2.02,.67, 2.02,0,533, -.38,
-.24, -.06,.08, -.21, -.34,
-.23,

199211, 4.26, 37.5,
2.39, 2.39, 1.74,
2.39,0,783,.69,.15,.13,.53,.13,-
.1,-.1,

199212, 3.35,
28.5,2.2,2.2,.17,2.2,0,
1069,.14,.54,.15,.66,.14,.07,
-.28,

199301, 2.69, 25.8, 1.83, 1.83,
-.43, 1.58,0, 1158, -.17,
-.11,.35,.12,.19, -.02, -.29,

199302, 2.72, 17.7, 1.69,
1.69,.14, 1.43,0, 1232,.16,
-.14, -.08,.13,.41,.09, -.

199303, 4.66, 30, 2.4, 2.4,
2.66,2.4,0, 1019, 1.08,.87,.59,
.4,.79, .3, -.14,

KOKON ILMAN ISTU-
MIKSI."

SANOI KOKKO, IL-
MAN LINTU:
"HYVINP√§
SIN√§KI LAAIT:
HEITIT KOIVUN
KASVAMAHAN,

Wildwood River Press
wildwoodriver.com

origin of birds
2014 by Kathy McTavish
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With love to Sheila Packa — I am thankful every day for her poetry, inspiration, artistic insight and loving kindness.

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5

origin of birds

196402, -2.64, -2233, -2.47, -2.47, -.99, -2.28, 0, 88,

196203, 2.82, 21.7, 1.82, 1.82, -1227, -1.05,

1.82, 0, 1263, -.24, -.37, -.24, -.94,

1966, 3.45, 34.3, -2.13, -2.13, .27, -.08

1.77, 0, 901, .11, -.24, .14, -.18, -.59, -1.18,

196202, 3.08, 28.8, 1.35, 1.35, .85, -1.8738, -.526

1173, .53, -.41, -.71, -.54, -.11, -.3, 1.71

196404, 4.11, 43.8, -1.45, -1.45, 1.39, -

5.0, 618, -.72, .53, .17, .82, -.21, .71, -.82,

196203, 2.26, 34.5, -1.31, -1.31, -1.75, -2.27, -196

196203, 2.2, 33.2, 1.26, 1.31, 1.64, 1.78, -2.21, -2.21, .4

1.81, 0, 917, -.09, -.47, -.52, -.81, -.94, -.54

1.81, 0, 917, -.09, -.47, -.52, -.81, -.94,

196205, 32.01, 58.9, -2.29, -2.98, -2.29,

14, 207, -.32, -.31, .42, -.67, .6, -.93, .71, -196

-.86, 196302, 2.04, -1.81, -1.81, .71, -196

196302, 2.5, 56.4, -2.28, -2.28, -.9

196204, 3.88, 44.7, -1.36, -1.36, .79, -

.97, 0, 358, -.53, -.27, -.27, -.87, -.58, -.51

9, 0, 558, -.53, -.37, -.11, -.27, -.87,

196406, 196306, 2.1, 2.88, -2.88, -2.45, -2.88,

54, 63, -1.88, -2.21, -.97, .53, .72, -3.66, -3.66, -4.

-.89, 1.95, 2.02, -1.37, .96, 196

196205, 2.09, 57.4, -2.11, -2.11, -2.69, -

196205, 2.08, 57.4, -2.11, -2.11, 2.69, -.07

2.11, 4.306, -1.32, 1.48, -1.08, 1.88, -1.13,

2.11, 4, 5830, -1.31, 1.69, -1.08, 1.61, 1.5, -2.61

196407, 3.49, 70.4, 23.01, 23.01, 44.28, -2.73, -2.73,

-.94, -.542, -1.26, -.31, -.199, 196

3.01, 176, -.187, -.99, -1.61, -1.04, -.17, -.58

-.85, -.99,

196206, 3, 65.3, 1.96312, 2.42, -1.958, -2.42, -3.06, -1.

68, 48, -.65, -.31, 1.49751, .21, -1.06, -1.12, 196

196408, 3.08, 63.8, 23.08, 23.08, 1.42, 23.08, -.48

47, 76, -1.42, -.75, -1.261, -1.061, -1.23, -.6299, -

1.06, 196401, 3.61, 24.8, -2.39, -2.39, 196

196207, 3.36, 66.1, 22.36, 22.36, -.55, -2.36,

196409, 1.74, 59.1, -3.86, -3.86, -3.29, -3.86,

14, 164, -1.75, -1.98, -1.55, -1.74, -1.43, -1.25, -

4.24,0,658, -.82,-1.48,-1.18, -1.1,-
2.03,-2.51,-1.52,
2.36, 88, 36, -.43,-.7, -1.3,-1.05,
-.54,
-.06,
-.17,
196202,
-3.08,
20.8,-
-1.35,-
-1.35,.85,
-.87,0,
-.7

PVSLVSHELLYT
PVSLKVSRETTVS
SELVVSLLE MEREN
SELVSLIE,
200,
TAKKE, LILE LAINE-
HILLE,
NOITA TUULI TU-
UITTELI,
MEREN LVSTKKVS

DYNAMICAL SYSTEMS ARE CHAOTIC WHEN THEY ARE HIGHLY SENSITIVE TO INITIAL CONDITIONS

edward lorenz: **CHAOS —** when the present determines the future, but the approximate present does not approximately determine the future.

dynamical systems are classified as chaotic when:

they are **SENSITIVE TO INITIAL CONDITIONS;**

they are **TOPOLOGICALLY MIXING;** and

their **PERIODIC ORBITS ARE DENSE.**

the requirement for sensitive dependence on initial conditions implies that there is a set of initial conditions of positive measure which do not converge to a cycle of any length

TULI TUHKIA LVS-
JVSNEN,
KOKO KUIVIA PORO-
JA.

SAIP' ON SIIHEN
LEMMEN LEHTI,
LEMMEN LEHTI,
TAMMEN TERHO,

IF LOST ONLY MEANT MISPLACED

BY SHEILA PACKA

at breakfast we crack the brown
eggshell on the rim
slice a pear at the table
with companies corporations alliances
species of petroleum
fracking and sulfide mining interests
radioactive waste
drink fair trade coffee —
think of the dark crows that bathed
in the roadside puddle of melted snow
yesterday was only iron
was only the beginning of extractions
while rivers empty their mineral breath
in the mouths of the lakes
layer beneath the spell of ice
on the bottom uneasy sediments
currents that might not rise
with tomorrow's thaw
news calling in the distance
while mothers wind the hair into braids
fasten the ends before the buses come
to bring the children to school
and back before the disaster
of lead or arsenic or benzene

origin of birds

before the silver mirrors of the water
shatter and fish descend in spirals
tainted with mercury
as the clouds redraw the shorelines
on the map as the governments
as the floods acts of God
after the fifth, sixth day of creation
on the phone calling him back
to repeat, to repeat, can't rest
without restoration on the map
without compost and tearing
down cardboard for recycling
while geological surveys mark the veins
to start mining then drilling
destination and departure
now a bare pipeline across
the farmers fields
trains rolling under the sunrise
burdened with freight
like the cars going over bridges
reinforced with stronger plates
contingencies in place
for spills in the waterways
as a new child tumbles into the world
whisked of wilderness
and another and another quick and along
the north road broken by the cold

lit with the sun, lined with the spires
of a forest that rises from the fallen
trees and casts its cones to the ground
in the tangle of roots in the tangles
of wings and nights that sync
with realizations a grandma sings
among other waves electronic
garbled messages from the solar system
from the bank, from the credit cards
from the garage and devices
lines in the factories
digital images, zero sums, satellites
detecting emissions from the deceased
side-effects named in advertisements
moneyed transactions that flare and backfire
among the tendrils
need repair, parts new and used
and fuel enough and not ever enough
for everybody to wander into new places
listen with instruments
record data and histories and make graphs
while maiden hair ferns wait
under the snow's crust to unfurl
their fiddleheads in sympathy
with wind along the ridge with acid rain
and memory of bareback rides on the mare
who grazed behind the fence

origin of birds

as the mother puts down her comb
turns out the light goes to bed
lays in the earth and her children bring
home new oppressions
measures to be made equal, to be hard won
scrubbed clean
to open all doors and windows
to fresh air music outside
the bloom of spring and boom
and sizzle of the fire
savor the grapes going back generations
on a quiet hillside contemplate stars
shining in the distance
consider companies corporations alliances
of bread and poetry and backyard gardens
people for nontoxic possibility
babies safe and strong
looking for the gift to give
replenishment — for the species

1.44, 1.34, .66, 1.1, .01, -1.05,

200007, 4.43, 66.1, 2.77, 2.77,

1.89, 2.77, 110, 26, .63, .81, -.51,-

1.06, 1.43, .83, 1.31, 1.23, -.59, -1.23,

200008, 3.69, 66.3, 2.72, 2.28, -2.25,-

2.72, .7, 2.72, 116, .93, .31, .35,-

-.03, .26, .59, 1.3,

200009, 3.6, 59

2.72, .8

-.02,

200010, 2.32, 49.4,

-.49, 2.01, 0, 438, .66, -.51,

-.48, .4, .16,

-.72, 1.18, 0, 726, .22, .08,

-.75, -.15,

200012, 3.63, 21.6,

1.83, .62, 1.41, .01, -.84,-

-.12, -.51, -.28, .59, .63, .49,

origin of birds

KALEVALA

TOINEN RUNO

NOUSI SIITVS

VVSINVSMVOINEN

JALAN KAHEN

KANKAHALLE

SAAREHEN SELVSI-

LISEHEN,

MANTEREHEN PUUT-
TOMAHAN.

VIIPYI SIIT√§
VUOTTA MONTA,

AINA EELLEHEN
ELELI

SAARESSA SANATTO-
MASSA,

origin of birds

MANTERESSA PUUT-

TOMASSA.

ANVELEE AJATA

TELEVI

PITKEN

PVSVSTVSNSVS

PITVSVT:

KENPVS MAIJA

KELVVSMVSHVSN

TOUKOJA TIHIT-TVMVHV$N?

PELLERVOINEN, PELLON POIKA, SAMPSA POIKA PIK-KARAINEN, SEP ON MAITA KALVVMVHV$N,

origin of birds

TOUKOJA TIHIT-TVSMVSHVSN!

KYLVI MAITA KYLY-HVSTTELI,

KYLVI MAITA, KYL-VI SOITA,

KYLVI AUHTOJA AHOJA,

PANETTAVI PAASIKOITA.

MVSET KYLVI

MVSNNIKVOIKSI,

KUMMUT KYLVI

KUUSIKOIKSI,

KANKAHAT KANERVIKOIKSI,

origin of birds

196402, 2.64, 2233, -2.47,-2.47, -.99,-2.28,0,
1.75,0,584,-1.23,-.47,-.97, -.87, -.49, -1,
-.76, 196302, 2.18, 17.1,-1.37,-1.37, -.91, -.99
196403, 3.45, 34.3,-2.13,-2.13,.27,-
1.77,0,901,.11, -.24,.14, -.18, -.59,-1.18,
196305, 3.04, 54.2,-1.81,-1.81, -.71,-
1.81,3,291,173,.38,-1.01,-.18,-1.14,-.53,
-.87,0,-1173,.53,.21,-.11,-.71,-.54,
-.78, -.97,
196404, 4.11, 43.8,-1.45,-1.45, 1.39,-
.5,0,618,-72,.53,.17,.82,-.21,-.71, -.82,
196203,2.26, 33.5,-2.21,-2.21,-1.78,-2.21,-2.21, .4
71,45,-7.46,-1.04,-1.45,-1.56, -.87,
196405,3.17, 58.1,-1.09,-1.09,-.29,-2.98,-2.29,
-.89,-1.05,
14,207, -.31,4, -.39, -.67, -.6, -.93,
196305, 3.04, 51.8,-1.81,-1.81, -.71,-1.8
-.86, 196307, 2.5, 56.4,-2.28,-2.28,-.9
196307, -.87,
196204, 3.88, 69.81,-2.61,-2.61, -1.5,-
2.61,199,3,-.68,1.23,-1.16,74.47,-.81,1.39,
196406,3.30, 44.7,-1.36,-1.36,.79,-
-.92,-1.29,-.58,-1.37,-2.88,-2.88,-2.45,-2.19,-2.35,
54, 63,-1.38,-2.21, 65.2,-2.38,-.93,-2.19,
-.89,-1.05, 2.02,-1.37, 22
196308, 3.9, 64.6,-2.21,-2.21, 4.1,97, 96,
196205, 2.09, 57.4,-2.11,-2.11,-2.69,
42,17, 196407,-3.61,-62.8,-2.36,-2.36,-2.45,-2.6
196407, 3.09, 70.4,-3.01,-3.01,-44.28,-2.73,-2.73,
-.94,-.54,-1.26,-.31,-.99,
3.01,176,6,-.18,-1.99,-1.61,-1.04, -.17,
196309,2.8, 56.4,-2.28,-2.28,-.9,-
-.85,-.99,
2.28,4,218, -.56,-.38,-.73,-1.49,-1.61,-
196206,3,65.3,-2.41,-1.58,-3.06,-3.06,-1.
1.04,48,1.2,-1.42,49.75,-.61,-1.06,-1.12,
196408,3.08, 63.8,-3.08,-3.08,-1.12,-3.08,
62,
57,75, -.67, -.69,-1.26,-1.08,-1.23, -.99,-
196310,.93, 53.9,-3.66,-3.66,-4.84,-
1.06, 196401, 3.61, 24.8,-2.39,-2.39,
3.66,5,303, -2.7,-1.93,-1.51,-1.94,-2.-
196207, 3.36, 66.1,-3.36,-3.36, -.55,-
2.02,-1.37,
196409, 1.74, 59.1,-3.86,-3.86,-3.29,-3.86,
14,164,-1.75,-1.98,-1.55,-1.74,-1.43,-1.25,-

4.24,0,658, -.82,-1.48,-1.18, -1.1,-
2.03,-2.51,-1.52,
1.37,

2.36, 88, 36, -.43,-.7, -1.3,-1.05,

196505, 31, 75, 79, 55, -.47, 93, -.47, 93, -.39,
4.47, 0, 470, 214, 03, -1.7, -1.07, -2.34, -1.51,
196311, 6, 26, 42, 37, -2.75, -2.73, 1.65, -
2.02, 0, 605, 2.02, .28, -.15, -.73, -1.05, -
1.31, -.99, -.61, -.09, -.29, -.59, 1.23,
196411, 2.51, 40, 5.35, 5.35, -4.03, -2.64, -
5.35, 0, 708, -.69, -1.51, -2.75, -2.28, -2.25, -
196312, 2, 1, 19.6, -3.06, -3.06, -1.82, -3.01,
2.02, 0, 605, -.73, -.75, 1.93, 1.93, .35, -
1.97, 1.97, 8, 189, .19, .02, -.28, -.72, -.96, -
1.06,
196412, 3.66, 2.66, 2.66, -5.05, -5.48, -5.48, -2.15, -
5.05, 0, 109, 1.34, -1.86, -2.16, -2.45,
196401, 38, 51, 02, 88, -21.34, -2.93, 1.078,
1.85, 0, 1169, .64, -.32, 1.02, -.28, -.84,
-.54, 0, 457, .66, .5, .34, -.57, -.61, -.8,
1.14, -.93,
196508, 4.07, 0, 67, -4.96, -4.96, -.15, -
196501, 78, 2, 104, -1.45, -1.56, -4.78, -.56, -
4.74, 0, 1325, 2.7, -.23, 1.93, -1.541, -21.942, 2.2,
196402, 2, 14, 22, 5, 2.47, -2.47, -.99, -
2.13, 87, -.23, 44, -.23, 15, -.97
2.28, 0, 1110, -.53, 1, -.59, -.49, -.92,
196501, 31, 05, 16, 30, 80, 3, 4.09, -.52, 6.23, 1, 4.15,
1.17, -1.05,
196502, 2.75, 23, 1, -.23, 1.21, -4.16, -4.16, -.82, 1.02,
1.78, 82, 2.02,
4.03, 0, 1213, 1.28, 2, -.08, 1.07, -.61, -1.86, -.94, 2.02
196403, 3, 45, 34, 3, -2.13, -2.13, -.27, -
1.17, 1.17, -32, 1.08, 23, 2, -.94, -.94, -.22, .08,
1.77, 0, 901, -.11, 1, -.24, 14, -.18, -.59, -1.19,
196504, 32, 3.67, 1.28, 19, -.36, 9.94, -.24, -.92, 3.2, -5.55,
-.86, 1.29,
4.99, 0, 1041, -1.50, -1.14, -5.82, -1, -2.01, -
196503, 2, 12, 31, 4.31, -4.31, -1.74, -.73,
2.28, -2.28,
4.31, 0, 969, 1.18, -.81, -.02, -.95, -1.48, -1.85,
196801, -14, 255, 1, 2.05, -1.19, -.02, 1.19, -2.04, .84, -
4.85, 0, 1169, .64, -.32, 1.02, -.28, -.84,
196507, 0, 1225, 3, 1.58, 4, -3.52,
1232, 32, -.9, -.85, -.57, -1.7, -2.05, -2.24,
196504, 2.47, 41.7, -4.24, -4.24, -1.12, -

origin of birds

NOTKOT NUORIKSI VESOTKSI,

NORDMAILLE KOIVUT KYLVT,

LEPVST MAILLE LEYHKE ILLE,

TUOMET KYLVI TUO-REHILLE,

RAIAT MAILLE
RAIKKAHILLE,
PIHLAJAT PYHILLE
MAILLE,
PAJUT MAILLE PAI-
SUVILLE,
KATAJAT KARUILLE
MAILLE,
TAMMET VIRRAN VI-
REMILLE.

LVSKSI PUUT

YLENEMVSHVSN

VESAIL NUOREI

NOUSEMAHAN

KASVOI KUUSET

KUKKALAIVAT

LAUTUI LAK-

KAPVSVST PETVS-

JVST.

JOSTA KASVOI KAUNIS TAIMI,

YIENI VIHANTA VIRPI;

27

KASTA MAN SIKKAISNA,

KASVOI KAKSI HAARUKKAISNA.

origin of birds

NOUSI KOIVUPUUT

NOROILLA,

LEPVST MAILLA

LEYHKE ILLVS,

TUOMET MAILLA TU-

ORENILLA,

KATAJAT KAKUILLA

MAILLA,

KATAJAHAN KAUNIS

MARJA,

TUOMEHEN HYVÄ HE ELMÄ.

VAKA VANHA VÄSINÄ MÖINEN KÄVÄVI TUOTA KATSOMAHAN SAMPSAN SIEMENEN ALOA,

origin of birds

PELLERVOISEN KYL-VVSMVS.

NVSKI PUUT YLEN-NEHEKSI, VESAT NUORET NOUSNEHEKSI;

YKS, ON TAMMI TAIMIMATTA, JUURTUMATTA PUU JUMALAN.

HEITTI HERIAN VALLOILLENSA, ZEVILLEN ONNILLENSA; VUOTTI VIELVS VVOTVS KOLME, SAMAN VERRAN PVSTVLVSKI.

KVSVI SILTVS KATSOMAHAN VIIKON VIIMEISTVSKI: EI OLE TAMMI KASTANUNNA, JUURIUNUNNA PUU JUMALAN.

32

NEIN NV$KEVI

NEIJV$ NEITTV$,

VIISI VEEN ON

MORSIANTA.

33

NE OLI NURMEN

NEITV$ NVSSV,

KASTEKORREN KAT-

KONNASSA

NENVSSV UTU-

LISEN NIEMEN,

origin of birds

PVSVSSSVS SAAREN TERHENISEN; MINK, ON NIITTI, SEN HARAVOI, KAIKKI KARHILLE

TUITTA MERESTVS TURSAS;

UROS AALLOISTA YLENI.

TUNKI HEINVSSET TULEHEN,

ILMIVALKEAN VVSKEHEN;

NE KAIKKI POROKSI POLITI,

KYPENIKSI KYYETTELI.

origin of birds

OJENTELI OKSIAN-SA, LEVITTELI LEH-VIVSNSVS. LATVA TVSYTTI TATVAHALLE, LEHVSTI ILMOILLE LEVISI. PIVSTTI PILVET JUOKSEMASTA,

origin of birds

"Climate change over the past 30 years has produced numerous shifts in the distributions and abundances of species and has been implicated in one species-level extinction. Using projections of species' distributions for future climate scenarios, we assess extinction risks for sample regions that cover some 20% of the Earth's terrestrial surface. Exploring three approaches in which the estimated probability of extinction shows a power-law relationship with geographical range size, we predict, on the basis of mid-range climate-warming scenarios for 2050, that 15—37% of species in our sample of regions and taxa will be committed to extinction. When the average of the three methods and two dispersal scenarios is taken, minimal climate-warming scenarios produce low-

er projections of species committed to extinction (~18%) than mid-range (~24%) and maximum-change (~35%) scenarios. These estimates show the importance of rapid implementation of technologies to decrease greenhouse gas emissions and strategies for carbon sequestration."

Ibid. and Thomas, C. D., A. Cameron, R. E. Green, M. Bakkenes, L. J. Beaumont, Y. C. Collingham, B. F. N. Erasmus, M. Ferreira de Siqueira, A. Grainger, Lee Hannah, L. Hughes, Brian Huntley, A. S. van Jaarsveld, G. F. Midgley, L. Miles, M. A. Ortega-Huerta, A. Townsend Peterson, O. L. Phillips, and S. E. Williams. 2004. Extinction risk from climate change. Nature 427: 145–148.

summary from full article:

As many as 30 to 50 percent of all species are possibly heading toward extinction by mid-century

origin of birds

ILMAN PVSIVVSN PAISTAMATTA, KUUHUEN KUMOTTA-MATTA.

ET OLEISIVS UROSTA EIKVS MIESTVS URHEATA.

JOKA TAISI TAMMEN KAATA, 100 SATALAT-VAN LANGETTOA.

41

SITTVS VANHA VVSINVSMVOINEN ITSE TUON SANOIK-SI VIRKKI:

origin of birds

,,KAVE VSITI,

KANTAJANI,

LUONNOTAR,

YLENTVSJVSNI!

E≠||

LAITAPA VE EN

VVSKEVS

— VEESSVS ON

VVSKEVS PALJO —

TVSMVS TAMMI

TAITTAMAHAN,

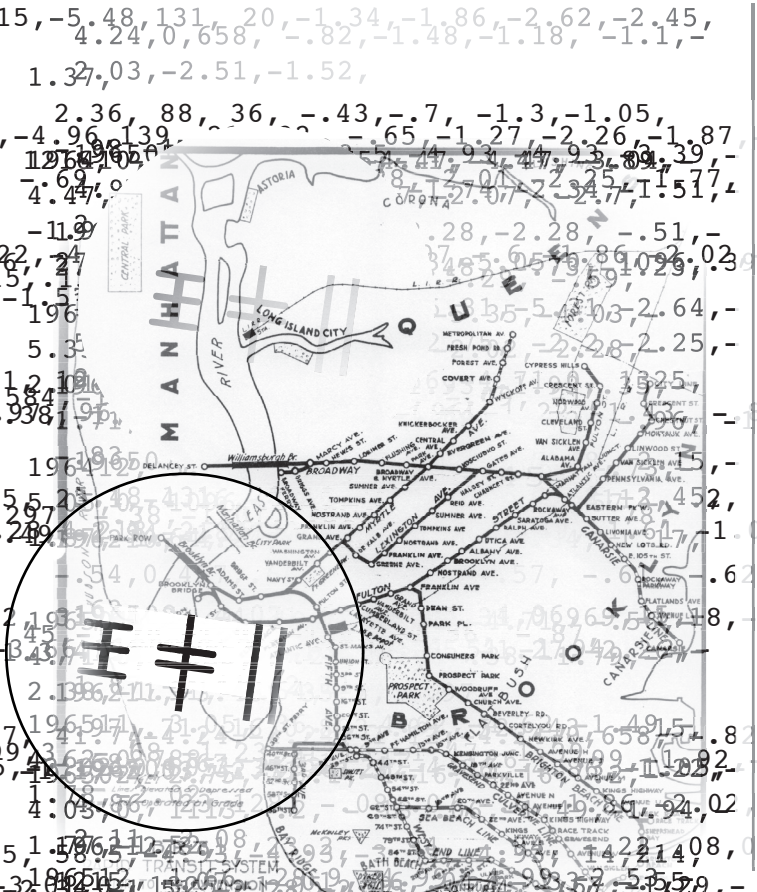
PUU PAHA HV§VIT-
TV§MV§HV§N
EST V§ PI§IV§N
PAISTAVAISEN,
43
110 TIELT V§
KUUN KUMOT-
TAVAISEN!"
NOUSIPA MERESTV§
MIESI,

origin of birds

196201, 1.53, 21.7, 1.84, 1.82, -1.27, -1.05,
196405, 2.01, 58.3, 19.52, -2.29, -2.79, 2.62, 4.96,
1.82, 0, 1.39, -2.48, -1.37, -1.24, -1.94, -1.37, -.91,
14,207, 196402, 2.92, 41.2, 1.16, -.6, -.93, 5.35,0,
196403, -3.45, 34.3, -2.13, -2.13, .27, -
-.86,
1.77,0,901,.11, -.24,.14, -.18, -.59,-1.18,
196509, 3.37, 61.3, -4.86, -4.86,
-196202, 3.08, 20.8, -1.35, -1.35, .85, 1.11, .38, -.53,
196406, 2.36, 64.1, 2.18, 2.08, -2.49, -2.88, -.23,
-.87,0, 1.73, .53, .21, -.71, -.54,
54, 63, -1.38, -2.21, -1, -.77, -.72, -.96,
196404, 4.11, 43.8, -1.45, -1.45, 1.39, -
-.96,
.5,0,618, .72, .53, .17, .82, -.21, -.71, -.82, 196501,
196304, 2.13, 44.4, -1.75, -1.75, -2.27, -1.
196203, 2.2, 33.5, 1.81, 1.81, 1.78, 2.21, -2.25,
196407, 3.16, 70.4, -3.01, -3.01, -1.28,
196205, 3.09, 15.9, -.52, -.52, -.89, -.98, -.94,
3.01,1.76, 2.01, .18, .22, -1.64, -.17,
14,207, -.31, -.34, -.67, -.6, -.93, 196502,
-.85, -.86, 196305, 3.04, -1.81, -1.81, -.71, -1.8
196309, 2.5, 56.4, -2.28, -2.28, -.06
-.87,
-1.2
196204, 3.88, 44.7, 1.36, -1.36, .79, -
196408, 3.08, 63.8, -3.08, -3.08, -1.12, -3.08,
196406, 2.23, 64.3, 2.28, 2.28, -2.49, -2.88, 196503,
57,405, 196306, 2.09, -2.38, -2.38, -2.99, -2.35,
54,583, -1.38, -2.21, 196310, .97, .53, .72, -3.86, -4.9
1.06, -.89, -1.05, .96,
-.96, 2.02, -1.37,

44

196205, 2.09, 57.4, -2.11, -2.11, -2.69, -
196409, 196407, 59.1, 3.86, 3.83, 2.66, 3.29, 3.86, 196504,
196407, 3.09, -1.31, 196401, 3.29, 44.8, -1.73, -1.73, -1.87,
14,184, -1.92, -1.28, -1.55, -1.74, -1.43, -1.25, -
3.01,176,6, -.18, -.99, -1.61, -1.04, -.17,
1.37,
-.85, -.99,
196505,
196206,3, 65.3, -2.42, 2.42, -1.58, -2.42, -3.06, -1.
196410, 1.94, 47.2, -4.47, -4.47, -3.04, 12,
196408, 3.08, -1.63, 4.28, 4.28, 3.06, 12, 3.08,
4.47,0,470, -1.03, -1.03, -2.07, -2.07, -1.9,
57.75, -.67, -.69, -1.26, -1.08, -1.23, -.99,
1.07, -1.64, 196506,
1.06, 196401, 3.61, 24.8, -2.39, -2.39, -2.
196207, 3.36, 66.1, 2.36, 2.36, -.55, -
196411, 2.51, 40, -5.35, -5.35, -4.03, -
196409, 1.74, 59.1, -3.86, -3.86, -3.29, -3.86,
14,184, -1.75, -1.98, -1.55, -1.74, -1.43, -1.25, -


MANHATTAN
QUEENS
BROOKLYN
ASTORIA
CORONA
LONG ISLAND CITY
RIVER
CENTRAL PARK
BROADWAY
DELANCEY ST.
Williamsburgh Bk.
MARCY AVE.
NEWS ST.
LORIMER ST.
BROADWAY & MYRTLE AVE.
SUMNER AVE.
TOMPKINS AVE.
NOSTRAND AVE.
MYRTLE AVE.
LEXINGTON AVE.
FRANKLIN AVE.
GREENE AVE.
FULTON
FRANKLIN AVE
DEAN ST.
PARK PL.
CONSUMERS PARK
PROSPECT PARK
WOODRUFF AVE.
CHURCH AVE.
BEVERLEY RD.
CORTELYOU RD.
NEWKIRK AVE.
KENSINGTON JUNC.
PARKVILLE
GRAVESEND
CULVER
BRIGHTON BEACH
KINGS HIGHWAY
AVENUE N
AVENUE P
AVENUE T
RACE TRACK
GRAVESEND
SEA BEACH LINE
WEST END LINE
BATH BEACH
BAY RIDGE
McKINLEY
PARK ROW
BROOKLYN BRIDGE
ADAMS ST.
BRIDGE ST.
FULTON ST.
FLATBUSH
CANARSIE
CANARSIE LINE
METROPOLITAN AV.
FRESH POND RD.
FOREST AVE.
COVERT AVE.
CYPRESS HILLS
CRESCENT ST.
NORWOOD
CLEVELAND
VAN SICKLEN AVE.
ALABAMA AV.
LINWOOD ST.
PENNSYLVANIA AVE.
EASTERN PKWY.
SUTTER AVE.
LIVONIA AVE.
NEW LOTS RD.
ROCKAWAY PARKWAY
FLATLANDS AVE.
FLATBUSH AVE.
BROOKLYN AVE.
NOSTRAND AVE.
UTICA AVE.
ALBANY AVE.
BROOKLYN AVE.
SARATOGA AVE.
BALPH AVE.
ROCKAWAY AVE.
KINGS HIGHWAY
TRANSIT SYSTEM
WAY CHANGES OF 1915

URÖS AALLOSTA

YLENT.

EI TUO OLI

SUUREN SUUI

EIKVS ALVAN PI-

ENEN PIENI:

MIEHEN PE ON

PIIUINEN

VAIMON VAAKSAN

KORKEUINEN.

VASKI – OIL HATTU HARTIOILLA, VASKISAAPPAHAT JALASSA, VASKIKINTAHAT KVSESSVS, VASKI – KIRJAT KINTAHIS – SA,

origin of birds

VASKI VYVOHYT

VYVOLIE VYVOTTY

VASKIKIRVES VYVON

TAKANA:

VARSI PEUKALON

PIIRRENEN

TERVS KINNEN

KORKEUINEN:

4.24,0,658, -.82,-1.48,-1.18, -1.1,-
1.37, 2.03,-2.51,-1.52,

VAKA VANHA
VV§INVV§MVƏINEN
ARVELLEE, AJAT-
TELEVI-
NV§KE-
LEIVV§NSVV§,
UROS SIIMVV§NLUON-
TIANSA,
PYSTYN PEUKALON
PITUINEN;

196504, 2.47, 41.7,-4.24,-

origin of birds

130 HVSRVSN

KYNNEN KORKUNAIN-

EN!

SITVS TUON SA-

NOIKSI VIRKKA

TISE LAUSUI, NOIN

NIMESI.

MI SINVS OLET

MIEHIVSSI,

50

KU, KURJA, URO-
HIASI?
VVSHVSN KUOLIUT-
PAREMPI,
KAUNIA KAUNI-
HAMPI!"
SANOI PIKKU MIES
MERESTVS,

origin of birds

UROS AALLON VAS-

TAELI:

"OLEN MIE MOKOMA

MIESI,

140

PIENI, VEEN

VVSKEVS.

TULIN TAMMEN

TAITTAMAHAN,

PUUN MURSKAN

MURENTAMAHAN. ”

VARANHA

ITSE TUON SANOIK-SI VIRKKI:

EI KENE SINUA LUOTU

EIPVS LUOTU

origin of birds

EIKVS SUOTU

ISON TAMMEN TAIT

TAJAKSI

PUUN KAMALAN

KAATAJAKSI

SAI TOKI SANONE-

HEKSI

150 KAT-

SAHTAVI VIELV§

KERRAN:

NV§KI MIEHEN

MIIRINEHEN,

55

NV§KI MIEHEN TARO-

HON!

SAHTAVI NAKSATEU-

TAROIVI,

NV§V§HYT PITVIV§

PITV§VI;

55

origin of birds

PARTA ON

EESSVS POLVEN

PVSVSILVS,

HIVUS KANNOILLA

TAKANA

SIVVS OLI

SILMIEN VVSLISSE,

SYLTVS HOUSUT

LAHKEHESTA,

PUOLTATOISTA POL-

160

VEN PVSVSSTVS, KAHTA KAATION RAJASTA. HIVELEVI KIR-VESTVSNSVS, TAHKAISI TASA-TEREVS

the book of pullman

origin of birds

"Palaeontologists recognize five major extinction events from the fossil record, with the most recent, the Cretaceous mass extinction, ending some 65 million years ago. Given the many species known to have disappeared in the past few thousand years, some biologists suggest that a sixth such event is now under way. Barnosky et al. set out to review the evidence for that claim, and conclude that the recent loss of species is dramatic and serious, but not yet in the mass extinction category — usually defined as a loss of at least 75% of Earth's species in a geologically short time frame. But that said, there are clear indications that the loss of species now classed as 'critically endangered' would soon propel the world into its sixth mass extinction."

— *http://www.nature.com/nature/journal/v471/n7336/full/nature09678.html*

LAVE, ILLA LAHKE-
HILLA,
LEVE, ILLVS ILLE-
HUTMILLA.

59

ASTUI KERRAN
KEINAHUTTI
170 HIEN-
OISELLE HIETI-
KOLLE,
ASTUI TOISEN

TORKAHUTTI

MAALLE MAKSALKAR-

VAISELLE

KOLMANNENKI KAHUTTI

JUURELLE

TAMMEN

ISKI PUU

HELLVS, TARPAISI TASATERVS LLVS.

ISKI KERRAN, ISKI TOISEN, KOHTA KOLMANNEN YRITTI; TULI TUISKI KIRVEHESTVS,

origin of birds

180 PANU

TAMMESTA PAKENI:

TAHTOI TAMMI

KALLISTUA,

LYSIX / S RUHIMO-

RAT 1.

NIIN KERRALLA

KOLMANNEILA

JOPA TAISI TAMMEN KAATA, RUHTOA RUTIMO-RAJAN, LAVAN LASKE-TELLA. TYVEN TYVONNYTTI ITVSHVSN, LAIVAN LASKI LU-OTEHESEN,

LEHVVST SUUREHEN SUVEHEN, 190 OKSAT BUOLIN POHJOSEHEN.

KENPVS SIIVS OKSAN OTTI, SE OTTI IKUISEN ONNEN;

According to an ancient Greek story, the god Chaos was the first to emerge at the creation of the universe. Soon after her came Gaia (Earth), Tartaros (the Underworld) and Eros (Love). In many versions, Chaos then gave birth to the Birds. From the primordial depths of time, from Chaos herself came these winged first beings. This wild birthing created migrations and flight.

In more recent times, soon after Darwin published his book, *On the Origin of the Species*, scientists began a heated debate about the origin of birds. Most scientists today believe that birds are one of the few remaining descendants of the dinosaurs.

In our own brief Anthropocene era, we are witnessing a rapid increase in the rate of extinction. We are in a geologic epoch marked indelibly by a hu-

origin of birds

man-created, asteroid-scale period of rapid loss of life as we know it on the planet. This planetary devastation is moving very quickly now. Soon birds quite possibly will be swallowed back into some primordial chaos. Or perhaps these small winged dinosaurs will survive another wave of extinction - another geologic era and we will be the ones whose wax wings burn.

I created a film generator called the graffiti angel to express a stuttering before god - an infinite resistance / a relentless howl or noisy elegy - a way to respond, to witness.

The "origin of birds" exhibit first appeared at the Prøve Gallery in Duluth, MN in 2014. The physical installation has a companion interactive web site (originofbirds.blueboatfilms.com). The origin of birds mixes image, sound, data, text and a live twitter

stream to create a video collage / a multi-sensory torrent. The physical installation includes multiple projections, live performance, and QR code “portals” into the interactive web environment.

I am hoping to create a story "swarm" - an immersive river. The online website allows you to drill-down into individual text, image and sound pieces of the larger work - an immersive dive into the wreck - grief and ecstasy, a queer flame, a sanctified rejoicing amidst the rubble of it all.

VS NOIAN NUO-LIANSA, AMPUJAN ASEHIAN-KAATUNUNNA PUU KATALA,

"Holy! Holy! Holy! ...Holy the super-natural extra brilliant intelligent kindness of the soul!"

— Allen Ginsberg from the Footnote to Howl, Berkley 1955 ....

PVSVSSI PVSIVVST PAISTA-MAHAN, 220 PVSVSSI KUUT KUMOTTAMAH-AN, PILVET PITKIN PUUKSENAHAN, TATVON KAAKET KAARTAMAHAN

origin of birds

NEN√§H√§N UTU-

ISEN NIEMEN,

P√§√§H√§N SAAREN

TERHENISEN.

Ξ≠||

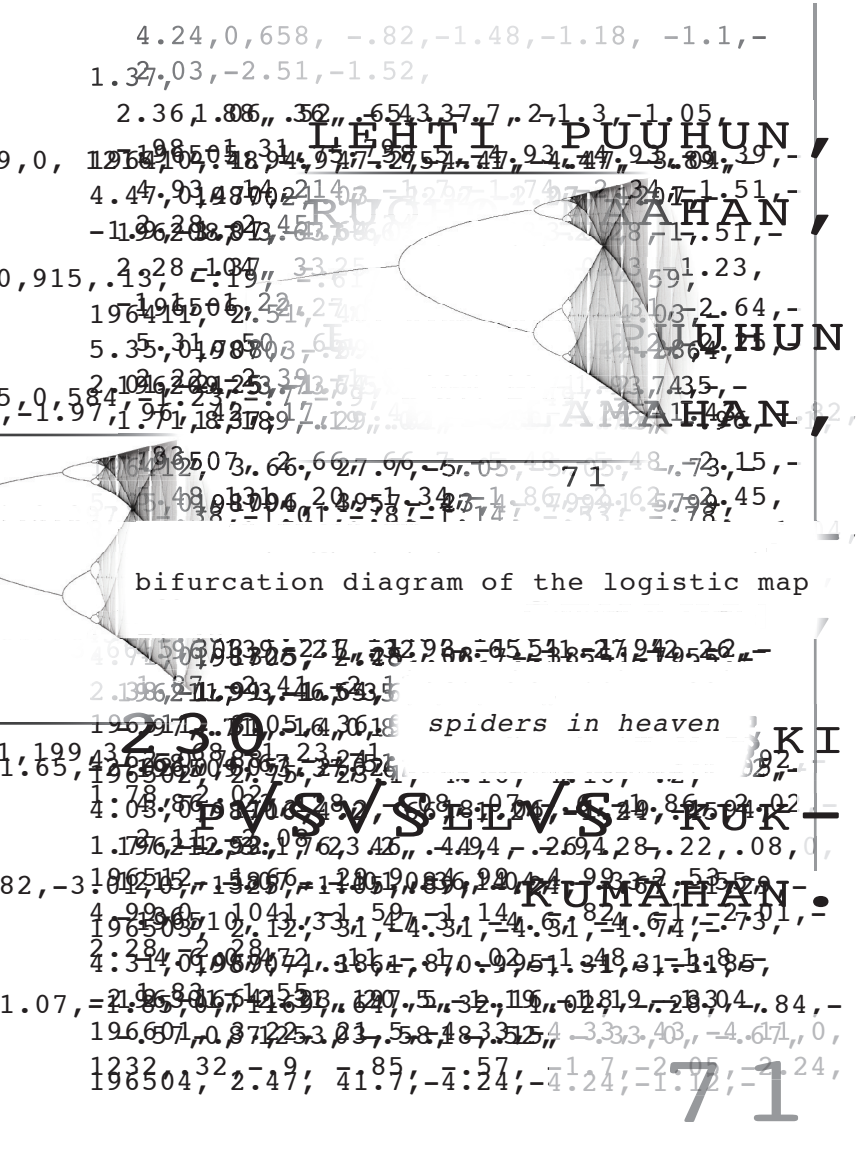
SIIT, ALKOT SALOT

70

χαος

MIELIN

KAUNEL,


LEHTI PUUHUN
71
bifurcation diagram of the logistic map
spiders in heaven
230
PYSYSLLYS KUK-
KUMAHAN.
71

origin of birds

KASVOI MAAHAN MARJANVARRET, KUKAT KULTAISET KEOLIE; RUOHOT KASVOI KATKENLAISET, MONENMUOTOISET SIKESI. OHRA ON YKSIN NOUSEMATTA,

TOUKO KALLIS KASVAMATTA.

the book of icarus

SIIT√§ VANHA V√§INV√§MV√∂INEN ASTUVI, AJATTELEVI RANNALLA SEL√§N SINISEN,

240 VE EN VANKAN VIEREMI-LIVS.

LVOYTI KUUSIA JYVIVS

SEITSEMIVS SIEME-NIVS

RANNALTA MERELLI-SELIVS,

HIENOISELTA HI-

ETTIKVÕLTVS; KVSTKI NVSVS, VSN NAH-KASEHEN, KOLPEHEN KES-VSORAVAN. LVSKSI MAATA KYLVVSMVSHVSN,

origin of birds

SIEMENTVS SIROT-TAMAHAN VIEREHEN KALEVAN KAIVON, SMON PENKERE-HEN

250

76

IIRSKUIPA TIAINEN PUUSTA:

76

„EIPVÅ NOUSE
OSMON OHRA,
EI KASVA KALEVAN
KAURA
ILMAN MAAN ALLA
TAMATTA,
ILMAN KASKEN
KAATAMATTA,
TUON TULELLA
POLTTAMATTA.“

origin of birds

VAKA VANHA

VÅSINÅSMÅOINEN

TEETTI KIRVEHEN

TERÅSVÅSN.

SITÅS KAATOI

KASKEN SUUREN,

260 MAHOTTO-

MAN MAAN ALISTI.

"At the beginning there was only Khaos (Air), Nyx (Night), dark Erebos (Darkness), and deep Tartaros (Hell's Pit). Ge (Earth), Aer (Air) and Ouranos (Heaven) had no existence. Firstly, black-winged Nyx (Night) laid a germless egg in the bosom of the infinite deeps of Erebos (Darkness), and from this, after the revolution of long ages, sprang the graceful Eros (Desire) with his glittering golden wings, swift as the whirlwinds of the tempest. He mated [or fertilised] in deep Tartaros (Hell-Pit) with dark Khaos (Air), winged like himself, and thus hatched forth our race [the birds], which was the first to see the light."

Aristophanes, Birds (trans. O'Neill)

LENTI KOKKO HALKI TAIVON, LINTUNEN YLITSE ILMAN, TULI TUOTA KATSO-MAHAN: "MIKSIPVS ON TUO JVSTETTY KOIVAHAINEN KAAT-AMATTA,

270 PUU SOREA SORTAMATTA?"

SANOI VANHA VVSINVSMVSINEN: SIKSIPVS ON TUO JVSTETTY: LINTUJEN LEPEVS-MIKSI,

KOKON IIMAN ISTU-MIKSI.

SANKI KOKKO II-MAN LINTU:

"HYVINDYS SINVSKI LAAIT:

HEITIT KOIVUN KASVAMAHAN,

PUUN SOREA
SEISOMAHAN
LIINNIKLIE LEPE/S-
MIKSI,
83
ITSELLE-
NI ISTUMIKSI.
ITUTA ISKI JIMAN
LINTU,
83

origin of birds

VALAHUTTI

VALKEAISTA.

POHJAISTUULI

KASKEN POLTTI,

KOILLINEN KOVIN

PORONTI:

POLTTI KAIKKI

PUUT POROKSI,

KYPENTKSI

KYYETTELI.

SIIT√§ VANHA V√§IN√§M√§OINEN

OTTI KUUSIA

JYVI√§, SEITSEMI√§ STEME-NI√§ 290

the book of ahab

KASESTA,

85

196402, -2.64, -2233, -2.47, -2.47, -.99, -2.28, 0,
1196201, 1.52, 821, 21, 79, 1-849, 1-822, -1227, -1.05,
1.82, 0, 1.29, -.04, -.37, -.24, -.94,
196302, 2.18, 17.1, -1.37, -1.37, -.91, -.99,
1964, 1.94, 1.47, 1.14, 48.2, 1.13, -72.13, 1.67, -
1.77, 2.98, .67, 0, -4324, -214.7, -1.19, -.59, -1.18,
-196202.83, .08, 0.20.28, -7235.55, 1.35, .85,
196303, 3.4, 7, 33.8, -1.11, -1.11, .38, -.53,
-.87, 0, 1173, .53, .21, .1, -.71, -.54,
1964, 1.94, 1.11, 1.42, 98, .12, .45, -.5, 1.45, 1.39, -
.5, 0, 1.84, .72, 6, .32, .07, .60, .82, .57, .21, -.79, .71, -.82,
196303, 2.5, 1.3, 1.4, 1.4, 1.3, 1.8, 1.4, 1.5, 1.6, -1.75, -2.27, -1.75,
-2.76,
1.81, 0, .917, -1.09, -.52, -.81, -.94,
196405, 2.01, 58, .29, -2.98, -2.29,
14, 207, 1.94, 1.24, 2.83, 1.04, .47, 1.67, -.93,
196305, 3.04, 1.81, -1.81, -.71, -1.8
-.86, -.59, .2, 0, .954, .27, .21, .56, .4, -2.28, -2.28, -.9
-.87,
196204, 3.18, 574, 4.52, -1.2, -1.36, -1.36, .79, -
.9, 0, .558, .53, .64, .37, -.11, -.27, -.87,
196406, 1.58, 3.30, 64, 1, -2.88, -2.88, -2.49, -2.88,
196306, 2.5, 1.65, 2.52, -2.53, -6.33, -7.13, -2.35,
57, 1.95, 1.48, 2.52, 1.96, 1.25, 1.58, 1.72, -3.66, -4.
-.96, 1.46, .97, .75, 0, .104, 1.37, .59, .86, .44
196205, 2.2, .096, .54, 4.92, .11, 2.3, 2.69, -
2.11, 4, 3.09, -1.31, 1.29, -8, 2.26, 1.51, -1.5, -2.6
196307, 3.1, 1.63, 1.28, 1.51, 1.28, -2.73, -2.73,
196407, 3.92, -1.26, 1.04, 23.01, 23.01, 41.28, -2.73,
-.94, 1.05, 1.31, 1.99, 1.47, 1.04, 1.47, -.17,
3.01, 196302, -2.28, -2.8, -1.47, -1.04,
-.85, -.79, .09, 0, 1.26, -.35, .16,
196206, 1.31, 65.59, -1.44, 1.22, 2.24, -19.56, -3.06, 3.06, -3.06, -1.
68, 48, -.6, -1.42, 1.49, 751, .01, 1.06, -1.12,
196408, 1.38, 63.8, -13.08, 13.08, 13.08, -1.12, -3.08,
57, 75, 1.95, 1.67, 1.969, -16.26, -1.08, -1.23, -.99, -
1.06, 2.63, -1.3, 0, 1.855, 1.37, 1.61, 1.41, 1.8, -2.39, -2.39,
196207.73, -16.19, 1.61, 1.44, 1.23, 1.26, -.55, -
196409, 1.74, 59.1, -3.86, -3.86, -3.29, -3.86,
14, 164, -1.75, -1.98, -1.55, -1.74, -1.43, -1.25, -

KOIVESTA KEST

VSORAYAN /

KESVSKVSRPVSN

KVSMIMENESTVS

LVSSIMTMAATA

KYLVVSMVSHVSN,

SIEMENTVS SIROT-

TAMAHAN.

ITSE TUON SANOIK-SI VIRKKI: „MINVS KYI VSN KYYHVSTTELEN

87

LUOJAN SORMLEN LOMITSE, KVSEN KAUTTA KAIKKIVALLAN TVSILE MAALLE KASVAVALLE,

300 AHOLLEN YLENEVVSLLE.

"AKKA MAN-TEREN-ALAINEN, MANNUN EUKKO, MAAN EMVSNTVS!

PANE NYT TURVE TUNKEMAHAN,

EIP, ON MAA VVSKEVS PUUTU SINVS ILMOISNA TKVSNVS, KUNNIE ARMO AN-TAJISTA, LUPA LUONNON PYTTVSRISTVS.

origin of birds

NOUSE, MAA, MA-KOAMASTA, 310 NURMI, TA!

LUOJAN NUKKUMAS-PANE KORRET-KORT-TUMAHAN

王丰川

90

SEKVS VARRET VARTTUMAHAN!

TUHANSIN NENIVS

NOSTA,
SAOIN HAAROJA HA—
JOTA
KYNNÅSTÅSNI,
KYLVÅSTÅSNI,
VARSIN VAIVANI
NÅSÅSTÅS!

„OI UKKO, YLI—

origin of birds

196402, 2.64, 2233, -2.47, -2.47, -.99, -2.28,0,

196403, 3.45, 34, 1.77,0,901, 11, 24, 14, 1.77,0,901, 11, 24, 14, -.87, -0.74, 173, 33, 11, 63, 1.03, 196404, 4, 11, .5,0,618, 72, 1.81, 10.39, 196405, 14,207, 23, -.86, -.87, 9,0,35548, 196406, 54, 63, -.96, -1.89, 2.11, 14, 196407, 3.01,176,6, -.85, -.99, 68, 48.61, 196408, 57, 75, -.67, -.69, 1.06, 196409, 14,164, -1.75, -1.98,-1.55,-1.74,-1.43,-1.25,-

4.24,0,658, -.82,-1.48,-1.18, -1.1,-
1.32,-2.03,-2.51,-1.52,

-.87,-1.16,121, 22,-9.3,-0.05,
-.37,-.53,-.8,-.93,.32,-3.39,-
200108, 2.91, 70.6,-1.93,-1.93,-
-2.3,-1.93,235,4,-.89,-1.24,
-.57,-.69,-.94,-1.06,.29,-2.64,-
200109, 3.85, 60.2,-1.73,-1.73,-
-.01,-1.67, 38, 99,.27,-2.34,.96,-
-.79,-1.11,-.99,-2.15,-

93

200110, 1.92, 50.4,-2.41,-2.41,-
2.58,-2.41,0,382,-1.05,-.59,
-.93,-.96,-.98,-1.18,-.33,-
200111, 1.99, 43.4,-3.59,-3.59,-
4.27,-3.59,0,606,-1.17,-1.72,-
1.17,-1.23,-1.23,-1.46,-.46,-1.92,-
200112, 2.46, 34.6,-4.02,-4.02,-
2.41,-4.02,0,876,-.67,-1.33,-1.29,-
1.81,-1.73,-1.9,-1.69,-.39,-2.01,-
200201, 2.27, 29.8,-3.97,-3.97,-
1.11,-3.97,0,1011,-.63,-1.01,-
1232, 32,-.9,-.85,-.57,-1.7,-2.05,-2.24,
196504, 2.47, 41.7,-4.24,-4.24,-1.02,-

origin of birds

196402, 2.14, 2233, -2.47, 2.47, 0, 28, 0,
1.05,
1.82,0, 1239, -.04, 196302, -2.18, -1.1, -1.37, 2.47, -1.94, 9, @ @@@@ 9
-.54, -.06, -.17,
196403,0.2247, 2.41, -.29, 1.93, 32.92, 32.92,
1.77,0, 1.951, -3.12, 0.24, 14, 59, 1.18,
-196402,243, -18.762, -18, 35, 35.58, -1.18,
-.87,0, 1173, .53, 196403,
-.11, -3.
196404,0.2031, 34, 35.58, -.53,
.5,0, 6.29, 7.57, 196304,
196203,52, 2.1, 76,
1.81,0, 91,
196405, 2.01, 1.96,
14;2.0.2044, 136,
-.86, 2.74,
196204, 1.
9,0, 558,
196406, 1.
54; 63, -1.89,
-.96, 200205, 4.
196205,022, 0.9355,
2.11,14,0.586304,
196407, 3.62, 1.0261,
-.94, -.84, 1.39,
3.01,176,6, 18,
-.85, 200206, 4.88,
196206,19, 6.52, 3.6,
68, 48.21, 6.65, 42,
196408, 3.08, 63.8, 43, 38, 3.08, 12, 43, 3.08,
62,
57; 75, -.67, -.69,-1.26,-1.08,-1.23, -.99,-
1.06, 200207, 2.55, 196403, 3.78, -24.8,-2.39,-2.39,
196207,623, -26.346, 1.14, 1.34, 2.29, 52, -16.51, -.55,-
196409, 1.74, 59.1,-3.86,-3.86,-3.29,-3.86,
14,164, -1.75,-1.98,-1.55,-1.74,-1.43,-1.25,-

4.24,0,658, -.82,-1.48,-1.18, -1.1,-
1.37,
2.36, -.88, .48, .4643, -.37, -1.79,-1.05,
196501, 31, 75, 79, 55, -.47, 93, -.47, 93, -.89, 39,-
196510, 18, 94, 97, 55, -.47, 93, -.47, 93, -.89, 39,-
4.47, 93, 14, 214, 31, 70, 1.24, 1.74, 2.34, 1.51,-
1.96, 38, 43, 62, 46, 30, .52, -.28, .69, -.28, .94, .51,-
2.28, -.82, .36, .61, .48, .97, -.86, -.29, -1.13, -1.23,
-.13, -.15, -.22, .27, .67, .35, -5.31, -5.35, -4.03, -2.64,-
196511, 2.31, 10, 5.35, -5.31, -5.35, -4.03, -2.64,-
200209, 484, -1.63, 13, -2.01, -2.75, -2.22, -2.25,-
2.06, -.85, -.59, 1.64, .93, 331, -.93, .35,-
1.01, 3.11, 9, .44, .87, -.49, .23, -1.43,
1.44, 24, 1.66, 27, .76, -.7, -.05, -.96, -.73, -2.15,-
200210, 20, 1, 34, 23, 1, 86, 1.62, 1.59, -2.45,
1.44, 24, 1.66, 27, .76, -.7, -.05, -.96, -.73, -2.15,-
4.47, .61, -.74, -.57, -.61, -.62,
200211, 1.57, 1.56, 3.75, 1.23, 1.79, 1.88, 1.24,
1.71, 1.91, 6, 36, 80, 3, 4.09, 2, -.52, 6.23, 1.49, 1.15,
196512, 1.21, 1.47, 2.61, 39, 09, 1.02,
200212, 1.28, 1.27, 5, -.08, .07, -.61, -.19, .86, -.02,
11, 12, .08, 1.13, 2.81, -.94, 14, .09, -.22, .08,
196513, 2.12, 3.31, 4.31, -4.31, -1.74, -.73,
2.28, -2.28, 4.31, 0, 0, .18, -.81, -.02, .95, -1.48, -1.85,
196514, 2.47, 41.7, -4.24, -.57,

origin of birds

196402, -2.47, -2.35, -2.47, -2.47, -.99, -2.28,0,

196201,0,10.8,21,1.81,.59,-1.98,-1.74,-1.92,-1.02,-1.27,-1.05,

1.82,0,86,1.23,-.19,-.09,

196403, -3.47,

1.77,0,901,.11, -.24, .14, -.18,

-196202,0,10.2,-.29,

-.87,-0.74,1.73,.78,

196404, 4.11,

.5,0,618, .72,

196203,0,12.03,

1.81,0,391,.70,

196405, 2.01,

14,207,

-.86,

196204,0,10.48,1.64,

196406,

54,

-.96,

96

196205,0,12.50,

196407, 3.59,

3.01,176,6,

-.85, -.99,

196206,0,10.66,

196408, 3.08,

57, 75, -.67, -.69, -1.26, -1.08, -1.23, -.99,

1.06,

196401, 3.61, 24.8,-2.39,-2.39,

196207,0,10.73,

王丰川

196409, 1.74, 59.1,-3.86,-3.86,-3.29,-3.86,

14,164,-1.75,-1.98,-1.55,-1.74,-1.43,-1.25,-

4.24,0,658, -.82,-1.48,-1.18, -1.1,-
2.03,-2.51,-1.52,

-.87,-1.16,121, 22,-9,3,-0.05,
-.37,-.53,-.8,-.93,.32,-3.39,-
200108, 2.91, 70.6,-1.93,-1.93,-1.51,-
-2.3,-1.93,235,4,-.89,-1.24,
-.57,-.69,-.94,-1.06,.29,-2.64,-
200109, 3.85, 60.2,-1.73,-1.73,-
-.01,-1.67, 38, 99,.27,-2.34,.96,-
-.79,-1.11,-.99,-2.15,-

200110, 1.92, 50.4,-2.41,-2.41,-
2.58,-2.41,0,382,-1.05,-.59,
-.93,-.96,-.98,-1.18,-.33,-
200111, 1.99, 43.4,-3.59,-3.59,-
4.27,-3.59,0,606,-1.17,-1.72,-
1.17,-1.23,-1.23,-1.46,-.46,-1.92,-
200112, 2.46, 34.6,-4.02,-4.02,-
2.41,-4.02,0,876,-.67,-1.33,-1.29,-
1.81,-1.73,-1.9,-1.69,-.39,-2.01,-
200201, 2.27, 29.8,-3.97,-3.97,-
1.11,-3.97,0,1011,-.63,-1.01,-
1232, 32,-.9,-.85,-.57,-1.7,-2.05,-2.24,
196504, 2.47, 41.7,-4.24,-4.24,-1.02,-

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origin of birds

196402, -2.64, -2233, -2.47, -2.47, -.99, -2.28, 0,
1196201.152, .827, .216, 7911, -.849, 1.482, -1.27, -1.05,
1.82, 0, 1239, -.04, -.37, -.24, -.94,
-.54, -.06, -.17,
196402, 03.427, 3.43, -20.23, -32.13, 7.27, -
1.77, 0, 1.161, -.81, 0, -1.82, 1.48, -.18, -.59, -1.18,
-1962-2.083, .08, .283, 8.281, .365, -1.35, .85,
-.87, 0, 1173, .53, .21, .1, -.71, -.54,
-.11, -.3,
196402, 03.031, 3.23, -1.45, -1.45, 1.39, -
.5, 0, 638, 1.727, 5.39, 1.76, 8.25, 0.243, -.71, -.82,
196304, 2.193, 3.44, 4.9, -1.54, -1.75, -1.77, -1.7
1962-3.08, 2.353, -5.13, .61, 1.81, .17, 8, -1.21, -2.21, .4
-.76,
1.81, 0.517, -1.09, -.52, -.81, -.94,
196405, 2.01, 58, -.29, -2.98, -2.29,
14, 207, -.31, .4, -.36, -.67, -.6, -.93,
196305, 3.04, -1.81, -1.81, -.71, -1.8
-.86, 200304, 2.65, 43.1, 2.36, -.36, -2.28, -2.28, -.9
-.87,
196204, 03.88, 364, 0.52, 1.36, 6.21, -.36, .79, -
.9, 0, 558, .503, 0.837, 28, 11.44, .27, -.87,
196406, 1.39, 64, 1.27, 2.88, 2.78, 2.43, -2.88,
58, -1.38, -2.21, 196310, .92, 53, .72, -3.66, -2.19, -2.35,
54, 63, -.89, -1.05, .97, .96, -3.66, -4.
-.96, 200305, 4.58, 54.1, .51, 98
196205, 12.109, 295.84, -241.1, -22, .114, -26.69, -
2.11, 2, 196307, 3.15, 69.8, 52.61, 2.61, -1.5, -2.6
196407, 3.92, -1.26, 70.4, 23.01, 23.01, 44.28, -2.73, -2.73,
-.94, -.54, 1.39, -.99, -1.61, -1.04, -.17,
3.01, 176, 6, -.18, -.99, -1.61, -1.04, -.17,
-.85, 200306, 4.78, 63.6, 1.15,
196206.13, 65.09, -29.45, 1.22, 2.41, 1.96, -3.06, -3.06, -1.
68, 48.04, 6.571, 42.1, 4.775, 18.1, -2.406, -1.12,
196408, 3.08, 63.8, -3.08, 3.08, -1.12, -3.08,
62, 57, 75, -.67, -.69, -1.26, -1.08, -1.23, -.99, -
1.06, 200307, 4.45, 69.3, 1.46, 24.46, -2.39, -2.39,
196207.29, 3.16, 66.2, 1.42, 3.69, 3.83, 1.055, -

196409, 1.74, 59.1, -3.86, -3.86, -3.29, -3.86,
14, 164, -1.75, -1.98, -1.55, -1.74, -1.43, -1.25, -

the book of night crow

origin of birds

196402, -2.47, -2.47, -.99, -2.28, 0,
1.82, 0, 1239, -2.48, 1.77, 0, 1.98, 1.16, 0, -1.96, 2.13, 0.48, 1.96, -.87, 0, 1.73, -.44, 1.53, -.11, 0, 3.31, 1.24, 1.33, .5, 0, 1.83, 2.73, 1.96, 1.81, 0, 1.91, 2.01, 1.32, 1.96, -.86, 1.91, 1.87, 1.17, 1.96, 9.0, 558, 1.53, 1.96, 1.58, 1.96, -.96, 2.41, 1.77, 1.96, 2.11, 4, 1.96, 3.01, 1.96, -.85, 1.39, 1.96, 68, 48, 1.96, 62, 57, 1.06, 3.78, 3.1, 1.96, 1.06, 3.36, 1.64, 1.96, 1.06, 3.86, 3.29, 3.86,
1.98, 1.55, 1.74, 1.43, 1.25,

100

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KOKON IIMAN ISTU-
MIKSI.

SANKI KOKKO II-
MAN LINTU:

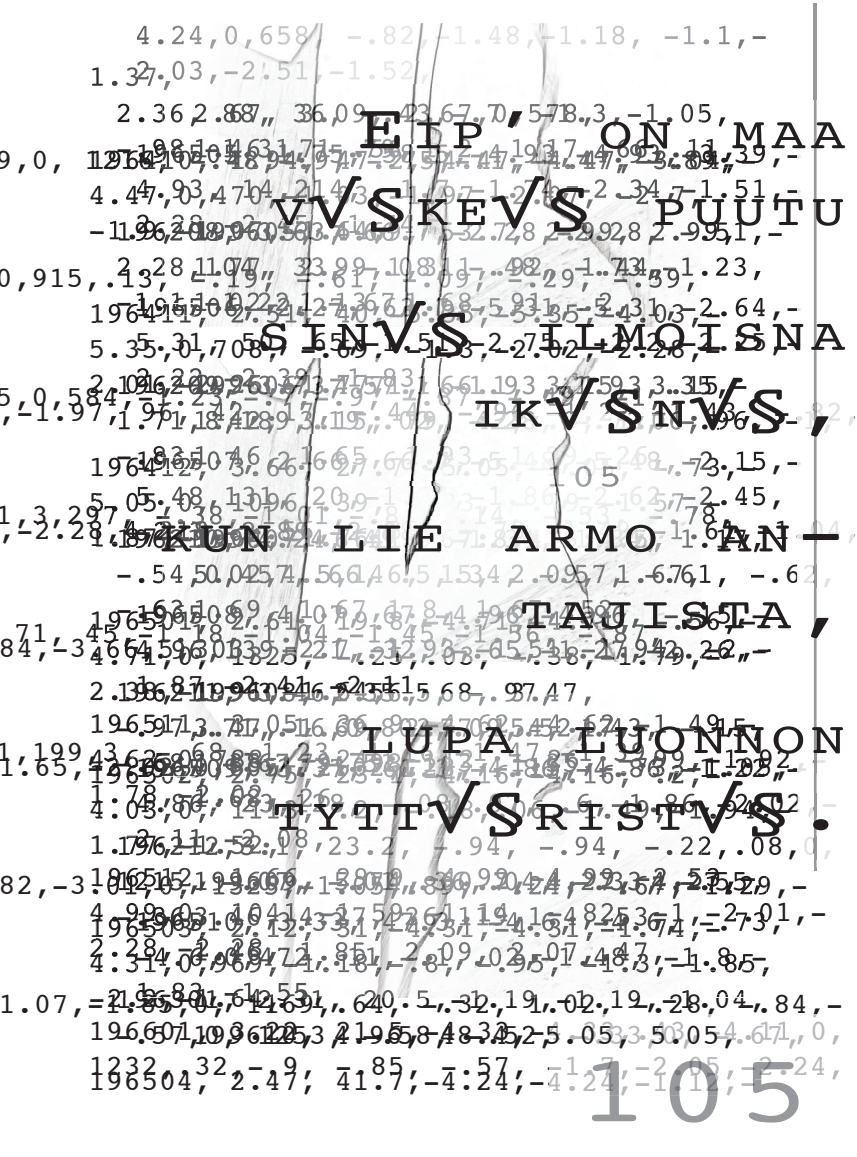
"HYVINDYS
SINVSKI LAAIT:
HEITIT KOIVUN
KASVAMAHAN"

PUUN SOREA
SEISOMAHAN
LIEPE/S-
MIKSI,
103
ITSELLE-
ISTUMIKSI.
ΛΙΡΕΣ
TUTTA ISKI JIMAN
LINTU,
103

300 AHOLLEN YLENEVVSLLE.

"ARKA MAN-TEREN-ALAINEN, MANNUN EUKKO, MAAN EMVSNTVS!

PANE NYT TURVE TUNKEMAHAN,



EIP, ON MAA VV§KEV§ PUUTU SINV§ ILMOISNA IKV§NV§, KUN LIE ARMO AN-TAUISTA, LUPA LUONNON TYTTV§RISTV§.

„NOUSE, MAA, MÄ—KOAMASTA,

310 LUOJAN

NURMI, NUKKUMAS—TA!

PANE KORRET KORT—TUMAHAN

SEKV§ VÄRRET

VÄRTTUMAHAN!

TUHANSIN NENIV§

NOSTA,
SAOIN HAAROJA HA—
JOTA
KYNNÅSTÅSNI,
KYLVÅSTÅSNI,
VARSIN VAIVANI
NÅSÅSTÅS!

„OI UKKO, YLI—

KOKON ILMAN ISTU-MIKSI.

SANKI KOKKO ILMAN LINTU:

"HYVINDYS SINVSKI LAAIT:

HEITIT KOLVUN KASVAMAHAN"