MATTHEWS.
Dr. A. E. WINCHELL.	PAUL BOESSLER.
Dr. C. S. THOMSON, Fair Haven.	E. S. WHEELER & CO.
	ROLLING MILL CO.
<i>Dentists.</i>	APOTHECARIES HALL.
Dr. E. S. GAYLORD.	E. A. GESSNER.
Dr. R. F. BURWELL.	AMERICAN TEA CO.
	<i>Meat & Fish Markets.</i>
<i>Miscellaneous.</i>	W. H. HITCHINGS, City Market.
REGISTER PUBLISHING CO.	GEO. E. LUM, " "
POLICE OFFICE.	A. FOOTE & CO.
POST OFFICE.	STRONG, HART & CO.
MERCANTILE CLUB.	
QUINNIPIAC CLUB.	<i>Hack and Boarding Stables.</i>
F. V. McDONALD, Yale News.	CRUTTENDEN & CARTER.
SMEDLEY BROS. & CO.	BARKER & RANSOM.
M. F. TYLER, Law Chambers.	

Office open from 8 A. M. to 2 A. M.
 After March 1st. this Office will be open all night.



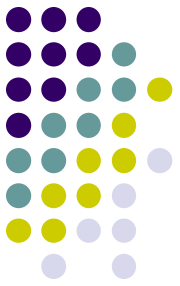
First telephone directory
 in the world.
 New Haven 1878





Last published Moscow telephone directory.

Subsequent editions deemed confidential and not generally available.

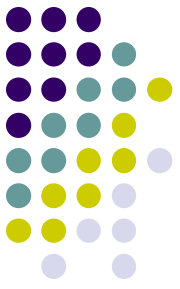


- Current telephone directories are getting smaller: .
 - Contain fewer and fewer of last year's numbers
 - Growing number of ex-directory entries
 - Mobile phones replacing some lines.
 - Mobile phones not listed.

Suppressing information



- Political suppression of inconvenient evidence
 - Napoleonic France (Humphry Davy)
 - Stalin's Russia or other communist states
- Security aspects
 - Data encoding, steganography
- Computer software and Pharmaceutical industry
 - Commercial reasons
 - Complete suppression
 - Time limited
 - Overestimating benefits or underestimating risks



Protecting IP

- Current emphasis on links between research and industry (transfer of technology).
 - Need to protect intellectual property (IP)
 - Delaying the publication until the IP rights are secured .
- Recent trend
 - In some areas a deliberate decision not to publicise, or even protect, latest advances in order to secure one's commercial advantage.



**Aren't we loosing something we used
to take for granted?**



J. S. Newton
Anno 1682

Aug 19
Saturday at 1^h 20' P. Med. Noct. A. f. R
in a right line. fR was = to twice fg &
layle pointed to E in y^e Beavrs no
& was about 6 degrees long reaching

Aug 20
Sunday at 9^h 20' before midnight fS =
JSH. Sf = JS = 1 $\frac{1}{2}$ Sf = 3 $\frac{1}{2}$ fg.
layle ended over against y^e middle of
& ~~cut~~ produced cut of $\frac{1}{4}$ or $\frac{1}{5}$ of C
towards C.

Aug 21
Monday at 8^h 40' at night RTV in
a right line TV = 1 $\frac{1}{2}$ fg. The layle
over against H, & pointed towards B.

Newton's record of observations of the comet of 1682, now known as Halley's Comet, written on a scrap of paper perhaps torn from a letter.



Arabic fragments still to be restored



~~Wishing~~ ①

Moonrise

While my anxiety ~~was~~ ^{stood} phoning you last evening,
my simpler self lay marvelling through glass
at the full moon ~~marbling~~ ^{marbling} a cloud, ~~its~~ ^{its} ~~clicking~~ ^{clicking} ~~disk~~ ^{disk} a headlight ⁱⁿ in an underpass,
until it slipped free, wounded, deadly clear,
earth's stillborn twin unspoiled by life or air.

in shifts,

stet

And while our voices ^{long tenacity of} huddled mouth to ear,
I saw how ^{the reach} ~~tenacity~~ of long imagination
still cast ~~her~~ ^{me} in a film of the old goddess,
chaste of the chase, more virgin than the Virgin,
lifting herself from that rucked, unfeeling waste
as from the desert of her own ruined face.

Such an unhinging light. To see her. To see that.
As no one else had seen her. Or might see that.

~~felt~~ ~~know~~ ~~felt~~ saw
I saw ~~tenacity~~ of long imagination
casting her still in a film of the
old goddess,
casting

best
post
progressive
house

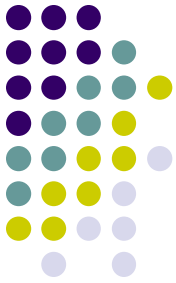
why,
post
progressive
house

I saw how ~~my~~ ^{long} tenacity of imagination
still cast ~~her~~ ^{me} in a film of the old goddess
in shifts
Elastic
vising,
a head lamp in an underpass
flashing a headlamp in an underpass

A draft of Anne Stevenson's sonnet 'Moonrise', (from MS Add. 9451).



Emails are generally replacing informal means of communication e.g. letters to colleagues and friends.



Handwritten text, likely a letter or journal entry, written in cursive script. The text is dense and covers most of the page, with some corrections and underlines. It appears to be a personal or scientific note.

1832.]

RIO.

233

even yet marvellous in my own eyes, and I dare say it is little less so to you, the receiving a letter from a son of yours in such a quarter.

Believe me, my dear Father,
Your most affectionate son,
CHARLES DARWIN.

C. Darwin to W. D. Fox.

Botofogo Bay, near Rio de Janeiro,
May, 1832.

MY DEAR FOX,

I have delayed writing to you and all my other friends till I arrived here and had some little spare time. My mind has been, since leaving England, in a perfect *hurricane* of delight and astonishment, and to this hour scarcely a minute has passed in idleness. . . .

At St. Jago my natural history and most delightful labours commenced. During the three weeks I collected a host of marine animals, and enjoyed many a good geological walk. Touching at some islands, we sailed to Bahia, and from thence to Rio, where I have already been some weeks. My collections go on admirably in almost every branch. As for insects, I trust I shall send a host of undescribed species to England. I believe they have no small ones in the collections, and here this morning I have taken minute *Hydropori*, *Noterus*, *Colymbetes*, *Hydrophilus*, *Hydrobius*, *Gromius*, &c. &c., as specimens of fresh-water beetles. I am entirely occupied with land animals, as the beach is only sand. Spiders and the adjoining tribes have perhaps given me, from their novelty, the most pleasure. I think I have already taken several new genera.

But Geology carries the day: it is like the pleasure of gambling. Speculating, on first arriving, what the rocks may be, I often mentally cry out 3 to 1 tertiary against primitive;

Darwin's correspondence

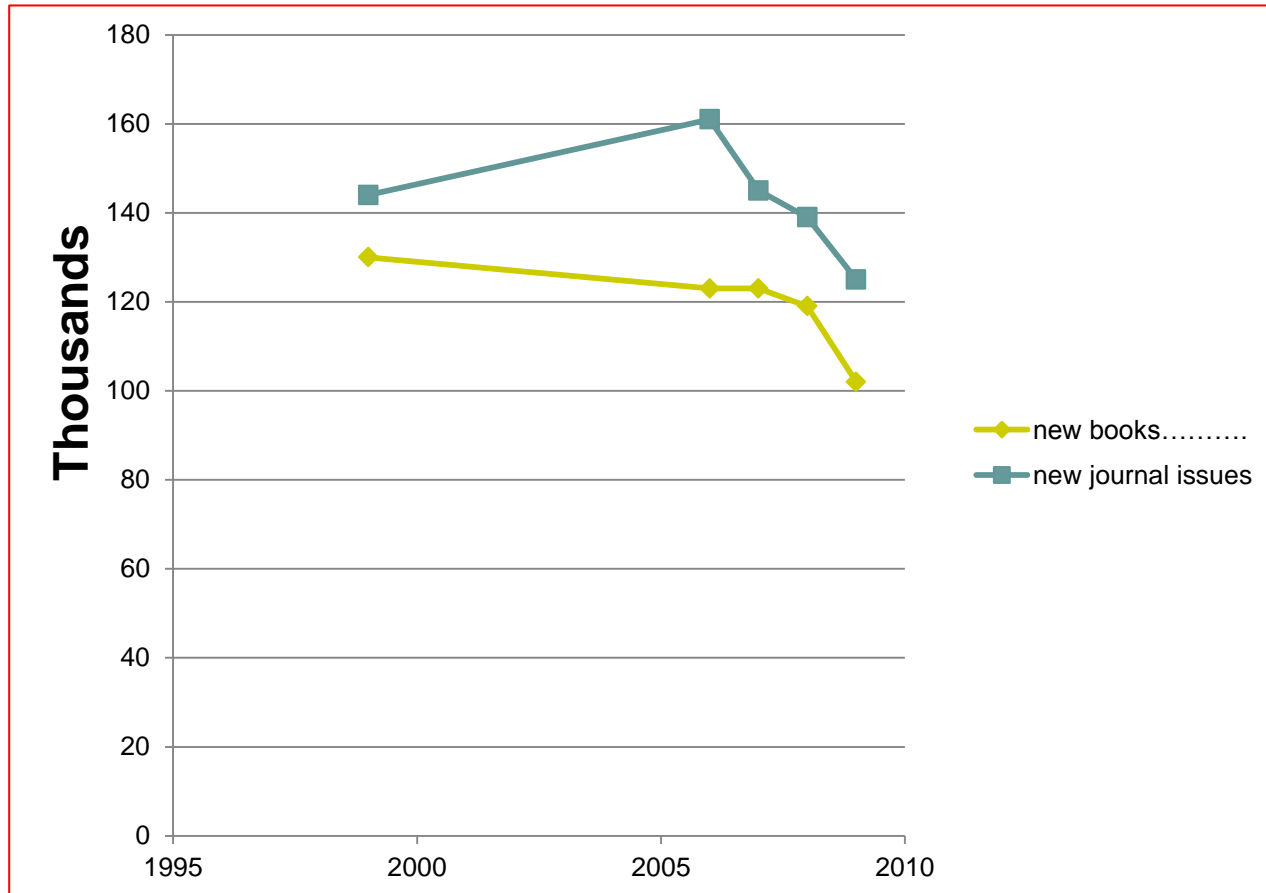


Does anybody keep copies of his
emails with colleagues?



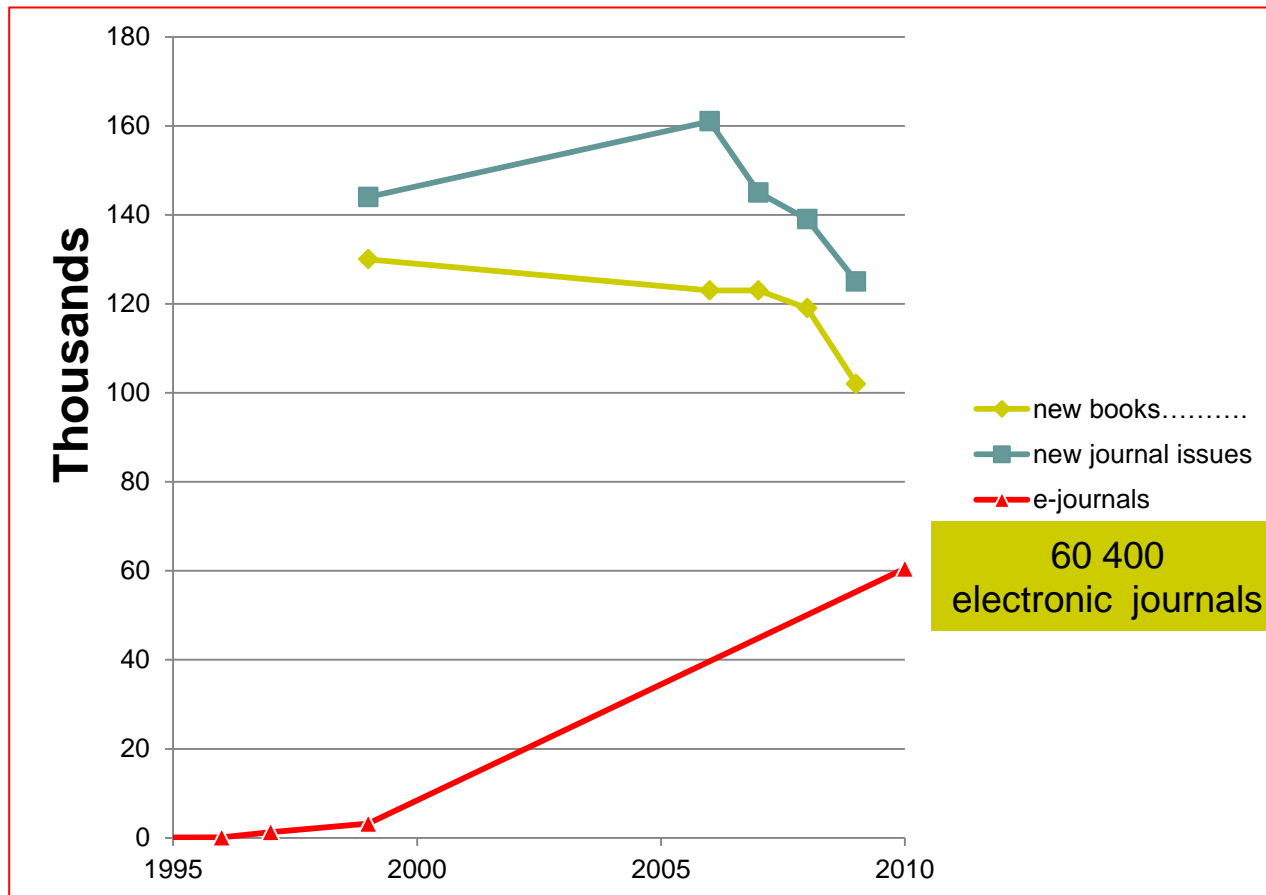


New acquisitions



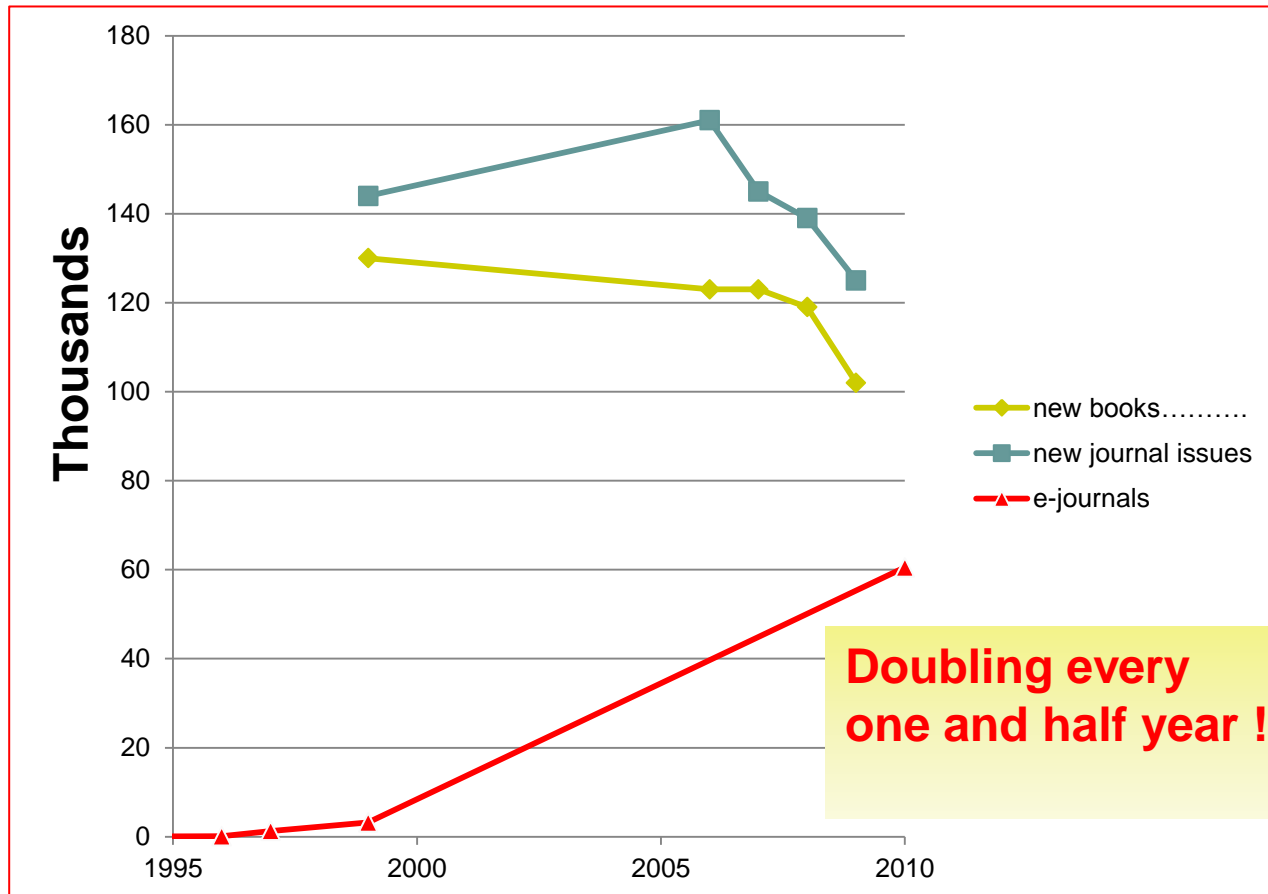


New acquisitions





New acquisitions





How secure, reliable and technologically up-to-date are the archives of older electronic documents and publications?.





Crisis of scientific communication;

fact or fiction

