

DAILY BREAD

“Grain of Hope : Slice of Heaven”

Conform and Transform

Encoded history

Let us not think
of bones confined in museum cases,
of yellowing scrolls.
Let us turn away from ourselves

to a plant striding
seven feet high in the Euphrates delta.
No wonder
when the Jews saw those heads bowed down
with grain

they located Eden there.
A plant born
of spiky wild wheat, of bristling goat grass,
seed-swelled by humans

in an enterprise
patient, centuries-slow, yet prodded forward
by sharp hunger.
This is a story

of migration, of forced adapting
to hostile weather,
to a soil-patchwork stretching through the world.
This is a tale of gene-families gained

and lost:
the plant gaining vigour as it sheds,
selecting from a seething thrust of grasses,
turning their gene-variety into strength.

A selfhood
which is not a noun fixed into time and place,
but rather a verb
shaping and being shaped.

It may seem conformed
in field upon field of tamed crops,
yet each plant still carries its potential
to be transformed

and perhaps re-wilded.
Humbling to think
that if all our brain-history,
all the work

of scholars, archaeologists, all the stories
with which we define ourselves
were wiped away,
each of us still would carry

the long human struggle written deep
in our flesh and bones
and bear our forebears onward in a self
made anew

in the encounter of each day.

Diane Pacitti, 2020

How should we think about genes? Since the 1950s and the discovery of DNA the ‘central dogma’ (essentially one gene equals one characteristic) has taken hold of our imaginations. It’s simple, it’s reductive, it’s ‘scientific’. The mindset is ‘if we can only find the genes for X, Y and Z we could cure disease, increase yield, live forever’. This has led to a revolution in genetic engineering of many species, although as of the end of 2019 no genetically engineered wheat was licensed for commercial sale anywhere in the world.

It turns out genes and gene action are not so straightforward. The new field of *epigenetics* describes how changes in gene expression by factors other than alterations to the DNA sequence can be inherited. This is potentially a Copernican revolution for genetics: ‘epi’ factors external to the DNA itself, such as proteins and hormones, can change future generations. The all-powerful gene is dislodged as director of its own universe and becomes contingent on its home environment.

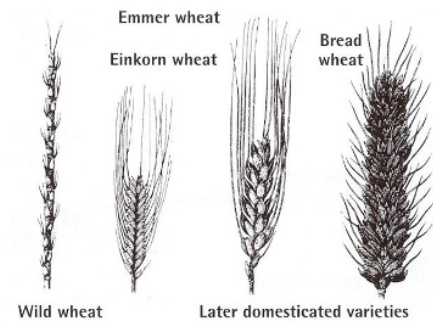
There is also increasing evidence for an *omnigenic* model, in which genes influence each other in large interdependent networks and a change in one gene affects expression across the whole network. The ‘one gene, one characteristic’ model is upended, and characteristics such as height are seen to be influenced by thousands of variants. **It’s looking like the future of genetics is ecological.**

The oldest cereal in the world is considered to be **einkorn**; it was domesticated circa 9,000 B.C. and derives from grasses originating in a fertile area between the Tigris and Euphrates rivers (today’s Iraq and Syria) known as the **Fertile Crescent**, from where it spread to the Central and Northern Europe.

During the Bronze Age (6000 – 3000 B.C.) Einkorn became one of the main crops cultivated, but its importance began to wane in favour of higher-yielding species, such as **Emmer** wheat. Crossing Emmer with Einkorn resulted in **khorsan wheat** and **durum wheat**. Further crossing with wild grasses and with cultivated Emmer resulted in **Spelt** and **modern wheat types**.

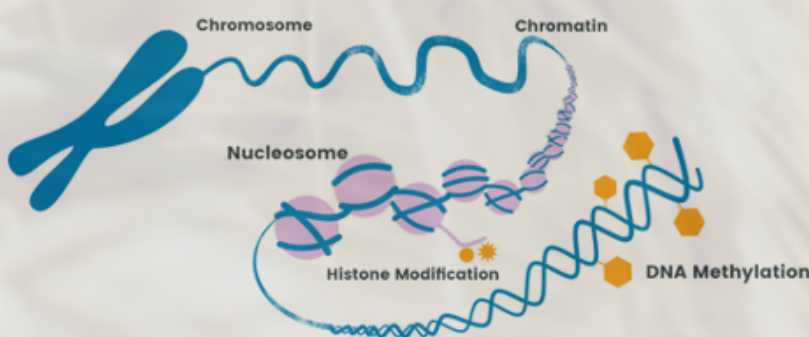


Above. Map showing the **Fertile Crescent** where wheat originated as a hybrid of several wild grass species. According to the book of Genesis, Abraham the father of the Jewish people was a native of Ur in Mesopotamia.



The three ancestors of modern wheat; Emmer, Einkorn and Wild Wheat.

Einkorn wheat arose well before humans, around 400,000 years ago.



Epigenetics describes how changes in gene expression by factors other than alterations to the DNA sequence can be inherited.

Background photograph: An ancient form of wheat showing the long awns (whiskers) which have been bred out of most modern wheat grown in this country.



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