

Co-operation!

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UKTI South East

8th November 2012
Doha





18191901

1857.....1944





18571944

1926 ???





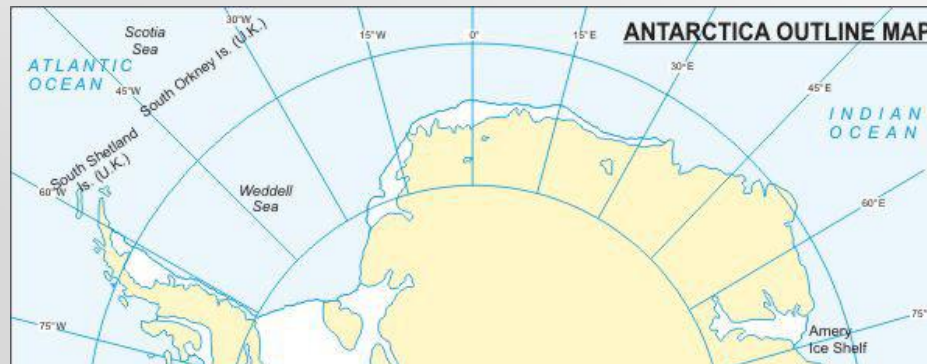
What was it like in 1840?

Mummy told me

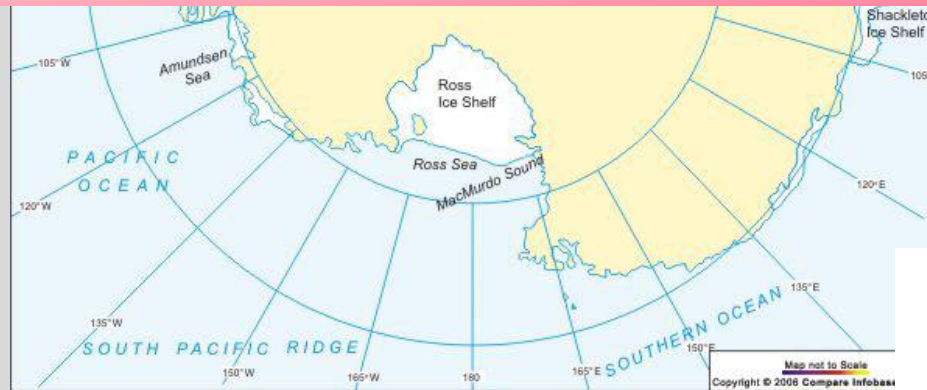


What was 1840 like?

What were the headlines?



Discovery of Antarctica as a continent





The RMS Britannia was launched

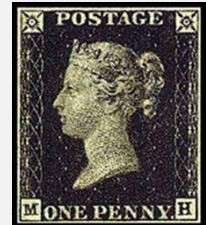


Remember,
we are just two conversations apart

Fastest crossing of the Atlantic????

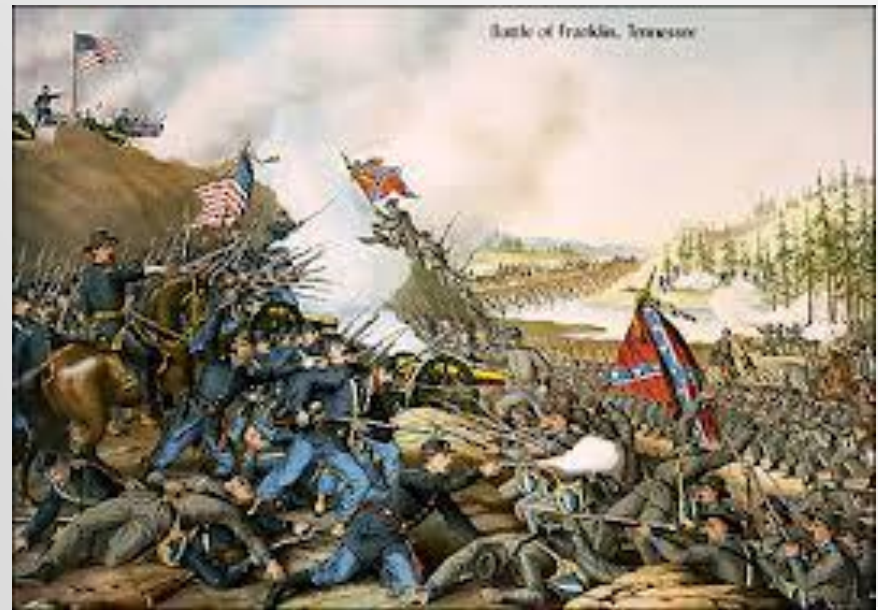


From Penny Black to Twitter



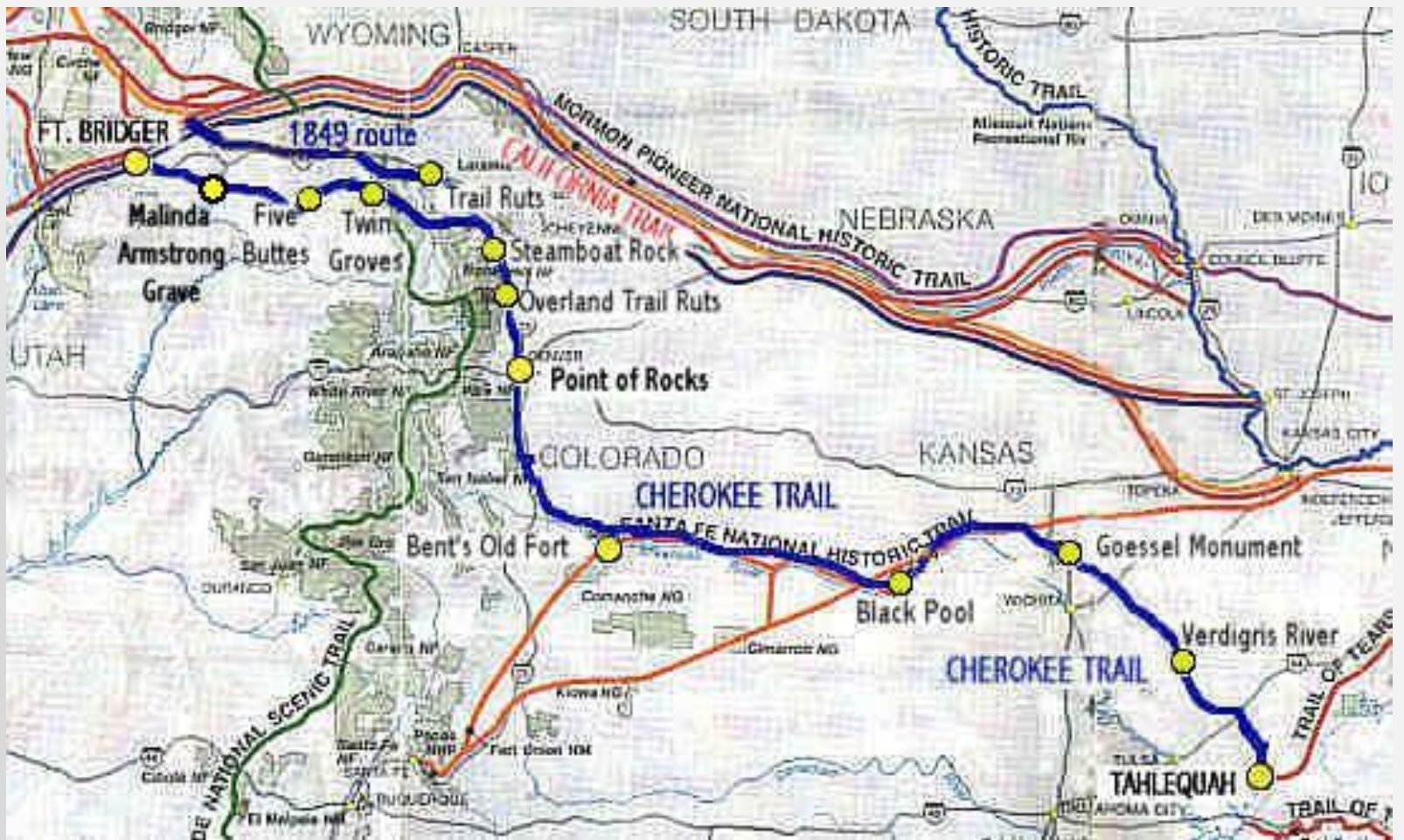
As we have crossed the Atlantic, let us stay there for a while

1840's America predates the Civil War





And the Gold Rush and the Wagon Trains





Even General
George Custer had
yet to go to College,
let alone fight in the
Civil War or go to
Little Bighorn

Two conversations

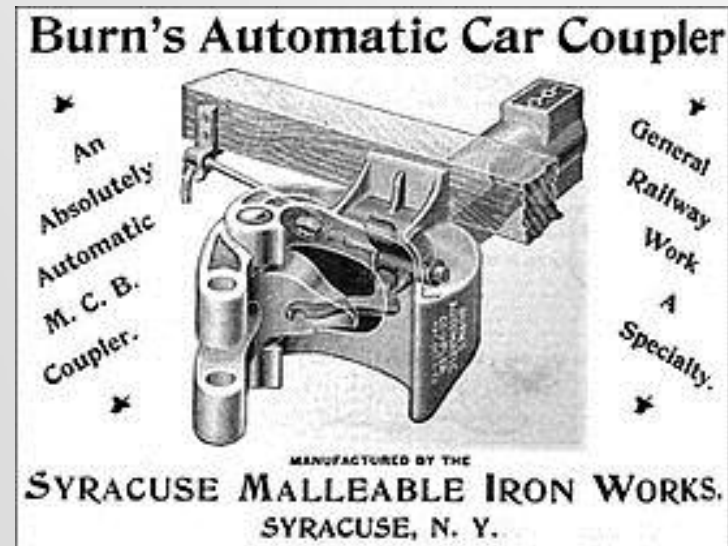
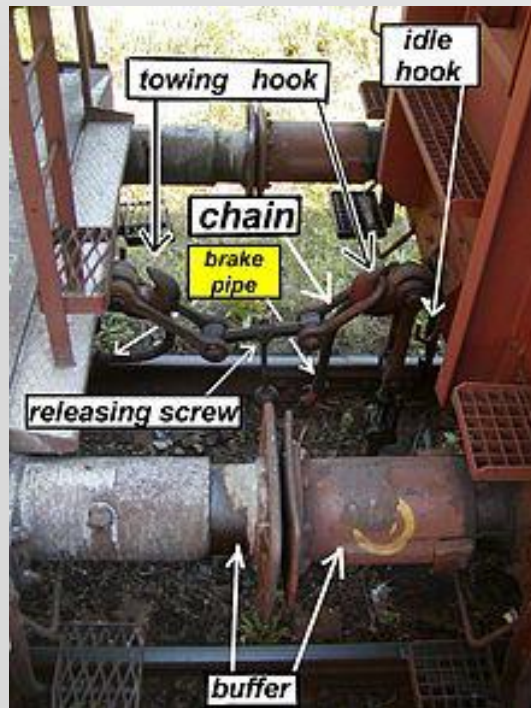
In fact the development of the Railroads in America at this time have many lessons which are relevant to today.

With only 3000 miles of track – would eventually grow to 430 000 miles – it was engineering in its infancy

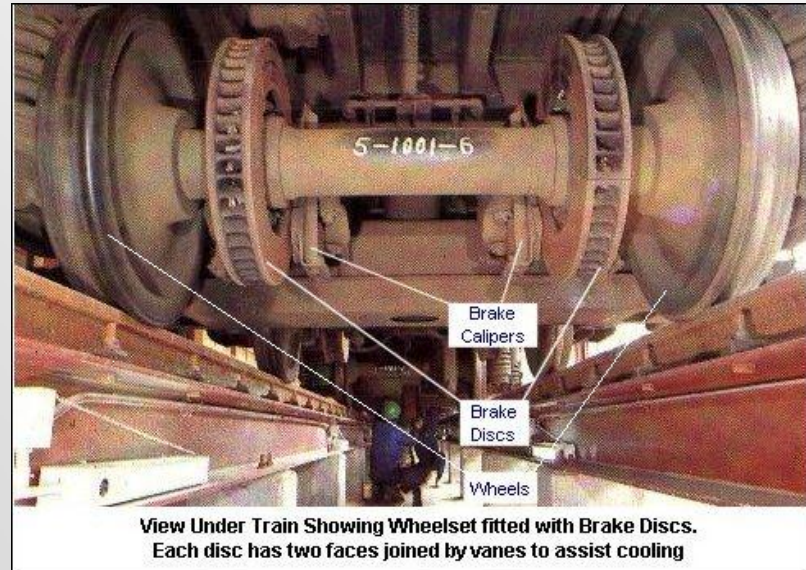


3000 miles and 20+ different gauges

Literally thousands of trucks and countless methods of coupling them together



Brakes???? What brakes?

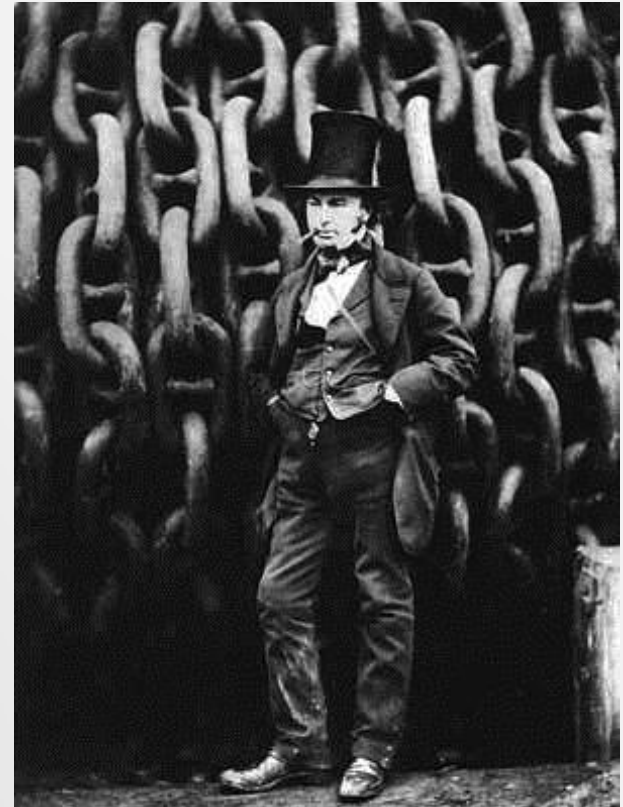


Hence the need for co-operation

To agree protocols and standards and to agree implementation of those decisions

However decisions which are taken can have far reaching effects

Had this man had his way

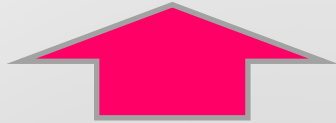


This would have been even bigger!



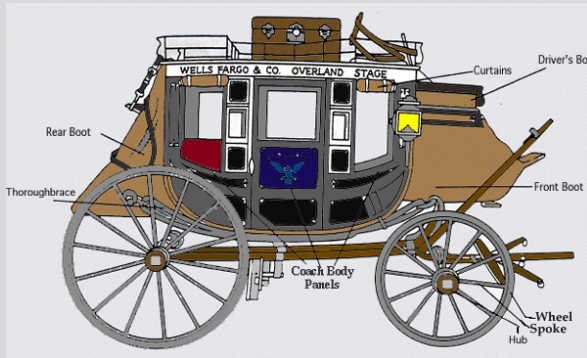
It all started with the Romans

Whose chariots were pulled by two horses

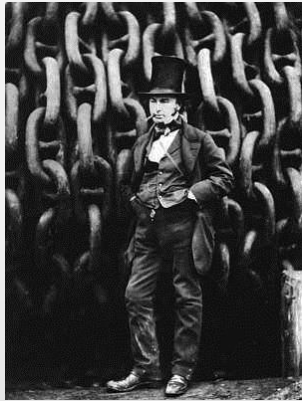


Which set the axle size

Which set the cart and stagecoach size
And Tram sizes



Which set the gauge size



wanted 7' $\frac{1}{4}$ "

but the country decided on 4' $8\frac{1}{2}$ "

- Based on those two Roman horses

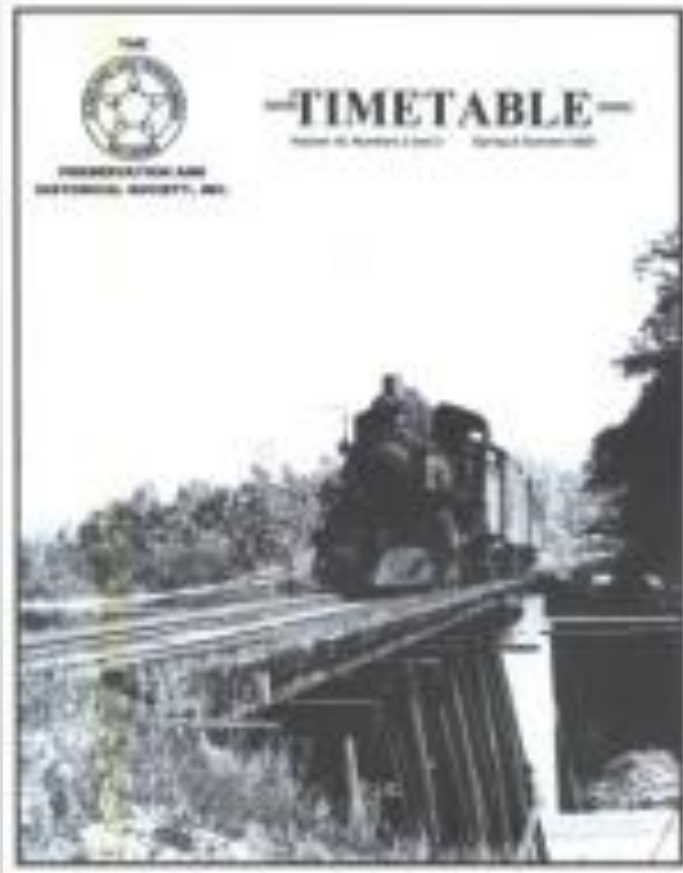
That size was also adopted eventually by the Northern Railroad systems of the USA, and the railroad size was a factor in moving the Saturn Rocket launchers around the country!

(accountants v engineers?)



There is still another lesson from the railroads





Noon
18th November
1883

Four Time Zones

1918 Accepted by Congress

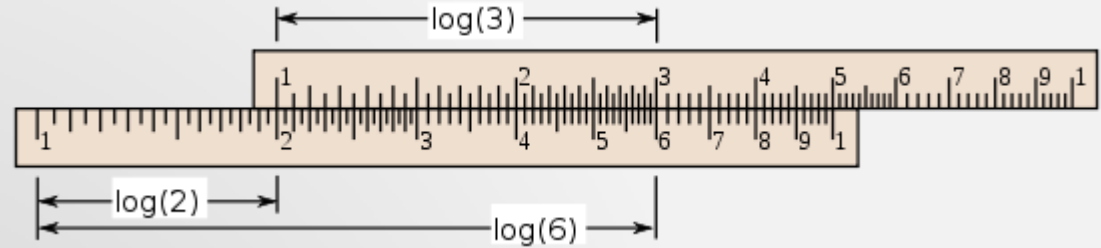
Still within the timescale of these two conversations



We have seen that, in a very short period of time – literally our “two conversations” how the conditions and assumptions of the past have had to change and that those changes have only come about as a result of some kind of co-operation between individuals

Engineers have often been at the centre of such discussions

Engineers such as Telford and Stephenson



And the kit they had!



Remember these?

LOGARITHMS, BASE 10 $\log_{10}x$ or $\lg x$

x	0 1 2 3 4 5 6 7 8 9									1 2 3 4 5 6 7 8 9									
	ADD																		
10	.0000	0043	0086	0128	0170							4 8	13	17	21	25	29	34	38
11	.0414	0453	0492	0531	0569	0212	0253	0294	0334	0374	4 8	12	16	20	24	28	32	36	
12	.0792	0828	0864	0899	0934	0607	0645	0682	0719	0755	4 7	11	15	19	22	26	30	33	
13	.1139	1173	1206	1239	1271	0969	1004	1038	1072	1106	4 7	11	14	18	21	25	28	32	
14	.1461	1492	1523	1553	1584	1303	1335	1367	1399	1430	3 7	10	14	17	20	24	27	31	
15	.1761	1790	1818	1847	1875	1614	1644	1673	1703	1732	3 6	9	12	15	18	21	24	27	
16	.2041	2068	2095	2122	2148	1903	1931	1959	1987	2014	3 6	8	11	14	17	20	22	25	
17	.2304	2330	2355	2380	2405	2175	2201	2227	2253	2279	3 5	8	10	13	16	18	21	23	
18	.2553	2577	2601	2625	2648	2405	2430	2455	2480	2504	2 5	7	10	12	15	17	20	22	
19	.2788	2810	2833	2856	2878	2648	2672	2695	2718	2742	2 5	7	10	12	14	17	19	22	
20	.3010	3032	3054	3075	3096	2878	2900	2923	2945	2967	2 4	6	9	11	13	15	18	20	
21	.3222	3243	3263	3284	3304	3118	3139	3160	3181	3201	2 4	6	8	11	13	15	17	19	
22	.3424	3444	3464	3483	3502	3324	3345	3365	3385	3404	2 4	6	8	10	12	14	16	18	
23	.3617	3636	3655	3674	3692	3502	3522	3541	3560	3579	2 4	6	8	10	11	13	15	17	
24	.3802	3820	3838	3856	3874	3711	3729	3747	3766	3784	2 4	5	7	9	11	13	14	16	
25	.3979	3997	4014	4031	4048	3892	3909	3927	3945	3962	2 4	5	7	9	11	13	14	16	
26	.4150	4166	4183	4200	4216	4082	4099	4116	4133	4150	2 3	5	7	9	10	12	14	15	
27	.4314	4330	4346	4362	4378	4249	4265	4281	4298	4314	2 3	5	6	8	10	11	13	14	
28	.4472	4487	4502	4518	4533	4409	4425	4440	4456	4472	2 3	5	6	8	9	11	12	14	
29	.4624	4639	4654	4669	4683	4564	4579	4594	4609	4624	1 3	4	6	7	9	10	12	13	
30	.4771	4786	4800	4814	4829	4698	4713	4728	4742	4757	1 3	4	6	7	9	10	12	13	
31	.4914	4928	4942	4955	4969	4857	4871	4886	4900	4914	1 3	4	6	7	8	10	11	13	
32	.5051	5065	5079	5092	5105	4997	5011	5024	5038	5051	1 3	4	6	7	8	10	11	13	
33	.5185	5198	5211	5224	5237	5132	5145	5159	5172	5185	1 3	4	5	7	8	9	10	12	
34	.5315	5328	5340	5353	5366	5263	5276	5289	5302	5315	1 3	4	5	6	8	9	10	12	
35	.5441	5453	5465	5478	5490	5391	5403	5416	5428	5441	1 2	4	5	6	7	8	10	11	
36	.5563	5575	5587	5599	5611	5514	5527	5539	5551	5563	1 2	4	5	6	7	8	10	11	
37	.5682	5694	5705	5717	5729	5635	5647	5658	5670	5682	1 2	4	5	6	7	8	10	11	
38	.5798	5809	5821	5832	5843	5752	5763	5775	5786	5798	1 2	3	4	6	7	8	9	10	
39	.5911	5922	5933	5944	5955	5866	5877	5888	5899	5911	1 2	3	4	6	7	8	9	10	
40	.6021	6031	6042	6053	6064	6085	6096	6107	6117	6128	1 2	3	4	5	7	8	9	10	
41	.6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	1 2	3	4	5	6	7	8	9	
42	.6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	1 2	3	4	5	6	7	8	9	
43	.6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	1 2	3	4	5	6	7	8	9	
44	.6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	1 2	3	4	5	6	7	8	9	
45	.6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	1 2	3	4	5	6	7	8	9	
46	.6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	1 2	3	4	5	6	7	8	9	
47	.6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	1 2	3	4	5	6	7	8	9	
48	.6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	1 2	3	4	5	6	7	8	9	
49	.6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	1 2	3	4	5	6	7	8	9	

Examples:

$\lg 3.674 = 0.5647 + 0.0005 = 0.5652$
 $\lg 367.4 = \lg (3.674 \times 10^2) = 2.5652$
 $\lg 0.003674 = \lg (3.674 \times 10^{-3}) = -3.5652$

Constant	π	e	$\lg e$	Into
Value	3.14159	2.71828	0.43429	2.30259
log (base 10)	0.49715	0.43429	1.63778	0.36222

4 Figure Log Tables

Would it be realistic, in today's world, to take 35 years to ratify the decision of a group of Railway Companies to divide the US into four time zones?

What else has changed?



The frequency of the atomic clock is in the microwave region of the electromagnetic spectrum and is a convenient one for locking a microwave oscillator. Cesium clocks have demonstrated stability to 2 parts in 10^{14} , or one second in 1,400,000

1980

Tim Berners-Lee

“Enquire within”

WWW.

+4years .org .edu .gov

It is clearly no longer possible for one individual to know “everything” in the way that it once was.

The key is for companies to learn the value of co-operation across all the boundaries and subject areas

For companies to nurture strategic links and to keep an open mind

UK
TRADE &
INVESTMENT



In conclusion



Please talk to your children and grandchildren!

And enjoy the remainder of this conference

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UK Trade & Investment (South East)

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8th November 2012
Doha