

ORIGIN Old English *Wodnesdag*, named after the Germanic god **ODIN**; translation of late Latin *Mercurii dies*; compare with Dutch *woensdag*.





information economy

Solow Paradox

"We see computers everywhere but in the productivity statistics" c. 1988

Solow solved?

determinism with lag time?

David, Paul. 1990. 'The Dynamo and the Computer:An Historical Perspective on the Modern Productivity

Paradox,' American Economic Review, 80(2): 355-361.

"techno-economic regimes formed around general purpose engines"

"regime transition"

"diffusion lags"

alternatively

towards an information society

a long-term, sedimentary process

process of abstraction

time, time keeping

money, balancing

time is money

the spirit of capitalism?

Remember that TIME is Money. He that can earn Ten Shillings a Day by his Labour, and goes abroad, or sits idle one half of that Day, tho' he spends but Sixpence during his Diversion or Idleness, ought not to reckon That the only Expence; he has really spent or rather thrown away Five Shillings besides.

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Benjamin Franklin, Advice to A Young Tradesman Written by An Old One. 1748

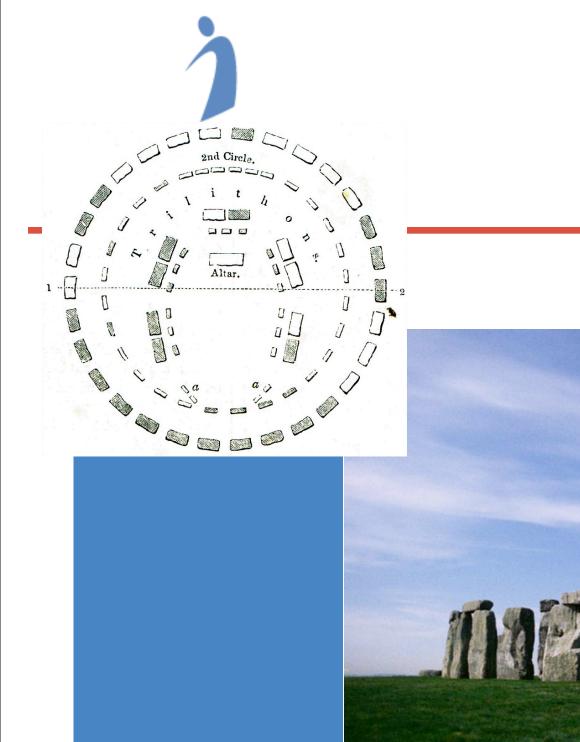
the cost of sin

1309: An indulgence to pardon a year's worth of sin costs one penny. Clement V.





CLEMENDA SE PRE SUBJECTANO RELIQUIAS TRANSPOLIT, OUPLABICCO PCCLESIA: SPECIALE CONCESSIT UBILARUM, VERA EPTICIES



the long then

c 3100 bce





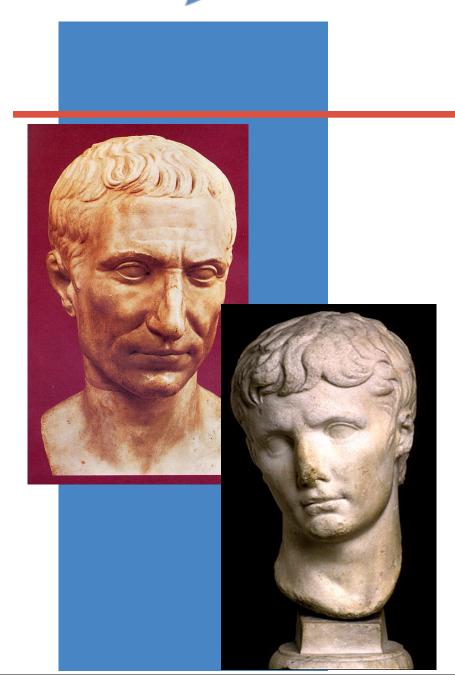
Julius Caesar (100 - 44 bce) Julian Calendar

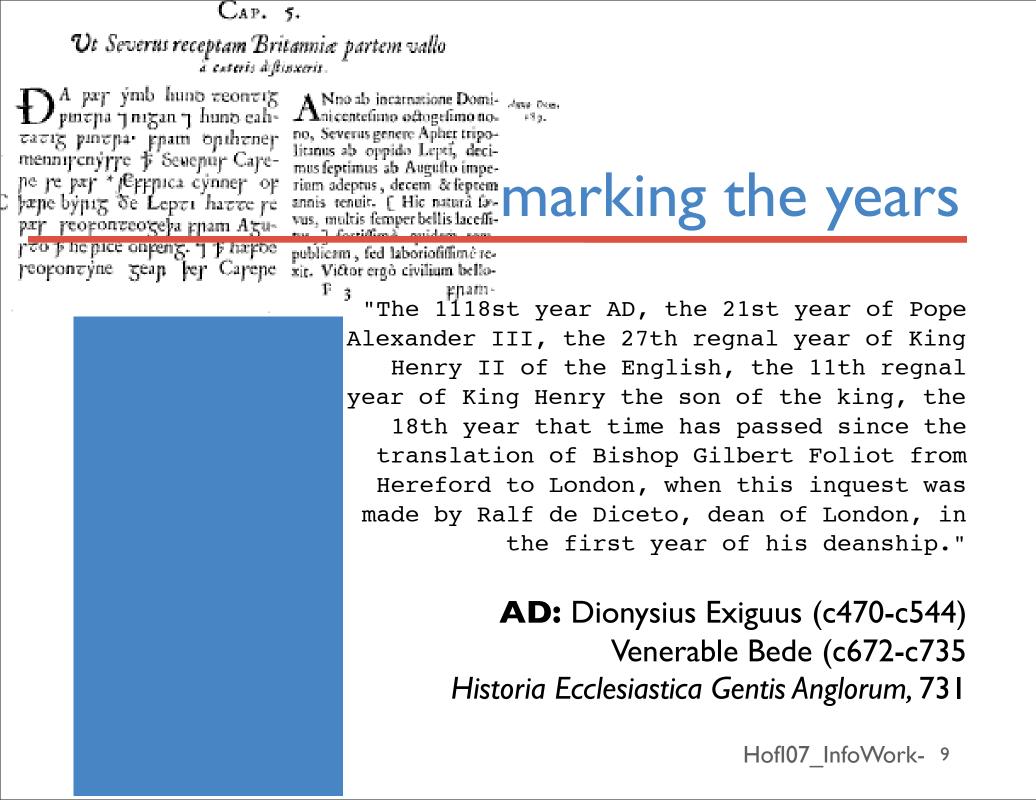
troublesome equinox

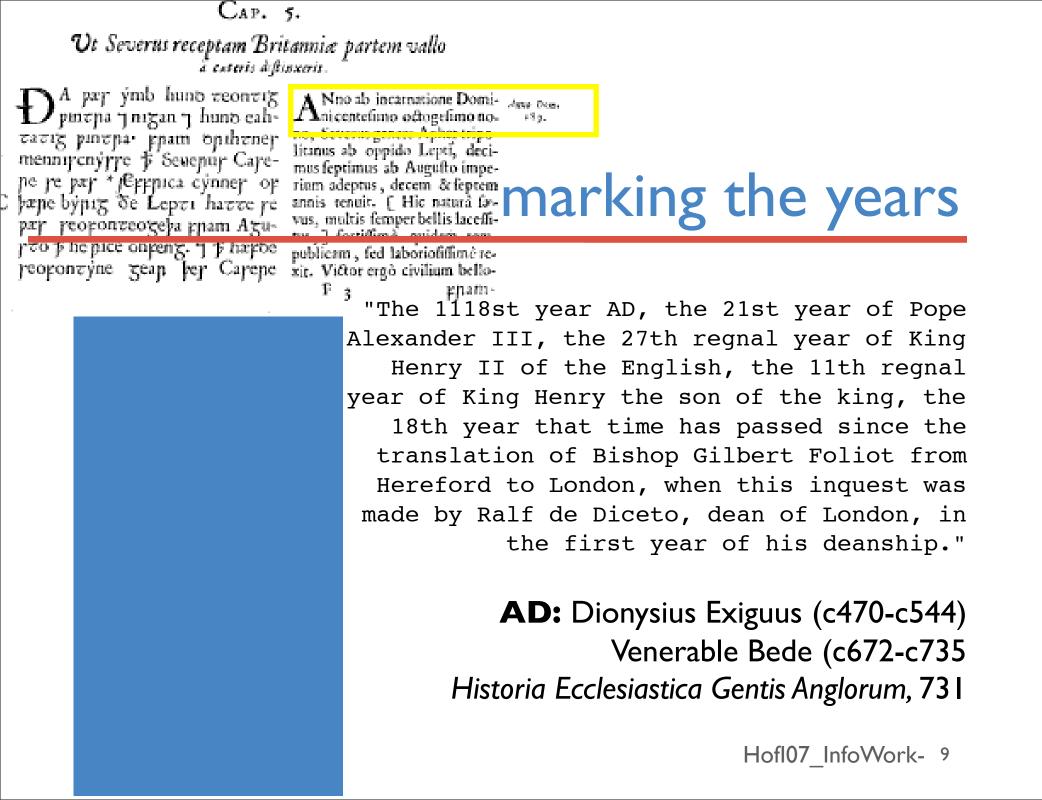
46 bce: 445 days

45 bce: 365-1/4

Augustus (63 bce - 14 ce) 8 bce: a further course correction







beginning again

New Year

January I or March 25 (ab incarnatione)?

the struggle for Easter

1582: Gregory XIII

recalibrating: leap years & centurial years

cutting time: Thursday October 4 to Friday October 15





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Gregorian Calendar



Get an instance of the Calendar class.

Calendar cal = GregorianCalendar.getInstance();

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Ah, got some light:

if I change

Calendar cal = GregorianCalendar.getInstance();

to

Gregorian Calendar

I get better results:

fighting back

Orthodox & Protestants unchanged Feb 1/12; Feb 1 [OS] 1694/5

1752: Anglo-American course correction "give us back our eleven days"

revolution

year I again [1792] Vendémiaire, Brumiare, Frimiare, Nivôse, Pluviôse, Ventose, Germinal, Floréal, Prairial, Messidor, Thermidor, Fructidor



the holy hours

"seven times a day I praise Thee" Psalms 119: 64

matins, prime, tierce, sext none, vespers, compline



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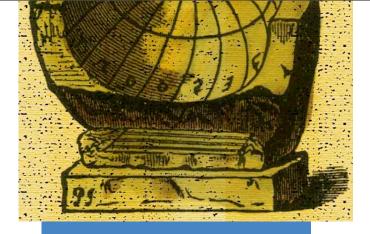
dividing the day

accordian hours

"are there not twelve hours in the day?" John 6.6.

equal hours

I 330 (Germany) I 370 (England)



and the technology

3500 bce: sundials

700 ce: hourglasses

1086: Su Sung's water clock

1300: mechanical clocks

1580...: Chinese trading with West; looking for ways to fix calendar

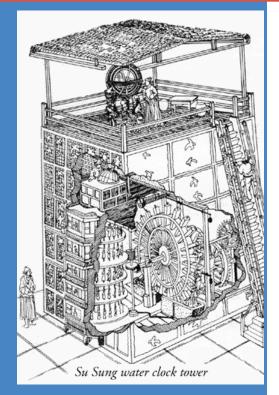
1656: Huygens pendulum clock

1761: Harrison's nautical clock

c1850: telegraph time

1852: Greenwich mean time

1884: Meridian Conference, Washington DC Hofl07_InfoWork- 14





times

absolute time

"Absolute, true, and mathematical time, of itself, and from its own nature, flows equably without relation to anything external."

Isaac Newton, Principia Mathematica, 1687

mundane time

"looking upon her Watch, I accidentally discovered the Figure of a Coronet on the back Part of it? --Addison, Spectator 8, March 1711 HoflO7 InfoWork- 15

by 1800, "recorded time (one suspects) belonged in the mid-[18th] century still to the gentry, the masters, the farmers, and the tradesmen"

Thompson

time control

bell tolling

1335, Amiens start of work, lunch, end of the day controlled by bell rung by the city --decree of Phillip VI

fields to factories

task orienting to time orienting

"the industrial revolution demanded a greater synchronization of labour"

a vigorous and licensed popular culture had evolved, which the propagandists of discipline regarded with dismay"

Wedgwood ... 'the first recorded system of clocking-in"

schools "a spectacle or order and regularity"

"fight, not against time, but about it"

Hofl07_InfoWork- 17

"England's was the first industrial revolution, and there were not Cadillacs, steel mills, or television sets to serve as demonstrations as to the object of the operation" Thompson

controul



The Guide, the Wardens of our faculties And Stewards of our labour, watchful men And skilful in the usury of time, Sages, who in their prescience would controul All accidents, and to the very road Which they have fashion'd would confine us down Like engines.

accounting for time

work and leisure

How longe tyme wol ye rekene and caste Youre somme, and your bookes, and your thynges? The devel have part on all swich rekenynge Geoffrey Chaucer, The Shipman's Tale

> "What can there great and noble be expected from him whose attention is ever fixed upon balancing his books, and watching over his expenses?" Joseph Addison, Spectator

> > Hofl07_InfoWork- 19



"January 1st [1668]. Up, and all morning in my chamber making up some accounts against this beginning of the new year."

Pepys

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determinism again?

Max Weber (1864-1920)

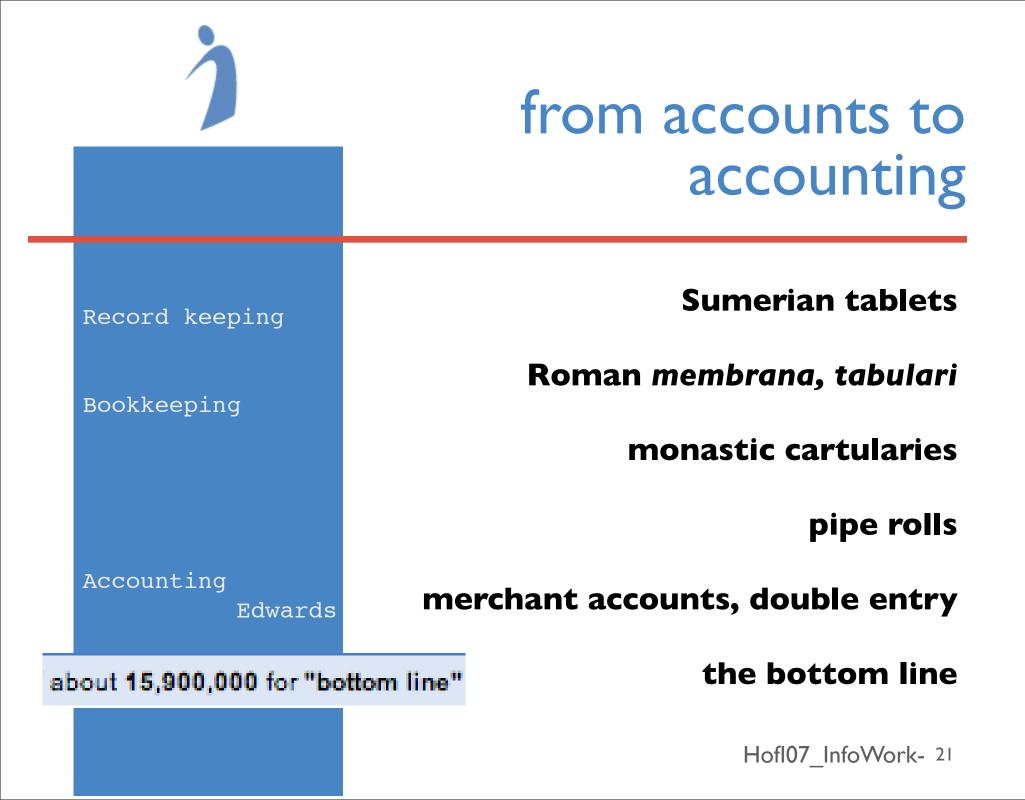
"a rationalistic capitalistic establishment ... one with capital accounting, that is, an establishment which determines its income yielding power by calculation according to the methods of modern bookkeeping and the striking of a balance"

Werner Sombart (1863-1941)

"abstraction of profit [leads to] economic calculation ... systemic organization ... depersonalization."

Hofl07_InfoWork- 20

[is it true that]
"Scientific
bookkeeping was
causal, or at
least a
predisposing
factor in the
emergence and
development of
capitalism"
Basil Yamey, 1949



the Italian method

1211: proto double entry, Florence

c 1340: double entry in Genoa

1366: The Merchant of Prato (Francesco di Marco Datini) "Arabic" numerals

1494: Luca Pacioli Summa de Arithmetica



Ed Illuftrifimum Poincipun Gui Elbaldum Brbini Burd Abontio fe rica: Duraptis Comiton. Orceis latinido, littrio & matifilimumo: Aba ematice videpline culterem foruentifimum: fratrio Ruee ve Courgo fan Bepuldoi: admini minop: clane Ebeelogie Abagifiri. In artes arithtite: «Geometric. Porfabo.

Aquantita Magnanimo Duca: finobile a creellite cola doemolni phylolophi per queto Ibano ciudicata ala fubftanzia para: ccôzifa coeterna. Peroche bano cognofeitto per verñ modo alcuna cola n rera natura fença lei no potore eniftere-for la qual cola pelei îtêdo (cô lainto pe colui dbeli noîtri fenfi reggi) tractarge:nondseperalmi prächi e antichi phylofophi tenne fia copiefamente tractatore in theorica e pratica. dena per che los pieri gia ali rempi noftri fonno molto obfcurite pamolei male aprefice ale pratiche vulgari ma le applicati: piche i loso operationi molto variano: e con di dabosioli affanni mettano in operasili pe numeri como pe milure : vode pi ci parlando non intendo fe non quâto ebe ala poatica e operare fia meltierot, melco andoci fecodo duogloi, opecenni ancora la ebecoticatecanía pe tale operaret fi pe numeni cômo ce geometria. Elea prima accio meglio dillo doe fequita fe babia appoebédere effa quantita pundiremo lecodo el noftro propolitoreduixiondola acialem luo mentro aflegnaremo lua propria e vera pifinicione e pelerapitone. E alora poi fequira quillo de Anil. oici in feando poller. Luc entra maxime feirar aliquid cam sabenir iuam quid elt vé.

Diffimitations a buillie billarent a coheinue quancitaties arriculais primus prin orbitationia.

Res adóra. La quittia effore inteliate binembercioe continua e polereta, La continua e quilla lettui parti louno copulare e giorne a derito territo territo por e dila lettui parti nol fono gióre adalcuno termine conceino en 2.3, 72. Dette prima rela toloretación e de munitorio e por toda continua cioe geometria; quiàto tolo interno afoccia chiaramento terreto.

Frankling Treasurers and the second s and part had a star for a first free had a set of the set of The second start of the Rest of Start Strength in the same of Condition of the set of the bridge for the set of the proof and the production from the product of the purpose and the party party have been by a and top day for the state or board and provide property if p a it was a last part of the product of the second many of the work such same the same prove to a new other the property of all the street to actual an an appropriate and white again the same second and the same second start and the and the growth Dig day a global to be being provide a print from some togen friger an from types - spine for g and some the state support that and support A surface of the second s the growth with some shart with the open which But what you'd pain give that reference with their loss with The seal of the second se being and in April of Star printlying from a manufacture and a sugar a state

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entry

"On this day, we have (or I have) bought from Filippo de Ruffoni of Brescia, twenty pieces of white Bresciani cloth. They are stored in Stefano Tagliapietra's vault and are of so many arm lengths apiece, as agreed upon. They cost twelve ducats each and are marked with a certain number. Mention if the cloth is made of triple warpcord, four to five arm lengths square, wide or narrow, fine or medium, whether Bergamene, Vicenzan, Veronese, Paudan, Florentine, or Manuan. State whether the transaction was made entirely for cash, or

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Recognition of the loss in the second state and a garden was and some share they a provide and a property of provide and the proan and a second se and the set of the particular strength and a strength and A-man and a second and and the property of the second An any some former particular strong some \$100 and a discould be price a new data of Register - hadre the short based to be appendent of the same highand prover to provide the spectrum in plantane bands on higher being and and date 2. I may be presented to the second states Contraction of the second second of property of the state of the second state of party party

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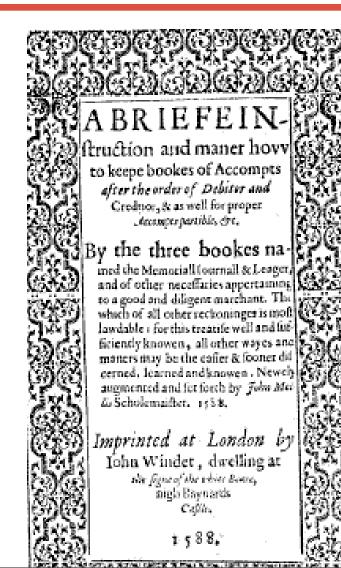
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entry

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10/7/07	592	Ronald H. Berman			37.70		5,025.28	
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10/19/07		MBNA			371.20	Deposit	4,654.08	
,12	•	[WAssetsVisa-7978]	▼	6ZZ4F-P1NJH	Open Split			
10/22/07	EFT	PG&E			50.66		4,603.42	Vork- 23
		Utilities:Gas & Electric		6ZZ4H-L9X79				

abstraction



the books

"after the form of Venice"

"the three principall bookes"

memorial journal ledger

memorial

"in which a merchant writes all his daily business"

19

October 9th, bought two pipes of wine @ £30 each from Joseph Smith, paid £20 cash with balance to be paid January 1.

27

October 30, sent two pipes of wine to England for sale there; cost £10.

30 November I, sold two pipes of wine to B&H @ Hofl07_InfoWork- ²€50 ea.

journal

"This Journal ought to bee signed and marked with the same marks or letter as the memorial. And also the leaves numbered."

Theft oz money is Debitoz (02			
oweth) to focke belonging to mee M. N. and is for pounds, willings,			
and pence, fo many, fr. 02 buckets			
fo many, sc. erpselling the name, number and value as appeareth in			
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Journal

- October 9 19. Wine owes cash £20 for deposit on two pipes of wine bought of **Joseph Smith**
 - 19. Wine owes Joseph Smith £40 for balance of two pipes of wine bought October 9.

October 30th, wine owes transport £10 for carriage of two pipes of wine to England.

November 20, B&H owes wine £100 for two pipes of wine sold them.



"every one parcell that is sette in your Journall ought to bee made two parcels in your ledger."

wine account

39	to cash	20	19	from B&H	100
	to Joseph Smith	40			
27	to transport	10			
		70			100
	To profit & loss	30			20



"every one parcell that is sette in your Journall ought to bee made two parcels in your ledger."

wine account

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wine account

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27	to transport	10			
		70			100
	To profit & loss	30			20

double entry

Joseph Smith

		19	for 2 pipes of wine	60
from cash	40			
from wine	60			60
				from cash 40

2

accounting for

interlinked accounts

a debit in one set is a credit in another linking money and merchandize

proto hypertext?

balancing the books

spreading the numbers

"In the past seven centuries bookkeeping has done more to shape the perceptions of more bright minds than any single innovation in philosophy or science. While a few people pondered the words of René Descartes and Immanuel Kant, millions of others of yeasty and industrious inclination wrote entries in neat books and then rationalized teh world to fit their books."

Alfred Crosby, The Measure of Reality

information workers

telling times and counting coins

rise of numeracy

bottom up?

Graunt: shopkeeper's arithmetic

Pepys

"Up by five o'clock... Comes Mr. Cooper, mate of the Royal Charles, of whom I intend to learn mathematiques... Up by four o'clock and at my multiplicationtable hard" July 4 & 9, 1662 HoflO7 InfoWork- 33



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balancing nations

Treaty of Utrecht, 1713

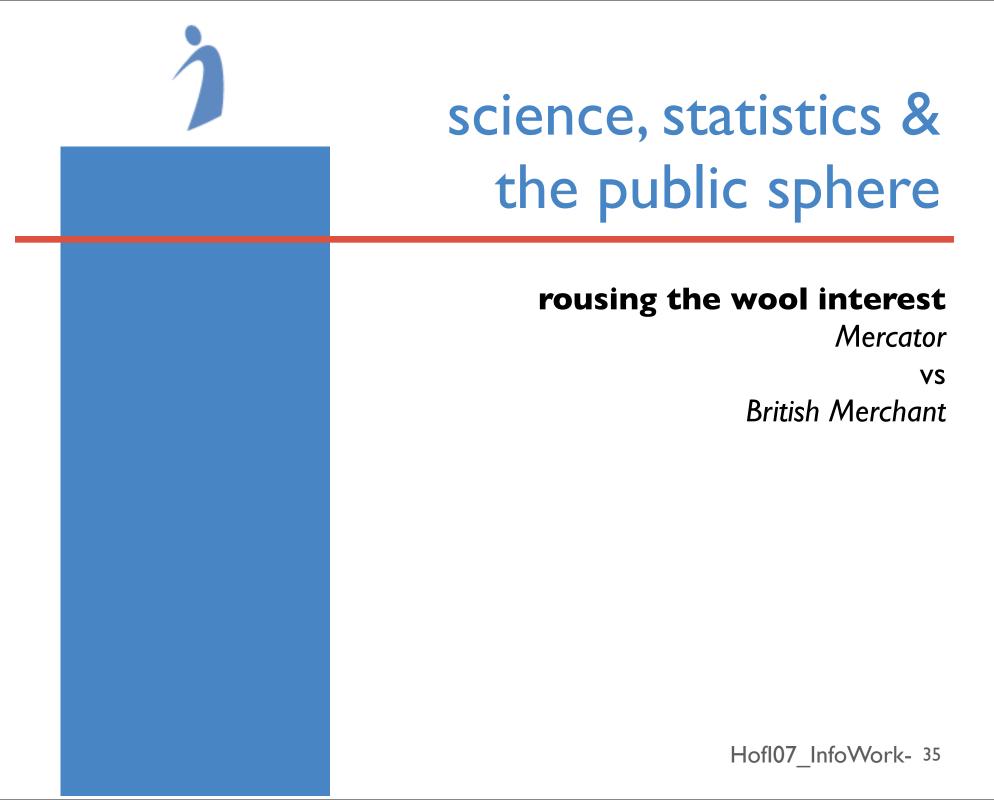
War of the Spanish Succession

the commercial treaty

free trade with France

the balance of trade

mercantilism and national interest



science, statistics & the public sphere

rousing the wool interest

Mercator

vs British Merchant



science, statistics & the public sphere

rousing the wool interest

Mercator vs

British Merchant





1

search for statistics

THEAL M & G. C. BRITISH MERCHANT;

OR,

Commerce Preferv'd.

IN THREE VOLUMES.

By Mr. CHARLES KING, Chamber-keeper to the Treasury, and late of London Merchant.

LONDON.

To fum up all, if we pay to France yearly,

450000

600000

70000

20000

500000

1650000

200000

1450000

For their Wines For their Brandies For their Linen For their Paper For their Silks

And they take from us in Lead, Tin, Leather, Allum, Copperas, Goals, Horn-Plates, Gr. and Plantation-Goods, to the Value of

Great Britain lofes by the ? Balance of that Trade yearly ? Charles Davenant An Essay upon the Probable Methods of Making a People Gainers in the Ballance of Trade 1699

VS

Paul Methuen

Economic Policy

RESEARCH FOR BROADLY SHA

November 17, 2003 | EPI Briefing Paper #147

The high price of 'free' trade

NAFTA's failure has cost the United States jobs across the nation

by Robert E. Scott

Distorting the record

NAFTA's promoters play fast and loose with facts

by Robert E. Scott

1990 - 1996

Period	Mexico Exports to U.S.	Mexico Imports from U.S.	Mexico Trade Surplus U.S.
1990	\$18,456.180	\$20,521.430	\$-2,06
1991	\$33,952.648	\$36,867.648	\$-2,91
1992	\$37,468.032	\$44,278.592	\$-6,81
1993	\$43,116.192	\$46,539.800	\$-3,42
1994	\$51,943.048	\$57,008.632	\$-5,06
1995	\$66,472.408	\$53,994.560	\$12,47
1996	\$31,762.440	\$26,318.440	\$5,44

Note: Data for 1996 is for January-June. All Trade Data is FOB

Source: INEGI, Banco de Datos, 1996

Trade with NAFTA with Canada (Consump) : 2005

NOTE: All figures are in millions of U.S. dollars.

Month	Exports	Imports	Balance
January 2005	5,223.1	10,550.7	-5,327.6
February 2005	5,689.3	11,272.1	-5,582.8
March 2005	6,820.2	12,138.4	-5,318.2
April 2005	6,577.5	11,303.9	-4,726.4
May 2005	6,839.8	11,765.8	-4,926.0
June 2005	6,881.9	12,240.1	-5,358.2
July 2005	5,113.9	9,717.4	-4,603.5
August 2005	6,365.8	13,398.3	-7,032.5
September 2005	6,719.8	13,457.7	-6,737.9
October 2005	6,838.9	13,780.0	-6,941.1
November 2005	6,559.4	13,914.1	-7,354.7
December 2005	6,160.8	12,723.1	-6,562.3
TOTAL	75,790.4	146,261.6	-70,471.2

balancing acts

"apprehension of the wrong balance of trade, appears of such a nature, that it discovers itself wherever one is out of humour with the ministry, or is in low spirits." David Hume,

"Of the Balance of Trade," 1752

in sum

time is money

technological developments

social agreements

standards and interdependencies