1943, [illegible] Achelis – [illegible], A.L.A 1876: [illegible]
[illegible]
[illegible] 1.12.25 (1 [illegible]
321 [illegible]
3) 1066 [illegible] 4) 1215: [illegible]
5) 1492 [illegible] Ch. C [illegible]
6) 1582 [illegible]
7) 1776.7.4 [illegible]
8) 1861.4.12 [illegible] Fort Sumter [illegible] (1865.4.14) [illegible] 1917.4.6 [illegible]
[illegible] Peary [illegible] 1900.4.6 [illegible]
[illegible]

1) [illegible]
2) [illegible] wet 12 dry [illegible] 30.4 [illegible] 354
3) [illegible] 360 [illegible]
4) [illegible] 4236 [illegible] 3251.6.18 [illegible]
[illegible] 1.1.1 [illegible]
Akhenaton [illegible]
5) [illegible] Canopus [illegible] 1886 [illegible] M.W.C.D.W [illegible]
[illegible] Wallis Budge [illegible]
[illegible]

The Year of t. City's founding = Anno Urbis Conditae = $\overline{753}$ = Ab Urbe Condita = A.U.C
$\overline{715}$–$\overline{672}$ 43a Numa Pompilius [illegible], Remus & Romulus [illegible]
(4) Pleiades [illegible] Maius [illegible] aperire, Martius [illegible] 304 [illegible]
[illegible] Junius [illegible] Januarius [illegible] doors, gateway [illegible]
Februare [illegible] wrongs [illegible] 28 [illegible] 5 = N. 29 [illegible] 7 = N. 31 [illegible]
[illegible]
[illegible] J. College of Pontiffs [illegible]
[illegible] (pons, facere) [illegible]
Pontifex Maximus [illegible] Mercedonius [illegible]

$\overline{452}$. Januar [illegible] Februar [illegible] Decemvirs [illegible]

[illegible] Pawn [illegible] (withheld) [illegible]
[illegible]
[illegible] abetted [illegible]
304. Cneius Flavius [illegible] on what [illegible] paying tithes – custom [illegible]
publicly listed t prohibited dates on tables hung ab t Forum [illegible] means [illegible]
[illegible]
[illegible] subterfuges [illegible] triumvir [illegible] tribun [illegible] M & P [illegible]
for all to see [illegible] blazoned [illegible] t deed was done [illegible] annual event [illegible]
$\overline{153}$ [illegible] 1/3 [illegible]
3/1 [illegible] 3/25 [illegible]
[illegible] (2. Natali D. 238) Censorinus Pol. A. 11.7919 [illegible]
a farmer t revenue [illegible] P.H. 63 [illegible] Sosigenes [illegible] Caesar [illegible]
[illegible] 67 [illegible] Aemilius Lepidus [illegible] 445 [illegible]
23 Feb = Terminalia [illegible] A.S.N [illegible] S.S.D [illegible] (355) [illegible]
long y – adjustment (well called y o confus with 445 [illegible] (46B) Saturnalia (325-385) Macrobius
$\overline{45B}$ [illegible]
[illegible] 18,4, 19,4 – 17,6 | 18,4 – 17,6 – 18,4 – 17,6 – 16,4 – 19,4 [illegible]
[illegible] 45.1.1 [illegible] 12/25 [illegible]
[illegible] 8 [illegible] (8–8) [illegible]
[illegible] 1932 [illegible]
Galloway [illegible] 1842 [illegible]
[illegible]
[illegible] 321 [illegible]
Diessolis = sunnan-Daeg, Lunae = Monan-, [illegible] = Tuwes-, Mercurii = Wodnes, Joves = thunres, veneris
5.. Dionysius Exiguus = Denys t Little [illegible] Saterni = [illegible], Frige =
5h48'46" = .2422 : 1582, E = 3/11 ≠ 25 [illegible] 4a [illegible]

Bast pr [illegible] 3 zot
BELL

Haz Mayus Q.O calendae	1	Jan Dec C.C.C		
6	2	4.4.4		
5	3	3.3.3		
4	4	P.P.P		
3	5	N.N.N		
Prid Nonae	6	8.8.8		
N	7	7		
8	8	6		
7	9	5		
6	10	4		
5	11	3		
4	12	P		
3	13	9		
P Idus	14	19	18	16
9	15	18		
17	16	17		
16	17	16		
15	18	15		
14	19	14		
13	20			
12	21			
11	22			
10	23			
9	24			
8	25			
7	26			
6	27	6	5	3 P
5	28	5	4	
4	29	4	3	
3	30	3	P	
Prid calc.	31	[illegible]	K	F

1929: how to simplify life 1) spelling 2) Univ Wt measures 3) improv t calendar [illegible]
Dr Melvil Dewey (famous for taking [illegible]
1849 Auguste Comte 13×28. 13 [illegible], blank = 365 = Extra d [illegible] all dead [illegible]
[illegible] 1526 (Brünecker) Valley [illegible] Luz [illegible]
[illegible] 3) Augustine [illegible] 38 [illegible] Russia
[illegible] W 1731.2.11.O.S = 1732.2.22 NS (Augustine) Mary [illegible] at [illegible] never [illegible]
[illegible] 3.25 [illegible]
5h48m46s = .2422 [illegible]
tiw's d = [illegible] Woden, Thor, Frigg [illegible] K.N [illegible] 321
ahead [illegible] 1582 : 129a/1 = 11'14" [illegible] 365 5h 48' 46" [illegible]
Dionysius Exiguus [illegible] anni [illegible]
[illegible] 1582.10.4–15 [illegible] 3300 [illegible] 48 [illegible]
[illegible] 1752.9.2 = 14 [illegible] 1751 [illegible]
NS (1732.2.22) = OS (30/4, 1732) 10 [illegible] 1731 [illegible] Mary [illegible]
[illegible] 1940.6.26 – 1929.10.1 [illegible] 1918 [illegible] 1912 [illegible] 1873 [illegible]
[illegible] Nicea (325) [illegible] Alogaina [illegible]
[illegible] 4905 = 3323 [illegible]
[illegible] 25 – 26 – 4 [illegible] 1988 [illegible]

3

metabolism

refer

release

muscle

rate

tempo

feature

personality

lively

leisure

at different times

involuntary

contract

skeletal

intake

violent exercise

step

to offer

walking

Mission

Amoeba

age

gills

embryonic stage

exhibits

specimen

conspicuous

to clear

leafy

tree

herb

shrub

beam

evolved

event

realm

ancestors

remote

feature

embryo

notochord

a curved unjointed

and at different

composed of cartilage

puppy

sparrow

infant

clear a family

job

work

quadrennial

leapyear day

Sculptor

Nicaea

Sarcophagus

Numa Pompilius

Boethius

Stonehenge

Cheops

Tiahuanaco

Mexico

Yucatan

Chichen-Itzá

Hayana

Aztec

reached back

Sumerian

Akkad

Kaaba

Sarton

Vatican

Vatican

tempo

price

lowest

shortest

job

to do to best possible

well

valuable

Logarithms

gears

hectic

land plan

co-operation

[illegible]

A) [illegible] M' [illegible] **Monarch butterfly** [illegible] = 4-10 cm [illegible] egg case [illegible] milkweed leaf [illegible]

caterpillar (larva) [illegible] 21 g [illegible] 5 cm [illegible] molt [illegible]

4) chrysalis (pupa) [illegible] sturdy stem [illegible] twig [illegible]

[illegible] pupal stage [illegible] chitin [illegible] t hat [illegible] chrysalis shedt [illegible] 3-10 cm [illegible] thorax [illegible] image [illegible] causing [illegible] mate [illegible]

[illegible] B [illegible] M [illegible]

[illegible] H.B [illegible]

B) Mosquito - larva - pupa [illegible] 10-15 [illegible] C [illegible] zoea [illegible]

B) Crab - egg, zoea, megalops = [illegible] adult [illegible] crab & molts [illegible]

D) Fiddler C [illegible] Cape Cod [illegible] salt marshes [illegible] dam [illegible]

II [illegible] d.C [illegible] 50 [illegible] T.H [illegible] t.T. [illegible] 50 [illegible] C [illegible] F.C. [illegible] d.C [illegible] d.c. t.C [illegible]

E) [illegible] Forel [illegible] ago [illegible] Buttel-Reepen [illegible] flowering buckwheat [illegible] t-ee [illegible] in bloom [illegible] hive [illegible] honeycomb [illegible] pictures [illegible] keyed [illegible] recurrence [illegible]

[illegible] 1557 [illegible] abours [illegible] back [illegible] "pre-settling" [illegible] wullfully [illegible]

A) t arctic fox [illegible] ptarmigan 3) t weasel [illegible] delays radiation of body heat [illegible] t eggs [illegible]

northern typ of grouse [illegible] A.R [illegible]

4) Snowshoe rabbit [illegible] 5) [illegible] grouse & crows [illegible]

6) [illegible] grunion [illegible] relative [illegible] open areas [illegible] occur [illegible] hatch [illegible] g [illegible] to spawn. beaches southern California [illegible] spawn [illegible] 14 g [illegible]

tail A & almost up to her head [illegible] digs her set [illegible] soft moist sand - beach [illegible] level [illegible] 5 cm [illegible] to eject their milt [illegible] gather up [illegible] containing sperm cells, this material seeps down into t sand to fertilize [illegible] (into t surf) slither [illegible] 30 [illegible]

[illegible] mature 16 [illegible] t receding waves - t next h.t. will uncover them [illegible] follow t ebbing w. to t [illegible] & hatch [illegible]

Cycles [illegible] adjust [illegible] most intriguing biological clocks [illegible] approach [illegible]

→ at t tidal peak [illegible] 30 [illegible]

[illegible] 45" 85" [illegible] amazing [illegible] 48 h [illegible] fruit of neglect

[illegible] blooms [illegible] bloom [illegible] flower [illegible] chrysanthemums [illegible] bulbs [illegible] strung on lines [illegible] t

Pleistocene = Most recent

quartzite = sa, slate = sh, marble = l.

Project Mohol 1960 — Moho discontinuity

Dendrochronology =

Protoceratops

Fossils = dug from

Cenozoic Era = age mammals, rock strata - previous 160' Mesozoic = a. reptiles 370' Pale = amphibian

4) Cambrian Period = earliest part - Pale = 500-600 = primitive marine & land, sponges, trilobites (3-lobed)

5) 1947 = Prec. (Precambrian) — Ferruginous limestone, soft corals (sea pens), jellyfish, annelid worms, sponges, spirogyra

Fr brachidium bear no resemblance to any kn organism — Tomopteris, long annelid worm, cactus, Dickinsonia costata

6) Ontario: deposit - Fe ore (1".3), flint = 2", kind algae, 2 type fungi, calcareous flagellate, protozoa

a type - Primate = 30' (efficiency - br, nerv sys)

1) Dr Leakey. E. Af M: Zinjanthropus (1'750) skull

2) Java M (= Pithec a = Ape M) (550-700) erectus = 61 inch³

3) E Africa = Kanjera M: subspecies - Homo sapiens = 200

4) S. Af = Rhodesian M: shelving brows, broad nose = 40

5) S tip Af = Florisbad M = H.s.

1) Heidelberg M (500) Neanderthal M (150-25), 2) Swanscombe M (500-250) 3) Fontéchevade M (250-75), Cro-Magnon M (35-25)

Bushman

radioactive C isotope at wt 14 (1946) Dr Willard F. Libby (Univ. Calif) C. dioxide

11,936 a = 1/4 — 16,704 = 1/8

bone, antlers, wood, plant fibers, seeds, heat, charcoal, dung, pollen grains, once living material

preserved in glacier ice (bodies of mammoths)

Neat Hippo

Ohio River

Tokyo

Pleistocene Ice Age ended 12

outer space

Life span = 70 a - 6) 1 = evol as reason and 6 = gal

Milky Way

as yet cannot spec upon t - Their sh do not comp agree

a) a sing Or: = explosion - a vast, comp mass "blob" of primordial matter

b) agree: t starry galaxies we see do hr a p. crea int. argue that t U clearly did not

in such a "steady state" U

by other atom-built formations favorit proces

2) C ≐ 14 73 – 15 43: ev ch pos int t is obs in t sky is due to t m-t obs of Qor of t obs
2) Galileo Galilei 15 64 – 1642 is one wanderer (many) 3) or t t m-both: there could be no state of
"inv-t laboratory = quantitative experimental method imitating nature experimentally
in such a way that a single factor in her methods could be perceived & analysed
= a manner of dissecting nature, so to speak

poor observation faulty reasoning: light-heavy according to their essential qual
Dust rose, stones fell w. diff v. each sub had its own partic w. 1) Why things had
1) He allowed how drift
2) polished & grooved surf. an incl. pl. rumpdown
he reduced t ∠ of g by decreasing t slope-t pl. falling at a slow rate

V = t-rate-m-ch of t posit-a fall body
a = t-r-v-ch of its v

had a stout body determined mind often expressed itself by m. a sharp t. narrow-gut where
he set out to demolish: blinking, tangled up in his robes, scuttles aw. for t cat-his study
like a fright. cat for a hole

3) R = 15 71 – 1630 F.B. (1546-1601)
1609 1619

N = 16 48-17 27 = Ed. 1687 (45) momentum, F.
27/12 (quantity) momentum, D.
Lincolnshire
precise v-o-ch-v-v = differential cal = (instant) = d/t
(?) N did n take into cons any m t t obs pums might
be experiencing while he watch a mov. obj.

48	= ♁	60 Km
36	= ♂	221
30.8	= ⊕	225
25	= ♃	365.25
13.5	= ♄	686
10	= ♅	836
	= ♆	805
	= N	1476
	= P	1429.46
		29.46
		84
		3000
		4600
		164.80
		248.40

2) Nor was t not-t obs included when N def momentum (= quantity-motion) of a mov. body
expressed as mv, he thought of Rums as perf stationary

E 173 (1/2) 125 (1/2) 711,666 (1/2) 55 (1/2)
washing

C 18° (–) Röne = 3.6
1676 (1755) 145 (1672) 160
1905
310,5 AL. 300 34
36 AL. (3AL = .26) parsec 450 = AL 1'5
31,666 = AL 30" 3AL
A.E. 1879-1955 (Ulm Bavaria) mastered mind
Zurich has laboratory, pencil, paper, restless
2400 2000 AU 20 V = 1'
2333 Jet
Rocket

ante Meridiem Post (noon) 5) 1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) 12)
before
t first or sec crowing t cock
a literary Relic Morning Tide eventide noontide
sundial t. upright t cast gnomon (one who knows) hollow globe a marker bar flat disc
Egyptian obelisk like Cleopatra's Needle in Central Park NYC to a match stick
of much concern too accurately for a certain loyalty
to men who found t t sen a crowing rooster a reliable alarm for early rising upon calibration
2) improved to a high standard of accuracy w a slanting gnomon depends
well

3) clepsydra = (water thief) acquired an astron complexity
before it became outmoded int clay-t 16 Egypt Thebes
level

4) Ctesibius
a float lifts
a slender on top which w. secured a figurine w a pointer t ascend p. recorded t
as it passed over a scale-h marked on a perch column
Ct = contemporary Archimedes
geared mechanism
waste pipe
Pompey legal jargon bubbling
aquam dare (verb) = to allow t for speaking 2) ag. perdere = to waste W = to pack unnecessarily long
cert R adv w. tirelessly to t his own oratory freq found it neet moisten a beaker
Martial
muddy drunkard
to temper
to fat. 5) clepsamia = sandglass
refilling spell over
Fat. along wt a cylinder h-glass
friends, let us take another glass pulpit glasses
& inverted his sandglass forthwith
a 3' version

6) weight-driven train of gears
called a Clock = (cloche = clocca (Middle Latin) = bell
Gerbert: str. word "time keeper" = horologium
Benedictine monk (920) credited w. an escapement
1326-44 Abbot Wallingford
for at Albans
Henry 8 (1538) tower at W. minster Hall
former
tower of tools huge
horolog-gears
Jacquemarts = jacks-o'-the-clock
bracket cl-mechanism, progeny
Clock in Co 1631
Huygens (Dutch) 1629-95
gears
1642
(1681-73)
Metamorphic R → Magma → crystallizes igneous → sed (weathering) → sed R → Meta R

8) Dr Rob Hooke (1635-1703) introduced 1676 t anchor escapement, intend horuse in det. obs.
Thomas Tompion applied to domestic
9) George Graham 1715: deadbeat escapement, actual aret t anchor
elim t troublesome recoil. 10) a few later minor improv. 1900, pend cl was brought to a rest
11) Peter Henlein (Nurem) 1500 round shape watch. Clockmaker gear
deadbeat 1572 1/1 wrist W 1st cl
Geard-Jeweled gears & pinions
elim trouble true
12) Nicholas Facio use jeweled bearings
1675 charles II estab Royal Obs (Greenwich) long for perfecting navigat
act to G t
13) Philips
Sir Cloudesley Shovel commanded British fleet sutter. drowning in 1707
John Harrison (Yorkshireman)
Thomas Earnshaw, 1781
16) into a crystal-quartz unit circ-el clo
a top performance a quartz-may gain or lose 2/1000
17) 1948-9. t 1st successful atomic cl
at its apex
18) 1955 Dr Charles H. Townes col. Unc Radiation Lab: ammonia, Mdlt = microwave amplifier
by stimulated emission of radiation
19) Cesium cl. Dr Jerrold R Zacharias (Mass Institute of Technology)

6) ... tendency to wobble
BRD 1760
MSd
1844 USNO was est at W, 1865 began send t sig by telegraph 1904 by radio. turning in a Ra at noon
for obs t sig. MSd = artificial interval - t repr a mean - t being - all t sol d - t y
later 14'26" earlier 16'18" = S perod = apparent SN. MSD = 24h - 3'56".
Noon In fact, a local sd & loc cl = regulated to MSt agree only
1) t MSD = standard
travel air & rail
zones
Am t
650
30
tickung aw
jewel
Geo, aunt & M
NO
tell
meat
bennued
= noon Chicago = 12.13 Lincoln = 09 Louisville
11. Omaha = 41 st Paul = 48, Dubuque = 50 St Louis = 24 clear = 32
Fleming (1827-1915, canadian civ engineer, 1848-72 surveyed Continental railw 1878
W. Fred Allen (1846-1907) 1883, oct. 11 at a Central A'a plan
approx on lon - Philadelphia, Denver, Prairie, Eastern, Cen, Mtn, Pacific, Canada zone at
Maritime provinces 1883. Nov 18 = all railr cl w set to new st t at noon
perennial res to ch, t professional die-hards. Medievalists clergy denounc t unspeakable
tampering w t.: t ... w no right t interfere w nat-t sun (Rev Mr Watson) pounding an
old Waterbury w to extine ... on his pulpit. It's sinful en to ... t run their ... on
on t sabbath D. But now t want to interfere w t laws of G. Indianapolis Sentinel
... w bizarre not-Dst: I sun is no longer boss at t job. People ... of them - must ...
al. W as well as travel by rail. t The sun will be requested to ... set by r. t
make them cease by such ... magnates arrange. I excitement soon subsided, however
Czar Alex III called an Interna. M. Conf w convened at Roma in 1884, deleg. fr 26 nations
who met ag at W.D.C. 1884 Octo. Agr t adopt G at 0
E turns fr W to E:
Calcutta (90° E lon = 5:00 p.m. = noon Green = 6:00 a.m. Chicago 90° W lon
Cong. 1913. March 19
Ben Franklin sugg: retr ahead in summer
William Willett 1907
1916
conserv fuel
Letter, wrote to me

T most amaz qual-t liv organism a part fr t ~~stellgnur~~ - just lee, ist capac-a small
1) part t grow into a new whole. Host pl & many an., particularly t simpler,
soft-bodied K, readily reproduce in a purely vegetative manner. & fragme or buds
con give rise to larg m-individuals exactly lik t original
P produce ~~f~~ cutting is commonplace. M wor & some less familiar cr bud off long chains
-new end fr their hinder-end: some jelly fish grow new ones fr around t margin
& elsewhere. It is a basic property-life, though it is that is readily lost
∴ veg rep, alth it can prod lar local popul, is one-t variety t is t spruce-lofe with
2) ∴ In fact in most an only t rep cells-t ovaries retain t power. ∴ 2 rep. c. fr some in unlike
par fuse ∴ 2 splitting images ∴ introd a lit var ∴ sel can be made / can b4 = out fr b3 teased
& 1 make is distinguish fr an. even thoug t dif = puffling we choose t ort & 2 maintain a
∴ Art start t lab hab dir am those t store up reserves but stay put 2) t t move to int t
whosoever = minimum t) t oreg state - most liv things (An, Pl) seem to hav 2 sex 1.
ev end producing e & sperm. Yet to be much god t e ~~g~~ and shoul be t by 2-an
cross-breed = nec it t sys t lose much of hur value
There hav a ve-ad (unge) (An, Pl)
The common pat = t 1 t applies t hum, wher t prod-ert t e ots = supp dur t dev
it has its faults. it leav t mal far less uno int pr, competed for food & Comfort
(Shaw: H & superm. W = Nat Contrev for perf. H = W and ~~to fulfill~~ N behind
int m econ way. ~~Fig~~ serves to stimulate t otherwise comatose e to start
developing & to introd consider vari deriv fr t m fare
E alone t extr wit va, under cert circum readily develop
∴ mat organism = e dev w-add-2 ~~Very~~ e s can need t needs of a bree popula

(אין לנו הבנה מה הם מבקשים מאיתנו בדיוק)

whenever ~~ess~~ m become a nuisance they gen become red in n & in status
3) water flea, bees, ants, termites = societies - very long standing ~~the order a poy~~
≡ m will be pro only ac to need t master race or, better t mistress r, well-suit ~~their plan~~
overrun by emotionally disturbed supernumerary m. all this poking
pen at t stor, delv into t cells - downright dang. for whatever we K, we try to put to use
hence warning ag eat t fr t tree-K.
reve mainly for stud purposes & otherwise as a sort pet passing fr pillar to post

drones, Royal Jelly Hormone fed larvae
it stunted in their growth
& stop short of rep maturity: ~~x~~ ly inhibited maids-of-all-work or neuter
ept delayed Termites Helen Wheeler

2) סמוך אבל לא בדיוק אותו דבר. מלכת הדבורים, = כאן הלך. לפי ל"ב ל"ג. רק ל"ג (כמו-גלגל) הולך ומתרחק מעם
fish
veg rep = הפלגה ב"ל. אבל לא אותו דבר
ש"ל: הלוח הזה כך הפלה - Rep C ריטין סמוקה ל. ~ ש מוכן הכל אותם דבר ומאמצו לעזור כמה: אל אותם ומי - מבטאות
∴ סמוכין. - אבל כל מי שעבר ל אבל - מה נעשה בדבר המלכה, אבל אפשר הלאה, הם הלכו בלי לדבר מה.
בדיוק כמו שכ, כל ביטוי. סובבים אותה ל אל ב ∴ אל ל אל ל - הבנה. הנ' אינו מעוניין לדבר כך בדבר אלה.
אחר. אדם ואדם אחר (לא כאן: שם = בלבד לא לקום הכיון. H = הלאה אל לפי Behead מאכל
בדיוקים ידיעה שבוה הלאה. ליבר אינה נמצא, לאדה, אבל מאבד בלבל אבל מבט מעלה הוא אלוה בכל
כל הבקר לאדה בל מבריכה שבה נמצא לא כך קצת מבט ! ∴ מעלה בעל שעה ואחר ∴ מעל, ודאה, אינו בקר לתקבלאה
יש לו בלבלבל בל כל אבל מה מלכה בדיוקים, מאלוה = מבלבל לבריאה, לא ריבון. shrimps:
הסיבה לדבר בישוף, הבריאה אחרת שלה. לא רבר הקונטרולס ראשון אחר לכל המין
(בשלוה כן פה, אבל = נגב. הא מסכן לדר בקבס אין כאוס אז בהיאות מסבלת הבטות לשהו ל' בלבלה נוכחת לדעתב
∴ תמונה ראשון בשלוה. יחיל מי יאלד. נבקש. שו שם — ותראה. אשר אפו לדר נקבר ל, - ל' מעשה לדר מגנים
לא שיל ל. קבוד לאיים ל ל. בדם ימין. אבל אחר לדבר בכל ש. אינו מיבלבלים הבדל בקרבם עם המינים סמוכים
בל דרוקים ל — דרוש בבלבל ל בוסף ל. אין אחר לבסף - ל דלפני ל-מעשה פרטים
אל הבולם מלאל מין לאין back & ver
Oyster & other inactive mollusks
variation. בלמן ל אפרה = מקרים לאינים ∴ מבלה שינוי. ירחוק
t lesser fry מלבד שמים אינם
as clear a case - feathered bedding as קבלה בלבל = ירדו ל
left over fr t age steam אינו נעשה לא
t pride before t fall
All in all, t pr = complete but the
2) veg repr. Soft-bodied on buds
3) t crustacean water flea, sweetly known as Daphnia
t soc = unisexual. Parthenogenesis = t rule
t-produce
pond, lake, puddle
spoil in not
else alarms
t vestal ~~v~~ go on br as bet - part-tically & t rejected m hur no prop ag ve ducks to perform
it cond go fr bad t worse, t be t turn and sweet pr. e which must be ter
drought or frost & return - before t dev & renewal
seeds
4) Certain shrimps
many cases within t ann K - hermphroditcrat bec first ♂ & then ♀
but non where t revers is true
rather inactive mollusks
5) a reg sw fr 1 ♂ to an ♀ back is well known among oysters & some of
m & ♀ phases succeed 1 anot ev few months. so that all fert e = prod-ert par
6) t hive bee t qb. mates ur a m. but once (only on her nuptial flight ∴ all her e destined t b ♀
= ♀ fr ♂ acquired on that occasion
7) scorpion, some spiders
8) praying mantis even jumpe t gun & usually begins her meal while t head is being
in any br commonly, starfish, seals. a few
Bud Nature = both prolific & profligate & superabundance - ∴ means lit. as long as ap t fert

rate-t planet's circle-S/rate-spin abt its axis

an oddment needing an extra quick step or 4th y.

Aesop's tale: hare & tortoise — Hare runs on a principle — fast goes long stops

overconfidence

they get more liv-t than t long-liv tortoise, or a slow-wetted sloth

However lt is meas., how long it lasts depends on both h & t cond. burns chme these

ment = much more wated than that — any other crea. gen rule: t smaller, t shorter & faster their t. elp, whale = 20y, Hp = 40

unique in certain subtle ways

enough often t cues

= take-n dir for t reg Cony-plan & solar seq = ready made Cl.

7. fireworms — West Indian Reefs/4 wake at dawn 13 at dusk bats & fireflies

for t first few nights following t full Moon !! Sunset

tryst ethereal living all is dark, & t

1) slice-raw potato has a reg 24-h rise & fall in its rate-resp 2) certain single-cell org

Cockroacher, scuttle just as regular warning cues

Fore & Moo

to adjust apparently in tune

at t very start too close for life

to evolve on

to run on t cycle tuned to t local-pl we left

to reset (בשם ל) t-הבדל

Catnapping

knows enough to be bored

t Whole-t other phase

t-conscious

stored, imprinted for total recall until senility blurs t record

2) to gain access to it = and mother

reflective thru = record-past exp = helps ag t face

G.B.S

egg-layer

Roc-t Arabian Nights

gallery lard

מעפלים

2 m. massive as a Brontosaurus

3" = (2000.a) 6" a) however can we travel speed satellite orbitting 17 = 30 km/h = 120 km/h

50a) 17 = 50 km/h, 3500 a) 3" נשמר מעל פנים אדמה 4.3 AL

acc deceleration

Whole W prop. = incr at t.r. 125 ⅓ ∴ 400 $

b) h.m. can we transport. we need s-egy-fuel to remove 1 kg, but t supply-t has to be acc too & this again req more et

Nuclear electrons & equipm needed to st conthrust = cond & mass.

that t. vr rocket-reach. t val P (Power-mass ratio) attained in combustion rock

on pl 6%-all stars. 18.6 AL = (3.09×10^13 km = 1p = AL 3.26) - 5.6 parsec

Andromeda = Y

E = mc²

Rocket 1600 AL

positron-Electron, proton-Antip

nuclear fuel

2) H reactor

Wag: hangup, you dial

Dr Frank Drake

C.W. Virginia

Peri common t order t Dolphins

Sensat & mental life

G quarantine reg

using 1 molar at a t in line as t previous set wears out.

how can this x be made to contr for a mu lon t cutting out rate-t?

(a tree accum all its yeat in its heartwood not too dt t t mann which a coral reef forever grows upon t dying & dead reat skeleton) 2) t dur-life may depend on sec ques. can crop & chew pl

when they = ground down t gums. dea by starv puts an end to life

Enamel & denting alt alive = so densely crystalline & so slowly replaced that what is initiaty formed is practically all that will be available incr t lif span for a t. mu vast tee pres a prod. Rough t y & you d t wear, that is it t is rem. still left to be worn

Grass is so abrasive t t excee lon grind to wear d in less t 2 decades

? is no room for longer t nor can t be made harder

they employ Elep resort to a trick! t stand equip

4 gum in ea sed-t up & lo jaw, in succession ins all at once

digital computers

to lose capacity soon after exposure t formal education though

2) turn it about it subhuman

a feel. mus wrap in a bony skull

aware. our mental lim supple w restr & censored kind sensory unx

Goodness t ⊙ = some need-respite for t att w/ hub giving it

red sequoia = 3000a. giant tort = 140a. To start with this t matter-sheer wear & tear

lit liv not by endur but only as long it cond to replace itself

its pl & then giv way to new. T. flow = life. rate of = t mean l. fast at first & then slower

scum-crop

sat orbits 30 km/h = 125 g to nose-tot ground

4a3AL . 125 g/h

decayed

m.makes =

Lafuit (Dean Swift): מרגלים טרקלים

Phobos Deimos

Asaph Hall

Kear, Hence

gulliver

first

alpha ers t cank to shrane

recycling-t elem. of dust to dust

our entrance into t space age = successful orbiting - Sputnik I. 1957.10.4

9

Fenr. Vodin Thor Freya

trah

handbook

Philolaus (Pyth.

Herakleides

Eudoxus

mentor, Wetler

int Pl: [illegible] 7°, E P. K [illegible] . int Conj = [illegible] ☿

Ψ_e = [illegible] (line joining [illegible]) 26° 38 18° [illegible] Elongation [illegible] d_a

Π ∴ ☉ radius vec ⫽ line joining ... line-nodes, at a give n = (in 13a), (Comet 7a, [illegible]) [illegible] sid P = 88 d, syn P = 116 d | 60%, 40%

coincide w Π' line-nodes

[illegible] ∴ max T, min T (int W)

[illegible] = Mercury, [illegible] = Apollo | ∅ 5000 km, Π = [illegible] (A = 79) ∴ 60) | [illegible] 20 [illegible] 60 kg

[illegible] C, [illegible] = GE, [illegible] C | return [illegible] | int C = ☉♀θ | GELE ☉ = [illegible], GElW = [illegible]

m = 1/24

apo = away fr, peri = near to [illegible]

ge ecc ∴ libration in longi > ± 23° (= area "twilight zone"

[illegible] 100° [illegible] ∴ [illegible] | 3°24 = incl. [illegible] ecc ∴ [illegible] int Conj ♀

[illegible] (NASA) [illegible] 38 [illegible] Mariner II : 12/1962 | ∅ = 13000 km 500 | 43' = int Conj | = 36 km/s

[illegible], int C [illegible] | Dens = 82% | sid = 225 d, syn per 584

[illegible] | Mas = 85

[illegible] | surf gr = 84

7.6.2004 | 5.6.2012 [illegible] 243a [illegible]

1877: [illegible] canali = rut, groove, ice caps, [illegible] | 24h 37' 22" [illegible] | ∅ = 7000 km > ½ ☉ | Π = 214 A = 260 | 687, sy 780 d (24 km/s)

Percival Lowell; ∴ Asaph Hall | incl = 23° 5' Huyg 1659 | m = .108, sg = .38 ∴ 38 [illegible] | orb ± conc ☉, ∴ d orb = 583 [illegible] opp 150, ev 15a 17a

Phobos (fear) 1910 [illegible]

Deimos (Panic) 30h 18

1772 Johann Elert Bode: | 0 | 3 | 6 | 12 | 24 | 48 | 96 | 192 | 384

m/10 = mean d Pl-☉ | .4 | .7 | 1.0 | 1.6 | 2.8 | 5.2 | 10 | 19.6 | 38.8

~~[illegible]~~ [illegible] Piazzi 1781 ((cometa) Cereal 750 [illegible] ...

Karl Fr G [illegible] mat met - det orb fr 3 obs & method of least squares ∴ unt fr Piazzi predicted Ceres

Dr Heinrich W. Olbers, 31.12.1801 ∴ aster (star) oids (similar to) [illegible] > 1600 planetoids = [illegible] inc 0°–58 (2a–12a) ☉ [illegible] 30000 [illegible]

a few y ago, [illegible] detected radio-emiss fr ♃ many [illegible] detectors are presently "zeroed-in" on ♃ | [illegible] L = 1°3, [illegible] 11a 86 | ∅ eq = 148 km = ∅ p = 138 = 1318 ☉, D = 1/4, m = 318 (24 [illegible]), sg = 2.64 [illegible] | 766 – 843 | 13 km/s ♃

to record t sounds for interpret of their message content

Sm bel, t staticbursts originate in fierce storms gener in t turbul upper At – elec stor beyond our present search

[illegible] 1914-52 (m 9-12) [illegible] 4, 1610 = (4000 – 3) [illegible], ∅ = 6000,560 [illegible]

[illegible] - Cassini division = 366 [illegible] | 10h 14m, 29a5 | ∅ = 125 km [illegible] = 113, ∅ = 760 ☉, ∅ = 48, m = 95 [illegible] | 1475 – 166

[illegible] ring = 365, 30 = B, [illegible] Clerk Maxwell [illegible]

[illegible] 1905 [illegible]

Themis, [illegible] Phoebe, L = 10° [illegible]

[illegible] (Pl ∴ [illegible]) [illegible] 13, 3, 1781 [illegible] U

Georgium Sidus [illegible] Asteroid Belt [illegible] Bode [illegible]

Bode: Ur. [illegible] | 10h 45 | 84a (0° 46) | (d = 1333 km) [illegible]

Ritom 98 eq [illegible] oberon [illegible]

Leverrier [illegible] Bessel ∴ [illegible] 1845

"its own beat" L = 47 165a (5 km/s) [illegible] 4666

P. L. Flagstaff obs. 21.1.1930 = sat escapes to patrol | R [illegible] C [illegible]

[illegible] 30" ∴ [illegible] 1/5 = [illegible] 100a [illegible] 1/100 = [illegible] = H

[illegible] = B [illegible] 3 = A [illegible] 5" = [illegible] 1½ ...) [illegible] 5 [illegible] F

[illegible]

[illegible]

I best w can do is to constr models t will mol acc for things as they are.

I one t acc for t most – t pres peculiarities, t introduces no incongruities & makes t fewest initial assumptions, will be t most widely accepted, to be displaced only by one t could say – anyt y can do I can do better

U.S. National Radio Astronomy observatory in West Virginia

Radio Telescopes hv already been listening for possible signals fr t nearest stars. Dr Frank Drake hs inv an example – t sort-message which might hv arrived fr outside t Solar Sy, consisting of 551 zeros & ones

"Periodic Communications of t Order of t Dolphines"

= 29×19) a) rectangle of 29 [illegible] of 19 spaces, fill in each a corresponding to a figur 1 & leave blank t corr to zeros. b) rec: 19 [illegible] of 29 sp. ...

11100001010010000110001000000010000010100. If not ever comes through, What then? Perhaps all we can say that it was fun while it lasted & recognise t fact of our isolation

matthem) N J. Berril World Without End – you & t Univ G quarantine Regul

a rexe on Pl, life, & t

+23° =	–5 =	–4	41°F =	5°C =	4°R
+14	–10	–8	50	10	8
–4	–20	–16	59	15	12
			212	100,	80

Exobiologic Program

subcellular (e.g. molecular) lever. cybernetics (environment BP) (behavioral BPH) Physical B

where t'n goes, biol, like t sheep, are sure to follow.

South Sea Islands Chain, or corals contain wit their tissues innumerable sing-c plants (treely kind) abundantly interlock their melab w that t hosts

pl flourish by its: 1) t waste, 2) ammonia & urban exp & at t same t give of O as a byp-t (phosy c-ant to t internal resp-t an tus) & some carbohydrates & goat is had by all, altt mut, rature may not be eq. fly, dozy, g = some t happens, not merely a & w

like t str-course itself t whole org, w a cosm kind or not is truly a streaming in-unorg zel simple raw material, wh take t pl momentarily in an infinitely complex liv mac & displac washed shortly gone bef t - as though new le were pr into place in a tat-d by hence as fast as old liv were slip out-place. : any serious inter-input-any kind or block-output quickly

leadstad & dest : plans & experim proceed to define sys wit plastic sp capsules w a sum k-pl lib free O & cont w C dioxx = a pl-an metabolic sys w everyt goes 2 2 r = symbiosis

need a total leaf surf > 15 sq yards (vacuum) pr radiat

panoply

t reality lethal shortwave UV astab byo

t O mol-high alt, abst UV ex & a trans-t into a belt-ozone wt process

t Geiger counter

Van Allen belts - coar trap wt O mag F. = intense ast-o compl overhelm, blankout

1) 833 km - 4111 km 2) 20 - 83 = x-rays : solar flare

upheavals

quiet sun

clean as grazing hut

Dr. Reynolds sug: gastronautics

Lowell

What we need is not short spec ont mean-t km tacts but more t spec on

algae

lichen = comb fungus & alga

broth

virus, protozoa

take

there's t rub: how t life a-y supply steak (en pulla = eff m se tec)

maverick who pays t piper, calls t tune hopless 1950 capa cont prot mnc

fat

fattent raw like a strawberry goose

NASA will keep up t sleeve as hust hust se wither t t put dom when it below, t

Orbiting Sat - Explor & Vanguard

Get Propulsion Labora

stillbor kt t start

JPL

Sunwarped

Harnessed to V - Harn 1 - 1000 lb

could be rent

dizziness

you've got hold of t wrong side - t stick

Arthur Clarke

methane, ammonia, C dioxx : mess

a marginal kind of life

some lichens feed: they secret acids that dissolve rock

mushrooms, toadstools. Amoeba engulfs its food, slime mold

Jellyfish = 98%

algae

Nostoc kind

spores

Life on O, in its primary form, was sup to come in such a sound

This theory shelved t quest w and it

Echo

solar sailing

Saul

Rudder

coasting away

or such S.S. might miss t

route - t short trip, t t M, serving as trey check & reporting t fluctuating radiative & meteoritic hazards

cosmic climate. Cuiquer & Sacd Alice

68%

(scales feathers & hair, skin) = protein ant = water proofing

purpose t V

(m, main, bu, amph, bout, shark = 7)

carbonat ker

invert start lamp shell, coral, jelly fish = 3

cambria = 600 m

Arthropods (ins, crustacean, spider) = 5

Pre cam no fossils

(mollusks worm / sponge = 1)

remold = h-drawn car = aut (substeng for)

machine = nat type preadapt (ins and stor

centipede (act has ab 100 - legs) millip

will-o-the-wisp strangers. conducive, baleful cuddle

Diana makes us giddy

lanterns

lamprey

Rad fat

horses, huge like skins

devoid of At

Tycho radiates (Cop, Aristarchus)

(meteoritic or volcanic origin)

extinct

354 h

solar

upheavals

quiet sun

clean as grazing hut

Lowell

broth

virus, protozoa

take

there's t rub: how t life a-y supply steak (en pulla = eff m se tec)

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fattent raw like a strawberry goose

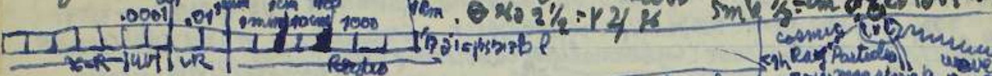
NASA will keep up t sleeve as hust hust se wither t t put dom when it below, t

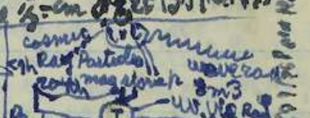
demagen East [illegible] meet bulnag W [illegible] H.G. Wells: [illegible] g.

an gen weaned on W. Edgar Rice Burroughs [illegible]: Tarzan [illegible]

F`g = t most fundamental in t U & t least understood 1/6 [illegible] 1/4 = [illegible] 1/8 = [illegible]

[illegible] 2 1/2 = [illegible] sm k 1/3 = cm [illegible]





[illegible] gets called on [illegible]

[illegible] 33m [illegible]

think well in cert ways & our most serious limits = those we cannot discern only

Haldane expr his susp "t t U is n only queerer t we sup, but qt w can [illegible] mind can tho

[illegible] Cues [illegible]

one's nose [illegible] to appendages [illegible] (keep even keel) [illegible]

for locomotion

fore-aft deck-keel [illegible] = awareness

port-starboard [illegible] sensitivity evolved as q gaul

to [illegible] w/ environment this pervading [illegible] primeval [illegible]

virtually all t [illegible]

[illegible] cornea [illegible]

layer [illegible]

[illegible] = versatile

malleable [illegible] frog tadpole teeth [illegible]

they simply [illegible]

trigger an escape reaction [illegible] mantle [illegible] scallop [illegible]

& hv noth todo w brains [illegible] (turret) [illegible]

[illegible]

taste-bud-covered filam droop fr t lower lip & t.b. along t sides - his body = catfish as well

[illegible] morsel [illegible]

[illegible] R [illegible]

[illegible] 10 [illegible]

[illegible] coiled [illegible]

cuticular [illegible]

albatross: gr glide, rare flap wings → humming bird's beat so fast t a blur is to be seen → moth, bee → midge > 1000 beat/s [illegible]

[illegible] man-o'-war [illegible]

[illegible] reels [illegible]

[illegible] adept get [illegible] R [illegible]

[illegible]

[illegible] whizzes [illegible] booz [illegible]

[illegible] upright [illegible]

dry outside made [illegible] wet [illegible] g [illegible] 400 gland whale

eye [illegible]

hand brain [illegible]

3 [illegible]

shrew = [illegible] trip over thud [illegible] (dray) [illegible]

[illegible]

[illegible] a lag [illegible] follow the [illegible] gorborne [illegible] metabolised [illegible]

[illegible] R [illegible]

[illegible] beak [illegible]

[illegible] pollen [illegible] = (bud leaf seeds) [illegible] stamens

[illegible] leaves [illegible]

[illegible]

evolve [illegible] evolve

(roundab [illegible]) [illegible]

[illegible] cont floor - abyss [illegible]

[illegible] (Bathyscaph) [illegible]

[illegible]

a sort of catch-as-c-can coexistence decay [illegible] squid = [illegible] seapen [illegible] all level [illegible]

swarms in enorm. schools [illegible] (clam snail [illegible])

[illegible] 25cm [illegible] 8m [illegible]

[illegible] a gr beak to boot [illegible] suckers [illegible]

[illegible] dinosaurian [illegible] unseen

ichthyosaur latter [illegible] rubber [illegible]

[illegible] Rep [illegible]

[illegible] drab [illegible] coral reef 30m [illegible]

[illegible] (porpoise W) [illegible]

[illegible] skin diving [illegible]

[illegible] bladder [illegible]

[illegible] Z = [illegible] 1

[illegible] gapes [illegible]

[illegible] Layer [illegible]

[illegible] light organs [illegible]

[illegible] glow a tell crag (to or toe) [illegible]

w gather event faintest glow

lure light-attracted pray to themselves by emitting live light algae [illegible]

morsel [illegible] akimbo [illegible]

stalked sponges sea skirts, luminescent seapens, ooze [illegible]

[illegible] urchins [illegible] burrow [illegible]

shelves shallow [illegible]

[illegible] 30m [illegible] continental [illegible]

[illegible]

[illegible]

[illegible] molds [illegible]

[illegible]

[illegible] purple [illegible]

[illegible] bilateral sym [illegible]

[illegible] drab like [illegible]

nerve-ring [illegible]

var = haphazard [illegible] R [illegible]

[illegible] evert [illegible]

[illegible] anemone

everted urchin urchin 30cm spine

stray (scallop [illegible]) aqualung, snorkel, vertigo, barracuda, glossy whale

Astrono. Jur & Soc Aca

CTA-21

CTA-102 Calif Inst Tech

Sternberg State Astr Inst

to draw attention to thing

confer on extraterrestrial Cu
fall 1964 at t Burakan Astrphy
Obs: indet poss tech for interce
ting signal from W

only a few yr ago to raise
such q. W so far as sc repect
va concer, hrb suicidal,
yet in 1959: t grant,
Federally owned t Nat
Green Bank Project Ozma
be aimed at 2 nearby Star

∴ Nov 1961 Meeting at
t Nat R-y Ob-y in
Green Bank, W. Virginia

Conveneer: t Space S Board
of t Nat Acad of Sc 2 P.T.
Subj: Intell Extra terrestrial Life
Melvin Calvin: N. Laureat
2) J.C. Lilly. Dolphin
Scot

t concept .. has been a dying

Sir Bernard Lovell dir at Jodrell Bank in England
Daddario
1962.3.22 הקר? אמנו
Connecticut
Harrison Brown Pr Geol (Col Inst Tech):
Ozma
1962 Journ
Pearman
"Extra terrestrial Life"
Dolphin
Dole 1964

35

מר שושני

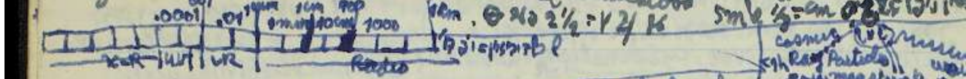
מחברת 35

ARC. 4* 2076:01:13

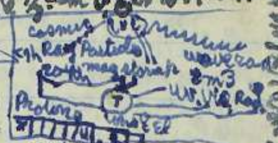
denizen Eozoi [illegible] macct bulugll [illegible] H.G. wells: [illegible]

an gen weaned on W. Edgar Rice Burroughs: Tarzan [illegible] ¼ [illegible] ¼ = [illegible]

F g = t most fundamental in t U & t least understood 5m [illegible]



1km, [illegible] 2½ = [illegible]



15 [illegible]. gets called on [illegible]

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[illegible] morsel [illegible] R [illegible]

[illegible] ABC [illegible]

[illegible] ABC [illegible]

[illegible] coiled [illegible]

cuticular (x) [illegible]

albatross: qr glide, rare flap wings → hummingbird's beat so fast t a blur is to be seen → [illegible] moth, & bee → midge > 1000 beat / s [illegible]

[illegible] m [illegible] - man-o'-war [illegible]

[illegible] keels [illegible]

[illegible] adept get [illegible] R [illegible]

[illegible] whizzes [illegible] buzz [illegible]

[illegible] upright [illegible]

dry outside make stays wet, etc. [illegible] 400 gland whale

eye [illegible]

[illegible] brain [illegible]

[illegible] [illegible] snouty [illegible] drag [illegible]

shrews = [illegible], trip over, thud [illegible]

[illegible] (I) [illegible] follow the [illegible] [illegible] a log [illegible] [illegible] maintained [illegible]

t-up [illegible]

(II) [illegible] R [illegible] [illegible] beak [illegible]

[illegible] pollen [illegible] (bud [illegible] stamens) [illegible]

[illegible] larvae [illegible]

[illegible]

evolve [illegible]

(III) [illegible] (roundab. [illegible])

[illegible] (Bathyscaph) [illegible] ocean floor-abyss [illegible]

[illegible]

a sort of catch-as-c-can existence [illegible] decay [illegible] squid [illegible] sea pens [illegible] - all level [illegible]

swarm in enorm. schools [illegible] (clam [illegible]) [illegible]

[illegible] 25cm [illegible] 8m [illegible] dive [illegible]

[illegible] - a gr beak to boot [illegible] suckers [illegible]

[illegible] unseen [illegible]

ichthyosaur letter [illegible]

[illegible] A o Rep [illegible]

[illegible] Z 36, drab [illegible] R. coral reef 30m [illegible]

[illegible] -hull [illegible]

[illegible] bladder [illegible]

[illegible] gapes [illegible]

[illegible] R [illegible]

[illegible] light organ [illegible]

w gather event faintest glow [illegible] live

lure light-attracted prey [illegible]

morsel [illegible] abyss [illegible]

stalked sponges sea skirts [illegible]

[illegible] burrow [illegible]

shelves [illegible] ABC [illegible]

[illegible] R [illegible]

[illegible] copy [illegible] molds [illegible]

[illegible] purple [illegible]

[illegible] radials [illegible] bilateral sym [illegible]

[illegible] (hunt) [illegible] dead like [illegible]

[illegible] vage = haphazard [illegible] R [illegible]

[illegible] everts [illegible] anemone

everted urchin urchin zoom spine

stray (scallop [illegible]) aqualung. snorkel. vertigo. barracuda. glossy whale