# Official 47-Passage 01 Roman Cultural Influence on Britain

**After** **the** Roman **Empire**’s conquest **of** **Britain** **in** **the** **first** **century** **A**.D., **the** presence **of** administrators, **merchants**, **and** **troops** **on** **British** **soil**, **along** **with** **the** **natural** **flow** **of** **ideas** **and** **goods** **from** **the** **rest** **of** **the** **empire**, **had** an enormous **influence** **on** **life** **in** **the British** Isles. Cultural **influences** **were** **of** **three** **types**: **the** **bringing** **of** **objects**, **the** transfer **of** craft **workers**, **and** **the** **introduction** **of** massive **civil** **architecture**. **Many** **objects** **were** **not** **art** **in** **even** **the** **broadest** **sense** **and** comprised utilitarian items **of** **clothing**, utensils, **and** **equipment**. **We** **should** **not** underestimate **the** **social** **status** **associated** **with** **such** mundane **possessions** **which** **had** **not** previously **been** **available**. **The** **flooding** **of** **Britain** **with** **red**-gloss pottery **from** Gaul (**modern**-**day** **France**), **decorated** **with** **scenes** **from** **Classical** mythology, **probably** **brought** **many** **into** contact **with** **the** **styles** **and** artistic **concepts** **of** **the** Greco-Roman **world** **for** **the** **first** **time**, **whether** **or** **not** **the** symbolism **was** **understood**. **Mass**-**produced** **goods** **were** **accompanied** **by** **fewer** **more** aesthetically impressive **objects** **such** **as** statuettes. **Such** **pieces** **perhaps** **first** **came** **with** **officials** **for** **their** **own** **religious** worship; **others** **were** **then** **acquired** **by** **native** **leaders** **as** diplomatic **gifts** **or** **by** **purchase**. **Once** **seen** **by** **the** **natives**, **such** **objects** **created** **a** fashion **which** rapidly **spread** **through** **the** **province**.

**In** **the** **most** **extreme** instances, **natives** literally **bought** **the** **whole** **package** **of** Roman **culture**. **The** Fishbourne villa, **built** **in** **the** **third** **quarter** **of** **the** **first** **century** **A**.D., **probably** **for** **the** **native** client **king** Cogidubnus, amply illustrates **his** Roman pretensions. **It** **was** **constructed** **in** **the** **latest** **Italian** **style** **with** **imported** **marbles** **and** stylish mosaics. **It** **was** lavishly **furnished** **with** **imported** **sculptures** **and** **other** **Classical** **objects**. **A** **visitor** **from** Rome **would** **have** recognized **its** **owner** **as** **a** participant **in** **the** **contemporary** **culture** **of** **the** **empire**, **not** **at** **all** provincial **in** **taste**. **Even** **if** **those** **from** **the** **traditional** **families** **looked** **down** **on** **him**, **they** **would** **have** **been** **unable** **to** **dismiss** **him** **as** uncultured. **Although** exceptional, **this** demonstrates **how** **new** cultural **symbols** **bound** provincials **to** **the** **identity** **of** **the** Roman **world**.

**Such** **examples** established **a** **standard** **to** **be** **copied**. **One** **result** **was** an influx **of** craft **workers**, particularly **those** **skilled** **in** artistic **media** **like** **stone**-**carving** **which** **had** **not** **existed** **before** **the** conquest. **Civilian** **workers** **came** mostly **from** Gaul **and** **Germany**. **The** magnificent **temple** **built** **beside** **the** **sacred** **spring** **at** **Bath** **was** **constructed** **only** **about** **twenty** **years** **after** **the** conquest. **Its** detail **shows** **that** **it** **was** **carved** **by** **artists** **from** **northeast** Gaul. **In** **the** **absence** **of** **a** **tradition** **of** **Classical** **stone**-**carving** **and** **building**, **the** **desire** **to** **develop** Roman amenities **would** **have** **been** **difficult** **to** fulfill. Administrators **thus** **used** **their** **personal** contacts **to** **put** **the** Britons **in** **touch** **with** **architects** **and** masons. **As** **many** **of** **the** **officials** **in** **Britain** **had** **strong** **links** **with** Gaul, **it** **is** **not** **surprising** **that** **early** Roman **Britain** **owes** **much** **to** craft **workers** **from** **that** **area**. **Local** workshops **did** **develop** **and** stylistically **similar** **groups** **of** **sculpture** **show** **how** **skills** **in** **this** **new** **medium** **became** **widespread**. Likewise **skills** **in** **the** **use** **of** mosaic, **wall** **painting**, ceramic **decoration**, **and** **metal**-**working** **developed** **throughout** **the** **province** **with** **the** eventual emergence **of** characteristically Romano-**British** **styles**.

**This** **art** **had** **a** **major** impact **on** **the** **native** **peoples**, **and** **one** **of** **the** **most** **important** factors **was** **a** **change** **in** **the** scale **of** **buildings**. Pre-Roman **Britain** **was** highly localized, **with** **people** rarely traveling **beyond** **their** **own** region. **On** occasion **large** **groups** amassed **for** **war** **or** **religious** **festivals**, **but** **society** **remained** centered **on** **small** communities. **Architecture** **of** **this** era **reflected** **this** **with** **even** **the** **largest** **of** **the** fortified **towns** **and** **hill** forts **containing** **no** **more** **than** clusters **of** **medium**-**sized** structures. **The** **spaces** **inside** **even** **the** **largest** roundhouses **were** **modest**, **and** **the** **use** **of** **rounded** **shapes** **and** organic **building** **materials** **gave** **buildings** **a** **human** scale. **But** **the** **effect** **of** Roman **civil** **architecture** **was** significant. **The** sheer **size** **of** **space** enclosed **within** **buildings** **like** **the** basilica **of** **London** must **have** **been** **astonishing**. **This** **was** an **architecture** **of** dominance **in** **which** **subject** **peoples** **were** literally **made** **to** **feel** **small** **by** **buildings** **that** epitomized imperial **power**. Supremacy **was** accentuated **by** **the** unyielding **straight** **lines** **of** **both** individual **buildings** **and** **planned** **settlements** **since** **these** **too** **provided** **a** **marked** contrast **with** **the** **natural** curvilinear **shapes** dominant **in** **the** **native** realm.

# Official 30-Passage 01 Role of Play in Development

**Play** **is** **easier** **to** define **with** **examples** **than** **with** **concepts**. **In** **any** **case**, **in** **animals** **it** **consists** **of** leaping, **running**, **climbing**, **throwing**, **wrestling**, **and** **other** **movements**, **either** **alone**, **with** **objects**, **or** **with** **other** **animals**. **Depending** **on** **the** species, **play** may **be** primarily **for** **social** interaction, **exercise**, **or** exploration. **One** **of** **the** **problems** **in** **providing** **a** **clear** definition **of** **play** **is** **that** **it** involves **the** **same** behaviors **that** **take** **place** **in** **other** **circumstances** – dominance, predation, **competition**, **and** **real** **fighting**. **Thus**, **whether** **play** **occurs** **or** **not** **depends** **on** **the** **intention** **of** **the** **animal**, **and** **intentions** **are** **not** **always** **clear** **from** behavior **alone**.

**Play** **appears** **to** **be** **a** developmental **characteristic** **of** **animals** **with** **fairly** sophisticated **nervous** **systems**, mainly **birds** **and** mammals. **Play** **has** **been** **studied** **most** extensively **in** primates **and** canids (**dogs**). **Exactly** **why** **animals** **play** **is** **still** **a** **matter** **debated** **in** **the** **research** **literature**, **and** **the** **reasons** may **not** **be** **the** **same** **for** **every** species **that** **plays**. **Determining** **the** **functions** **of** **play** **is** **difficult** **because** **the** **functions** may **be** **long**-**term**, **with** **beneficial** **effects** **not** **showing** **up** **until** **the** **animal**’s adulthood.

**Play** **is** **not** **without** considerable **costs** **to** **the** individual **animal**. **Play** **is** **usually** **very** **active**, involving **movement** **in** **space** **and**, **at** **times**, noisemaking. **Therefore**, **it** **results** **in** **the** **loss** **of** **fuel** **or** energy **that** **might** **better** **be** **used** **for** **growth** **or** **for** **building** **up** **fat** **stores** **in** **a** **young** **animal**. **Another** **potential** **cost** **of** **this** **activity** **is** **greater** exposure **to** predators **since** **play** **is** **attention**-**getting** behavior. **Greater** **activity** **also** **increases** **the** **risk** **of** **injury** **in** **slipping** **or** **falling**.

**The** **benefits** **of** **play** must outweigh **the** **costs**, **or** **play** **would** **not** **have** evolved, **according to** Darwin’s **theory**. **Some** **of** **the** **potential** **benefits** **relate** directly **to** **the** **healthy** **development** **of** **the** **brain** **and** **nervous** **system**. **In** **one** **research** **study**, **two** **groups** **of** **young** **rats** **were** **raised** **under** **different** **conditions**. **One** **group** **developed** **in** an “enriched” **environment**, **which** **allowed** **the** **rats** **to** interact **with** **other** **rats**, **play** **with** **toys**, **and** **receive** maze **training**. **The** **other** **group** **lived** **in** an “impoverished” **environment** **in** individual **cages** **in** **a** dimly **lit** **room** **with** **little** stimulation. **At** **the** **end** **of** **the** **experiments**, **the** **results** **showed** **that** **the** **actual** **weight** **of** **the** **brains** **of** **the** impoverished **rats** **was** **less** **than** **that** **of** **those** **raised** **in** **the** enriched **environment** (**though** **they** **were** **fed** **the** **same** **diets**). **Other** **studies** **have** **shown** **that** **greater** stimulation **not** **only** **affects** **the** **size** **of** **the** **brain** **but** **also** **increases** **the** **number** **of** **connections** **between** **the** nerve **cells**. **Thus**, **active** **play** may **provide** **necessary** stimulation **to** **the** **growth** **of** synaptic **connections** **in** **the** **brain**, **especially** **the** cerebellum, **which** **is** responsible **for** **motor** **functioning** **and** **movements**.

**Play** **also** stimulates **the** **development** **of** **the** muscle **tissues** **themselves** **and** may **provide** **the** opportunity **to** **practice** **those** **movements** **needed** **for** **survival**. Prey species, **like** **young** **deer** **or** **goats**, **for** **example**, typically **play** **by** **performing** **sudden** **flight** **movements** **and** **turns**, whereas predator species, **such** **as** **cats**, **practice** stalking, pouncing, **and** **biting**.

**Play** **allows** **a** **young** **animal** **to** **explore** **its** **environment** **and** **practice** **skills** **in** comparative **safety** **since** **the** **surrounding** **adults** generally **do** **not** **expect** **the** **young** **to** **deal** **with** threats **or** predators. **Play** **can** **also** **provide** **practice** **in** **social** behaviors **needed** **for** courtship **and** **mating**. **Learning** **appropriate** **social** behaviors **is** **especially** **important** **in** species **that** **live** **in** **groups**, **like** **young** **monkeys** **that** **need** **to** **learn** **to** **control** selfishness **and** **aggression** **and** **to** **understand** **the** **give**-**and**-**take** involved **in** **social** **groups**. **They** **need** **to** **learn** **how** **to** **be** dominant **and** submissive **because** **each** **monkey** **might** **have** **to** **play** **either** **role** **in** **the** **future**. **Most** **of** **these** **things** **are** **learned** **in** **the** **long** developmental **periods** **that** primates **have**, **during** **which** **they** engage **in** countless **play** **experiences** **with** **their** peers.

**There** **is** **a** **danger**, **of** **course**, **that** **play** may **be** misinterpreted **or** **not** recognized **as** **play** **by** **others**, potentially **leading** **to** **aggression**. **This** **is** **especially** **true** **when** **play** **consists** **of** **practicing** **normal** **aggressive** **or** predatory behaviors. **Thus**, **many** species **have** evolved **clear** **signals** **to** delineate playfulness. **Dogs**, **for** **example**, **will** **wag** **their** **tails**, **get** **down** **on** **their** **front** **legs**, **and** **stick** **their** **behinds** **in** **the** **air** **to** indicate “**what** **follows** **is** **just** **for** **play**.”

# Official 54-Passage 01 The Commercialization of Lumber

**In** nineteenth-**century** **America**, practically **everything** **that** **was** **built** involved **wood**.**Pine** **was** **especially** **attractive** **for** **building** **purposes**.**It** **is** durable **and** **strong**, **yet** **soft** **enough** **to** **be** **easily** worked **with** **even** **the** **simplest** **of** **hand** **tools**.**It** **also** **floats** nicely **on** **water**, **which** **allowed** **it** **to** **be** **transported** **to** **distant** **markets** **across** **the** **nation**.**The** **central** **and** **northern** **reaches** **of** **the** **Great** **Lakes** **states**—Michigan, Wisconsin, **and** Minnesota—**all** **contained** extensive **pine** **forests** **as** **well** **as** **many** **large** **rivers** **for** **floating** logs **into** **the** **Great** **Lakes**, **from** **where** **they** **were** **transported** **nationwide**.

**By** 1860, **the** **settlement** **of** **the** **American** **West** **along** **with** timber shortages **in** **the** **East** converged **with** **ever**-widening impact **on** **the** **pine** **forests** **of** **the** **Great** **Lakes** **states**. **Over** **the** **next** 30 **years**, lumbering **became** **a** **full**-fledged **enterprise** **in** Michigan, Wisconsin, **and** Minnesota. Newly **formed** lumbering **corporations** **bought** **up** **huge** tracts **of** pineland **and** **set** **about** systematically **cutting** **the** **trees**. **Both** **the** colonists **and** **the** **later** industrialists **saw** timber **as** **a** commodity, **but** **the** **latter** **group** **adopted** **a** **far** **more** **thorough** **and** **calculating** **approach** **to** **removing** **trees**. **In** **this** **sense**, **what** **happened** **between** 1860 **and** 1890 **represented** **a** significant **break** **with** **the** **past**. **No** **longer** **were** **farmers** **in** **search** **of** **extra** **income** **the** **main** source **for** shingles, **firewood**, **and** **other** **wood** **products**. **By** **the** 1870s, **farmers** **and** **city** dwellers **alike** **purchased** **forest** **products** **from** **large** manufacturing **companies** located **in** **the** **Great** **Lakes** **states** **rather** **than** chopping **wood** **themselves** **or** **buying** **it** locally.

**The** commercialization **of** lumbering **was** **in** **part** **the** **product** **of** technological **change**. **The** **early**, **thick** **saw** blades **tended** **to** **waste** **a** **large** **quantity** **of** **wood**, **with** **perhaps** **as** **much** **as** **a** **third** **of** **the** log **left** **behind** **on** **the** **floor** **as** sawdust **or** scrap. **In** **the** 1870s, **however**, **the British**-**invented** **band** **saw**, **with** **its** **thinner** blade, **became** **standard** issue **in** **the** **Great** **Lakes** **states**' lumber **factories**.**Meanwhile**, **the** **rise** **of** **steam**-**powered** mills streamlined **production** **by** **allowing** **for** **the** **more** efficient, centralized, **and** continuous **cutting** **of** lumber. **Steam** **helped** **to** automate **a** **variety** **of** **tasks**, **from** **cutting** **to** **the** **carrying** **away** **of** **waste**. Mills **also** **employed** **steam** **to** **heat** log **ponds**, **preventing** **them** **from** **freezing** **and** **making** **possible** **year**-**round** lumber **production**.

**For** industrial lumbering **to** **succeed**, **a** **way** **had** **to** **be** **found** **to** neutralize **the** **effects** **of** **the** **seasons** **on** **production**. Traditionally, **cutting** **took** **place** **in** **the** **winter**, **when** **snow** **and** **ice** **made** **it** **easier** **to** **drag** logs **on** sleds **or** sleighs **to** **the** **banks** **of** **streams**. **Once** **the** **streams** **and** **lakes** thawed, **workers** rafted **the** logs **to** mills, **where** **they** **were** **cut** **into** lumber **in** **the** **summer**. **If** **nature** **did** **not** cooperate—**if** **the** **winter** **proved** **dry** **and** **warm**, **if** **the** **spring** thaw **was** **delayed**—**production** **would** **suffer**. **To** **counter** **the** **effects** **of** **climate** **on** lumber **production**, loggers **experimented** **with** **a** **variety** **of** **techniques** **for** **transporting** **trees** **out** **of** **the** **woods**. **In** **the** 1870s, loggers **in** **the** **Great** **Lakes** **states** **began** sprinkling **water** **on** sleigh **roads**, **giving** **them** an **artificial** **ice** **coating** **to** facilitate **travel**. **The** **ice** **reduced** **the** **friction** **and** **allowed** **workers** **to** **move** **larger** **and** **heavier** **loads**.

**But** **all** **the** sprinkling **in** **the** **world** **would** **not** **save** **a** logger **from** **the** threat **of** **a** **warm** **winter**. **Without** **snow** **the** sleigh **roads** **turned** **to** **mud**. **In** **the** 1870s, **a** **set** **of** snowless **winters** **left** lumber **companies** **to** ponder **ways** **of** **liberating** **themselves** **from** **the** **seasons**. Railroads **were** **one** **possibility**.**At** **first**, **the** remoteness **of** **the** **pine** **forests** **discouraged** **common** **carriers** **from** **laying** **track**.**But** **increasing** lumber **prices** **in** **the** **late** 1870s **combined** **with** periodic **warm**, **dry** **winters** compelled loggers **to** **turn** **to** **iron** **rails**. **By** 1887, 89 logging railroads crisscrossed Michigan, **transforming** logging **from** **a** **winter** **activity** **into** **a** **year**-**round** **one**.

**Once** **the** logs **arrived** **at** **a** **river**, **the** **trip** downstream **to** **a** mill **could** **be** **a** **long** **and** tortuous **one**.Logjams (buildups **of** logs **that** **prevent** logs **from** **moving** downstream) **were** **common**—**at** **times** stretching **for** 10 **miles**—**and** **became** **even** **more** **frequent** **as** **pressure** **on** **the** **northern** Midwest pinelands **increased** **in** **the** 1860s. **To** **help** **keep** **the** logs **moving** efficiently, **barriers** **called** **booms** (essentially **a** **chain** **of** **floating** logs) **were** **constructed** **to** **control** **the** **direction** **of** **the** timber. **By** **the** 1870s, lumber **companies** **existed** **in** **all** **the** **major** logging **areas** **of** **the** **northern** Midwest.

# Official 39-Passage 01 Early Writing Systems

**Scholars** **agree** **that** **writing** originated **somewhere** **in** **the** **Middle East** **East**, **probably** Mesopotamia, **around** **the** **fourth** millennium B.C.E. **It** **is** **from** **the** **great** **libraries** **and** **word**-hoards **of** **these** **ancient** **lands** **that** **the** **first** **texts** emerged. **They** **were** **written** **on** **damp** **clay** **tablets** **with** **a** wedged (**or** V-**shaped**) **stick**; **since** **the** Latin **word** **for** wedge **is** cunea, **the** **texts** **are** **called** cuneiform. **The** **clay** **tablets** **usually** **were** **not** **fired**; **sun** **drying** **was** **probably** reckoned **enough** **to** **preserve** **the** **text** **for** **as** **long** **as** **it** **was** **being** **used**. Fortunately, **however**, **many** **tablets** **survived** **because** **they** **were** accidentally **fired** **when** **the** **buildings** **they** **were** **stored** **in** **burned**.

Cuneiform **writing** **lasted** **for** **some** 3,000 **years**, **in** **a** **vast** **line** **of** succession **that** **ran** **through** Sumer, Akkad, Assyria, Nineveh, **and** Babylon, **and** **preserved** **for** us **fifteen** **languages** **in** an **area** **represented** **by** **modern**-**day** Iraq, Syria, **and** **western** Iran. **The** **oldest** cuneiform **texts** **recorded** **the** transactions **of** **tax** collectors **and** **merchants**, **the** **receipts** **and** **bills** **of** **sale** **of** an **urban** **society**. **They** **had** **to** **do** **with** **things** **like** **grain**, **goats**, **and** **real** estate. **Later**, Babylonian scribes **recorded** **the** **laws** **and** **kept** **other** **kinds** **of** **records**. **Knowledge** conferred **power**. **As** **a** **result**, **the** scribes **were** assigned **their** **own** goddess, Nisaba, **later** **replaced** **by** **the** **god** Nabu **of** Borsippa, **whose** **symbol** **is** **neither** weapon **nor** dragon **but** **something** **far** **more** fearsome, **the** cuneiform **stick**.

Cuneiform **texts** **on** **science**, **astronomy**, **medicine**, **and** **mathematics** abound, **some** **offering** astoundingly **precise** **data**. **One** **tablet** **records** **the** **speed** **of** **the** **Moon** **over** 248 **days**; **another** **documents** an **early** **sighting** **of** Halley’s Comet, **from** **September** 22 **to** **September** 28, 164 B.C.E. **More** esoteric **texts** **attempt** **to** **explain** **old** Babylonian **customs**, **such** **as** **the** **procedure** **for** **curing** **someone** **who** **is** **ill**, **which** **included** rubbing tar **and** gypsum **on** **the** **sick** **person**’s **door** **and** **drawing** **a** **design** **at** **the** **foot** **of** **the** **person**’s **bed**. **What** **is** **clear** **from** **the** **vast** body **of** **texts** (**some** 20,000 **tablets** **were** **found** **in** **King** Ashurbanipal’s **library** **at** Nineveh) **is** **that** scribes **took** **pride** **in** **their** **writing** **and** **knowledge**.

**The** foremost cuneiform **text**, **the** Babylonian Epic **of** Gilgamesh, **deals** **with** humankind’s **attempts** **to** conquer **time**. **In** **it**, Gilgamesh, **king** **and** warrior, **is** crushed **by** **the** **death** **of** **his** **best** **friend** **and** **so** **sets** **out** **on** **adventures** **that** prefigure mythical **heroes** **of** **ancient** **Greek** legends **such** **as** Hercules. **His** **goal** **is** **not** **just** **to** **survive** **his** ordeals **but** **to** **make** **sense** **of** **this** **life**. Remarkably, **versions** **of** Gilgamesh span 1,500 **years**, **between** 2100 B.C.E **and** 600 B.C.E., **making** **the** **story** **the** epic **of** an **entire** **civilization**.

**The** **ancient** **Egyptians** **invented** **a** **different** **way** **of** **writing** **and** **a** **new** substance **to** **write** **on**—papyrus, **a** precursor **of** **paper**, **made** **from** **a** wetland **plant**. **The** Greeks **had** **a** **special** **name** **for** **this** **writing**: hiero glyphic, literally “**sacred** **writing**.” **This**, **they** **thought**, **was** **language** **fit** **for** **the** **gods**, **which** **explains** **why** **it** **was** **carved** **on** **walls** **of** **pyramids** **and** **other** **religious** structures. **Perhaps** hieroglyphics **are** **Egypt**’s **great** **contribution** **to** **the** **history** **of** **writing**: hieroglyphic **writing**, **in** **use** **from** 3100 B.C.E. **until** 394 C.E., **resulted** **in** **the** creation **of** **texts** **that** **were** **fine** **art** **as** **well** **as** **communication**. **Egypt** **gave** us **the** **tradition** **of** **the** scribe **not** **just** **as** **educated** **person** **but** **as** **artist** **and** calligrapher.

**Scholars** **have** detected **some** 6,000 **separate** hieroglyphic **characters** **in** **use** **over** **the** **history** **of** **Egyptian** **writing**, **but** **it** **appears** **that** **never** **more** **than** **a** **thousand** **were** **in** **use** **during** **any** **one** **period**. **It** **still** **seems** **a** **lot** **to** recall, **but** **what** **was** **lost** **in** efficiency **was** **more** **than** **made** **up** **for** **in** **the** **beauty** **and** richness **of** **the** **texts**. **Writing** **was** **meant** **to** **impress** **the** **eye** **with** **the** vastness **of** creation **itself**. **Each** **symbol** **or** glyph—**the** **flowering** reed (**pronounced** **like** “i”), **the** owl (“m”), **the** quail **chick** (“w”), etcetera—**was** **a** **tiny** **work** **of** **art**. Manuscripts **were** compiled **with** an **eye** **to** **the** overall **design**. Egyptologists **have** **noticed** **that** **the** glyphs **that** constitute individual **words** **were** **sometimes** shuffled **to** **make** **the** **text** **more** **pleasing** **to** **the** **eye** **with** **little** **regard** **for** **sound** **or** **sense**.

# Official 18-Passage 02 The mystery of yawning

**According to** **conventional** **theory**, **yawning** **takes** **place** **when** **people** **are** **bored** **or** **sleepy** **and** **serves** **the** **function** **of** **increasing** alertness **by** reversing, **through** **deeper** **breathing**, **the** **drop** **in** **blood** **oxygen** **levels** **that** **are** **caused** **by** **the** **shallow** **breathing** **that** **accompanies** **lack** **of** **sleep** **or** boredom. **Unfortunately**, **the** **few** **scientific** investigations **of** **yawning** **have** **failed** **to** **find** **any** **connection** **between** **how** **often** **someone** **yawns** **and** **how** **much** **sleep** **they** **have** **had** **or** **how** **tired** **they** **are**. **About** **the** **closest** **any** **research** **has** **come** **to** **supporting** **the** tiredness **theory** **is** **to** **confirm** **that** **adults** **yawn** **more** **often** **on** **weekdays** **than** **on** **weekends**, **and** **that** **school** **children** **yawn** **more** frequently **in** **their** **first** **year** **at** **primary school** **than** **they** **do** **in** **kindergarten**.

**Another** flaw **of** **the** tiredness **theory** **is** **that** **yawning** **does** **not** **raise** alertness **or** physiological **activity**, **as** **the** **theory** **would** **predict**. **When** researchers **measured** **the** **heart** **rate**, muscle **tension** **and** **skin** conductance **of** **people** **before**, **during**, **and** **after** **yawning**, **they** **did** detect **some** **changes** **in** **skin** conductance **following** **yawning**, indicating **a** **slight** **increase** **in** physiological **activity**. **However**, **similar** **changes** **occurred** **when** **the** **subjects** **were** **asked** **simply** **to** **open** **their** **mouths** **or** **to** **breathe** **deeply**. **Yawning** **did** **nothing** **special** **to** **their** **state** **of** physiological **activity**. **Experiments** **have** **also** **cast** **serious** **doubt** **on** **the** **belief** **that** **yawning** **is** triggered **by** **a** **drop** **in** **blood** **oxygen** **or** **a** **rise** **in** **blood** **carbon** **dioxide**. **Volunteers** **were** **told** **to** **think** **about** **yawning** **while** **they** **breathed** **either** **normal** **air**, **pure** **oxygen**, **or** an **air** **mixture** **with** an **above**-**normal** **level** **of** **carbon** **dioxide**. **If** **the** **theory** **was** **correct**, **breathing** **air** **with** **extra** **carbon** **dioxide** **should** **have** triggered **yawning**, **while** **breathing** **pure** **oxygen** **should** **have** suppressed **yawning**. **In** **fact**, **neither** **condition** **made** **any** **difference** **to** **the** frequency **of** **yawning**, **which** **remained** **constant** **at** **about** 24 **yawns** **per** **hour**. **Another** **experiment** demonstrated **that** **physical** **exercise**, **which** **was** sufficiently vigorous **to** **double** **the** **rate** **of** **breathing**, **had** **no** **effect** **on** **the** frequency **of** **yawning**. **Again**, **the** implication **is** **that** **yawning** **has** **little** **or** **nothing** **to** **do** **with** **oxygen**.

**A** completely **different** **theory** **holds** **that** **yawning** **assists** **in** **the** **physical** **development** **of** **the** **lungs** **early** **in** **life**, **but** **has** **no** **remaining** biological **function** **in** **adults**. **It** **has** **been** **suggested** **that** **yawning** **and** hiccupping **might** **serve** **to** **clear** **out** **the** fetus’s airways. **The** **lungs** **of** **a** fetus secrete **a** **liquid** **that** **mixes** **with** **its** **mother**’s amniotic fluid. **Babies** **with** congenital blockages **that** **prevent** **this** fluid **from** **escaping** **from** **their** **lungs** **are** **sometimes** **born** **with** deformed **lungs**. **It** **might** **be** **that** **yawning** **helps** **to** **clear** **out** **the** **lungs** **by** periodically lowering **the** **pressure** **in** **them**. **According to** **this** **theory**, **yawning** **in** **adults** **is** **just** **a** developmental fossil **with** **no** biological **function**. **But**, **while** **accepting** **that** **not** **everything** **in** **life** **can** **be** **explained** **by** Darwinian **evolution**, **there** **are** **sound** **reasons** **for** **being** skeptical **of** **theories** **like** **this** **one**, **which** **avoid** **the** issue **of** **what** **yawning** **does** **for** **adults**. **Yawning** **is** distracting, **consumes** energy **and** **takes** **time**. **It** **is** **almost** **certainly** **doing** **something** significant **in** **adults** **as** **well** **as** **in** fetuses. **What** **could** **it** **be**?

**The** empirical **evidence**, **such** **as** **it** **is**, **suggests** an **altogether** **different** **function** **for** **yawning**—namely, **that** **yawning** **prepares** us **for** **a** **change** **in** **activity** **level**. **Support** **for** **this** **theory** **came** **from** **a** **study** **of** **yawning** behavior **in** **everyday** **life**. **Volunteers** **wore** **wrist**-mounted devices **that** automatically **recorded** **their** **physical** **activity** **for** **up** **to** **two** **weeks**; **the** **volunteers** **also** **recorded** **their** **yawns** **by** **pressing** **a** **button** **on** **the** device **each** **time** **they** **yawned**. **The** **data** **showed** **that** **yawning** **tended** **to** **occur** **about** 15 **minutes** **before** **a** **period** **of** **increased** behavioral **activity**. **Yawning** **bore** **no** **relationship** **to** **sleep** **patterns**, **however**. **This** accords **with** anecdotal **evidence** **that** **people** **often** **yawn** **in** **situations** **where** **they** **are** **neither** **tired** **nor** **bored**, **but** **are** **preparing** **for** impending **mental** **and** **physical** **activity**. **Such** **yawning** **is** **often** **referred** **to** **as** “incongruous” **because** **it** **seems** **out** **of** **place**, **at** **least** **on** **the** tiredness **view**: **soldiers** **yawning** **before** combat, **musicians** **yawning** **before** **performing**, **and** **athletes** **yawning** **before** **competing**. **Their** **yawning** **seems** **to** **have** **nothing** **to** **do** **with** sleepiness **or** boredom—**quite** **the** reverse—**but** **it** **does** precede **a** **change** **in** **activity** **level**.

# Official 17-Passage 01 Europe's Early Sea Trade with Asia

**In** **the** fourteenth **century**, **a** **number** **of** **political** **developments** **cut** **Europe**’s overland **trade** routes **to** **southern** **and** **eastern** **Asia**, **with** **which** **Europe** **had** **had** **important** **and** highly profitable commercial **ties** **since** **the** **twelfth** **century**. **This** **development**, **coming** **as** **it** **did** **when** **the** **bottom** **had** **fallen** **out** **of** **the** **European** economy, **provided** an impetus **to** **a** **long**-**held** **desire** **to** **secure** **direct** **relations** **with** **the** **East** **by** establishing **a** **sea** **trade**. Widely **reported**, **if** somewhat distrusted, **accounts** **by** **figures** **like** **the** **famous** **traveler** **from** Venice, Marco Polo, **of** **the** **willingness** **of** **people** **in** **China** **to** **trade** **with** Europeans **and** **of** **the** immensity **of** **the** **wealth** **to** **be** **gained** **by** **such** contact **made** **the** **idea** irresistible. **Possibilities** **for** **trade** **seemed** **promising**, **but** **no** **hope** **existed** **for** maintaining **the** **traditional** routes **over** **land**. **A** **new** **way** **had** **to** **be** **found**.

**The** **chief** **problem** **was** technological: **How** **were** **the** Europeans **to** **reach** **the** **East**? **Europe**’s maritime **tradition** **had** **developed** **in** **the** context **of** **easily** navigable **seas**—**the** Mediterranean, **the** Baltic, **and**, **to** **a** **lesser** extent, **the** **North** **Sea** **between** **England** **and** **the** **Continent**—**not** **of** **vast** **oceans**. **New** **types** **of** **ships** **were** **needed**, **new** **methods** **of** **finding** **one**’s **way**, **new** **techniques** **for** **financing** **so** **vast** **a** scheme. **The** sheer scale **of** **the** investment **it** **took** **to** **begin** commercial expansion **at** **sea** **reflects** **the** immensity **of** **the** **profits** **that** **such** **East**-**West** **trade** **could** **create**. Spices **were** **the** **most** **sought**-**after** commodities. Spices **not** **only** dramatically **improved** **the** **taste** **of** **the** **European** **diet** **but** **also** **were** **used** **to** manufacture **perfumes** **and** **certain** **medicines**. **But** **even** **high**-**priced** commodities **like** spices **had** **to** **be** **transported** **in** **large** bulk **in** **order** **to** justify **the** **expense** **and** **trouble** **of** **sailing** **around** **the** **African** **continent** **all** **the** **way** **to** **India** **and** **China**.

**The** principal seagoing **ship** **used** **throughout** **the** **Middle** **Ages** **was** **the** galley, **a** **long**, **low** **ship** **fitted** **with** **sails** **but** **driven** primarily **by** oars. **The** **largest** galleys **had** **as** **many** **as** 50 oarsmen. **Since** **they** **had** relatively **shallow** hulls, **they** **were** unstable **when** **driven** **by** **sail** **or** **when** **on** **rough** **water**; hence **they** **were** unsuitable **for** **the** **voyage** **to** **the** **East**. **Even** **if** **they** **hugged** **the** **African** coastline, **they** **had** **little** **chance** **of** **surviving** **a** **crossing** **of** **the** **Indian** **Ocean**. **Shortly** **after** 1400, shipbuilders **began** **developing** **a** **new** **type** **of** vessel **properly** **designed** **to** **operate** **in** **rough**, **open** **water**: **the** caravel. **It** **had** **a** **wider** **and** **deeper** hull **than** **the** galley **and** hence **could** **carry** **more** cargo; **increased** stability **made** **it** **possible** **to** **add** multiple masts **and** **sails**. **In** **the** **largest** caravels, **two** **main** masts **held** **large** **square** **sails** **that** **provided** **the** bulk **of** **the** thrust **driving** **the** **ship** **forward**, **while** **a** **smaller** **forward** mast **held** **a** triangular-**shaped** **sail**, **called** **a** lateen **sail**, **which** **could** **be** **moved** **into** **a** **variety** **of** **positions** **to** maneuver **the** **ship**.

**The** astrolabe **had** **long** **been** **the** **primary** **instrument** **for** navigation, **having** **been** **introduced** **in** **the** eleventh **century**. **It** **operated** **by** **measuring** **the** **height** **of** **the** **Sun** **and** **the** **fixed** **stars**; **by** **calculating** **the** **angles** **created** **by** **these** **points**, **it** **determined** **the** **degree** **of** latitude **at** **which** **one** **stood**. (**The** **problem** **of** **determining** longitude, **though**, **was** **not** solved **until** **the** eighteenth **century**.) **By** **the** **early** thirteenth **century**, **Western** Europeans **had** **also** **developed** **and** **put** **into** **use** **the** magnetic **compass**, **which** **helped** **when** **clouds** obliterated **both** **the** **Sun** **and** **the** **stars**. **Also** **beginning** **in** **the** thirteenth **century**, **there** **were** **new** **maps** refined **by** **precise** calculations **and** **the** **reports** **of** **sailors** **that** **made** **it** **possible** **to** trace **one**’s **path** **with** **reasonable** **accuracy**. **Certain** institutional **and** **practical** norms **had** **become** established **as** **well**. **A** maritime code **known** **as** **the** Consulate **of** **the** **Sea**, **which** originated **in** **the** **western** Mediterranean region **in** **the** fourteenth **century**, **won** acceptance **by** **a** **majority** **of** **sea** goers **as** **the** normative code **for** maritime **conduct**; **it** defined **such** **matters** **as** **the** **authority** **of** **a** **ship**’s **officers**, protocols **of** **command**, **pay** structures, **the** **rights** **of** **sailors**, **and** **the** **rules** **of** engagement **when** **ships** **met** **one** **another** **on** **the** **sea**-lanes. **Thus** **by** **about** 1400 **the** **key** elements **were** **in** **place** **to** enable **Europe** **to** **begin** **its** seaward **adventure**.

# Official 53-Passage 03 Paleolithic Cave Paintings

**In** **any** investigation **of** **the** **origins** **of** **art**, **attention** **focuses** **on** **the** **cave** **paintings** **created** **in** **Europe** **during** **the** Paleolithic era (C. 40,000-10,000 **years** **ago**) **such** **as** **those** depicting bulls **and** **other** **animals** **in** **the** Lascaux **cave** **in** **France**. **Accepting** **that** **they** **are** **the** **best** **preserved** **and** **most** visible **signs** **of** **what** **was** **a** global creative explosion, **how** **do** **we** **start** **to** **explain** **their** **appearance**? Instinctively, **we** may **want** **to** update **the** **earliest** **human** **artists** **by** **assuming** **that** **they** **painted** **for** **the** sheer **joy** **of** **painting**. **The** philosophers **of** **Classical** **Greece** recognized **it** **as** **a** defining trait **of** **humans** **to** “**delight** **in** **works** **of** imitation”—**to** **enjoy** **the** **very** **act** **and** triumph **of** representation. **If** **we** **were** **close** **to** **a** **real** **lion** **or** **snake**, **we** **might** **feel** **frightened**. **But** **a** **well**-executed **picture** **of** **a** **lion** **or** **snake** **will** **give** us **pleasure**. **Why** **suppose** **that** **our** Paleolithic **ancestors** **were** **any** **different**?

**This** **simple** acceptance **of** **art** **for** **art**’s sake **has** **a** **certain** **appeal**. **To** **think** **of** Lascaux **as** **a** **gallery** **allows** **it** **to** **be** **a** **sort** **of** **special** **viewing** **place** **where** **the** handiwork **of** **accomplished** **artists** **might** **be** displayed. Plausibly, **daily** **existence** **in** **parts** **of** Paleolithic **Europe** may **not** **have** **been** **so** **hard**, **with** an abundance **of** **ready** **food** **and** **therefore** **the** leisure **time** **for** **art**. **The** **problems** **with** **this** **explanation**, **however**, **are** **various**. **In** **the** **first** **place**, **the** proliferation **of** archaeological **discoveries**—**and** **this** **includes** **some** **of** **the** **world**’s innumerable **rock** **art** sites **that** cannot **be** **dated**—**has** **served** **to** emphasize **a** remarkably **limited** repertoire **of** **subjects**. **The** images **that** recur **are** **those** **of** **animals**. **Human** **figures** **are** **unusual**, **and** **when** **they** **do** **make** an **appearance**, **they** **are** rarely **done** **with** **the** **same** **attention** **to** **form** accorded **to** **the** **animals**. **If** Paleolithic **artists** **were** **simply** **seeking** **to** **represent** **the** **beauty** **of** **the** **world** **around** **them**, **would** **they** **not** **have** **left** **a** **far** **greater** **range** **of** **pictures**—**of** **trees**, **flowers**, **of** **the** **Sun** **and** **the** **stars**?

**A** **further** **question** **to** **the** **theory** **of** **art** **for** **art**’s sake **is** posed **by** **the** **high** incidence **of** Paleolithic images **that** **appear** **not** **to** **be** imitative **of** **any** **reality** whatsoever. **These** **are** geometrical **shapes** **or** **patterns** **consisting** **of** **dots** **or** **lines**. **Such** **marks** may **be** **found** isolated **or** **repeated** **over** **a** **particular** **surface**, **but** **also** scattered **across** **more** recognizable **forms**. **A** **good** **example** **of** **this** may **be** **seen** **in** **the** geologically spectacular grotto **of** Pêche Merle, **in** **the** **Lot** region **of** **France**. **Here** **we** encounter **some** favorite **animals** **from** **the** Paleolithic repertoire—**a** **pair** **of** **stout**-**bellied** **horses**. **But** **over** **and** **around** **the** **horses**’ **outlines** **are** multiple **dark** **spots**, daubed **in** disregard **for** **the** **otherwise** naturalistic representation **of** **animals**. **What** **does** **such** **patterning** imitate? **There** **is** **also** **the** factor **of** location. **The** **caves** **of** Lascaux **might** conceivably qualify **as** **underground** **galleries**, **but** **many** **other** **paintings** **have** **been** **found** **in** recesses **totally** unsuitable **for** **any** **kind** **of** **viewing**—**tight** nooks **and** crannies **that** must **have** **been** **awkward** **even** **for** **the** **artists** **to** penetrate, **let** **alone** **for** **anyone** **else** **wanting** **to** **see** **the** **art**.

Finally, **we** may **doubt** **the** notion **that** **the** **Upper** Paleolithic **period** **was** **a** paradise **in** **which** **food** **came** readily, **leaving** **humans** **ample** **time** **to** **amuse** **themselves** **with** **art**. **For** **Europe** **it** **was** **still** **the** **Ice** **Age**. An estimate **of** **the** **basic** **level** **of** sustenance **then** **necessary** **for** **human** **survival** **has** **been** **judged** **at** 2200 calories **per** **day**. **This** **consideration**, **combined** **with** **the** stark emphasis **upon** **animals** **in** **the** **cave** **art**, **has** **persuaded** **some** archaeologists **that** **the** **primary** motive **behind** Paleolithic images must **lie** **with** **the** **primary** **activity** **of** Paleolithic **people**: **hunting**.

**Hunting** **is** **a** **skill**. **Tracking**, stalking, chasing, **and** **killing** **the** prey **are** **difficult**, **sometimes** **dangerous** **activities**. **What** **if** **the** **process** **could** **be** **made** **easier**—**by** **art**? **In** **the** **early** **decades** **of** **the** **twentieth** **century**, Abbé Henri Breuil **argued** **that** **the** **cave** **paintings** **were** **all** **about** “sympathetic **magic**.” **The** **artists** strived diligently **to** **make** **their** **animal** images evocative **and** realistic **because** **they** **were** **attempting** **to** capture **the** **spirit** **of** **their** prey. **What** **could** **have** prompted **their** studious **attention** **to** **making** **such** naturalistic, recognizable images? **According to** Breuil, **the** **artists** may **have** **believed** **that** **if** **a** **hunter** **were** **able** **to** **make** **a** **true** likeness **of** **some** **animal**, **then** **that** **animal** **was** virtually **trapped**. Images, **therefore**, may **have** **had** **the** magical capacity **to** confer **success** **or** **luck** **in** **the** **hunt**.

# Official 12-Passage 02 Transition to Sound in Film

**The** shift **from** **silent** **to** **sound** **film** **at** **the** **end** **of** **the** 1920’s **marks**, **so** **far**, **the** **most** **important** transformation **in** motion **picture** **history**. Despite **all** **the** highly visible technological **developments** **in** theatrical **and** **home** delivery **of** **the** **moving** image **that** **have** **occurred** **over** **the** **decades** **since** **then**, **no** **single** innovation **has** **come** **close** **to** **being** **regarded** **as** **a** **similar** **kind** **of** watershed. **In** **nearly** **every** **language**, **however** **the** **words** **are** **phrased**, **the** **most** **basic** **division** **in** **cinema** **history** **lies** **between** **films** **that** **are** mute **and** **films** **that** **speak**.

**Yet** **this** **most** **fundamental** **standard** **of** historical periodization conceals **a** **host** **of** paradoxes. **Nearly** **every** **movie** theater, **however** **modest**, **had** **a** **piano** **or** **organ** **to** **provide** **musical** accompaniment **to** **silent** **pictures**. **In** **many** instances, spectators **in** **the** era **before** **recorded** **sound** **experienced** elaborate aural **presentations** **alongside** **movies**’ **visual** images, **from** **the** **Japanese** benshi (narrators) crafting multivoiced **dialogue** narratives **to** original **musical** **compositions** **performed** **by** **symphony**-**size** orchestras **in** **Europe** **and** **the** **United** **States**. **In** Berlin, **for** **the** premiere **performance** **outside** **the** Soviet **Union** **of** **The** Battleship Potemkin, **film** **director** Sergei Eisenstein worked **with** Austrian composer Edmund Meisel (1874–1930) **on** **a** **musical** **score** **matching** **sound** **to** image; **the** Berlin screenings **with** **live** **music** **helped** **to** **bring** **the** **film** **its** **wide** **international** fame.

**Beyond** **that**, **the** triumph **of** **recorded** **sound** **has** overshadowed **the** **rich** diversity **of** technological **and** aesthetic **experiments** **with** **the** **visual** image **that** **were** **going** **forward** simultaneously **in** **the** 1920’s. **New** color **processes**, **larger** **or** differently **shaped** **screen** **sizes**, multiple-**screen** projections, **even** **television**, **were** **among** **the** **developments** **invented** **or** **tried** **out** **during** **the** **period**, **sometimes** **with** startling **success**. **The** **high** **costs** **of** converting **to** **sound** **and** **the** **early** limitations **of** **sound** **technology** **were** **among** **the** factors **that** suppressed innovations **or** retarded advancement **in** **these** **other** **areas**. **The** **introduction** **of** **new** **screen** **formats** **was** **put** **off** **for** **a** **quarter** **century**, **and** color, **though** utilized **over** **the** **next** **two** **decades** **for** **special** **productions**, **also** **did** **not** **become** **a** norm **until** **the** 1950’s.

**Though** **it** may **be** **difficult** **to** **imagine** **from** **a** **later** perspective, **a** strain **of** critical **opinion** **in** **the** 1920’s **predicted** **that** **sound** **film** **would** **be** **a** **technical** novelty **that** **would** **soon** **fade** **from** **sight**, **just** **as** **had** **many** previous **attempts**, **dating** **well** **back** **before** **the** **First** **World** **War**, **to** **link** images **with** **recorded** **sound**. **These** critics **were** **making** **a** **common** **assumption**—**that** **the** technological inadequacies **of** **earlier** **efforts** (**poor** synchronization, **weak** **sound** amplification, **fragile** **sound** recordings) **would** invariably **occur** **again**. **To** **be** **sure**, **their** evaluation **of** **the** **technical** flaws **in** 1920’s **sound** **experiments** **was** **not** **so** **far** **off** **the** **mark**, **yet** **they** neglected **to** **take** **into** **account** **important** **new** **forces** **in** **the** motion **picture** **field** **that**, **in** **a** **sense**, **would** **not** **take** **no** **for** an **answer**.

**These** **forces** **were** **the** rapidly **expanding** **electronics** **and** telecommunications **companies** **that** **were** **developing** **and** **linking** **telephone** **and** wireless **technologies** **in** **the** 1920’s. **In** **the** **United** **States**, **they** **included** **such** **firms** **as** **American** **Telephone** **and** **Telegraph**, **General** **Electric**, **and** Westinghouse. **They** **were** **interested** **in** **all** **forms** **of** **sound** **technology** **and** **all** **potential** **avenues** **for** commercial exploitation. **Their** **competition** **and** collaboration **were** **creating** **the** **broadcasting** **industry** **in** **the** **United** **States**, **beginning** **with** **the** **introduction** **of** commercial **radio** **programming** **in** **the** **early** 1920’s. **With** financial assets considerably **greater** **than** **those** **in** **the** motion **picture** **industry**, **and** **perhaps** **a** **wider** vision **of** **the** **relationships** **among** **entertainment** **and** **communications** **media**, **they** revitalized **research** **into** **recording** **sound** **for** motion **pictures**.

**In** 1929 **the** **United** **States** motion **picture** **industry** released **more** **than** 300 **sound** **films**—**a** **rough** **figure**, **since** **a** **number** **were** **silent** **films** **with** **music** **tracks**, **or** **films** **prepared** **in** dual **versions**, **to** **take** **account** **of** **the** **many** **cinemas** **not** **yet** **wired** **for** **sound**. **At** **the** **production** **level**, **in** **the** **United** **States** **the** conversion **was** virtually **complete** **by** 1930. **In** **Europe** **it** **took** **a** **little** **longer**, mainly **because** **there** **were** **more** **small** producers **for** **whom** **the** **costs** **of** **sound** **were** prohibitive, **and** **in** **other** **parts** **of** **the** **world** **problems** **with** **rights** **or** **access** **to** **equipment** **delayed** **the** shift **to** **sound** **production** **for** **a** **few** **more** **years** (**though** **cinemas** **in** **major** **cities** may **have** **been** **wired** **in** **order** **to** **play** **foreign** **sound** **films**). **The** triumph **of** **sound** **cinema** **was** **swift**, **complete**, **and** enormously **popular**.

# Official 50-Passage 02 The Achievement of Brazilian Independence

**In** contrast **to** **the** **political** anarchy, economic dislocation, **and** military destruction **in** **Spanish** **America**, Brazil’s **drive** **toward** **independence** **from** Portugal proceeded **as** **a** relatively bloodless transition **between** 1808 **and** 1822. **The** **idea** **of** Brazilian **independence** **first** **arose** **in** **the** **late** eighteenth **century** **as** **a** Brazilian reaction **to** **the** Portuguese **policy** **of** tightening **political** **and** economic **control** **over** **the** colony **in** **the** **interests** **of** **the** **mother** **country**. **The** **first** significant conspiracy **against** Portuguese **rule** **was** organized **from** 1788–1799 **in** **the** **province** **of** Minas Gerais, **where** **rigid** governmental **control** **over** **the** **production** **and** **prices** **of** **gold** **and** **diamonds**, **as** **well** **as** **heavy** **taxes**, **caused** **much** discontent. **But** **this** conspiracy **never** **went** **beyond** **the** **stage** **of** **discussion** **and** **was** **easily** **discovered** **and** crushed. **Other** conspiracies **in** **the** **late** eighteenth **century** **as** **well** **as** **a** **brief** revolt **in** 1817 **reflected** **the** **influence** **of** republican **ideas** **over** **sections** **of** **the** elite **and** **even** **the** **lower** strata **of** **urban** **society**. **All** **proved** abortive **or** **were** **soon** crushed. **Were** **it** **not** **for** an **accident** **of** **European** **history**, **the** **independence** **of** Brazil **might** **have** **been** **long** **delayed**.

**The** **French** invasion **of** Portugal **in** 1807 **followed** **by** **the** **flight** **of** **the** Portuguese **court** (sovereign **and** **government** **officers**) **to** Rio de Janeiro **brought** **large** **benefits** **to** Brazil. **Indeed**, **the** transfer **of** **the** **court** **in** **effect** signified **achievement** **of** Brazilian **independence**. **The** Portuguese prince **and** **future** **King** João VI **opened** Brazil’s **ports** **to** **the** **trade** **of** **friendly** **nations**, **permitted** **the** **rise** **of** **local** **industries**, **and** **founded** **the** **Bank** **of** Brazil. **In** 1815 **he** elevated Brazil **to** **the** **legal** **status** **of** **a** **kingdom** coequal **with** Portugal. **In** **one** **sense**, **however**, Brazil’s **new** **status** signified **the** substitution **of** **one** dependence **for** **another**. **Freed** **from** Portuguese **control**, Brazil **came** **under** **the** economic dominance **of** **England**, **which** **obtained** **major** tariff concessions **and** **other** **privileges** **by** **the** Strangford Treaty **of** 1810 **between** Portugal **and** **Great** **Britain**. **The** treaty **provided** **for** **the** importation **of** **British** manufactures **into** Brazil **and** **the** **export** **of** Brazilian **agricultural** **produce** **to** **Great** **Britain**. **One** **result** **was** an influx **of** **cheap** **machine**-**made** **goods** **that** swamped **the** handicrafts **industry** **of** **the** **country**.

Brazilian elites **took** **satisfaction** **in** Brazil’s **new** **role** **and** **the** **growth** **of** educational, cultural, **and** economic opportunities **for** **their** **class**. **But** **the** **feeling** **was** **mixed** **with** resentment **toward** **the** **thousands** **of** Portuguese courtiers (**officials**) **and** hangers-**on** **who** **came** **with** **the** **court** **and** **who** **competed** **with** Brazilians **for** **jobs** **and** favors. **Thus**, **the** **change** **in** **the** **status** **of** Brazil **sharpened** **the** **conflict** **between** Portuguese elites **born** **in** Brazil **and** elites **born** **in** Portugal **and** loyal **to** **the** Portuguese crown.

**The** **event** **that** precipitated **the** **break** **with** **the** **mother** **country** **was** **the** **revolution** **of** 1820 **in** Portugal. **The** Portuguese revolutionaries framed **a** liberal **constitution** **for** **the** **kingdom**, **but** **they** **were** **conservative** **or** reactionary **in** **relation** **to** Brazil. **They** **demanded** **the** **immediate** **return** **of** **King** João **to** Lisbon, an **end** **to** **the** **system** **of** dual monarchy **that** **he** **had** devised, **and** **the** restoration **of** **the** Portuguese commercial monopoly. Timid **and** vacillating, **King** João **did** **not** **know** **which** **way** **to** **turn**. **Under** **the** **pressure** **of** **his** courtiers, **who** **hungered** **to** **return** **to** Portugal **and** **their** **lost** estates, **he** finally **approved** **the** **new** **constitution** **and** **sailed** **for** Portugal. **He** **left** **behind** **him**, **however**, **his** **son** **and** heir, Pedro, **and** **in** **a** **private** **letter** **advised** **him** **that** **in** **the** **event** **the** Brazilians **should** **demand** **independence**, **he** **should** **assume** leadership **of** **the** **movement** **and** **set** **the** crown **of** Brazil **on** **his** **head**.

**Soon** **it** **became** **clear** **that** **the** Portuguese parliament **intended** **to** **set** **the** **clock** **back** **by** abrogating **all** **the** **liberties** **and** concessions **won** **by** Brazil **since** 1808. **One** **of** **its** decrees **insisted** **on** **the** **immediate** **return** **of** Pedro **from** Brazil. **The** **pace** **of** **events** **moved** **more** rapidly **in** 1822. **On** **January** 9, **urged** **on** **by** Brazilian advisers **who** perceived **a** **golden** opportunity **to** **make** an orderly transition **to** **independence** **without** **the** intervention **of** **the** **masses**, Pedro **refused** an **order** **from** **the** parliament **to** **return** **to** Portugal, **saying** famously, “**I** **remain**.” **On** **September** 7, **regarded** **by** **all** Brazilians **as** **Independence** **Day**, **he** issued **the** **even** **more** **celebrated** proclamation, “**Independence** **or** **death**!” **In** **December** 1822, **having** **overcome** **slight** resistance **by** Portuguese **troops**, Dom Pedro **was** formally proclaimed constitutional **Emperor** **of** Brazil.

# Official 20-Passage 02 Early Settlements in the Southwest Asia

**The** **universal** global **warming** **at** **the** **end** **of** **the** **Ice** **Age** **had** dramatic **effects** **on** temperate regions **of** **Asia**, **Europe**, **and** **North** **America**. **Ice** **sheets** retreated **and** **sea** **levels** **rose**. **The** climatic **changes** **in** southwestern **Asia** **were** **more** subtle, **in** **that** **they** involved shifts **in** **mountain** **snow** **lines**, **rainfall** **patterns**, **and** vegetation **cover**. **However**, **these** **same** **cycles** **of** **change** **had** momentous impacts **on** **the** sparse **human** **populations** **of** **the** region. **At** **the** **end** **of** **the** **Ice** **Age**, **no** **more** **than** **a** **few** **thousand** foragers **lived** **along** **the** **eastern** Mediterranean **coast**, **in** **the** Jordan **and** Euphrates **valleys**. **Within** 2,000 **years**, **the** **human** **population** **of** **the** region **numbered** **in** **the** **tens** **of** **thousands**, **all** **as** **a** **result** **of** **village** **life** **and** **farming**. **Thanks** **to** **new** environmental **and** archaeological **discoveries**, **we** **now** **know** **something** **about** **this** remarkable **change** **in** **local** **life**.

Pollen samples **from** freshwater **lakes** **in** Syria **and** elsewhere **tell** us **forest** **cover** **expanded** rapidly **at** **the** **end** **of** **the** **Ice** **Age**, **for** **the** southwestern **Asian** **climate** **was** **still** **cooler** **and** considerably **wetter** **than** **today**. **Many** **areas** **were** **richer** **in** **animal** **and** **plant** species **than** **they** **are** **now**, **making** **them** highly favorable **for** **human** **occupation**. **About** 9000 B.C., **most** **human** **settlements** **lay** **in** **the** **area** **along** **the** Mediterranean **coast** **and** **in** **the** Zagros **Mountains** **of** Iran **and** **their** foothills. **Some** **local** **areas**, **like** **the** Jordan **River** **valley**, **the** **middle** Euphrates **valley**, **and** **some** Zagros **valleys**, **were** **more** densely populated **than** elsewhere. **Here** **more** sedentary **and** **more** **complex** **societies** flourished. **These** **people** **exploited** **the** landscape intensively, foraging **on** **hill** slopes **for** **wild** cereal **grasses** **and** **nuts**, **while** **hunting** gazellea **small**, swiftly **running** **desert** **animal** **and** **other** **game** **on** grassy lowlands **and** **in** **river** **valleys**. **Their** **settlements** **contain** exotic **objects** **such** **as** **seashells**, **stone** **bowls**, **and** artifacts **made** **of** obsidian (volcanic **glass**), **all** **traded** **from** afar. **This** considerable volume **of** intercommunity **exchange** **brought** **a** **degree** **of** **social** complexity **in** **its** **wake**.

**Thanks** **to** **extremely** **fine**-**grained** excavation **and** extensive **use** **of** flotation **methods** (**through** **which** **seeds** **are** **recovered** **from** **soil** samples), **we** **know** **a** **great** **deal** **about** **the** foraging **practices** **of** **the** inhabitants **of** Abu Hureyra **in** Syria’s Euphrates **valley**. Abu Hureyra **was** **founded** **about** 9500 B.C. **a** **small** **village** **settlement** **of** cramped pit dwellings (**houses** **dug** partially **in** **the** **soil**) **with** reed **roofs** **supported** **by** **wooden** uprights. **For** **the** **next** 1,500 **years**, **its** inhabitants **enjoyed** **a** somewhat **warmer** **and** **damper** **climate** **than** **today**, **living** **in** **a** **well**-**wooded** steppe **area** **where** **wild** cereal **grasses** **were** **abundant**. **They** subsisted **off** **spring** migrations **of** Persian gazelles **from** **the** **south**. **With** **such** **a** favorable location, **about** 300 **to** 400 **people** **lived** **in** **a** sizable, **permanent** **settlement**. **They** **were** **no** **longer** **a** series **of** **small** **bands** **but** **lived** **in** **a** **large** community **with** **more** elaborate **social** **organization**, **probably** **grouped** **into** clans **of** **people** **of** **common** descent.

**The** flotation samples **from** **the** excavations **allowed** botanists **to** **study** shifts **in** **plant**-**collecting** **habits** **as** **if** **they** **were** **looking** **through** **a** **telescope** **at** **a** **changing** landscape. **Hundreds** **of** **tiny** **plant** **remains** **show** **how** **the** inhabitants **exploited** **nut** **harvests** **in** **nearby** pistachio **and** oak **forests**. **However**, **as** **the** **climate** **dried** **up**, **the** **forests** retreated **from** **the** vicinity **of** **the** **settlement**. **The** inhabitants **turned** **to** **wild** cereal **grasses** **instead**, **collecting** **them** **by** **the** **thousands**, **while** **the** **percentage** **of** **nuts** **in** **the** **diet** **fell**. **By** 8200 B.C., drought **conditions** **were** **so** **severe** **that** **the** **people** **abandoned** **their** **long**-established **settlement**, persing **into** **smaller** **camps**.

**Five** **centuries** **later**, **about** 7700 B.C., **a** **new** **village** **rose** **on** **the** mound. **At** **first** **the** inhabitants **still** **hunted** gazelle intensively. **Then**, **about** 7000 B.C., **within** **the** **space** **of** **a** **few** **generations**, **they** **switched** abruptly **to** herding domesticated **goats** **and** **sheep** **and** **to** **growing** einkorn, **pulses**, **and** **other** cereal **grasses**. Abu Hureyra **grew** rapidly **until** **it** **covered** **nearly** 30 **acres**. **It** **was** **a** **close**-knit community **of** rectangular, **one**-**story** **mud**-**brick** **houses**, **joined** **by** **narrow** lanes **and** **courtyards**, finally **abandoned** **about** 5000 B.C.. **Many** **complex** factors **led** **to** **the** adoption **of** **the** **new** economies, **not** **only** **at** Abu Hureyra, **but** **at** **many** **other** locations **such** **as** ‘Ain Ghazal, **also** **in** Syria, **where** **goat** toe **bones** **showing** **the** telltale **marks** **of** abrasion **caused** **by** **foot** tethering (binding) testify **to** **early** herding **of** domestic stock.

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