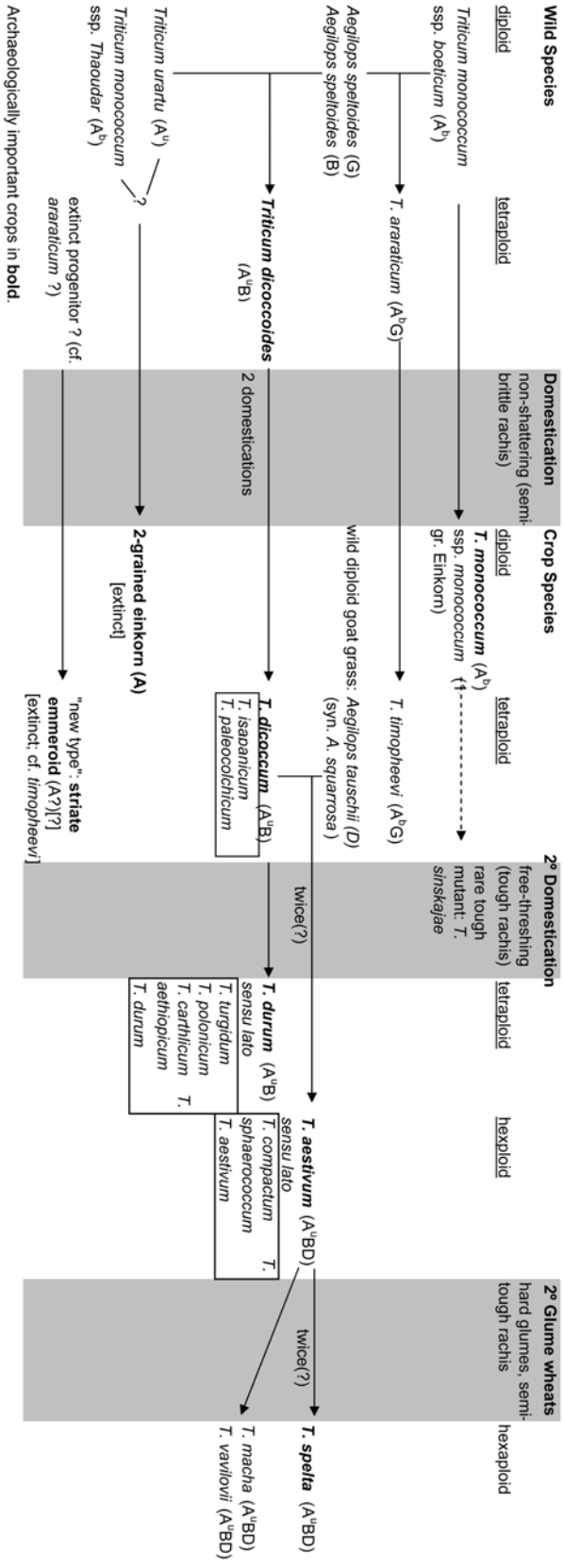
Cereal Chaff & Wheat Evolution

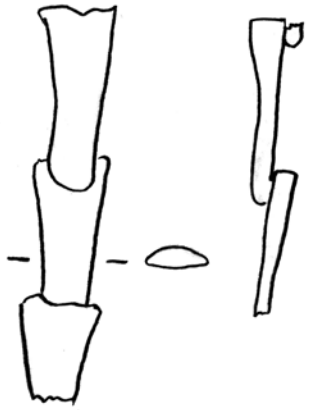
DQ Fuller 11.i.2007

Wheat evolution has been complex, involving hybridizations and selection for processing traits (hulled versus free-threshing). Archaeologically much of this evolution can be traced through the remains of chaff. It is also important to be able to distinguish barley and rye chaff from that of wheat. Some other cereals and grasses may also be preserved as chaff but have received less attention from archaeobotanists.



spikelet forks/ glume bases= glume wheat

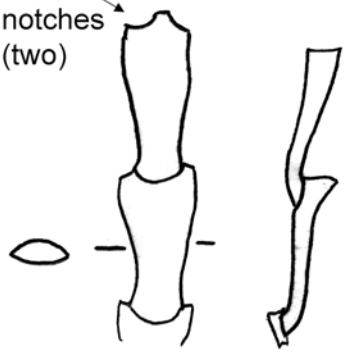
rachis segments, multiple or single= free-threshing by-product of wheat, rye or barley



basic: narrow tops:
probably subsp. ***distichon***
(2-row)

more flared, distinct
lateral bases:
6-row or **4-row**

side
notches
(two)



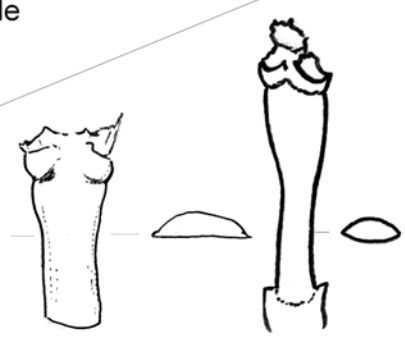
slight S-curve
or shield shape

profile:
slighly
recurved

Secale cereale

"simple" segments:
straight sides, slightly
flared top, straight profile
Hordeum vulgare

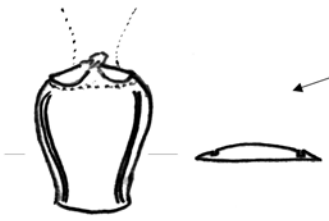
recurved, flared
top of segments:
free-threshing wheats



polonicum
"robust, long"
east Europe

carthlicum
"strechted, thin"
Caucasus/ Armenia

rare variant tetraploids



hexaploid (*aestivum sensu lato*)
** thin section, sharp edge,
distinct grooves
* shield-shaped
* no bulges or glume bases
"waist & no breasts"

tetraploid (*durum sensu lato*)
** rounded section, edge thick,
no grooves (but ribbing/
wrinkling on immature)
** bulges, sometimes glume bases
* stairght-edged, rarely
shield-shaped
"breasts & no waist"

Glume bases of glume wheats

monococcum
einkorn: square
cross-section, keel
protrudes forward
fork: narrow long scar
glumes usually with narrow angle

dicoccum
emmer: trapezoidal
cross-section, keel
protrudes to side;
a few striations,
fork: short, wide scar
wide angle between
glumes

?

"new" striate emmeroid:
like emmer but
ridged, keel
protrudes forward
timopheevi is similar

spelta
curved, heavily ridged
no clear keel

Aegilops
semi-circular, thick, heavily ribbed

some other chaff

Oryza spikelet base

like rye or barley, but very small
and thin: various wild grasses
such as *Lolium, Bromus*

Pennisetum involucre base (with bristle bases)

Sorghum rachis/ spikelet base

Setaria rachis with bristles