Introduction

ID 413: Information Graphics and Data Visualization
Spring 2016

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http://info-design-lab.github.io/ID413-DataViz/

Agenda

- Introductions
- Administrative information
- Introduction to Information Graphics & Data Visualization

Course Information

http://info-design-lab.github.io/ID413-DataViz/

Schedule of classes and topics
Lecture Slides
Readings
External Links
Assignments
References

Course Information

Registration:
ASC may require some of you to register manually. If so, use the registration form on the course website (or from IDC Office) and take my signature latest by Jan 9th, 11:00 am.

Timings:
Wednesdays and Fridays 9:30 am to 11 am (LT 303).

Attendance:
Students not having 80% attendance may be debarred from appearing in the semester end examination and be awarded XX grade, which requires the student to re-register for the course when it is offered again.

Office Hours:
Fridays 11:30 AM to 1:00 PM at my office in Transit Building, Room No. 330 or by appointment.

Course Information

Grading:
Your grades will be determined through

4 individual assignments (20%)
1 group project (40%)
No midsem
Endsem (30%)
Attendance & class participation (10%)

What is design?

What is design?

- a mixture of creativity and analyses
- problem solving
- evolution
- the creation of solutions to problems
- integrating into a coherent whole
- a fundamental human activity
- improve the human condition through physical change
- imaginative/creative jump from present facts to future possibilities
- thoughts and actions intended to change thoughts and actions

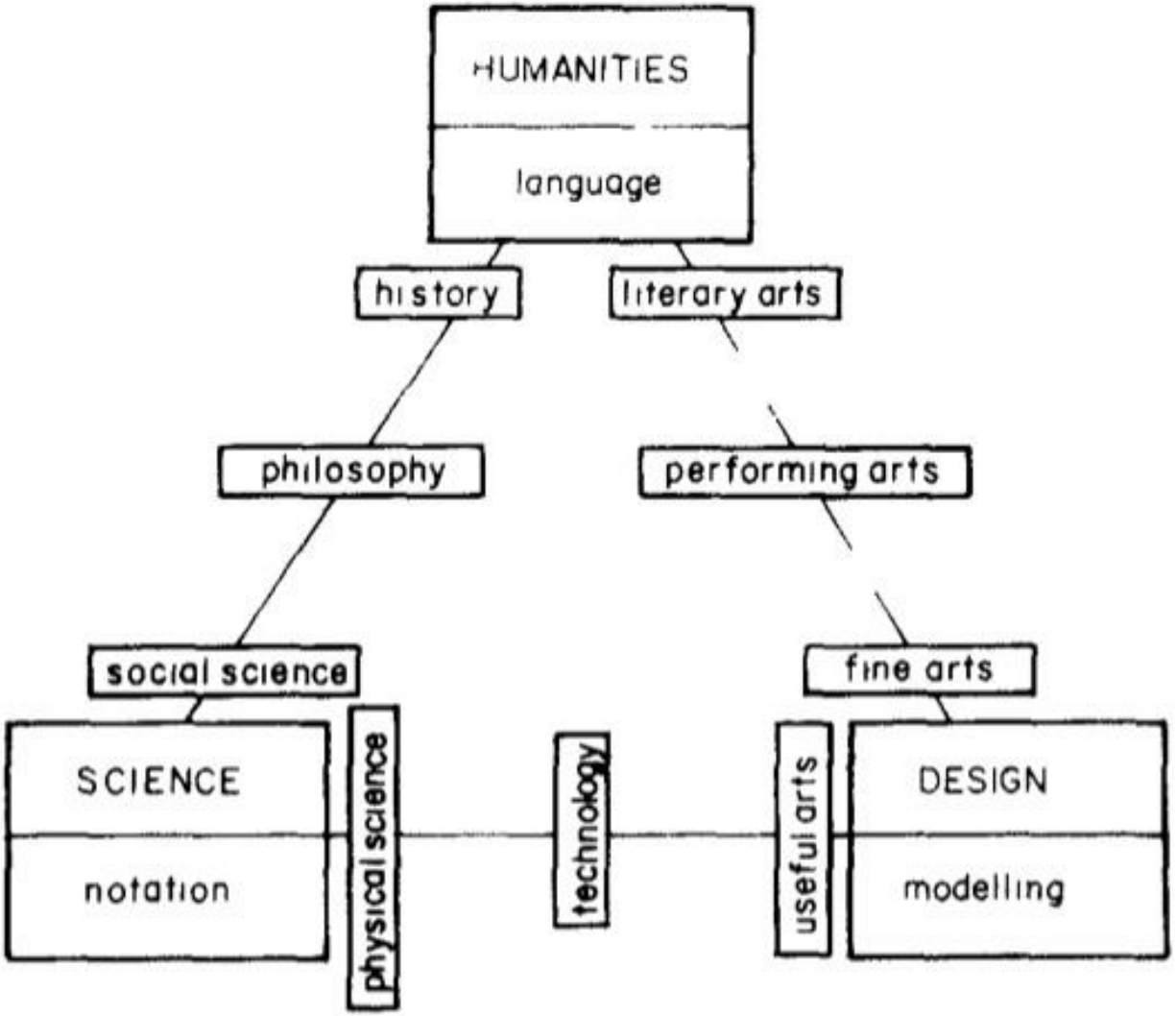
- etc...

What is design?

Everyone designs who devises courses of action aimed at changing existing situations into preferred ones. The intellectual activity that produces material artifacts is no different fundamentally from the one that prescribes remedies for a sick patient or the one that devises a new sales plan for a company or a social welfare policy for a state.

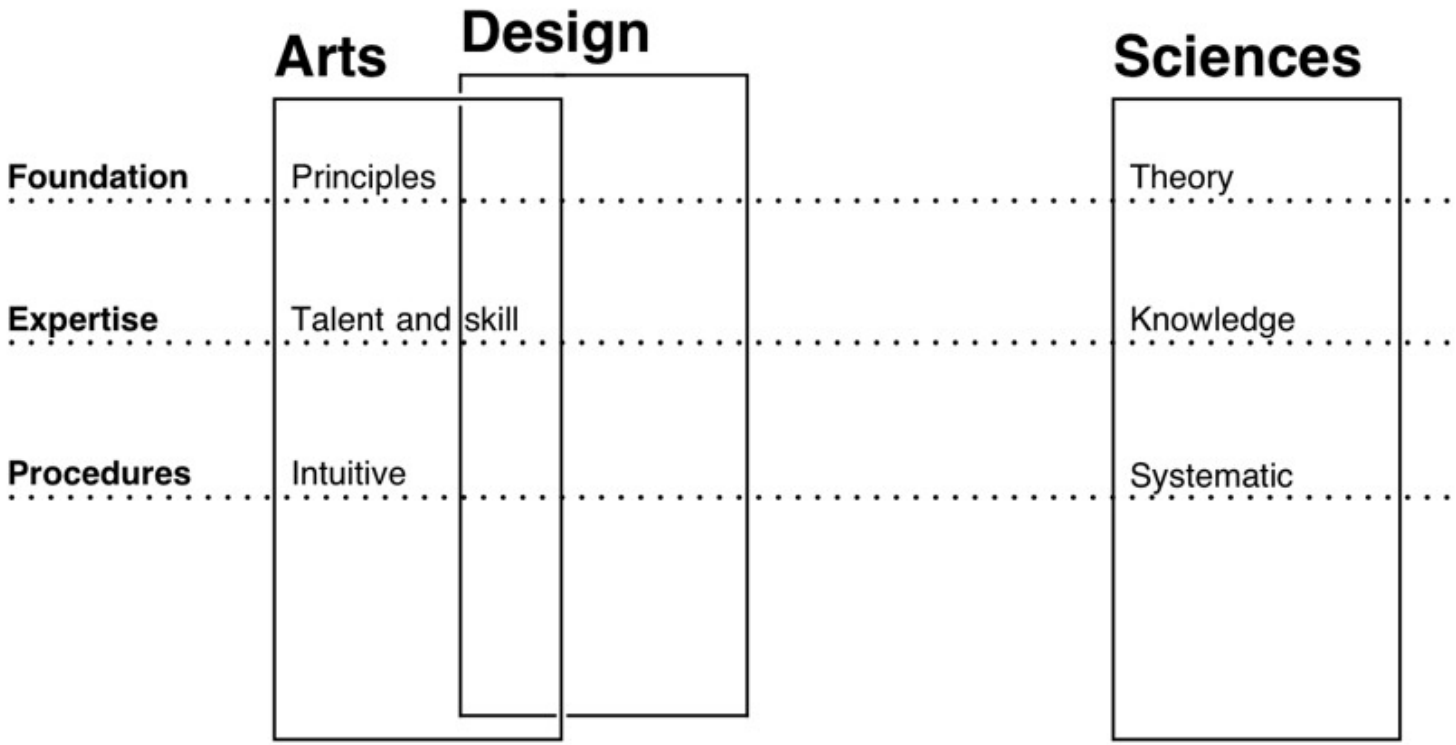
Herbert A. Simon (1969) *The Sciences of the Artificial*. P. 130. MIT Press, Cambridge, Mass.

What is design?



Bruce Archer (1979)

What is design?

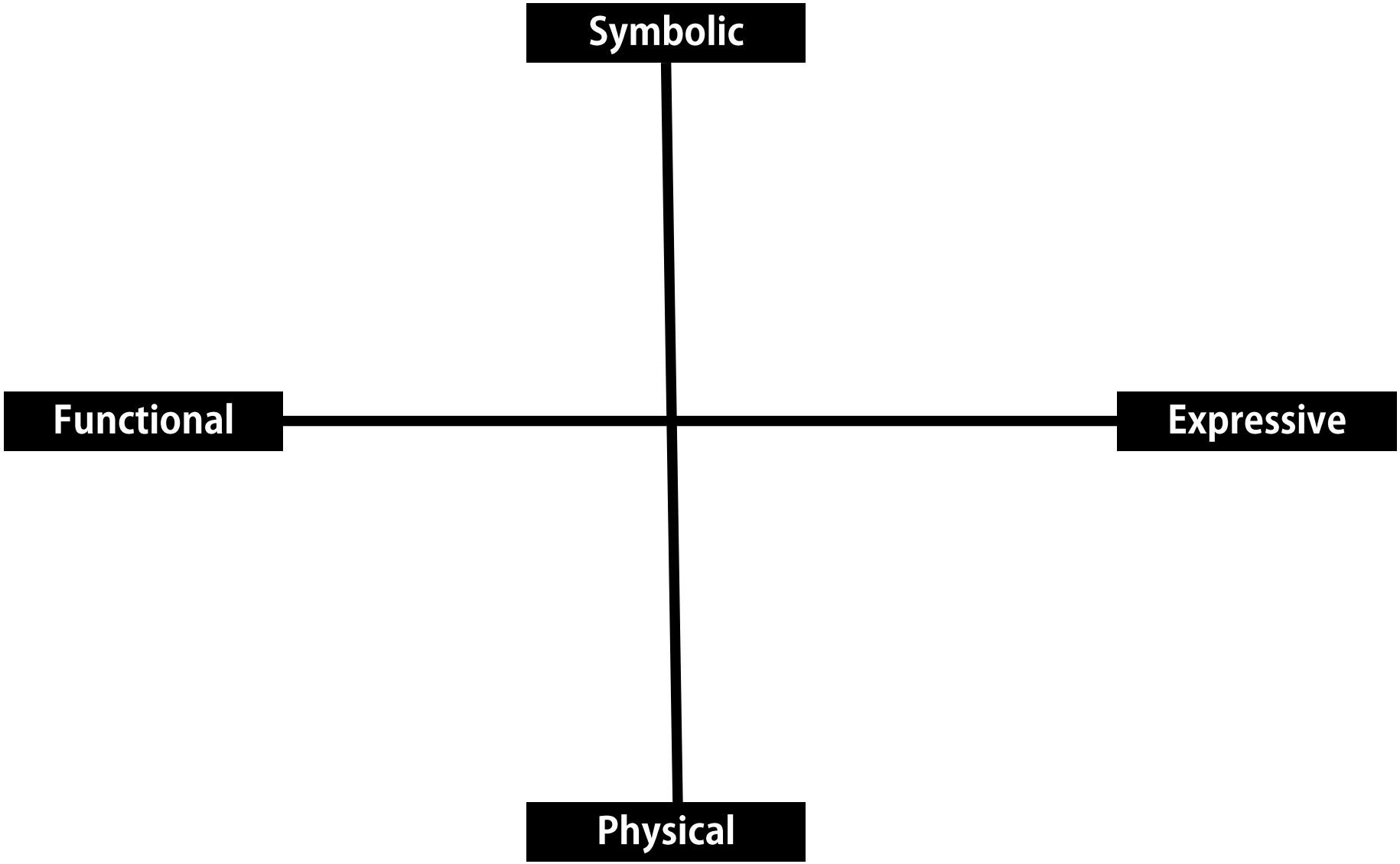


Value driven (biased)

Value free (unbiased)

Charles Owen (1991)

What is design?



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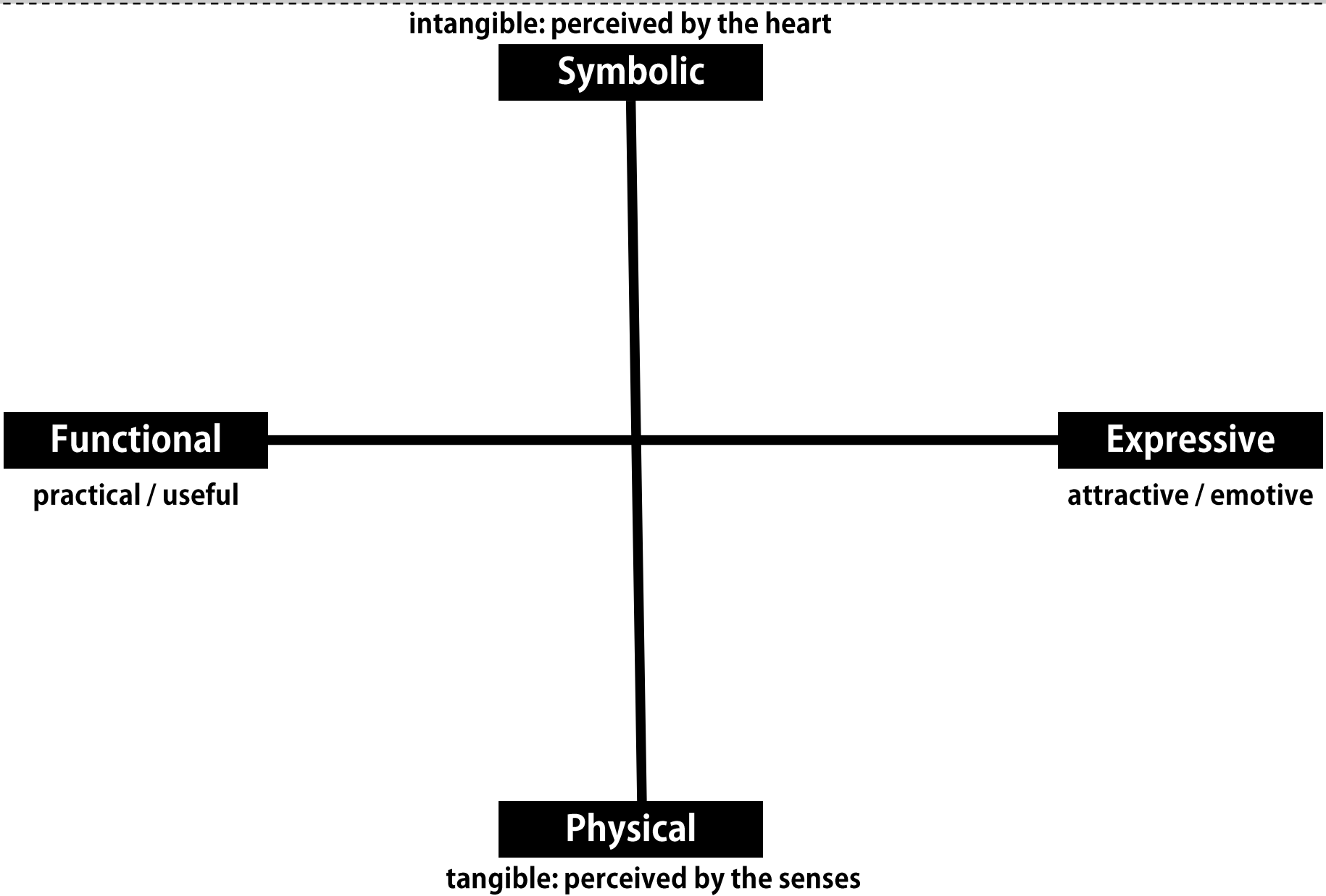

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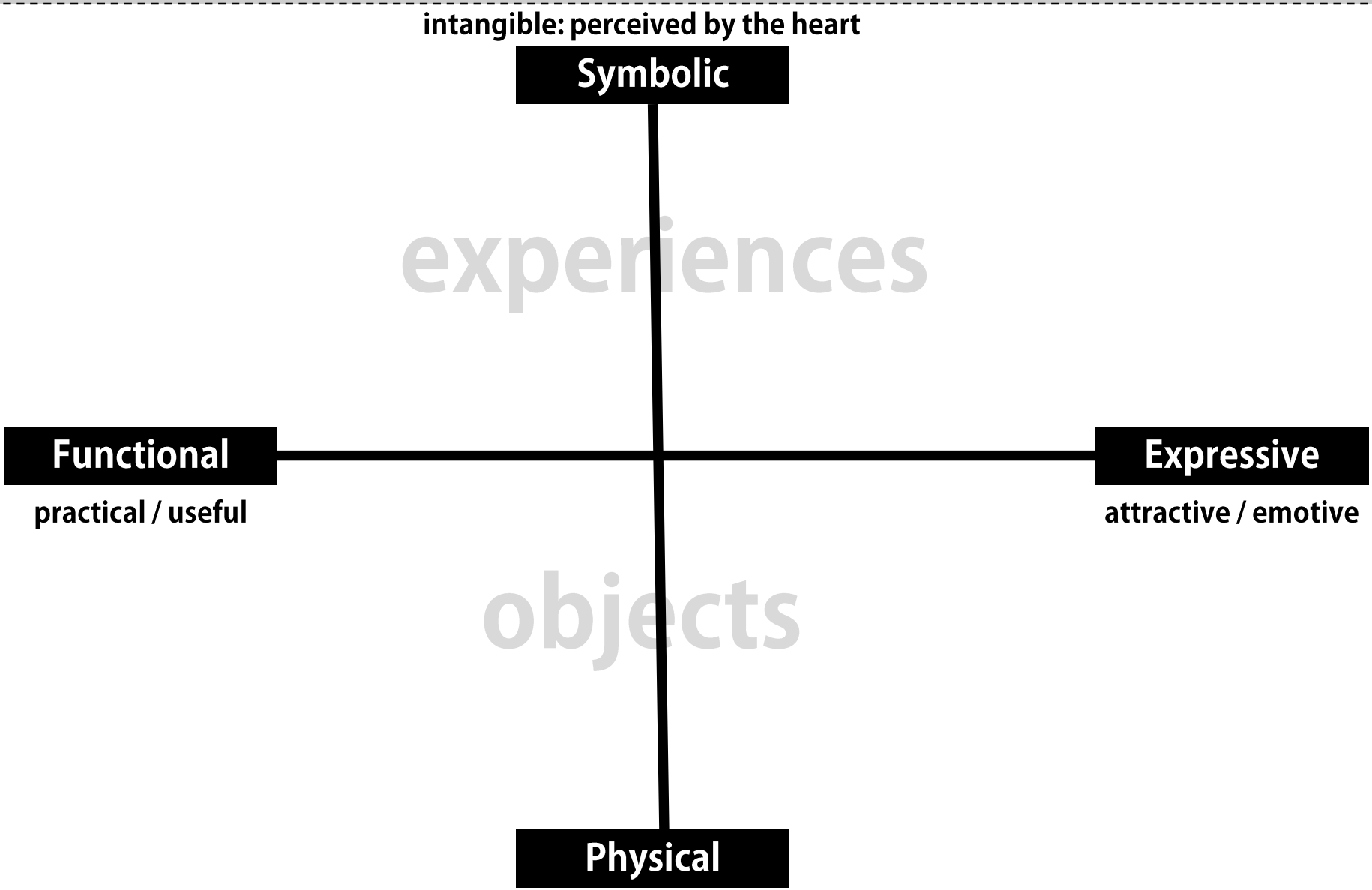

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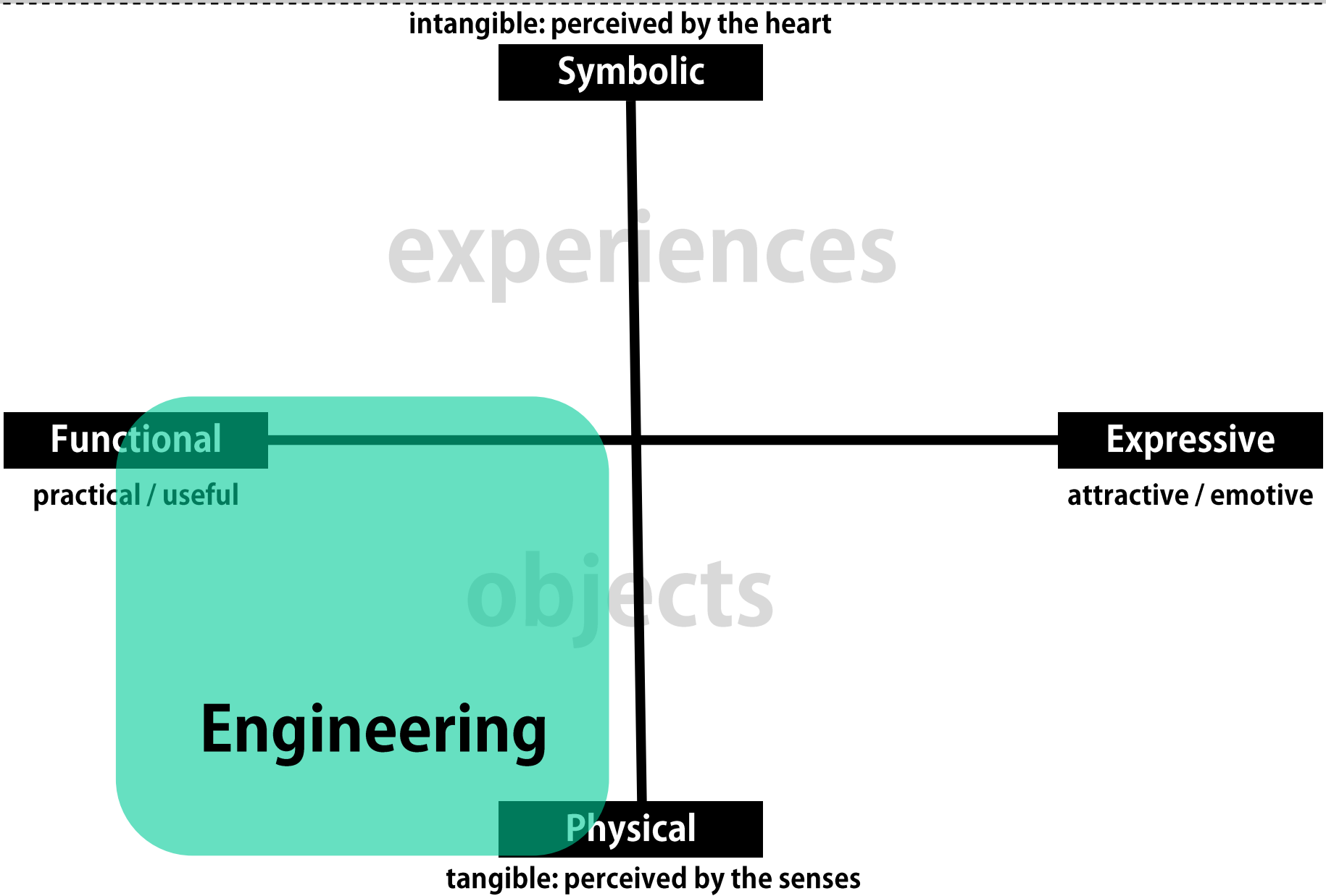

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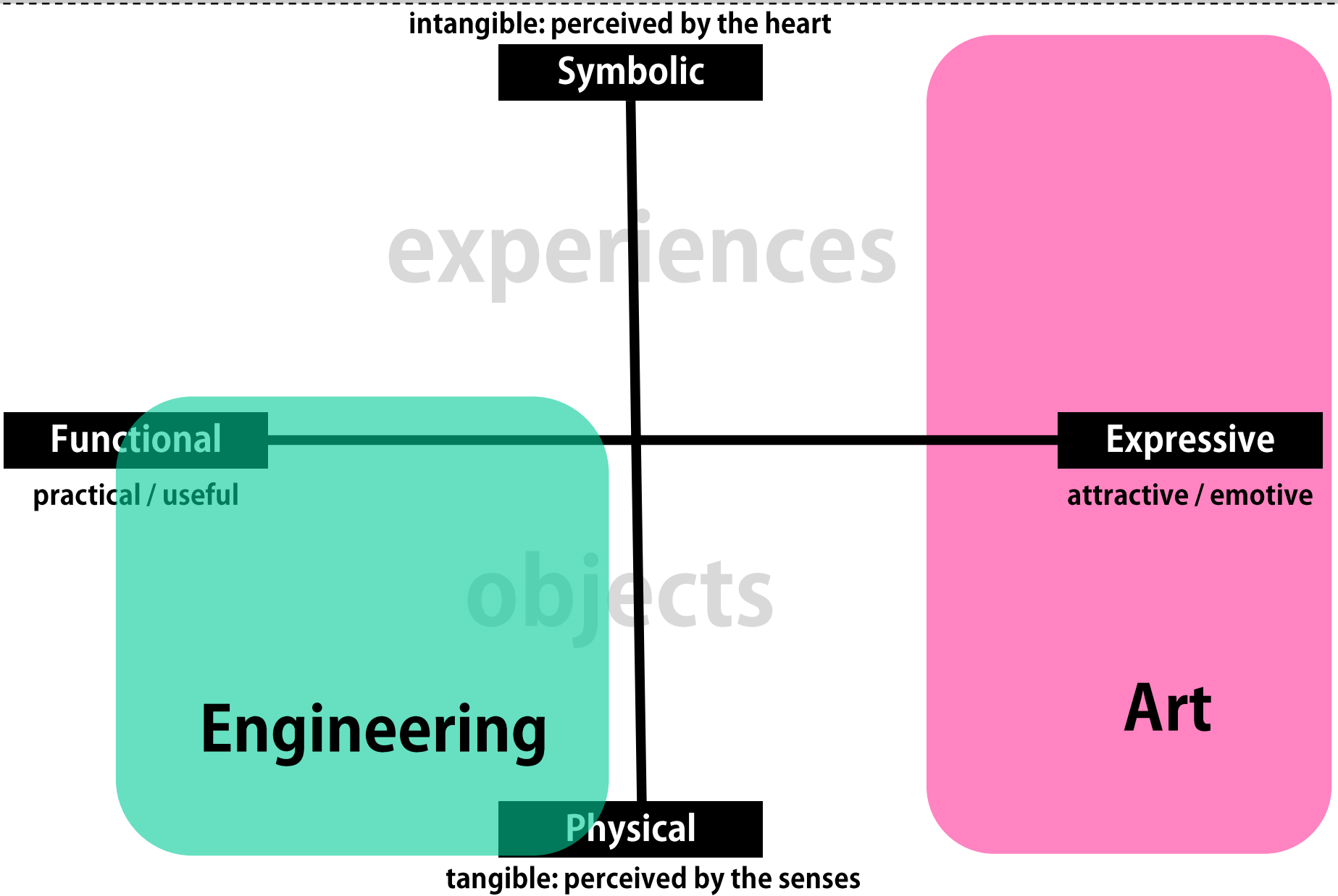

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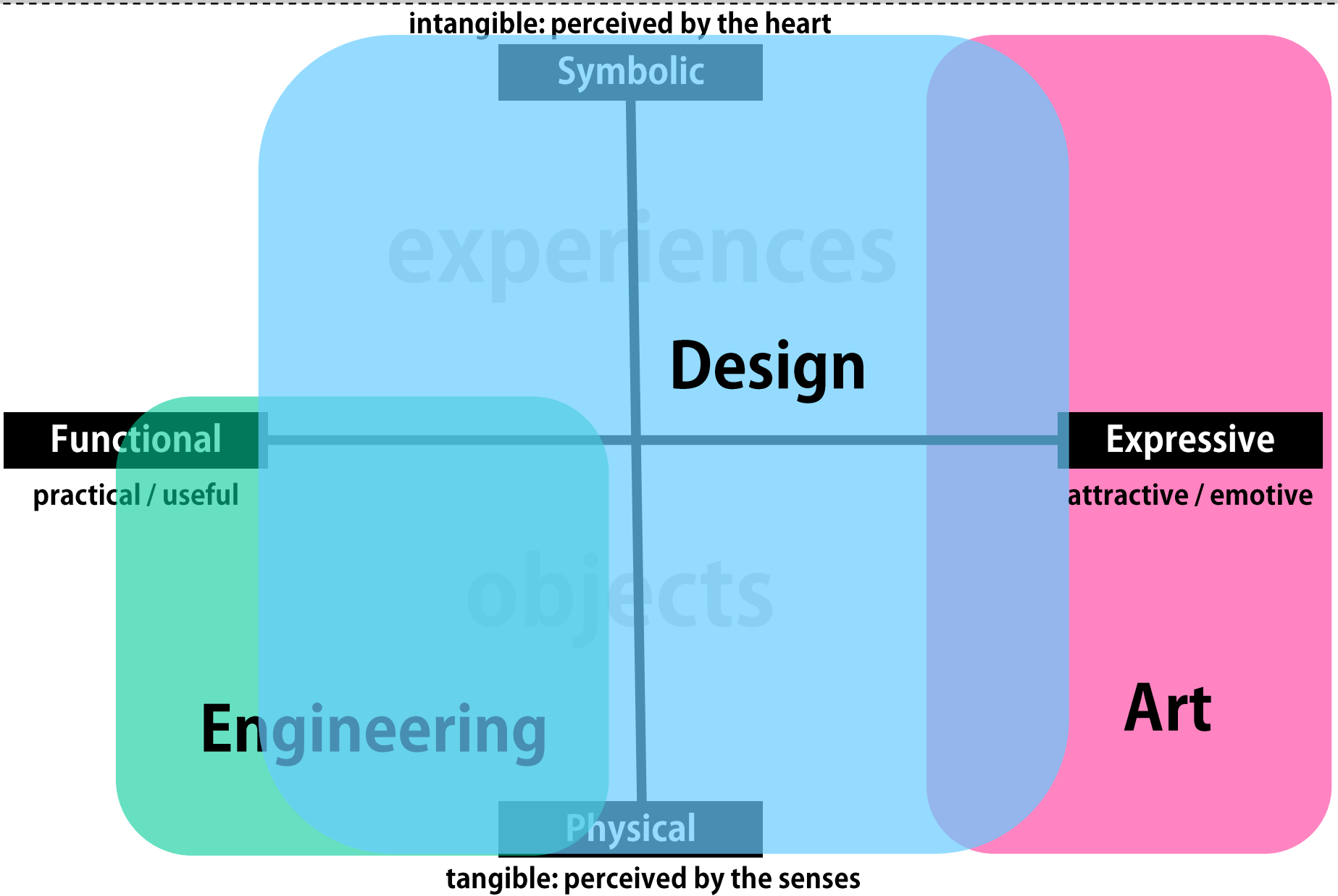


What is design?

Design, as a unique way of thinking and acting, does not have a long, well-developed scholarly history. Other intellectual traditions, such as science and art, have enjoyed thousands of years of considered thought.

Harold Nelson & Erik Stolterman (2002)c

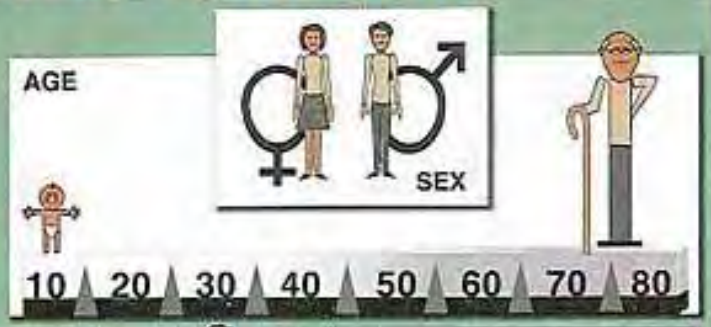
What are information graphics?

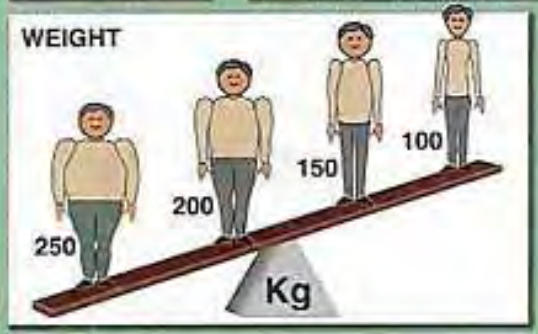
Clear thinking made visible – Edward Tufte

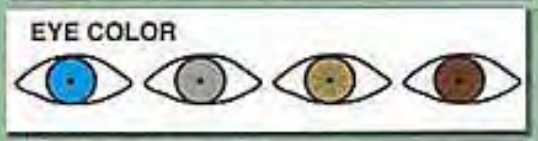
It is not about designing graphics. It is all about designing information – Richard Saul Wurman

Vision can no longer be employed simply to support verbal and conceptual meanings: Its potential as a cognitive power in its own right must be exploited – Kepes

IDENTIFICATION







AMBUSH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// PROGRAMM

MITTWOCH 21.04.2004

12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00

LAGERHALLE

KUNSTHALLE DOMINIKANERKIRCHE

DONNERSTAG 22.04.2004

12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00

LAGERHALLE

- BRAVE NEW WORLD
  12:00 // 58 min
- ELSEWHERE
  13:30 Le Gout du Kosmiz // 66 min
- MEMORIES ARE MADE OF THIS
  15:00 // 64 min
- JONAS AT THE OCEAN
  16:00 // Peter Sempel / 16mm / 2003 / 85 min

ARTHOUSE 4

- DIE PERLE IN DER KACKE
  13:30 // Dirk Bill / 82 min
- EWIG
  17:30 /
  »Artik

ARTHOUSE 5

- NIWATORI WA HADASHI DA
  13:30 // Atsuna Morisaki / Japan 2003 / 114 min / OmU
- ARAG
  17:30 /
  / Farb

HAUS DER JUGEND (HDJ)

- STUDENT FORUM: MEDIA ACADEMIES / PART I
  12:00 IAMAS Kyoto
  Chrlara Sommerer (A/JP)
  13:00 Academy of Fine Arts, Prague
  Anetta Mona Chisa (SK/CZ)
- STUDENT FORUM: MEDIA ACADEMIES / PART II
  15:00 HfG Offenbach
  Reinaud Papo (D)
  16:00 AKI Enschede
  Bill Sylnhoven (NL)
  17:00 KHM Köln
  Katrin Peters (D)

FREITAG 23.04.2004

12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00

LAGERHALLE

- SUICIDE
  12:00 // Amanda Trevelogue / 70 min
- 0F(F) BALANCE
  13:30 // 60 min
- RETROSPEKTIVE: C. MACLAINE
  15:00 // 16mm / 60 min
- VISIONS OF DELIGHT
  16:00 // 58 min

ARTHOUSE 4

- EWIGE SCHÖNHEIT
  13:30 // Marcel Schwierin / 90 min / mit Vorfilm: »Achkarfreu«
- DIE P
  17:30 /

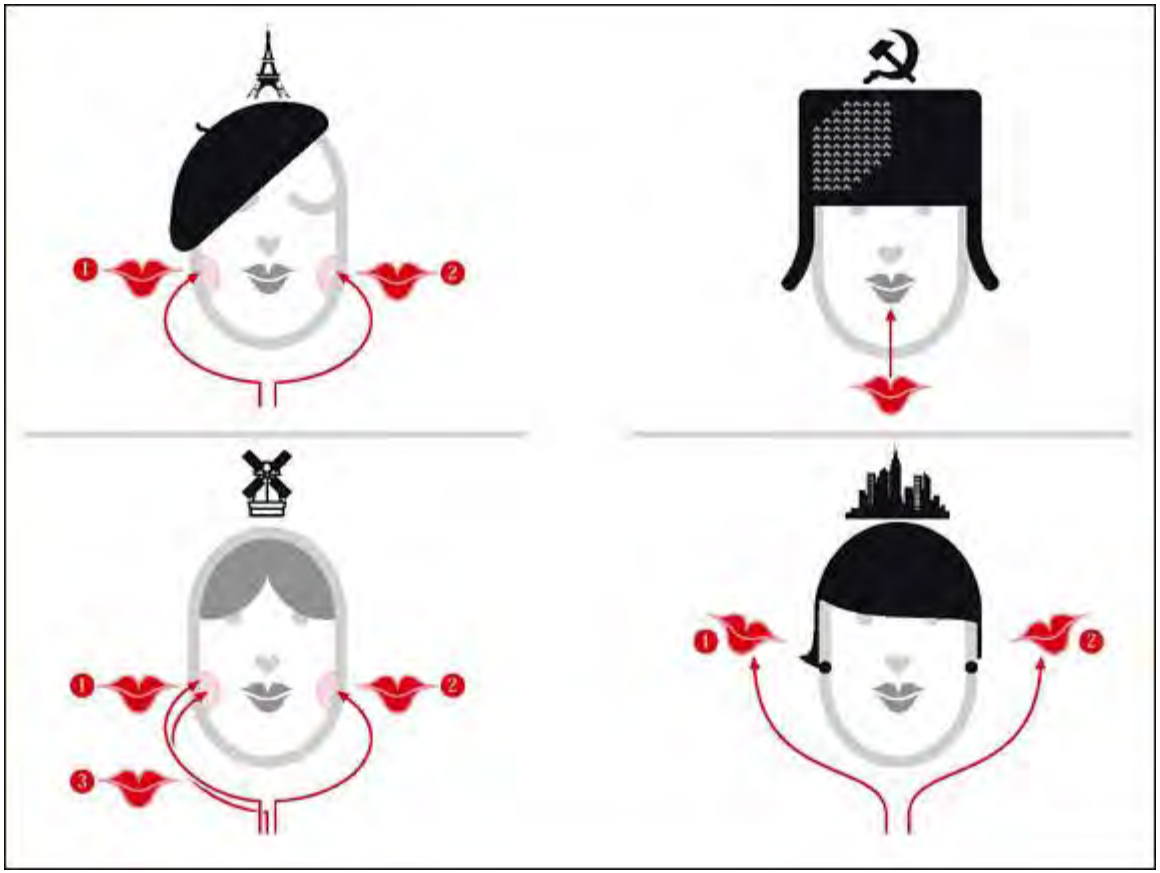
ARTHOUSE 5

- VAMPIRE HUNTER
  13:30 // Yoshiaki Kawajiri / Japan 2000 / Anime / 105 min / 35mm / Deutsche Fassung
- NIWA
  17:30 /

HAUS DER JUGEND (HDJ)

- TRANSMITTER PART I
  12:00 Dr. Katja Kwastek, Uni München / Introduction
  13:00 Ken Feingold (USA) »Dve-Art«
  14:00 Tim Fritzlow/Chaos Computer Club (D) »Einkonfight«
- TRANSMITTER PART II
  15:30 Fadeloun (D) »Transmitter, Transponder, RFID«
  16:30 Enric Ruiz Geli (E) »The Media House«
  17:30 Antin

DGB-GEBÄUDE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...VISITING BETSY

...was one of three direct hits on the New Orleans area ...past 100 years. Almost a Category 5 storm when it ...shore at Grand Isle, Betsy had weakened to a ...ory 3 an hour later when its eye was 35 miles ...west of New Orleans, battering the city with 125 mph ... A storm surge ranging from 8 to 16 feet flooded ...than 5,000 square miles of the coast, topping 8-foot ... in Chalmette, along the Mississippi River-Gulf Outlet ...ern New Orleans, and at Camp Leroy Johnson on ...ontchartrain. The surge also pushed through a ... underneath a levee along the Inner Harbor ...tion Canal, flooding the 9th Ward.

...E DAMAGE

...E SOLUTION

IF GEORGES HADN'T TURNED

1 THE MODEL

Here's what would happen ...

CITY BELOW THE SEA

Hurricane Category	Surge and waves at low tide*	Effect on New Orleans
1	[illegible]	Lake Pontchartrain's levees stop the lowest surge
2	[illegible]	Levees stop the surge, but some waves could find their way over
3	14 feet	Levees stop bulk of surge, but waves could cause considerable flooding
4	19 feet	Levees topped, causing catastrophic flooding
5	24 feet	Entire city submerged including Mississippi River levees

EXPLAINING THE BOWL

...T ARE WE REALLY SAFE? ...

FOREIGN INVADERS

CANALS/CHANNELS

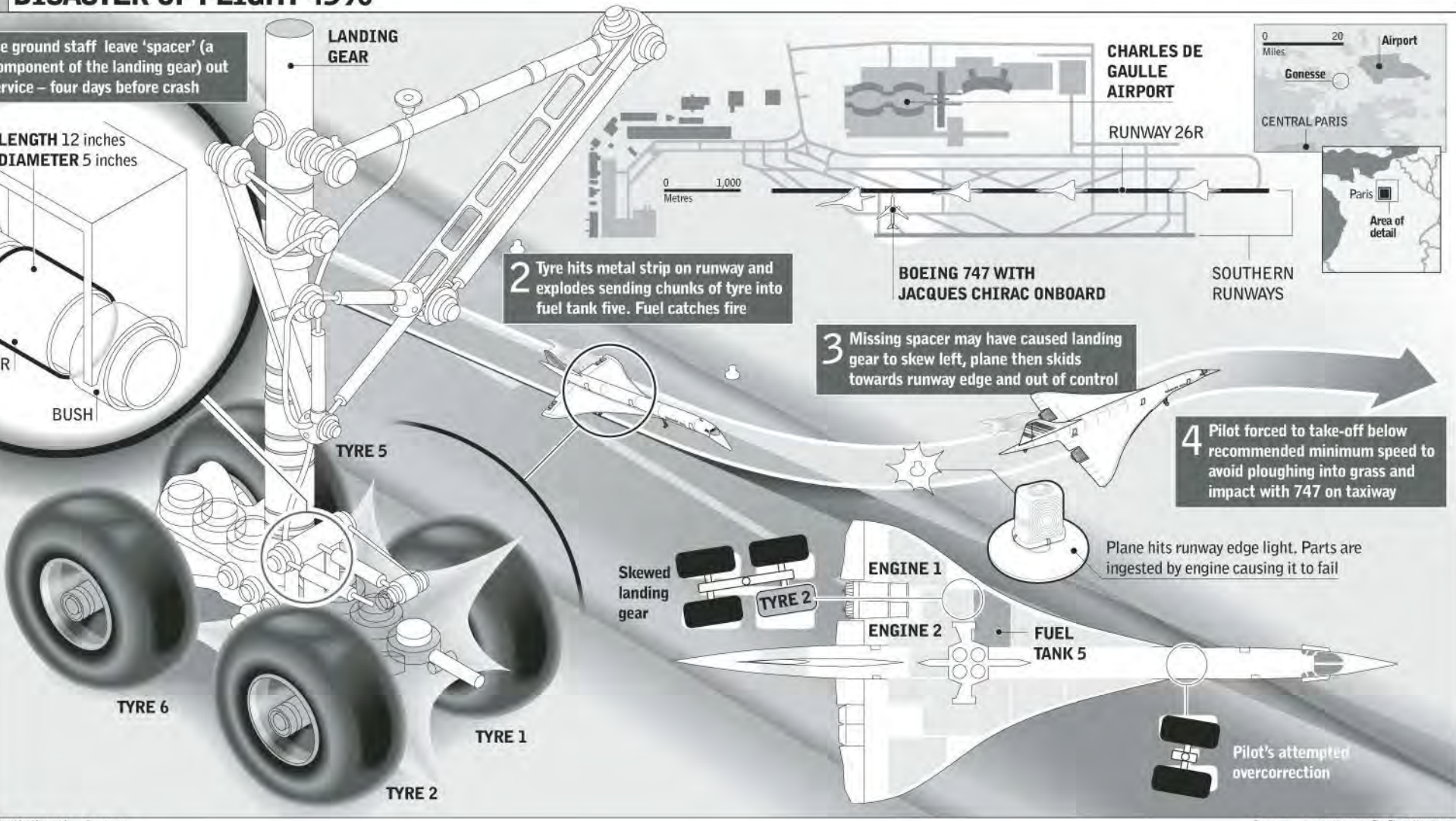
SALTWATER INTRUSION

LEVEES

SUBSIDENCE

SEA-LEVEL RISE

DISASTER OF FLIGHT 4590



Graphic: Michael Agar, Cath Levett

Source: www.concordesst.com, The Flier's Handbook

LONDON BLASTS

More than 50 people were killed and 700 injured in bomb attacks on a bus and several underground trains in London on Thursday. Officials believe the blasts bore hallmarks of an al-Qaeda terrorist attack

2 **0847 GMT**- Explosion rips through a No.30 double-decker bus on Woburn Place at Tavistock Square
13 confirmed fatalities

The bus was on a diverted route from Hackney to Marble Arch

3 **0817 GMT**- Train explosion in Edgware Road Station going to Paddington Station
7 confirmed fatalities

2 **0756 GMT**- Train explosion in Piccadilly line between King's Cross station and Russell Square
21 confirmed fatalities

1 **0751 GMT**- Train explosion around 100 metres from Liverpool Street Station
7 confirmed fatalities

1st explosion

- Train was 100 meters from Liverpool Street station headed from Aldgate carrying about 700 people
- Explosion ripped through third carriage tearing off roof and part of side wall
- Thick smoke and ash begun to fill other carriages
- Doors were fixed shut and drivers were unsuccessful in opening them
- Passengers started moving towards back of train to escape from smoke and blaze
- Rescuers from Aldgate freed and escorted the passengers to Liverpool Street station

Bombs
The bombs were 4.5 kg explosives according to London Police specialists

All bombs on the trains were in a rucksack or carrier bag

4th explosion

The explosion ripped off the roof of the double-decker bus. Investigators are now relying on a CCTV camera present in the bus

The bomb was in a metal box placed on the rear upper deck

2nd explosion

From King's Cross Station

- Explosion occurred in the first carriage
- Passengers smashed through windows and were lifted out by rescuers
- They were led out of both stern and destination stations

To Russell Square Station

3rd explosion

To Paddington Station

- Train was pulling out of Edgware Road station towards Paddington
- Force of the blast tore through the carriage, the wall and a train traveling towards Edgware Road on the opposite platform
- The explosion occurred in the second carriage
- Passengers in the middle carriages broke carriage door with fire extinguishers and escaped
- Underground staff arrived from Edgware station and began evacuating passengers from back of train
- Rescuers have yet gone into the worst affected carriage because of danger of tunnel collapsing

To Edgware Road Station

Source: London Metropolitan Police, Guardian Unlimited

REUTERS

BOCA EM AÇÃO

COMO É O TRÁFICO NA FAVELA?

Os pontos de tráfico de drogas, conhecidos como "bocas", operam como empresas, escondidos em favelas e bairros pobres das grandes cidades. Os criminosos se organizam em uma hierarquia preocupada em garantir duas coisas: o abastecimento constante de cocaína, maconha e outros entorpecentes e o sistema de proteção contra a polícia ou quadrilhas rivais.

Para garantir a eficiência do negócio, são contratados diversos funcionários. O esquema de segurança e a acirrada disputa entre traficantes põem em risco a vida de compradores e moradores da favela. "Até chegar à boca, o usuário tem que andar na favela. Ele é avaliado e nem percebe. Se os seguranças pensarem que ele é um policial disfarçado, atiram", diz o delegado Carlos Roberto Alves de Andrade, da Delegacia de Repressão ao Crime Organizado do Departamento de Narcóticos de São Paulo. S

publicado em Super

CRIME ORGANIZADO

VÁRIOS FUNCIONÁRIOS ESTÃO ENVOLVIDOS NO ESQUEMA DE TRÁFICO

AVIÕEZINHOS

Os garotos que levam a droga da boca para os clientes são mais comuns no Rio de Janeiro. Em São Paulo, onde as favelas são planas, a distância entre a boca e o consumidor é pequena e o serviço deles nem sempre é necessário

ALTO ESCALÃO

Traficantes de maior hierarquia ficam posicionados sobre lajes e barracos, onde podem se proteger melhor e atirar em caso de tentativa de invasão. Carregam fuzis, ideais para combates a longa distância

A BOCA

Geralmente fica perto de riachos, esgotos ou barrancos, para dificultar a chegada da polícia. Em uma mesma favela, podem existir várias bocas e nem toda a droga fica aqui. Barracos conhecidos como "paiol" são usados para armazenamento de grandes quantidades e da munição da quadrilha

GERENTE DA BOCA

É responsável pela chegada da droga e pela contratação do pessoal. É ele que comanda toda a operação dentro da favela e, por isso, é sempre alguém de muita confiança do dono da boca

SEGURANÇAS

A função deles é proteger os arredores da boca da polícia e de traficantes rivais. Eles usam armas próprias para combate a curta distância

EDIÇÃO DE BÁRBARA SIQUEIRA
DESIGN DE FABRÍCIO MIRANDA

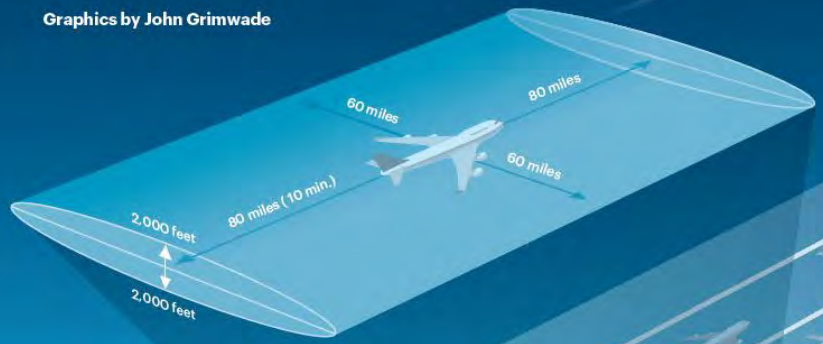
ENQUANTO ISSO...

O dono da "boca" não lida diretamente com a venda de droga. Ele compra a tráfico de um barraco ou casa afastada, por meio de terceiros. Bocas bem-sucedidas podem criar formar traficantes em bairros ricos e bem de vida

THE TRANSATLANTIC SUPERHIGHWAY

Every day, about 1,200 aircraft fly inside the North Atlantic Organized Track System. Here we follow a typical evening flight from New York's JFK to London's Heathrow as it cruises along the V track at 35,000 feet.

Graphics by John Grimwade



Concorde flew between 50,000 and 60,000 feet, far above the main traffic flow.

4 HALFWAY POINT
At 30W,° responsibility for the flight is transferred from Gander to Prestwick Oceanic Air Traffic Control in Scotland.

360 MILES

Some flight levels are reserved for aircraft flying in the direction opposite the peak flow.

3 POSITION CHECK
Aircraft in oceanic airspace are out of radar contact for about four hours. Position reports are made by radio at every 10 degrees of longitude, and the information is used to update displays at the oceanic control centers.

Aircraft crossing the main traffic flow (for example, Madrid to Los Angeles) are routed above or below the track system.

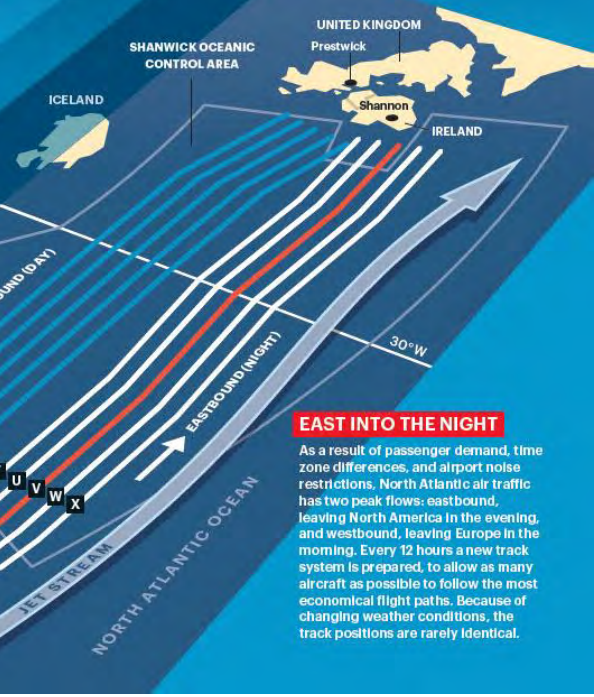
ORGANIZED TRACK SYSTEM

FLIGHT LEVELS (FEET)
39,000
37,000
35,000
33,000
31,000
29,000

T U V W X

2 SAFETY ENVELOPE
Aircraft must keep minimum distances from one another in the track system, while maintaining constant altitude and speed.

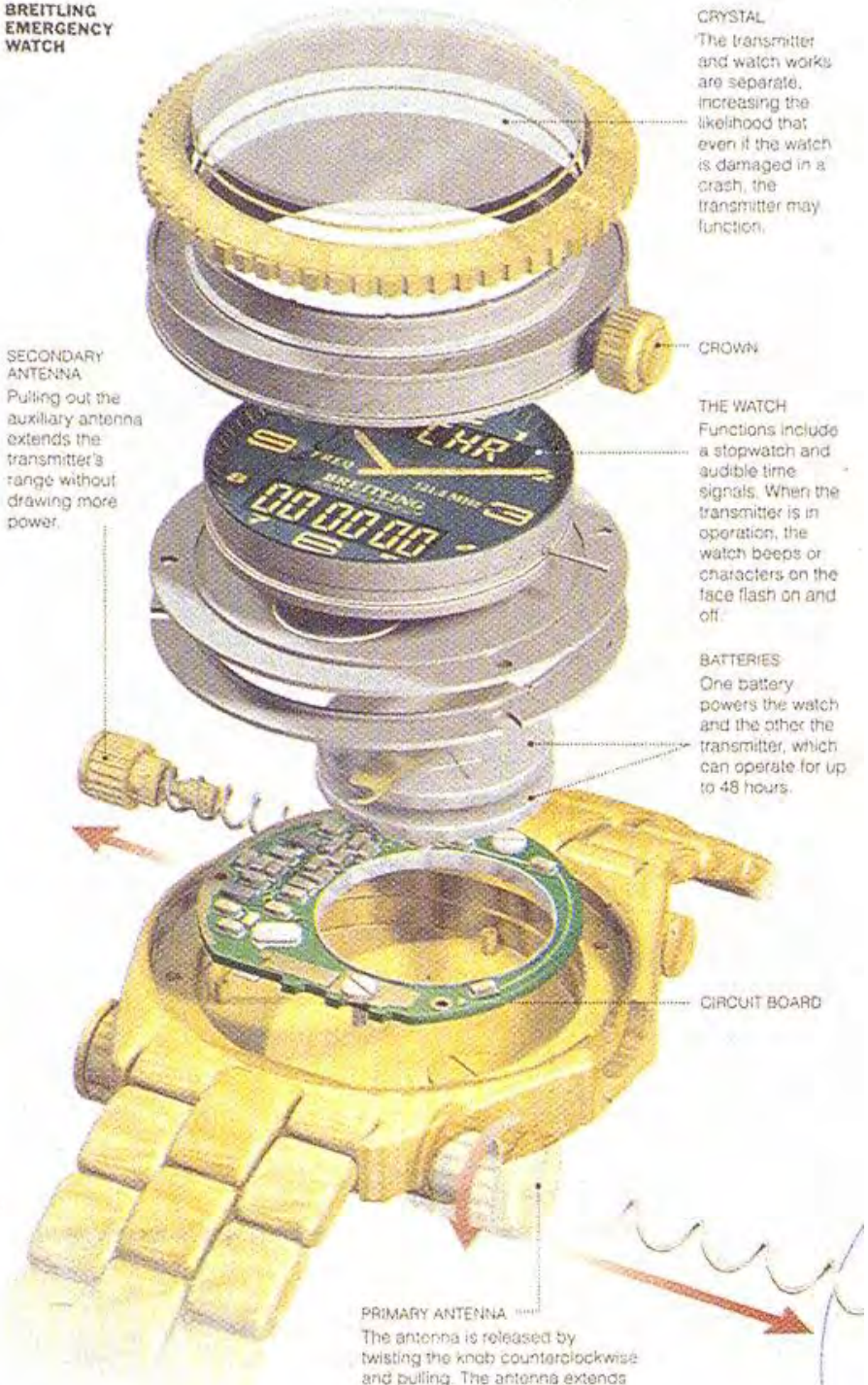
1 GETTING IN LINE
Taking into account airlines' preferred routes, oceanic controllers at Gander, Newfoundland, organize aircraft approaching from different directions into position for the Atlantic crossing. This flight is entering the system on track V at 35,000 feet.

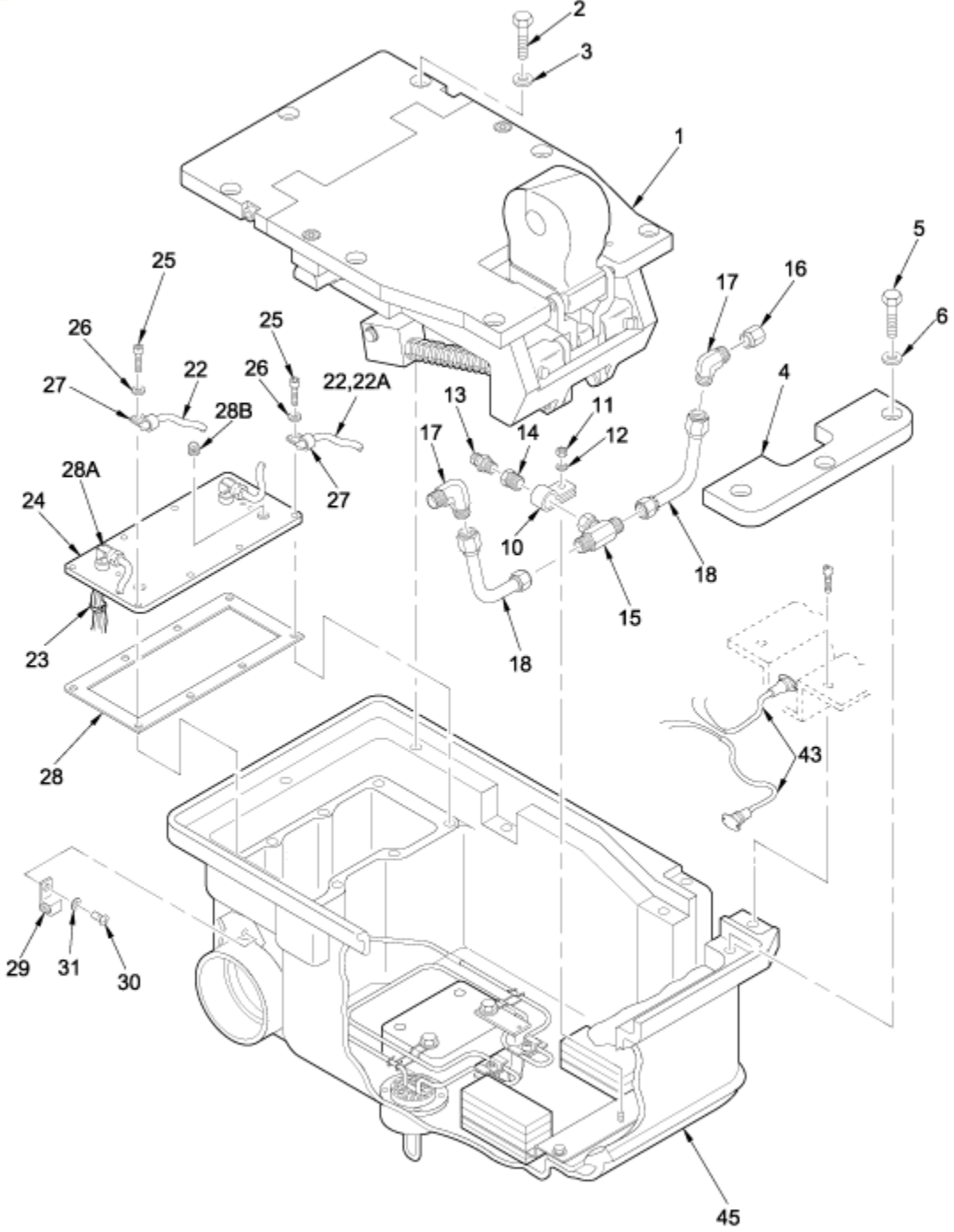


EAST INTO THE NIGHT

As a result of passenger demand, time zone differences, and airport noise restrictions, North Atlantic air traffic has two peak flows: eastbound, leaving North America in the evening, and westbound, leaving Europe in the morning. Every 12 hours a new track system is prepared, to allow as many aircraft as possible to follow the most economical flight paths. Because of changing weather conditions, the track positions are rarely identical.

BREITLING EMERGENCY WATCH

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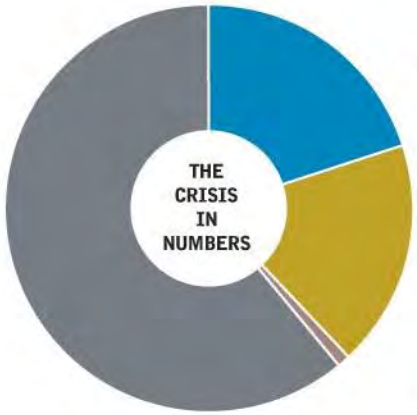
CAPTURED IN IRAQ: CHARTING THE HOSTAGE CRISIS

French hostages Christian Chesnot and Georges Malbrunot (top) are still held hostage. In April, captors threatened to burn detainees Noriaki Imai and Soichiro Koriyana alive if Japanese forces were not removed from Iraq.



61% HOSTAGES TAKEN AND RELEASED

20% HOSTAGES HELD

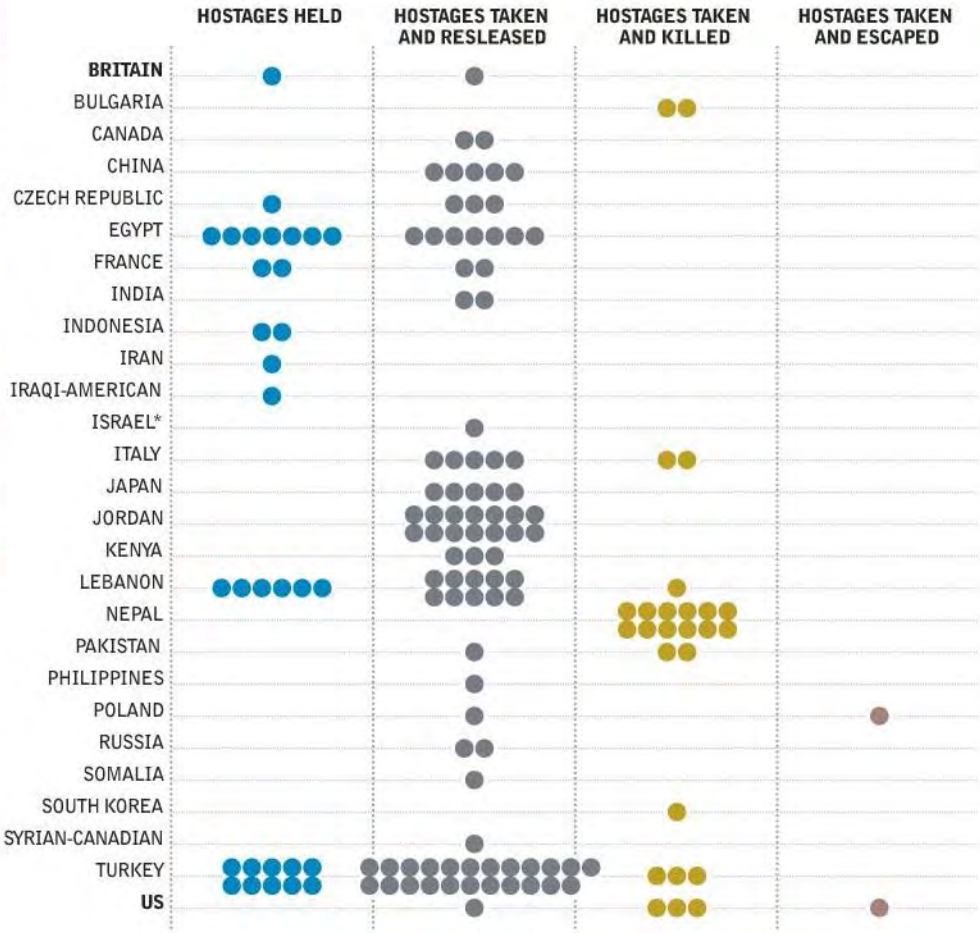
18% HOSTAGES TAKEN AND KILLED

2% HOSTAGES TAKEN AND ESCAPED

KEY

● ONE HOSTAGE

American hostages Jack Hensley and Eugene Armstrong were killed last month



Arab Christian from East Jerusalem

Released Italian charity workers Simona Pari (left) and Simona Torretta

Graphic: Michael Agar **Information:** Nicole Mowbray **Picture:** EPA (Simona Pari and Simona Toretta)

What are information graphics?

But are infographics just a means to visually record what we already know?

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Can they be used to discern new meaning or discover new knowledge?

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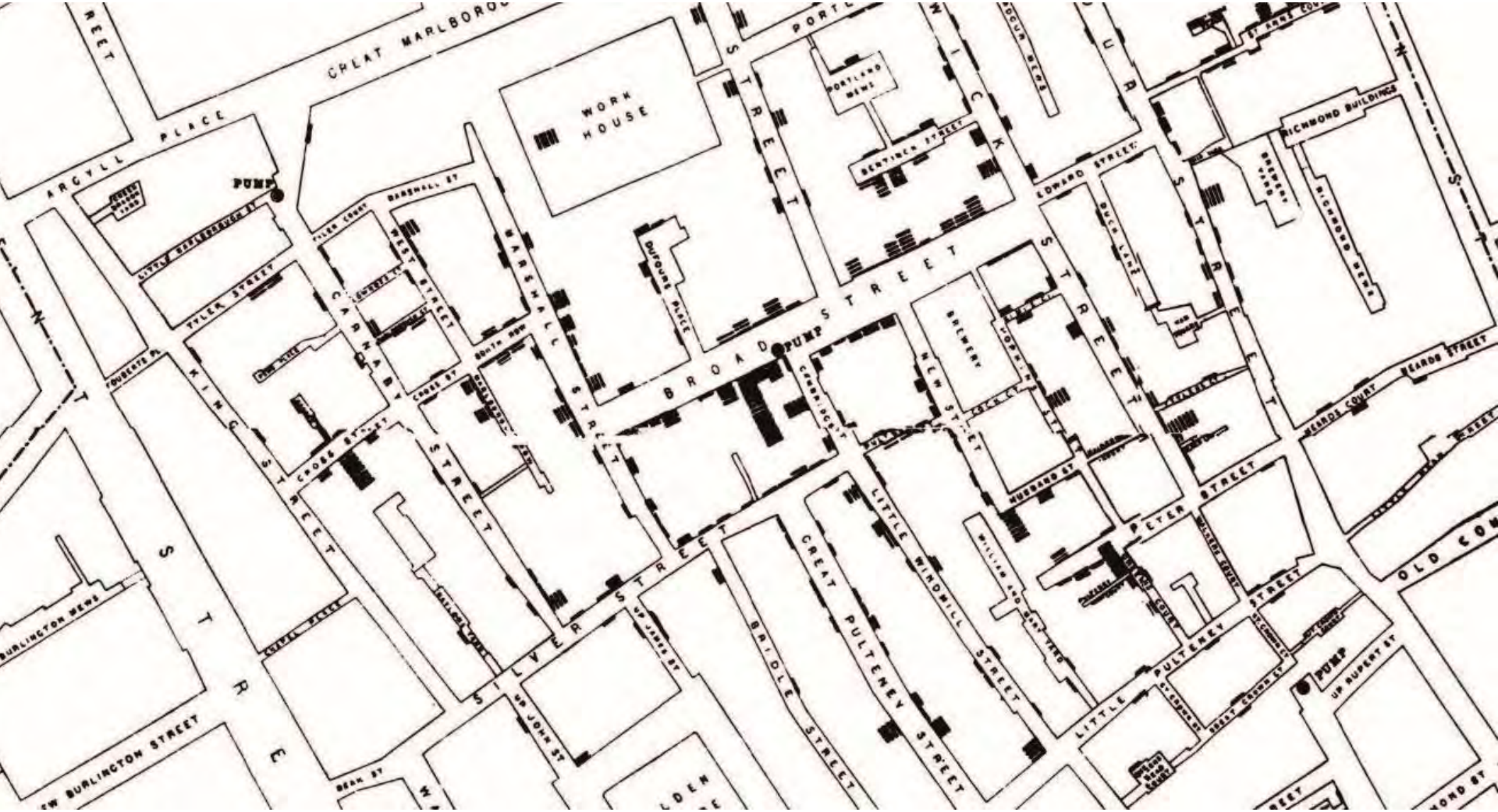
But are infographics just a means to visually record what we already know?

Or to merely clarify and communicate effectively?

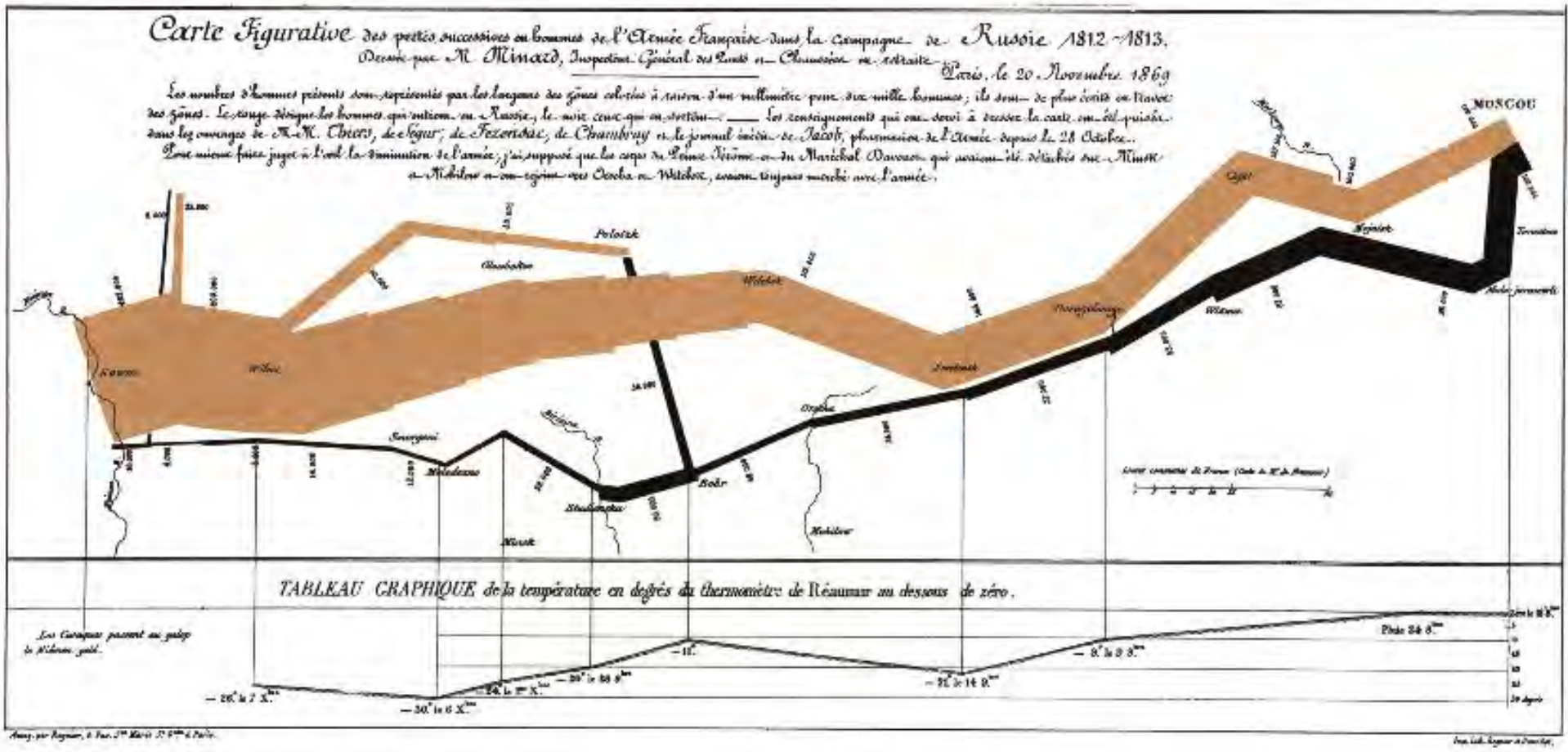
Can they be used to discern new meaning or discover new knowledge?

Or, can they tell a powerful story, to inspire and to move minds?

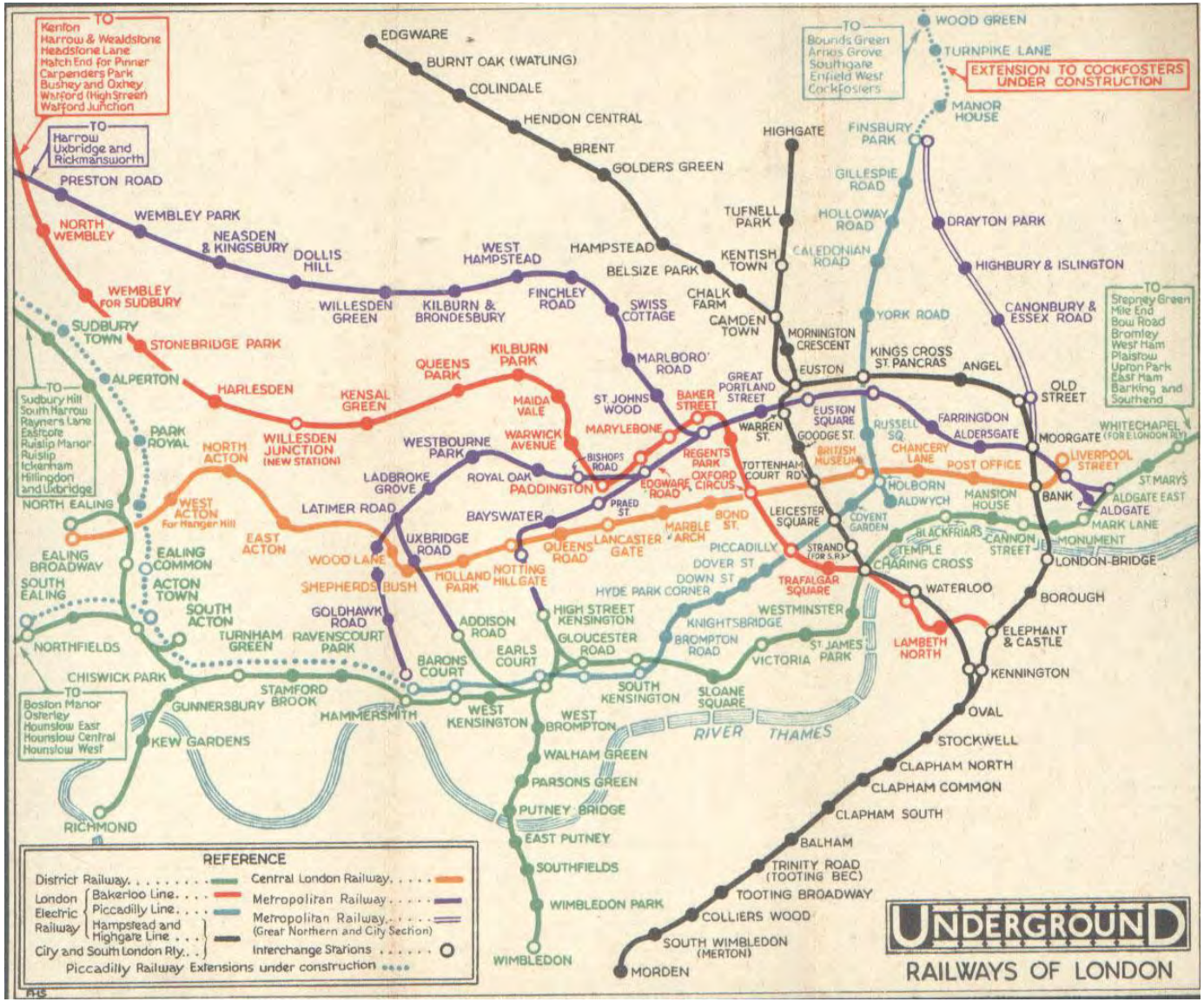
Cholera epidemic 1854 London – Dr Snow



Napoleon's 1812 Russian campaign – Charles Minard



London Underground Map 1931 – Henry Beck



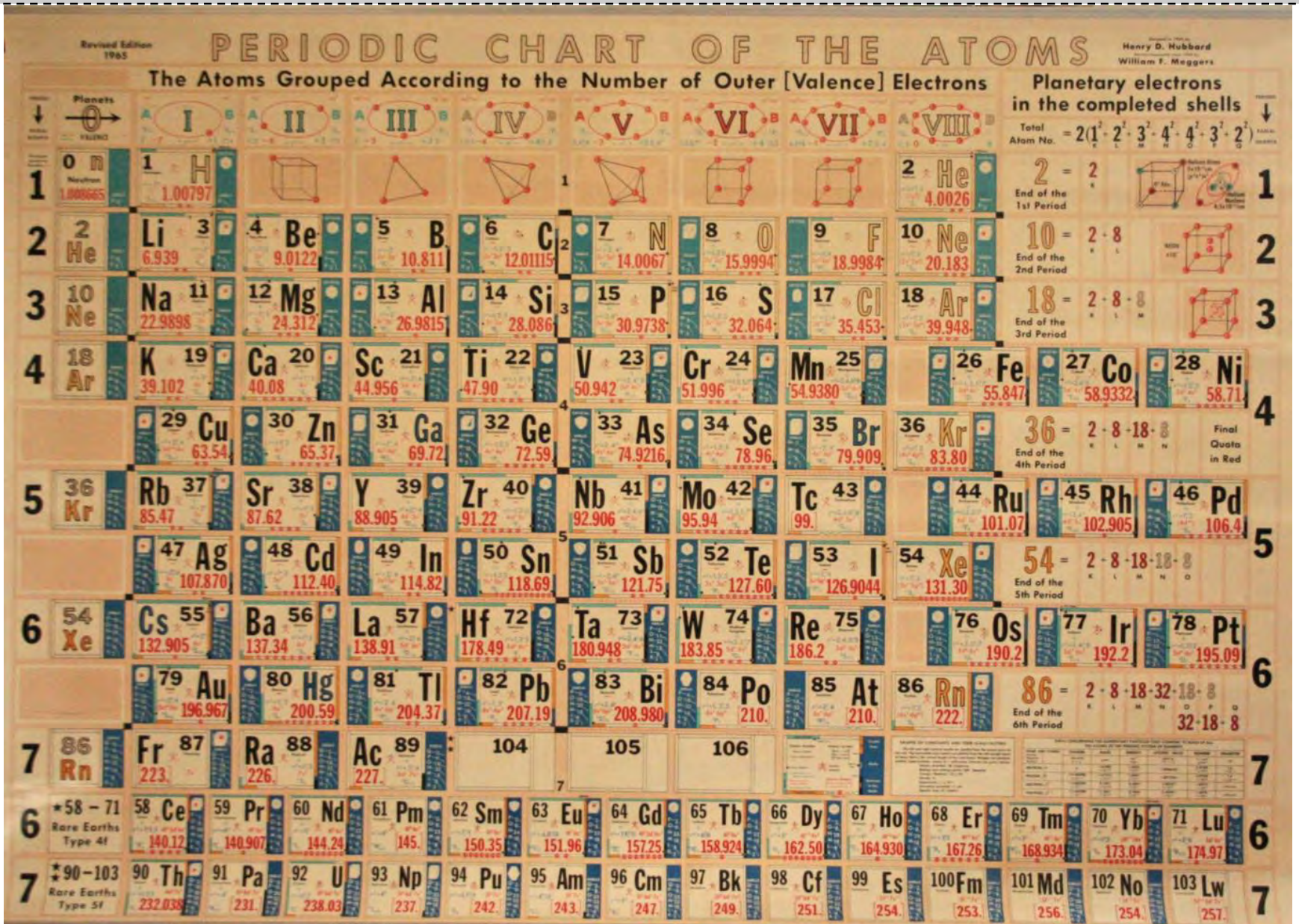
London Underground Map 1931 – Henry Beck

Periodic Table 1869 – Dimitri Mendeleev

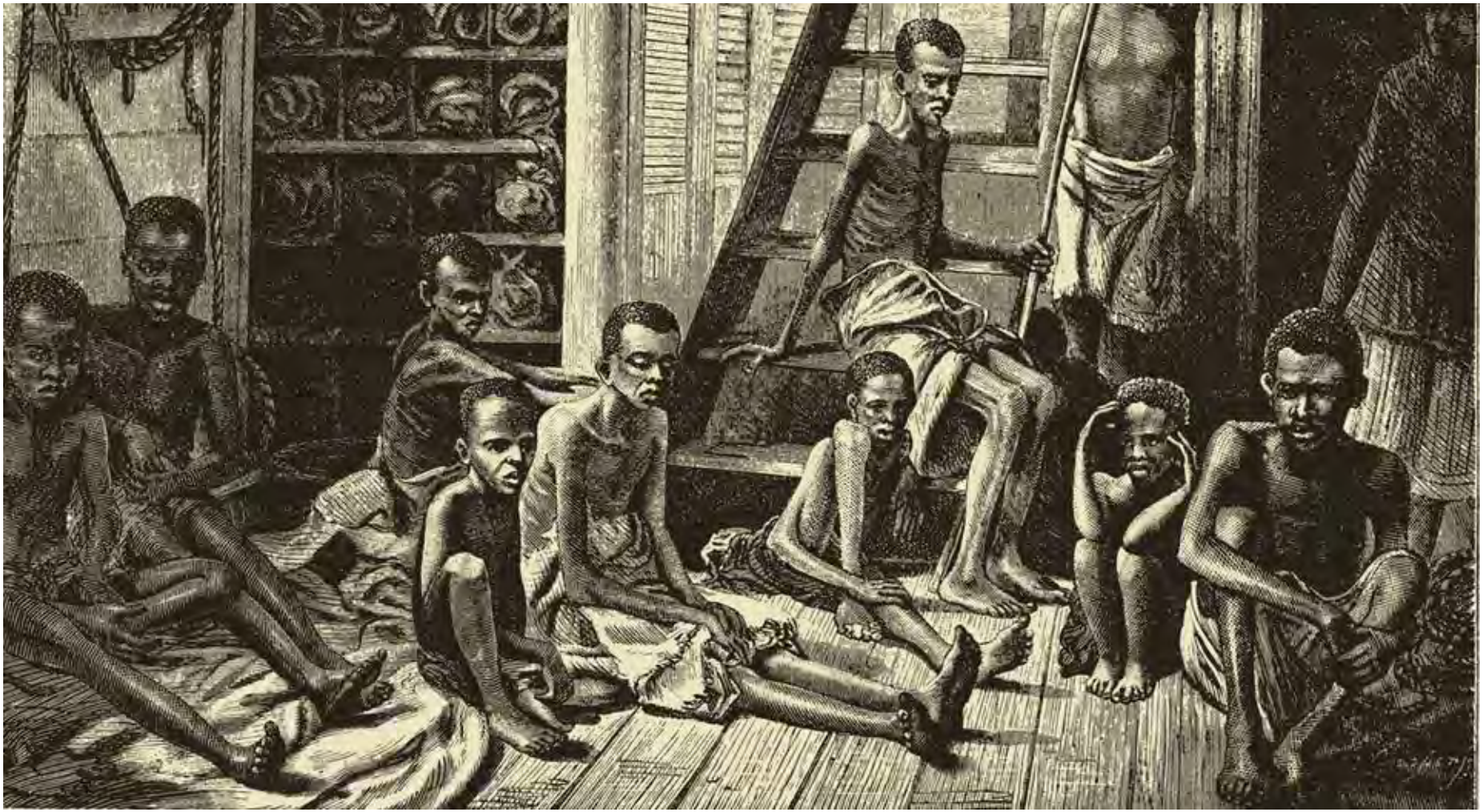
Ueber die Beziehungen der Eigenschaften zu den Atomgewichten der Elemente. Von D. Mendelejeff. — Ordnet man Elemente nach zunehmenden Atomgewichten in verticale Reihen so, dass die Horizontalreihen analoge Elemente enthalten, wieder nach zunehmendem Atomgewicht geordnet, so erhält man folgende Zusammenstellung, aus der sich einige allgemeinere Folgerungen ableiten lassen.

			Ti = 50	Zr = 90	? = 180
			V = 51	Nb = 94	Ta = 182
			Cr = 52	Mo = 96	W = 186
			Mn = 55	Rh = 104,4	Pt = 197,4
			Fe = 56	Ru = 104,4	Ir = 198
			Ni = Co = 59	Pd = 106,6	Os = 199
H = 1			Cu = 63,4	Ag = 108	Hg = 200
	Be = 9,4	Mg = 24	Zn = 65,2	Cd = 112	
	B = 11	Al = 27,4	? = 68	Ur = 116	Au = 197?
	C = 12	Si = 28	? = 70	Sn = 118	
	N = 14	P = 31	As = 75	Sb = 122	Bi = 210?
	O = 16	S = 32	Se = 79,4	Te = 128?	
	F = 19	Cl = 35,5	Br = 80	J = 127	
Li = 7	Na = 23	K = 39	Rb = 85,4	Cs = 133	Tl = 204
		Ca = 40	Sr = 87,6	Ba = 137	Pb = 207
		? = 45	Ce = 92		
		?Er = 56	La = 94		
		?Yt = 60	Di = 95		
		?In = 75,6	Th = 118?		

Periodic Table 1950 – Henry Hubbard



Drawings of slave ship Brookes by British abolitionist William Elford. 1788



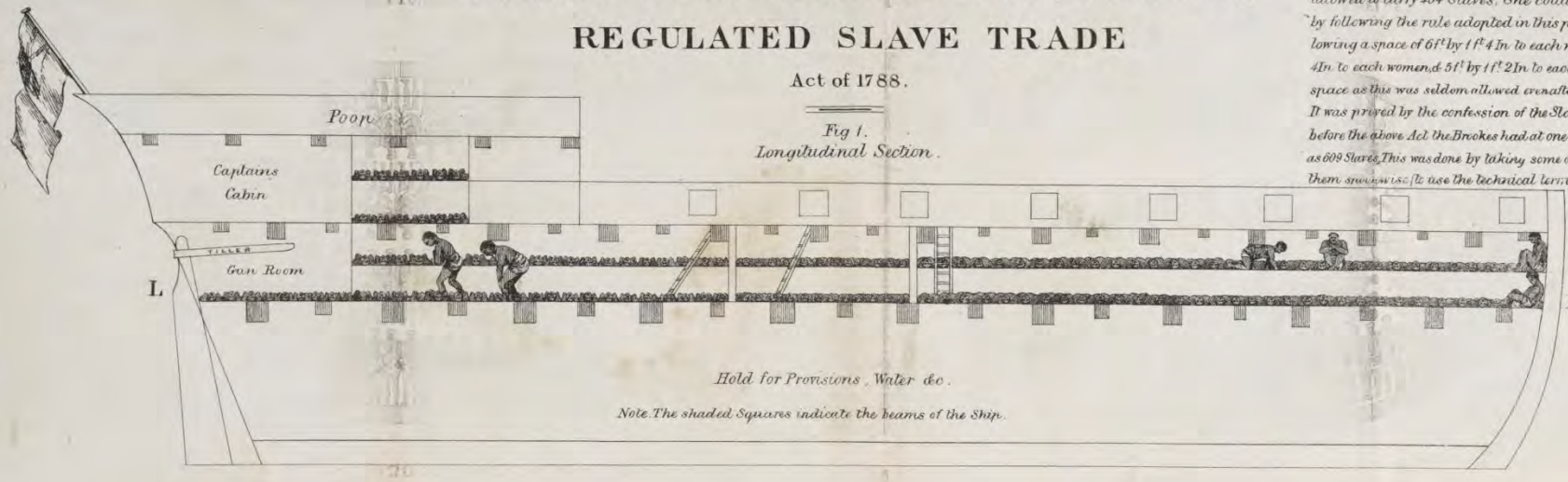
Drawings of slave ship Brookes by British abolitionist William Elford. 1788

STOWAGE OF THE BRITISH SLAVE SHIP "BROOKES" UNDER THE

REGULATED SLAVE TRADE

Act of 1788.

Fig 1.
Longitudinal Section.



Note. The Brookes after the Regulation Act of 1788, was allowed to carry 454 Slaves. She could stow this number by following the rule adopted in this plate, namely of allowing a space of 6ft by 1ft 4In. to each man; 5ft 10In by 1ft 4In. to each women & 5ft by 1ft 2In. to each boy, but so much space as this was seldom allowed even after the Regulation Act It was proved by the confession of the Slave Merchant that before the above Act the Brookes had at one time carried as many as 609 Slaves. This was done by taking some out of Irons & locking them sideways, to use the technical term, that is by stowing one within the distended legs of the other.

Shelf or Platform of the

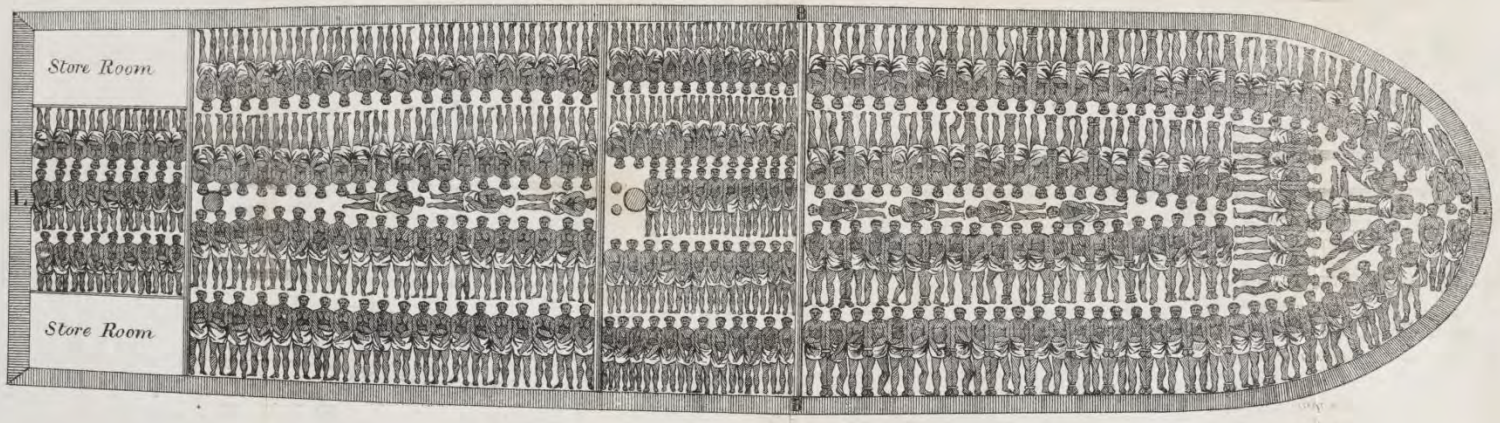
L Lower Deck

Note. The shaded Squares indicate the beams of the Ship.

PLAN OF LOWER DECK WITH THE STOWAGE OF 292 SLAVES

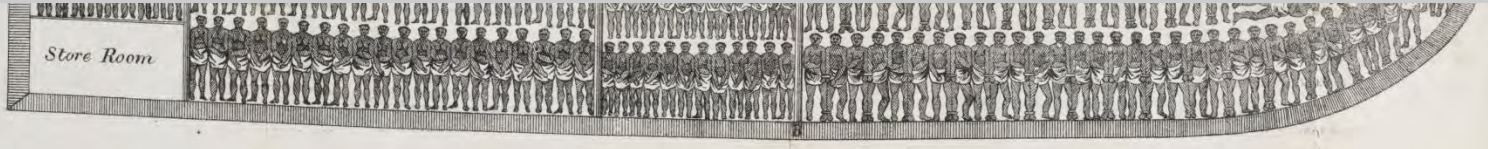
130 OF THESE BEING STOWED UNDER THE SHELVES AS SHEWN IN FIGURE B & FIGURE S.

Fig 2.



PLAN SHEWING THE STOWAGE OF 130 ADDITIONAL SLAVES ROUND THE WINGS OR SIDES OF THE LOWER DECK BY MEANS OF PLATFORMS OR SHELVES

Drawings of slave ship Brookes by British abolitionist William Elford. 1788



PLAN SHEWING THE STOWAGE OF 130 ADDITIONAL SLAVES ROUND THE WINGS OR SIDES OF THE LOWER DECK BY MEANS OF PLATFORMS OR SHELVES (IN THE MANNER OF GALLERIES IN A CHURCH) THE SLAVES STOWED ON THE SHELVES AND BELOW THEM HAVE ONLY A HEIGHT OF 2 FEET 7 INCHES BETWEEN THE BEAMS: AND FAR LESS UNDER THE BEAMS. *See Fig 1.*

Fig 3.

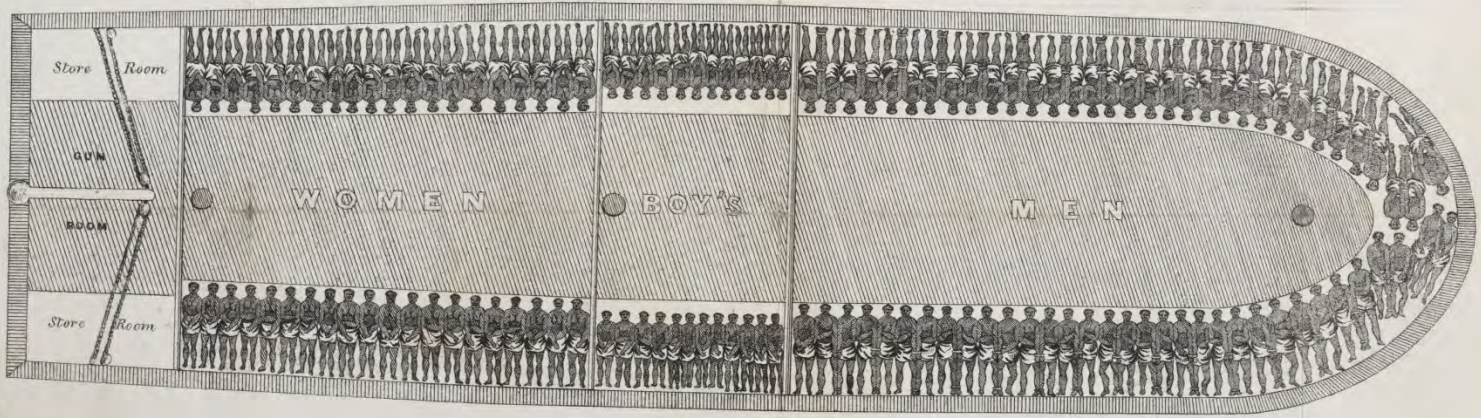


Fig 4.
Cross Section at the Poop.

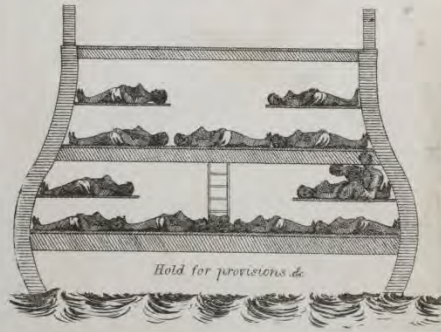


Fig 5.
Cross Section amidships

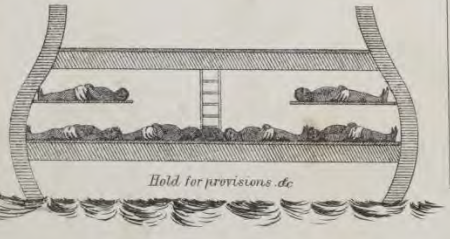


Fig 6.
Lower tier of Slaves under the Poop.

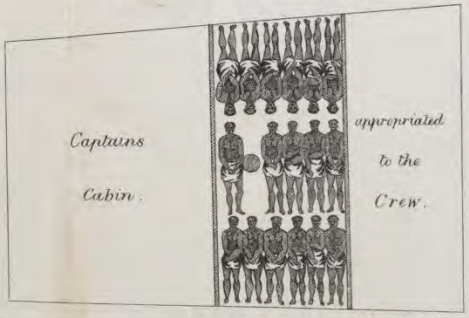
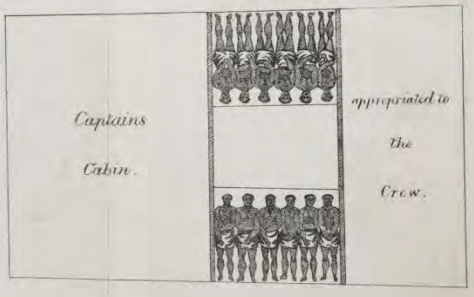
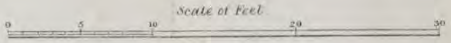


Fig 7.
Shelf tier of Slaves under the Poop.



Scale of Feet



Oliver Byrne's *Elements of Euclid*. 1847

THE *complements*

and

of the parallelograms which are about the diagonal of a parallelogram are equal.

(pr. 34.)

and

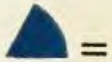
(pr. 34.)

∴

(ax. 3.)

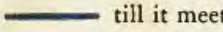
Q. E. D.

TO *a given ſtraight line* (——) *to apply a parallelogram equal to a given triangle* (), *and having an angle equal to a given rectilinear angle* ().

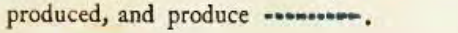
Make  =  with  = 

(pr. 42.)

and having one of its ſides ------ conterminous with and in continuation of ——.

Produce —— till it meets  || ------

draw —— produce it till it meets ------ continued;

draw ------ || ·····—— meeting 

produced, and produce ·····.

(pr. 43.)

but  = 

(conſt.)

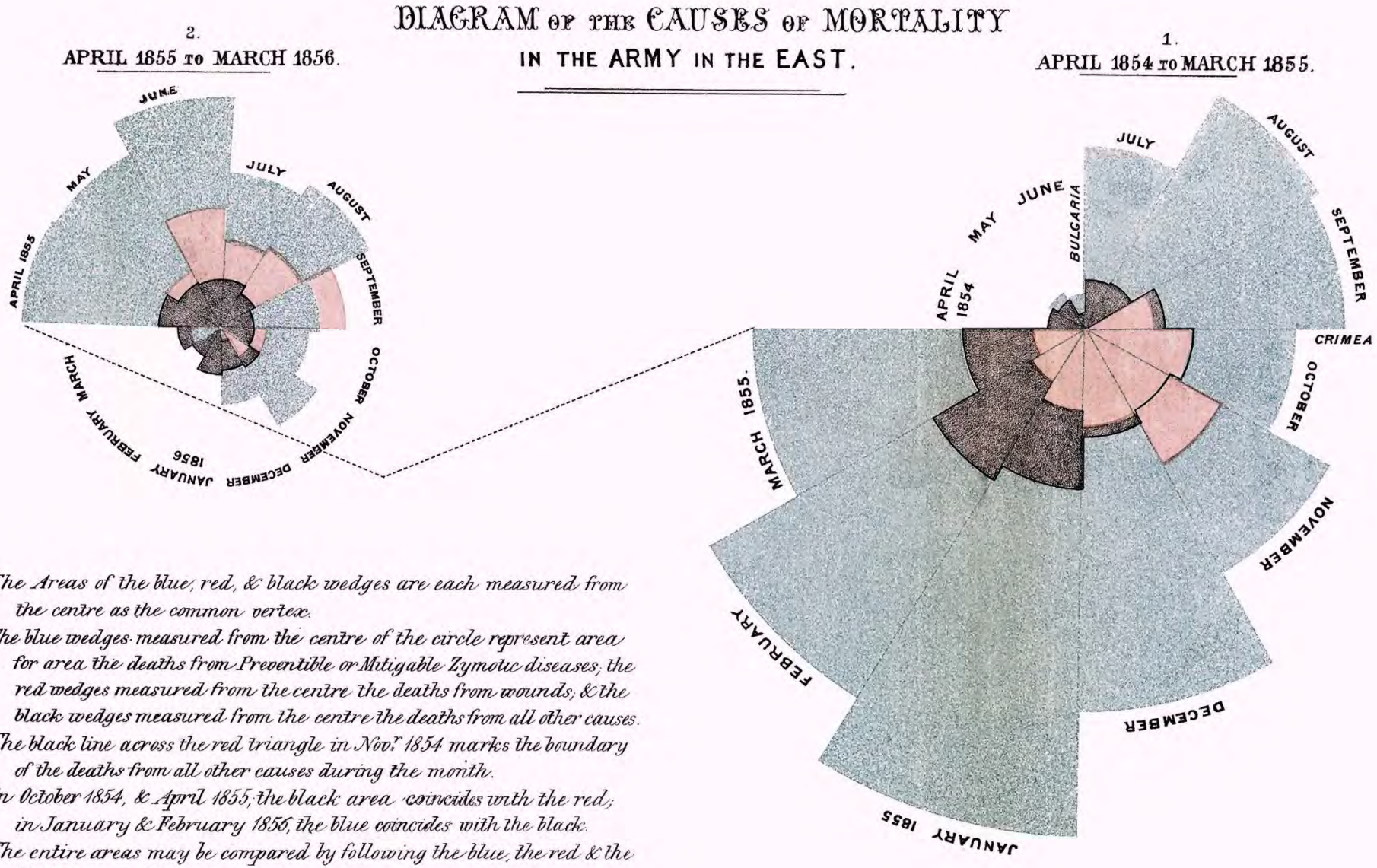
∴  =  ; and

(pr. 19. and conſt.)

Q. E. D.

A tangible visualization of Pythagorean theorem

Florence Nightingale on Crimean War. 1858



The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

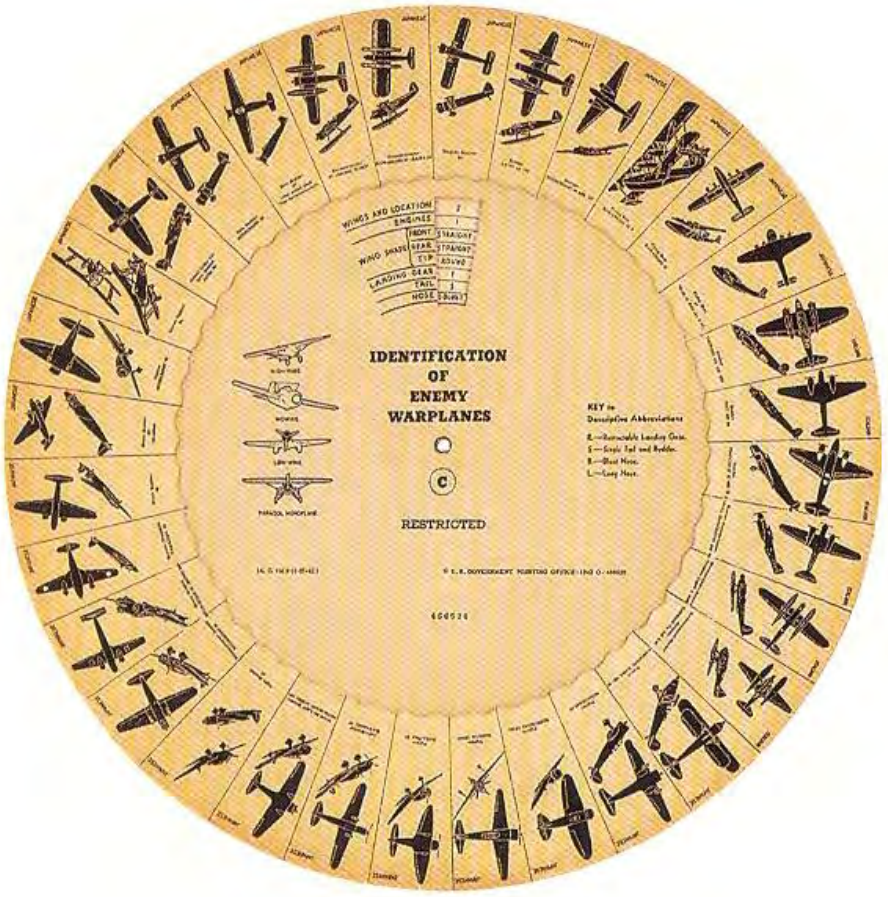
The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic diseases, the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.

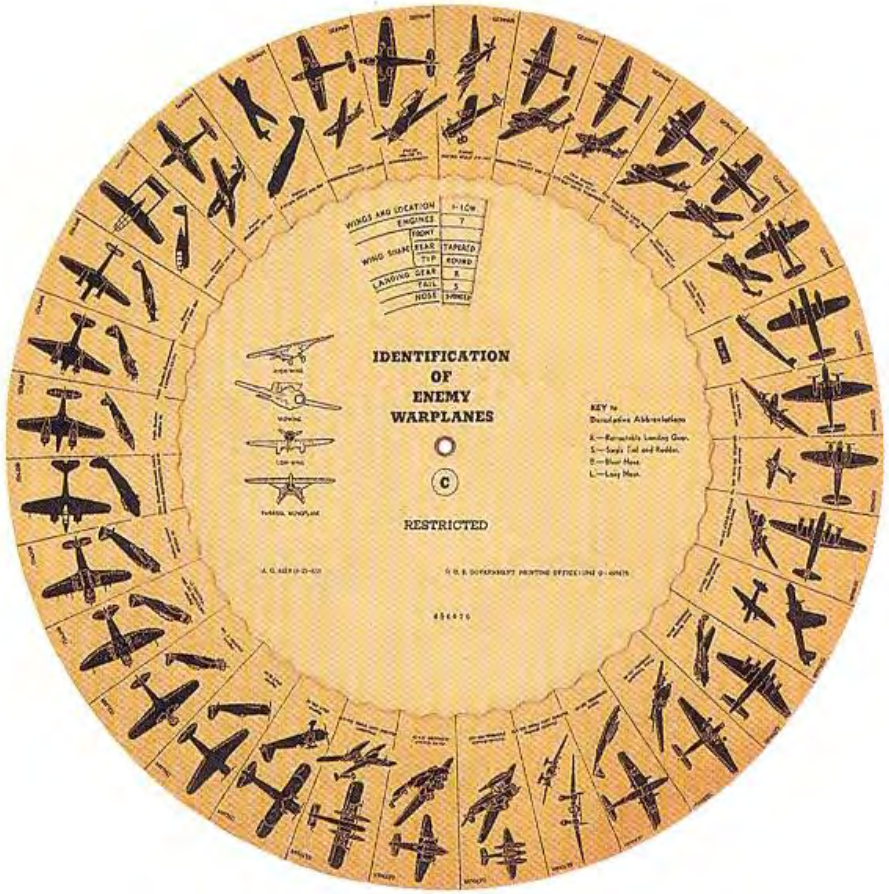
The black line across the red triangle in Nov.r 1854 marks the boundary of the deaths from all other causes during the month.

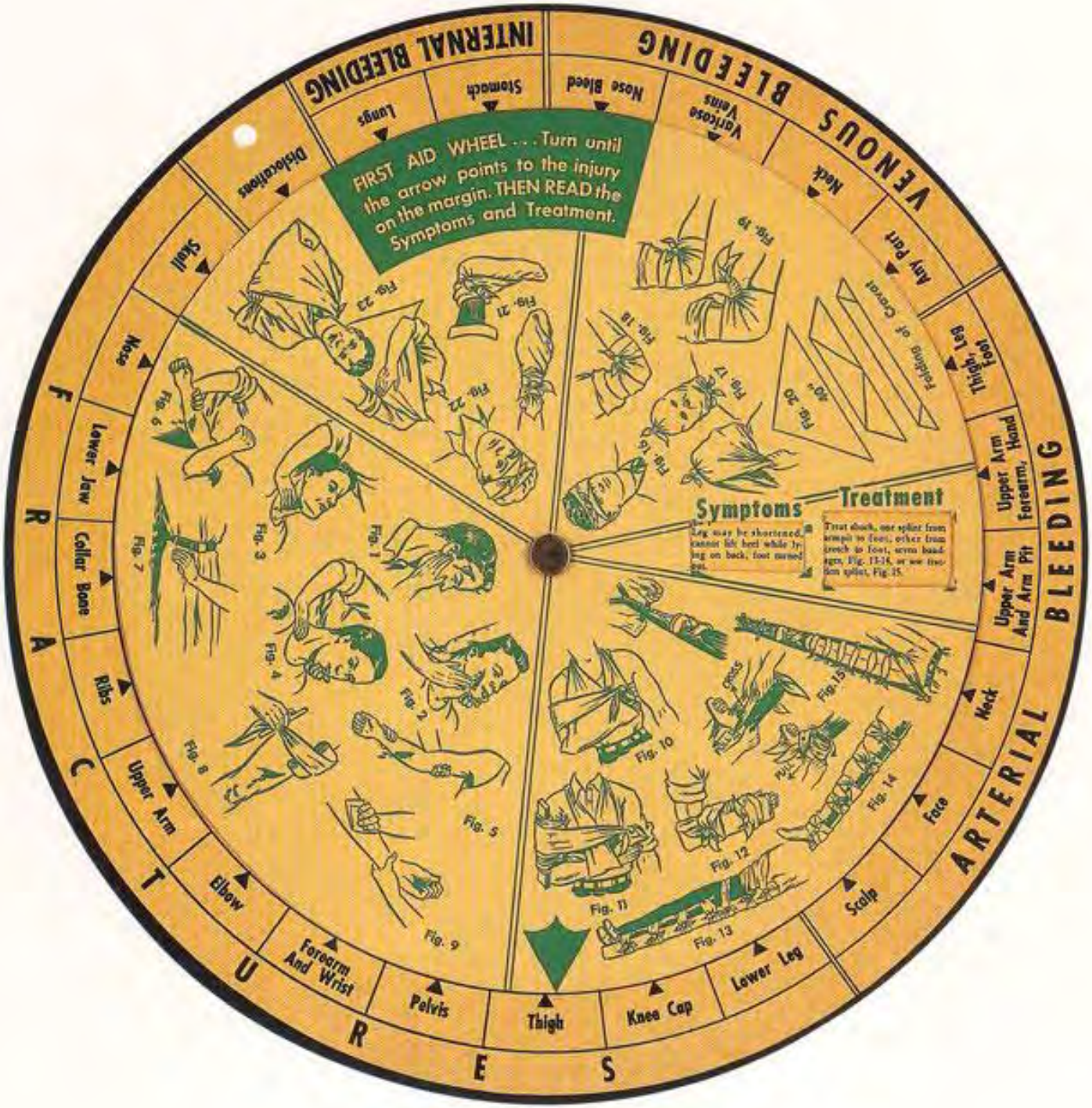
In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.

The entire areas may be compared by following the blue, the red & the black lines enclosing them.

Interactive information wheels






INTERNAL BLEEDING
VENOUS BLEEDING
ARTERIAL BLEEDING
FRACTURES
Dislocations
Skull
Nose
Lower Jaw
Collar Bone
Ribs
Upper Arm
Elbow
Forearm And Wrist
Pelvis
Thigh
Knee Cap
Lower Leg
Scalp
Face
Neck
Upper Arm And Arm Pit
Upper Arm Forearm, Hand
Thigh, Leg Foot
Any Part
Neck
Varicose Veins
Nose Bleed
Stomach
Lungs
FIRST AID WHEEL . . . Turn until the arrow points to the injury on the margin. THEN READ the Symptoms and Treatment.
Symptoms
Treatment
Fig. 1
Fig. 2
Fig. 3
Fig. 4
Fig. 5
Fig. 6
Fig. 7
Fig. 8
Fig. 9
Fig. 10
Fig. 11
Fig. 12
Fig. 13
Fig. 14
Fig. 15
Fig. 16
Fig. 17
Fig. 18
Fig. 19
Fig. 20
Fig. 21
Fig. 22
Fig. 23


WOODCOCK
DEER
ELK
ANTELOPE
MOUNTAIN GOAT
MOUNTAIN SHEEP
BLACK BEAR
MOOSE
RABBIT
SQUIRREL
PHEASANT
RUFFED GROUSE
DOVE
QUAIL
MALLARD
CANADIAN GOOSE
TURKEY
SET Indicator to Type of Game,
READ Most Popular Type of Gun, Ammo
and other pertinent information
in window below.
"LET'S GO HUNTING!"
SEARS
J.C.Higgins . . . Greatest
Hunting Equipment Values Anywhere
Satisfaction guaranteed or your money back
RULES OF SAFETY
Always handle a gun as if it were loaded.
Carry only empty guns taken down or with action open into camp, house, car or boat.
Always be sure that barrel and action are clear of obstruction—particularly after a fall or if gun has been dropped.
Carry your gun with the safety on—keep your finger off the trigger.
Unload gun before climbing a fence or tree.
Always carry your gun so that you can control the direction of the muzzle, even if you stumble.
Be sure of your target . . . see the game before you shoot. Don't shoot at a sound or brush movement.
Never point gun at anything you can't shoot.
Never leave a gun unattended unless you unload it first. Be sure it cannot fall.
Never mix gunpowder and alcohol.
Suggested Best
Gun - by JCH Model 20
Ammo. - J. C. Higgins
Ga. or Cal. - 12
Shotsize or Grain - 8
Other Popular
Ga. or Cal. - 16, 20, 28, 410
Shotsize or Grain - 7½, 9


The KITCHENETTE WHEEL
Put over a fast One on your Kitchenette Range
Sing a song of six-pence
Get ready for a meal,
A simple and a fast one
Is just around the wheel!
by PAN-HANDLER
26 RECIPES FOR CREATING FOOD OUT OF WHAT YOU HAVE IN THE ICE-BOX:
Palatable Food
Inexpensive Food
Food varied and easy to make
Quantities are given for dining à deux – halve for the hermit, multiply for mobs.
The big T is for TABLESPOON,
The little t is for TEASPOON,
C is for CUP and lb. stands for POUND.
cooking time:
minutes
DEVILLED CRAB
OYSTER STEW
BACON WAFFLES
KEDGEREE OMELET
EGGS A LA KING
EGGS AND TOMATO
DENVER SANDWICH
TOMATO TOAST
BAKED MUSHROOMS
CORN FRITTERS
FRIED EGG PLANT
ASPARAGUS WITH CROUTONS
DEVILED TEACUPS
CHOCOLATE SOUFFLÉ CAKE
APPLE DESSERT
BOILED EGG
PATRIOTIC VEAL
PAN BROILED STEAK
SCRAMBLED OYSTERS
FRIED RAW OYSTERS
SHRIMP PILAU
CREAMED OYSTERS AND CELERY
FISH FILLETS WITH BROWN SAUCE

space required to transport **60 people**

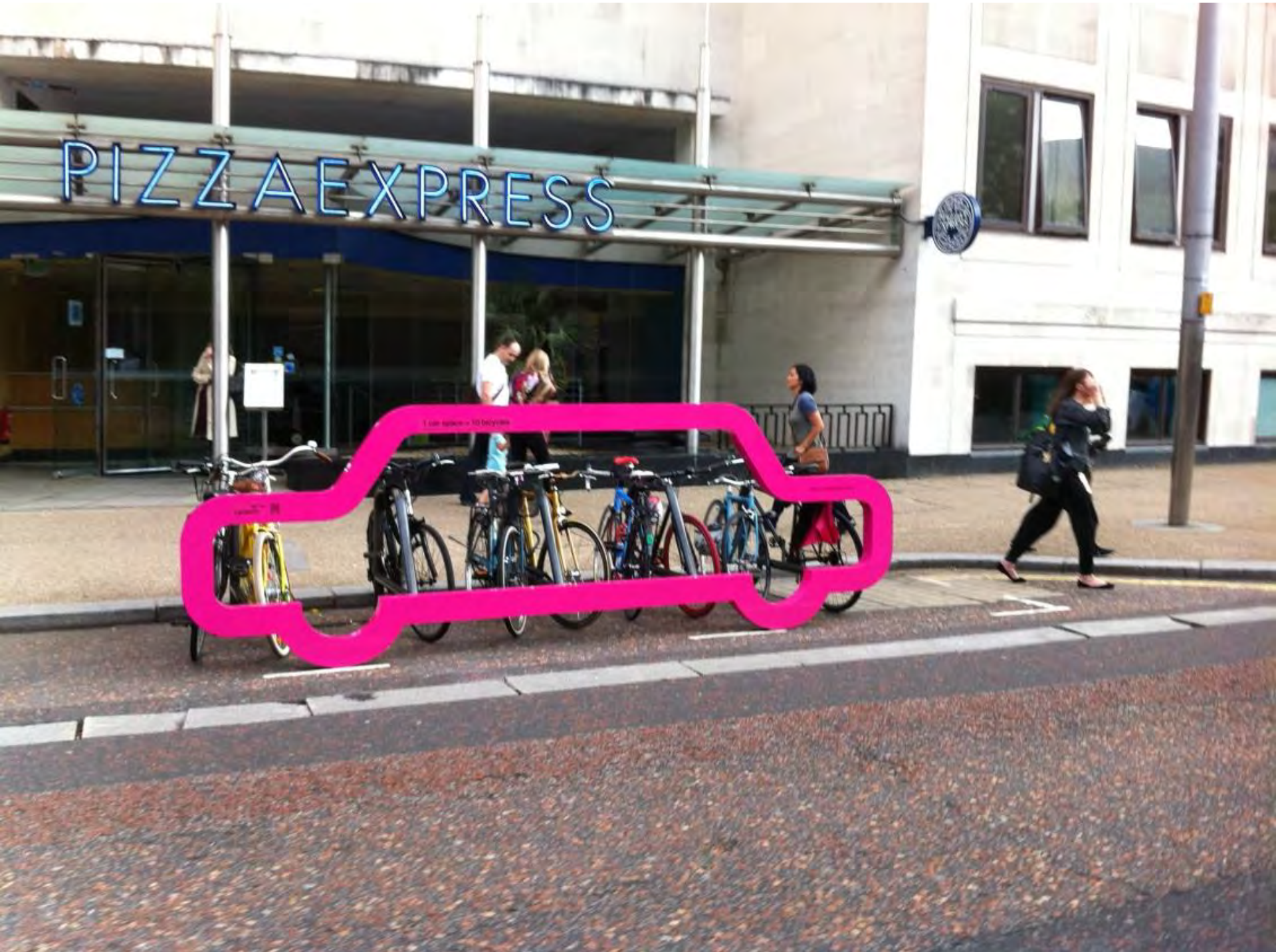
car

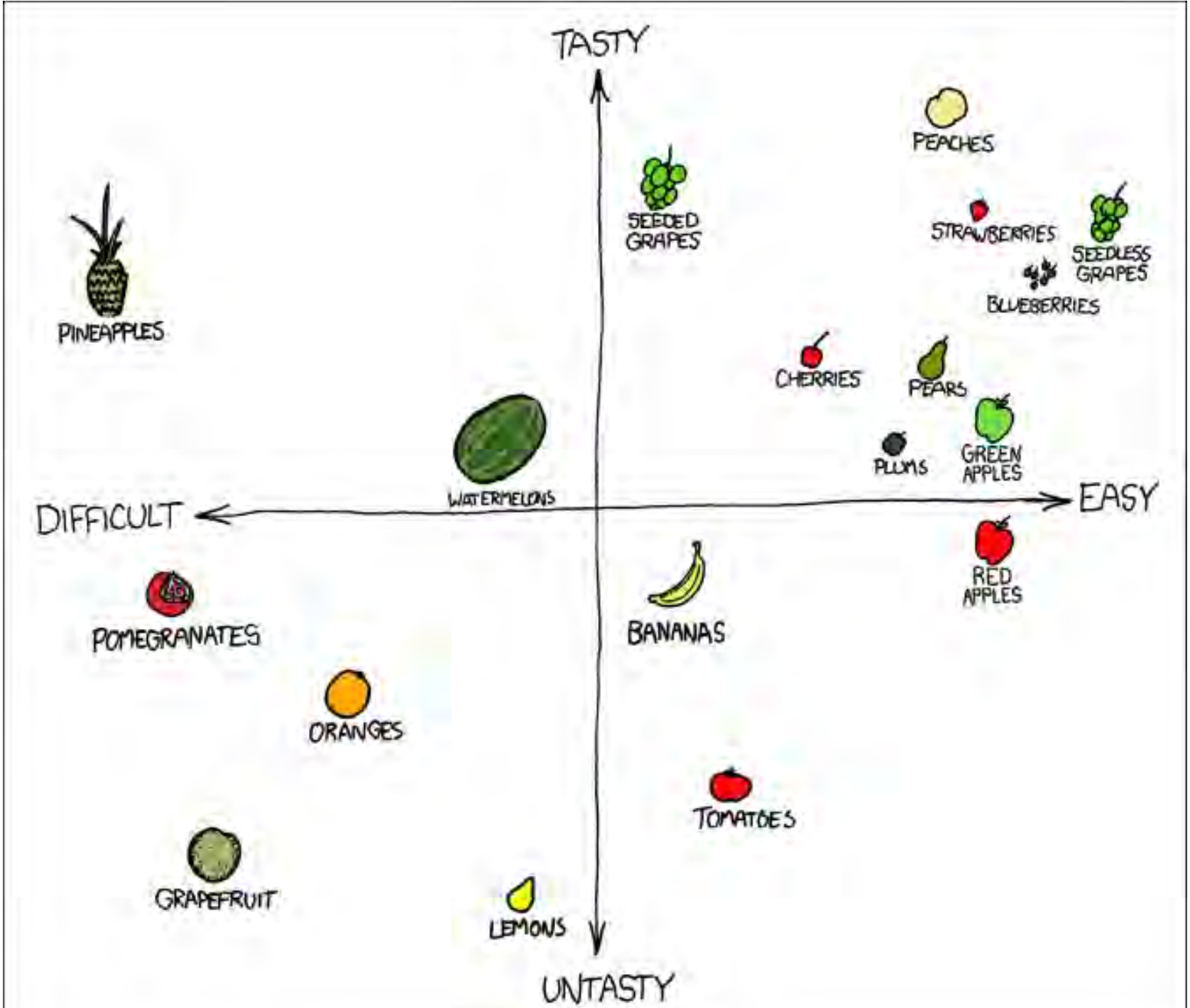
bus

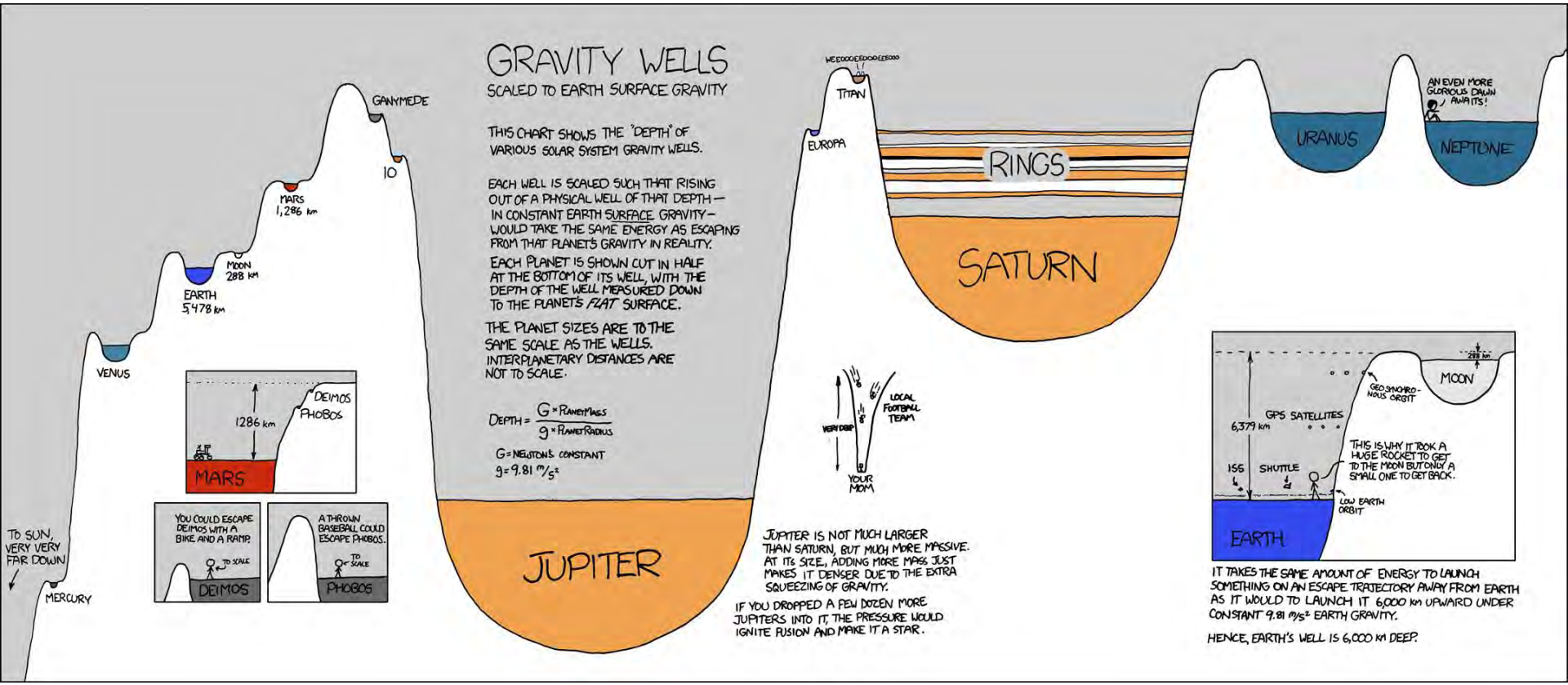
bicycle

Nadeem Haidary's visualization of caloric consumption per capita

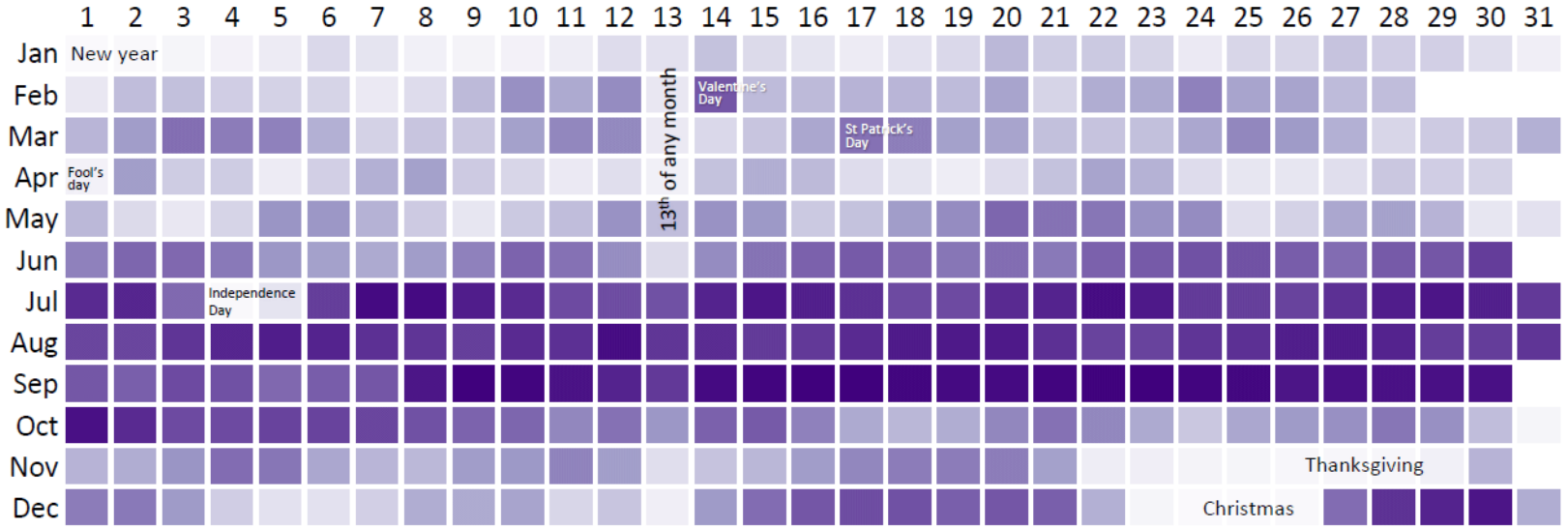

MESOZOIC ERA
PALEOZOIC ERA
CENOZOIC ERA
PRECAMBRIAN
TRIASSIC PERIOD
JURASSIC PERIOD
CRETACEOUS PERIOD
TERTIARY PERIOD
CAMBRIAN PERIOD
ORDOVICIAN PERIOD
SILURIAN PERIOD
DEVONIAN PERIOD
MISSISSIPPIAN PERIOD
PENNSYLVANIAN PERIOD
PERMIAN PERIOD
Paleocene Epoch
Eocene Epoch
Oligocene Epoch
Miocene Epoch
Pliocene Epoch
Pleistocene Epoch
Holocene Epoch
QUATERNARY PERIOD
TERTIARY PERIOD
65 MILLION YEARS AGO
200 M.Y. AGO
542 M.Y. AGO
416 M.Y. AGO
359 M.Y. AGO
299 M.Y. AGO
251 M.Y. AGO
56 M.Y. AGO
34 M.Y. AGO
23 M.Y. AGO
5 M.Y. AGO
2 M.Y. AGO
11,500 YR. AGO
1 BILLION YEARS AGO
2 BILLION YEARS AGO
3 BILLION YEARS AGO
EARLIEST ORGANIC STRUCTURES
4.5 BILLION YEARS AGO


PIZZAEXPRESS


TASTY
UNTASTY
DIFFICULT
EASY
PEACHES
SEEDED GRAPES
STRAWBERRIES
SEEDLESS GRAPES
BLUEBERRIES
PINEAPPLES
CHERRIES
PEARS
PLUMS
GREEN APPLES
WATERMELONS
RED APPLES
POMEGRANATES
BANANAS
ORANGES
TOMATOES
GRAPEFRUIT
LEMONS


GRAVITY WELLS
SCALED TO EARTH SURFACE GRAVITY
THIS CHART SHOWS THE "DEPTH" OF VARIOUS SOLAR SYSTEM GRAVITY WELLS.
EACH WELL IS SCALED SUCH THAT RISING OUT OF A PHYSICAL WELL OF THAT DEPTH — IN CONSTANT EARTH SURFACE GRAVITY — WOULD TAKE THE SAME ENERGY AS ESCAPING FROM THAT PLANET'S GRAVITY IN REALITY.
EACH PLANET IS SHOWN CUT IN HALF AT THE BOTTOM OF ITS WELL, WITH THE DEPTH OF THE WELL MEASURED DOWN TO THE PLANET'S FLAT SURFACE.
THE PLANET SIZES ARE TO THE SAME SCALE AS THE WELLS. INTERPLANETARY DISTANCES ARE NOT TO SCALE.
DEPTH = G × PLANETMASS / g × PLANETRADIUS
G = NEWTON'S CONSTANT
g = 9.81 m/s²
TO SUN, VERY VERY FAR DOWN
MERCURY
VENUS
EARTH 5,478 km
MOON 288 km
MARS 1,286 km
GANYMEDE
10
1286 km
DEIMOS
PHOBOS
MARS
YOU COULD ESCAPE DEIMOS WITH A BIKE AND A RAMP.
TO SCALE
DEIMOS
A THROWN BASEBALL COULD ESCAPE PHOBOS.
TO SCALE
PHOBOS
JUPITER
WEEEEEEEEEEEEEE
TITAN
EUROPA
RINGS
SATURN
URANUS
AN EVEN MORE GLORIOUS DAWN AWAITS!
NEPTUNE
VERY DEEP
LOCAL FOOTBALL TEAM
YOUR MOM
JUPITER IS NOT MUCH LARGER THAN SATURN, BUT MUCH MORE MASSIVE. AT ITS SIZE, ADDING MORE MASS JUST MAKES IT DENSER DUE TO THE EXTRA SQUEEZING OF GRAVITY.
IF YOU DROPPED A FEW DOZEN MORE JUPITERS INTO IT, THE PRESSURE WOULD IGNITE FUSION AND MAKE IT A STAR.
288 km
MOON
GEOSYNCHRONOUS ORBIT
GPS SATELLITES
6,379 km
ISS
SHUTTLE
THIS IS WHY IT TOOK A HUGE ROCKET TO GET TO THE MOON BUT ONLY A SMALL ONE TO GET BACK.
LOW EARTH ORBIT
EARTH
IT TAKES THE SAME AMOUNT OF ENERGY TO LAUNCH SOMETHING ON AN ESCAPE TRAJECTORY AWAY FROM EARTH AS IT WOULD TO LAUNCH IT 6,000 km UPWARD UNDER CONSTANT 9.81 m/s² EARTH GRAVITY.
HENCE, EARTH'S WELL IS 6,000 km DEEP.

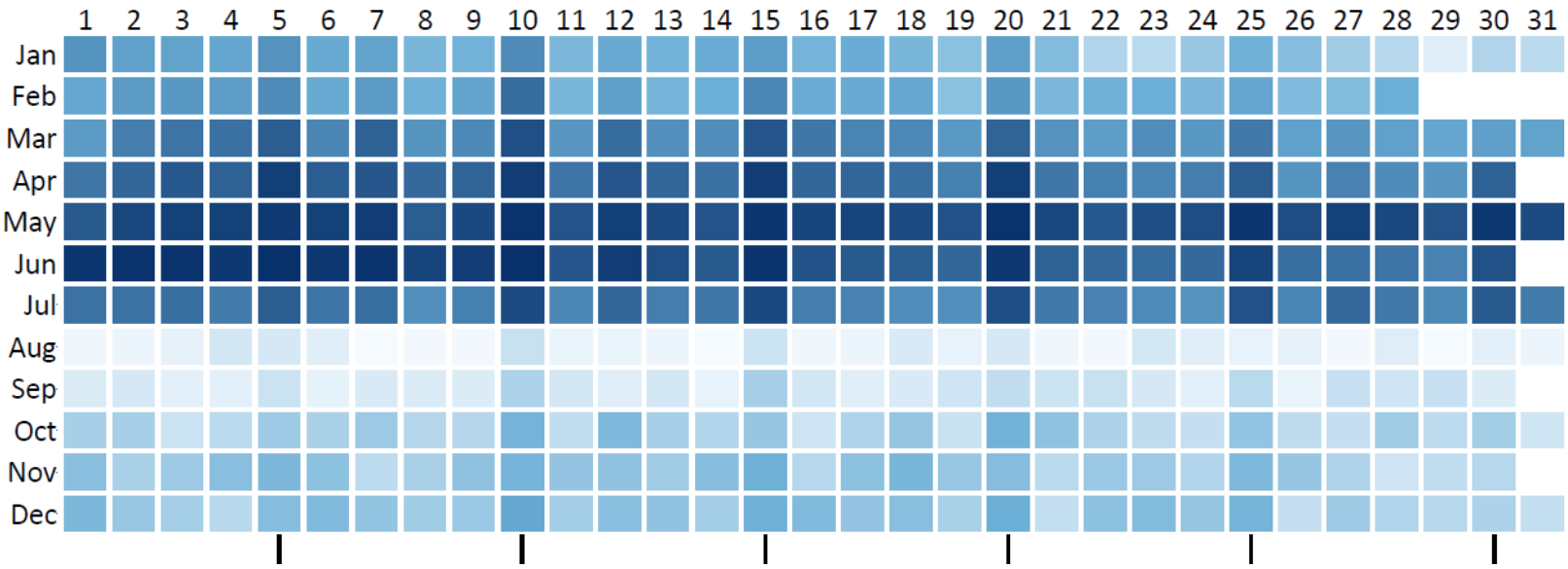
Birthdays in the U.S and in India, Gramener



U.S. Birthdays

Most birthdays are in Jul – Sep, roughly 9 months after the winter holidays

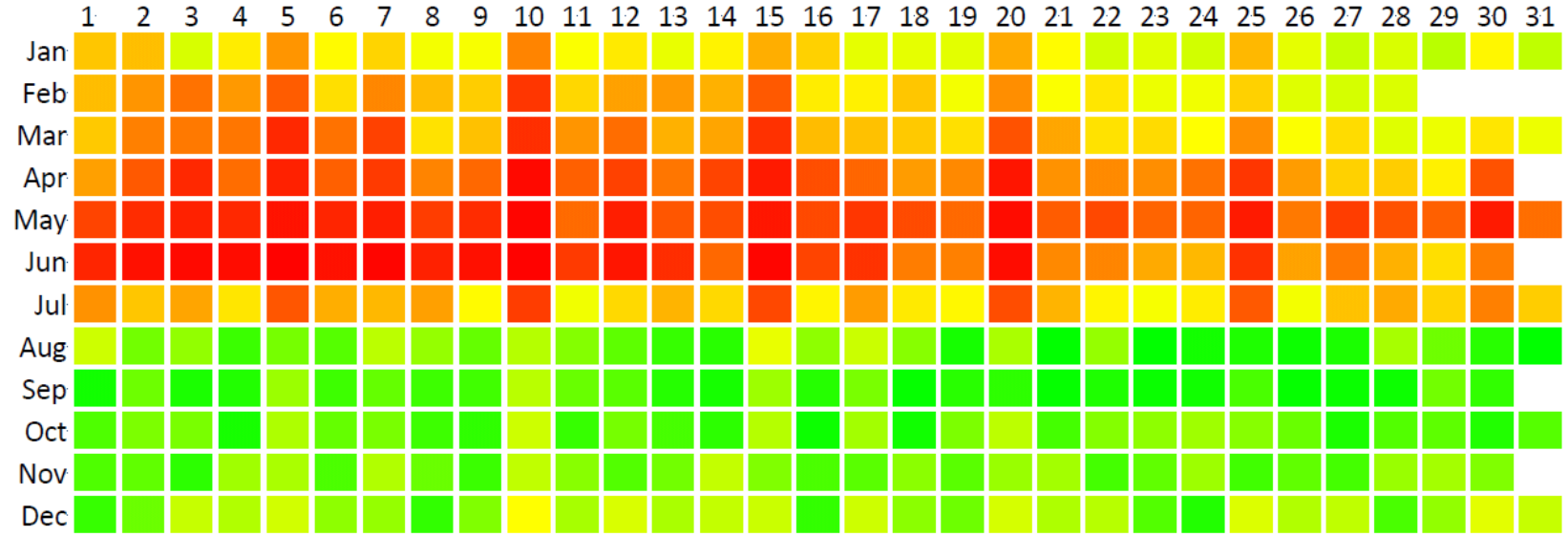
Birthdays in the U.S and in India, Gramener



Indian Birthdays

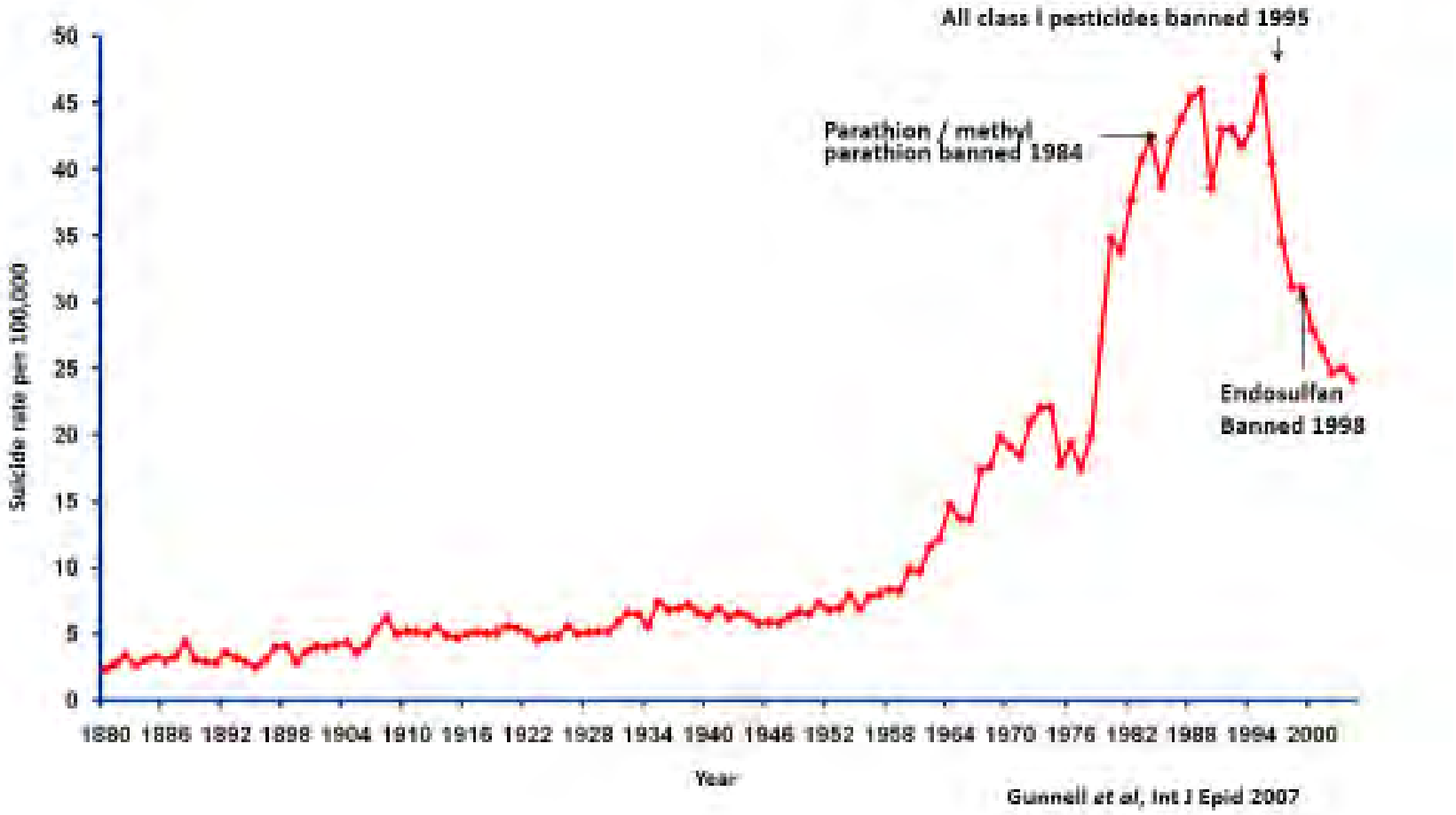
Most birthdays are in Apr-June, while almost no one is born in August.

Birthdays in the U.S and in India, Gramener



Suicide rates in Sri Lanka 1880-2005

Suicide rates in Sri Lanka 1880-2005

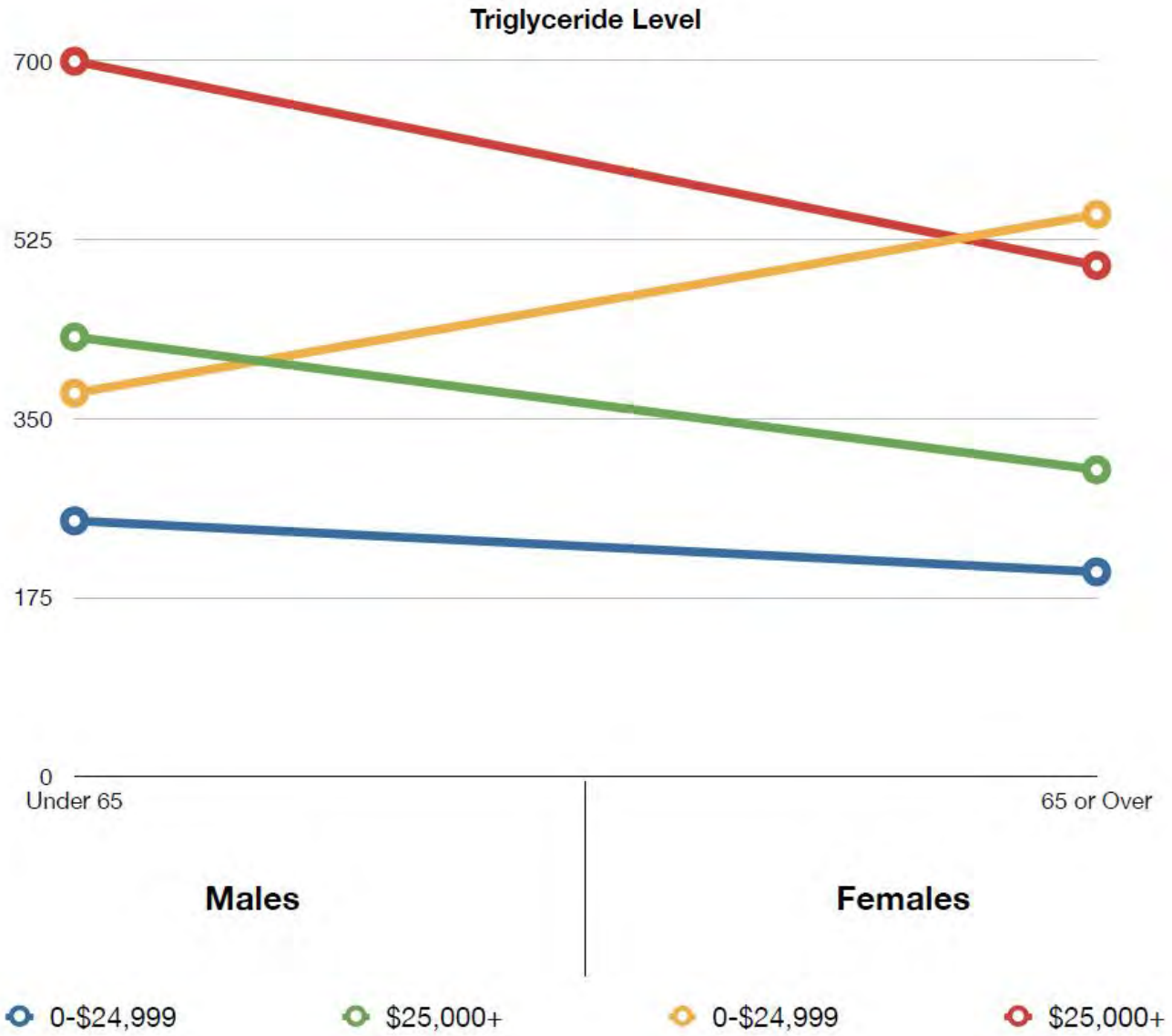


Visualize this!

Which gender or income level group shows different effects of age on cholesterol levels?

	Males		Females	
Income Group	Under 65	65 or Over	Under 65	65 or Over
0-$24,999	250	200	375	550
$25,000+	430	300	700	500

Visualize this! - class participation exercise 1



Hans Rosling TED 2006


12
1
2
3
4
5
6
7
8
9
10
11

Information Objects - class participation exercise 2

Find 3 non-digital, everyday objects in which some critical information that is related to the function of the object is communicated (either serendipitously or accidentally) visually. Explain:

1. What information do they possess?
2. Where is the information embedded?
3. Why is the information important?
4. How do they communicate it to us?

Photograph the objects. Come prepared to articulate and discuss your observations in class.