

# MEASURING TIME:

## THE ANCIENT EGYPTIAN INVENTION OF THE CLOCK

ARTS@GRAHAM “OBJECTS AS EVIDENCE”

### PRIMARY SOURCES AND ASSOCIATED TEXTS:

#### 1. *The So-Called “Astronomical Instrument” of King Tut*

OIM E12144 | New Kingdom, Dynasty 18, Reign of Tutankhamun (1336–1327 BC) | Purchased in Egypt, 1923 | H: 1.5 x L: 27 x TH: 2.9 cm

Bibliography: [Ritner 2019](#), p. 96, no. 67; [McClain 2007](#), pp. 97–98; [Larson 1992](#), pp. 77–86; [Larson 1985](#); [Reeves 1982](#), pp. 65–69; [Reeves 1981](#), pp. 49–55.

Links: [Museum Object Record](#); [Ancient Egyptian Astronomy Database](#)

Description: This L-shaped tool was known as a *merkhet* (*mrḫ.t*) in ancient Egyptian. Such tools were fixed with a plumb bob to ensure the tool was level, or on a level surface. It has been suggested that this *merkhet* may have been used in surveying and stare-gazing the night sky. However, like other *merkhet*s, this device shares many features with L-shaped shadow clocks used for telling time through a shadow cast by the sun. This example was inscribed on both sides with a dedicatory inscription of Tutankhamun.



𓂏𓂐𓂑𓂒𓂓𓂔𓂕𓂖𓂗𓂘𓂙𓂚𓂛𓂜𓂝𓂞𓂟𓂠𓂡𓂢𓂣𓂤𓂥𓂦𓂧𓂨𓂩𓂪𓂫𓂬𓂭𓂮𓂯𓂰𓂱𓂲𓂳𓂴𓂵𓂶𓂷𓂸𓂹𓃀𓃁𓃂𓃃𓃄𓃅𓃆𓃇𓃈𓃉𓃊𓃋𓃌𓃍𓃎𓃏𓃐𓃑𓃒𓃓𓃔𓃕𓃖𓃗𓃘𓃙𓃚𓃛𓃜𓃝𓃞𓃟𓃠𓃡𓃢𓃣𓃤𓃥𓃦𓃧𓃨𓃩𓃪𓃫𓃬𓃭𓃮𓃯𓃰𓃱𓃲𓃳𓃴𓃵𓃶𓃷𓃸𓃹𓃺𓃻𓃼𓃽𓃾𓃿𓄀𓄁𓄂𓄃𓄄𓄅𓄆𓄇𓄈𓄉𓄊𓄋𓄌𓄍𓄎𓄏𓄐𓄑𓄒𓄓𓄔𓄕𓄖𓄗𓄘𓄙𓄚𓄛𓄜𓄝𓄞𓄟𓄠𓄡𓄢𓄣𓄤𓄥𓄦𓄧𓄨𓄩𓄪𓄫𓄬𓄭𓄮𓄯𓄰𓄱𓄲𓄳𓄴𓄵𓄶𓄷𓄸𓄹𓄺𓄻𓄼𓄽𓄾𓄿𓅀𓅁𓅂𓅃𓅄𓅅𓅆𓅇𓅈𓅉𓅊𓅋𓅌𓅍𓅎𓅏𓅐𓅑𓅒𓅓𓅔𓅕𓅖𓅗𓅘𓅙𓅚𓅛𓅜𓅝𓅞𓅟𓅠𓅡𓅢𓅣𓅤𓅥𓅦𓅧𓅨𓅩𓅪𓅫𓅬𓅭𓅮𓅯𓅰𓅱𓅲𓅳𓅴𓅵𓅶𓅷𓅸𓅹𓅺𓅻𓅼𓅽𓅾𓅿𓆀𓆁𓆂𓆃𓆄𓆅𓆆𓆇𓆈𓆉𓆊𓆋𓆌𓆍𓆎𓆏𓆐𓆑𓆒𓆓𓆔𓆕𓆖𓆗𓆘𓆙𓆚𓆛𓆜𓆝𓆞𓆟𓆠𓆡𓆢𓆣𓆤𓆥𓆦𓆧𓆨𓆩𓆪𓆫𓆬𓆭𓆮𓆯𓆰𓆱𓆲𓆳𓆴𓆵𓆶𓆷𓆸𓆹𓆺𓆻𓆼𓆽𓆾𓆿𓇀𓇁𓇂𓇃𓇄𓇅𓇆𓇇𓇈𓇉𓇊𓇋𓇌𓇍𓇎𓇏𓇐𓇑𓇒𓇓𓇔𓇕𓇖𓇗𓇘𓇙𓇚𓇛𓇜𓇝𓇞𓇟𓇠𓇡𓇢𓇣𓇤𓇥𓇦𓇧𓇨𓇩𓇪𓇫𓇬𓇭𓇮𓇯𓇰𓇱𓇲𓇳𓇴𓇵𓇶𓇷𓇸𓇹𓇺𓇻𓇼𓇽𓇾𓇿𓈀𓈁𓈂𓈃𓈄𓈅𓈆𓈇𓈈𓈉𓈊𓈋𓈌𓈍𓈎𓈏𓈐𓈑𓈒𓈓𓈔𓈕𓈖𓈗𓈘𓈙𓈚𓈛𓈜𓈝𓈞𓈟𓈠𓈡𓈢𓈣𓈤𓈥𓈦𓈧𓈨𓈩𓈪𓈫𓈬𓈭𓈮𓈯𓈰𓈱𓈲𓈳𓈴𓈵𓈶𓈷𓈸𓈹𓈺𓈻𓈼𓈽𓈾𓈿𓉀𓉁𓉂𓉃𓉄𓉅𓉆𓉇𓉈𓉉𓉊𓉋𓉌𓉍𓉎𓉏𓉐𓉑𓉒𓉓𓉔𓉕𓉖𓉗𓉘𓉙𓉚𓉛𓉜𓉝𓉞𓉟𓉠𓉡𓉢𓉣𓉤𓉥𓉦𓉧𓉨𓉩𓉪𓉫𓉬𓉭𓉮𓉯𓉰𓉱𓉲𓉳𓉴𓉵𓉶𓉷𓉸𓉹𓉺𓉻𓉼𓉽𓉾𓉿𓊀𓊁𓊂𓊃𓊄𓊅𓊆𓊇𓊈𓊉𓊊𓊋𓊌𓊍𓊎𓊏𓊐𓊑𓊒𓊓𓊔𓊕𓊖𓊗𓊘𓊙𓊚𓊛𓊜𓊝𓊞𓊟𓊠𓊡𓊢𓊣𓊤𓊥𓊦𓊧𓊨𓊩𓊪𓊫𓊬𓊭𓊮𓊯𓊰𓊱𓊲𓊳𓊴𓊵𓊶𓊷𓊸𓊹𓊺𓊻𓊼𓊽𓊾𓊿𓋀𓋁𓋂𓋃𓋄𓋅𓋆𓋇𓋈𓋉𓋊𓋋𓋌𓋍𓋎𓋏𓋐𓋑𓋒𓋓𓋔𓋕𓋖𓋗𓋘𓋙𓋚𓋛𓋜𓋝𓋞𓋟𓋠𓋡𓋢𓋣𓋤𓋥𓋦𓋧𓋨𓋩𓋪𓋫𓋬𓋭𓋮𓋯𓋰𓋱𓋲𓋳𓋴𓋵𓋶𓋷𓋸𓋹𓋺𓋻𓋼𓋽𓋾𓋿𓌀𓌁𓌂𓌃𓌄𓌅𓌆𓌇𓌈𓌉𓌊𓌋𓌌𓌍𓌎𓌏𓌐𓌑𓌒𓌓𓌔𓌕𓌖𓌗𓌘𓌙𓌚𓌛𓌜𓌝𓌞𓌟𓌠𓌡𓌢𓌣𓌤𓌥𓌦𓌧𓌨𓌩𓌪𓌫𓌬𓌭𓌮𓌯𓌰𓌱𓌲𓌳𓌴𓌵𓌶𓌷𓌸𓌹𓌺𓌻𓌼𓌽𓌾𓌿𓍀𓍁𓍂𓍃𓍄𓍅𓍆𓍇𓍈𓍉𓍊𓍋𓍌𓍍𓍎𓍏𓍐𓍑𓍒𓍓𓍔𓍕𓍖𓍗𓍘𓍙𓍚𓍛𓍜𓍝𓍞𓍟𓍠𓍡𓍢𓍣𓍤𓍥𓍦𓍧𓍨𓍩𓍪𓍫𓍬𓍭𓍮𓍯𓍰𓍱𓍲𓍳𓍴𓍵𓍶𓍷𓍸𓍹𓍺𓍻𓍼𓍽𓍾𓍿𓎀𓎁𓎂𓎃𓎄𓎅𓎆𓎇𓎈𓎉𓎊𓎋𓎌𓎍𓎎𓎏𓎐𓎑𓎒𓎓𓎔𓎕𓎖𓎗𓎘𓎙𓎚𓎛𓎜𓎝𓎞𓎟𓎠𓎡𓎢𓎣𓎤𓎥𓎦𓎧𓎨𓎩𓎪𓎫𓎬𓎭𓎮𓎯𓎰𓎱𓎲𓎳𓎴𓎵𓎶𓎷𓎸𓎹𓎺𓎻𓎼𓎽𓎾𓎿𓏀𓏁𓏂𓏃𓏄𓏅𓏆𓏇𓏈𓏉𓏊𓏋𓏌𓏍𓏎𓏏𓏐𓏑𓏒𓏓𓏔𓏕𓏖𓏗𓏘𓏙𓏚𓏛𓏜𓏝𓏞𓏟𓏠𓏡𓏢𓏣𓏤𓏥𓏦𓏧𓏨𓏩𓏪𓏫𓏬𓏭𓏮𓏯𓏰𓏱𓏲𓏳𓏴𓏵𓏶𓏷𓏸𓏹𓏺𓏻𓏼𓏽𓏾𓏿𓐀𓐁𓐂𓐃𓐄𓐅𓐆𓐇𓐈𓐉𓐊𓐋𓐌𓐍𓐎𓐏𓐐𓐑𓐒𓐓𓐔𓐕𓐖𓐗𓐘𓐙𓐚𓐛𓐜𓐝𓐞𓐟𓐠𓐡𓐢𓐣𓐤𓐥𓐦𓐧𓐨𓐩𓐪𓐫𓐬𓐭𓐮𓐯𓐰𓐱𓐲𓐳𓐴𓐵𓐶𓐷𓐸𓐹𓐺𓐻𓐼𓐽𓐾𓐿𓑀𓑁𓑂𓑃𓑄𓑅𓑆𓑇𓑈𓑉𓑊𓑋𓑌𓑍𓑎𓑏𓑐𓑑𓑒𓑓𓑔𓑕𓑖𓑗𓑘𓑙𓑚𓑛𓑜𓑝𓑞𓑟𓑠𓑡𓑢𓑣𓑤𓑥𓑦𓑧𓑨𓑩𓑪𓑫𓑬𓑭𓑮𓑯𓑰𓑱𓑲𓑳𓑴𓑵𓑶𓑷𓑸𓑹𓑺𓑻𓑼𓑽𓑾𓑿𓒀𓒁𓒂𓒃𓒄𓒅𓒆𓒇𓒈𓒉𓒊𓒋𓒌𓒍𓒎𓒏𓒐𓒑𓒒𓒓𓒔𓒕𓒖𓒗𓒘𓒙𓒚𓒛𓒜𓒝𓒞𓒟𓒠𓒡𓒢𓒣𓒤𓒥𓒦𓒧𓒨𓒩𓒪𓒫𓒬𓒭𓒮𓒯𓒰𓒱𓒲𓒳𓒴𓒵𓒶𓒷𓒸𓒹𓒺𓒻𓒼𓒽𓒾𓒿𓓀𓓁𓓂𓓃𓓄𓓅𓓆𓓇𓓈𓓉𓓊𓓋𓓌𓓍𓓎𓓏𓓐𓓑𓓒𓓓𓓔𓓕𓓖𓓗𓓘𓓙𓓚𓓛𓓜𓓝𓓞𓓟𓓠𓓡𓓢𓓣𓓤𓓥𓓦𓓧𓓨𓓩𓓪𓓫𓓬𓓭𓓮𓓯𓓰𓓱𓓲𓓳𓓴𓓵𓓶𓓷𓓸𓓹𓓺𓓻𓓼𓓽𓓾𓓿𓔀𓔁𓔂𓔃𓔄𓔅𓔆𓔇𓔈𓔉𓔊𓔋𓔌𓔍𓔎𓔏𓔐𓔑𓔒𓔓𓔔𓔕𓔖𓔗𓔘𓔙𓔚𓔛𓔜𓔝𓔞𓔟𓔠𓔡𓔢𓔣𓔤𓔥𓔦𓔧𓔨𓔩𓔪𓔫𓔬𓔭𓔮𓔯𓔰𓔱𓔲𓔳𓔴𓔵𓔶𓔷𓔸𓔹𓔺𓔻𓔼𓔽𓔾𓔿𓕀𓕁𓕂𓕃𓕄𓕅𓕆𓕇𓕈𓕉𓕊𓕋𓕌𓕍𓕎𓕏𓕐𓕑𓕒𓕓𓕔𓕕𓕖𓕗𓕘𓕙𓕚𓕛𓕜𓕝𓕞𓕟𓕠𓕡𓕢𓕣𓕤𓕥𓕦𓕧𓕨𓕩𓕪𓕫𓕬𓕭𓕮𓕯𓕰𓕱𓕲𓕳𓕴𓕵𓕶𓕷𓕸𓕹𓕺𓕻𓕼𓕽𓕾𓕿𓖀𓖁𓖂𓖃𓖄𓖅𓖆𓖇𓖈𓖉𓖊𓖋𓖌𓖍𓖎𓖏𓖐𓖑𓖒𓖓𓖔𓖕𓖖𓖗𓖘𓖙𓖚𓖛𓖜𓖝𓖞𓖟𓖠𓖡𓖢𓖣𓖤𓖥𓖦𓖧𓖨𓖩𓖪𓖫𓖬𓖭𓖮𓖯𓖰𓖱𓖲𓖳𓖴𓖵𓖶𓖷𓖸𓖹𓖺𓖻𓖼𓖽𓖾𓖿𓗀𓗁𓗂𓗃𓗄𓗅𓗆𓗇𓗈𓗉𓗊𓗋𓗌𓗍𓗎𓗏𓗐𓗑𓗒𓗓𓗔𓗕𓗖𓗗𓗘𓗙𓗚𓗛𓗜𓗝𓗞𓗟𓗠𓗡𓗢𓗣𓗤𓗥𓗦𓗧𓗨𓗩𓗪𓗫𓗬𓗭𓗮𓗯𓗰𓗱𓗲𓗳𓗴𓗵𓗶𓗷𓗸𓗹𓗺𓗻𓗼𓗽𓗾𓗿𓘀𓘁𓘂𓘃𓘄𓘅𓘆𓘇𓘈𓘉𓘊𓘋𓘌𓘍𓘎𓘏𓘐𓘑𓘒𓘓𓘔𓘕𓘖𓘗𓘘𓘙𓘚𓘛𓘜𓘝𓘞𓘟𓘠𓘡𓘢𓘣𓘤𓘥𓘦𓘧𓘨𓘩𓘪𓘫𓘬𓘭𓘮𓘯𓘰𓘱𓘲𓘳𓘴𓘵𓘶𓘷𓘸𓘹𓘺𓘻𓘼𓘽𓘾𓘿𓙀𓙁𓙂𓙃𓙄𓙅𓙆𓙇𓙈𓙉𓙊𓙋𓙌𓙍𓙎𓙏𓙐𓙑𓙒𓙓𓙔𓙕𓙖𓙗𓙘𓙙𓙚𓙛𓙜𓙝𓙞𓙟𓙠𓙡𓙢𓙣𓙤𓙥𓙦𓙧𓙨𓙩𓙪𓙫𓙬𓙭𓙮𓙯𓙰𓙱𓙲𓙳𓙴𓙵𓙶𓙷𓙸𓙹𓙺𓙻𓙼𓙽𓙾𓙿𓚀𓚁𓚂𓚃𓚄𓚅𓚆𓚇𓚈𓚉𓚊𓚋𓚌𓚍𓚎𓚏𓚐𓚑𓚒𓚓𓚔𓚕𓚖𓚗𓚘𓚙𓚚𓚛𓚜𓚝𓚞𓚟𓚠𓚡𓚢𓚣𓚤𓚥𓚦𓚧𓚨𓚩𓚪𓚫𓚬𓚭𓚮𓚯𓚰𓚱𓚲𓚳𓚴𓚵𓚶𓚷𓚸𓚹𓚺𓚻𓚼𓚽𓚾𓚿𓛀𓛁𓛂𓛃𓛄𓛅𓛆𓛇𓛈𓛉𓛊𓛋𓛌𓛍𓛎𓛏𓛐𓛑𓛒𓛓𓛔𓛕𓛖𓛗𓛘𓛙𓛚𓛛𓛜𓛝𓛞𓛟𓛠𓛡𓛢𓛣𓛤𓛥𓛦𓛧𓛨𓛩𓛪𓛫𓛬𓛭𓛮𓛯𓛰𓛱𓛲𓛳𓛴𓛵𓛶𓛷𓛸𓛹𓛺𓛻𓛼𓛽𓛾𓛿𓜀𓜁𓜂𓜃𓜄𓜅𓜆𓜇𓜈𓜉𓜊𓜋𓜌𓜍𓜎𓜏𓜐𓜑𓜒𓜓𓜔𓜕𓜖𓜗𓜘𓜙𓜚𓜛𓜜𓜝𓜞𓜟𓜠𓜡𓜢𓜣𓜤𓜥𓜦𓜧𓜨𓜩𓜪𓜫𓜬𓜭𓜮𓜯𓜰𓜱𓜲𓜳𓜴𓜵𓜶𓜷𓜸𓜹𓜺𓜻𓜼𓜽𓜾𓜿𓝀𓝁𓝂𓝃𓝄𓝅𓝆𓝇𓝈𓝉𓝊𓝋𓝌𓝍𓝎𓝏𓝐𓝑𓝒𓝓𓝔𓝕𓝖𓝗𓝘𓝙𓝚𓝛𓝜𓝝𓝞𓝟𓝠𓝡𓝢𓝣𓝤𓝥𓝦𓝧𓝨𓝩𓝪𓝫𓝬𓝭𓝮𓝯𓝰𓝱𓝲𓝳𓝴𓝵𓝶𓝷𓝸𓝹𓝺𓝻𓝼𓝽𓝾𓝿𓞀𓞁𓞂𓞃𓞄𓞅𓞆𓞇𓞈𓞉𓞊𓞋𓞌𓞍𓞎𓞏𓞐𓞑𓞒𓞓𓞔𓞕𓞖𓞗𓞘𓞙𓞚𓞛𓞜𓞝𓞞𓞟𓞠𓞡𓞢𓞣𓞤𓞥𓞦𓞧𓞨𓞩𓞪𓞫𓞬𓞭𓞮𓞯𓞰𓞱𓞲𓞳𓞴𓞵𓞶𓞷𓞸𓞹𓞺𓞻𓞼𓞽𓞾𓞿𓟀𓟁𓟂𓟃𓟄𓟅𓟆𓟇𓟈𓟉𓟊𓟋𓟌𓟍𓟎𓟏𓟐𓟑𓟒𓟓𓟔𓟕𓟖𓟗𓟘𓟙𓟚𓟛𓟜𓟝𓟞𓟟𓟠𓟡𓟢𓟣𓟤𓟥𓟦𓟧𓟨𓟩𓟪𓟫𓟬𓟭𓟮𓟯𓟰𓟱𓟲𓟳𓟴𓟵𓟶𓟷𓟸𓟹𓟺𓟻𓟼𓟽𓟾𓟿𓠀𓠁𓠂𓠃𓠄𓠅𓠆𓠇𓠈𓠉𓠊𓠋𓠌𓠍𓠎𓠏𓠐𓠑𓠒𓠓𓠔𓠕𓠖𓠗𓠘𓠙𓠚𓠛𓠜𓠝𓠞𓠟𓠠𓠡𓠢𓠣𓠤𓠥𓠦𓠧𓠨𓠩𓠪𓠫𓠬𓠭𓠮𓠯𓠰𓠱𓠲𓠳𓠴𓠵𓠶𓠷𓠸𓠹𓠺𓠻𓠼𓠽𓠾𓠿𓡀𓡁𓡂𓡃𓡄𓡅𓡆𓡇𓡈𓡉𓡊𓡋𓡌𓡍𓡎𓡏𓡐𓡑𓡒𓡓𓡔𓡕𓡖𓡗𓡘𓡙𓡚𓡛𓡜𓡝𓡞𓡟𓡠𓡡𓡢𓡣𓡤𓡥𓡦𓡧𓡨𓡩𓡪𓡫𓡬𓡭𓡮𓡯𓡰𓡱𓡲𓡳𓡴𓡵𓡶𓡷𓡸𓡹𓡺𓡻𓡼𓡽𓡾𓡿𓢀𓢁𓢂𓢃𓢄𓢅𓢆𓢇𓢈𓢉𓢊𓢋𓢌𓢍𓢎𓢏𓢐𓢑𓢒𓢓𓢔𓢕𓢖𓢗𓢘𓢙𓢚𓢛𓢜𓢝𓢞𓢟𓢠𓢡𓢢𓢣𓢤𓢥𓢦𓢧𓢨𓢩𓢪𓢫𓢬𓢭𓢮𓢯𓢰𓢱𓢲𓢳𓢴𓢵𓢶𓢷𓢸𓢹𓢺𓢻𓢼𓢽𓢾𓢿𓣀𓣁𓣂𓣃𓣄𓣅𓣆𓣇𓣈𓣉𓣊𓣋𓣌𓣍𓣎𓣏𓣐𓣑𓣒𓣓𓣔𓣕𓣖𓣗𓣘𓣙𓣚𓣛𓣜𓣝𓣞𓣟𓣠𓣡𓣢𓣣𓣤𓣥𓣦𓣧𓣨𓣩𓣪𓣫𓣬𓣭𓣮𓣯𓣰𓣱𓣲𓣳𓣴𓣵𓣶𓣷𓣸𓣹𓣺𓣻𓣼𓣽𓣾𓣿𓤀𓤁𓤂𓤃𓤄𓤅𓤆𓤇𓤈𓤉𓤊𓤋𓤌𓤍𓤎𓤏𓤐𓤑𓤒𓤓𓤔𓤕𓤖𓤗𓤘𓤙𓤚𓤛𓤜𓤝𓤞𓤟𓤠𓤡𓤢𓤣𓤤𓤥𓤦𓤧𓤨𓤩𓤪𓤫𓤬𓤭𓤮𓤯𓤰𓤱𓤲𓤳𓤴𓤵𓤶𓤷𓤸𓤹𓤺𓤻𓤼𓤽𓤾𓤿𓥀𓥁𓥂𓥃𓥄𓥅𓥆𓥇𓥈𓥉𓥊𓥋𓥌𓥍𓥎𓥏𓥐𓥑𓥒𓥓𓥔𓥕𓥖𓥗𓥘𓥙𓥚𓥛𓥜𓥝𓥞𓥟𓥠𓥡𓥢𓥣𓥤𓥥𓥦𓥧𓥨𓥩𓥪𓥫𓥬𓥭𓥮𓥯𓥰𓥱𓥲𓥳𓥴𓥵𓥶𓥷𓥸𓥹𓥺𓥻𓥼𓥽𓥾𓥿𓦀𓦁𓦂𓦃𓦄𓦅𓦆𓦇𓦈𓦉𓦊𓦋𓦌𓦍𓦎𓦏𓦐𓦑𓦒𓦓𓦔𓦕𓦖𓦗𓦘𓦙𓦚𓦛𓦜𓦝𓦞𓦟𓦠𓦡𓦢𓦣𓦤𓦥𓦦𓦧𓦨𓦩𓦪𓦫𓦬𓦭𓦮𓦯𓦰𓦱𓦲𓦳𓦴𓦵𓦶𓦷𓦸𓦹𓦺𓦻𓦼𓦽𓦾𓦿𓧀𓧁𓧂𓧃𓧄𓧅𓧆𓧇𓧈𓧉𓧊𓧋𓧌𓧍𓧎𓧏𓧐𓧑𓧒𓧓𓧔𓧕𓧖𓧗𓧘𓧙𓧚𓧛𓧜𓧝𓧞𓧟𓧠𓧡𓧢𓧣𓧤𓧥𓧦𓧧𓧨𓧩𓧪𓧫𓧬𓧭𓧮𓧯𓧰𓧱𓧲𓧳𓧴𓧵𓧶𓧷𓧸𓧹𓧺𓧻𓧼𓧽𓧾𓧿𓨀𓨁𓨂𓨃𓨄𓨅𓨆𓨇𓨈𓨉𓨊𓨋𓨌𓨍𓨎𓨏𓨐𓨑𓨒𓨓𓨔𓨕𓨖𓨗𓨘𓨙𓨚𓨛𓨜𓨝𓨞𓨟𓨠𓨡𓨢𓨣𓨤𓨥𓨦𓨧𓨨𓨩𓨪𓨫𓨬𓨭𓨮𓨯𓨰𓨱𓨲𓨳𓨴𓨵𓨶𓨷𓨸𓨹𓨺𓨻𓨼𓨽𓨾𓨿𓩀𓩁𓩂𓩃𓩄𓩅𓩆𓩇𓩈𓩉𓩊𓩋𓩌𓩍𓩎𓩏𓩐𓩑𓩒𓩓𓩔𓩕𓩖𓩗𓩘𓩙𓩚𓩛𓩜𓩝𓩞𓩟𓩠𓩡𓩢𓩣𓩤𓩥𓩦𓩧𓩨𓩩𓩪𓩫𓩬𓩭𓩮𓩯𓩰𓩱𓩲𓩳𓩴𓩵𓩶𓩷𓩸𓩹𓩺𓩻𓩼𓩽𓩾𓩿𓪀𓪁𓪂𓪃𓪄𓪅𓪆𓪇𓪈𓪉𓪊𓪋𓪌𓪍𓪎𓪏𓪐𓪑𓪒𓪓𓪔𓪕𓪖𓪗𓪘𓪙𓪚𓪛𓪜𓪝𓪞𓪟𓪠𓪡𓪢𓪣𓪤𓪥𓪦𓪧𓪨𓪩𓪪𓪫𓪬𓪭𓪮𓪯𓪰𓪱𓪲𓪳𓪴𓪵𓪶𓪷𓪸𓪹𓪺𓪻𓪼𓪽𓪾𓪿𓫀𓫁𓫂𓫃𓫄𓫅𓫆𓫇𓫈𓫉𓫊𓫋𓫌𓫍𓫎𓫏𓫐𓫑𓫒𓫓𓫔𓫕𓫖𓫗𓫘𓫙𓫚𓫛𓫜𓫝𓫞𓫟𓫠𓫡𓫢𓫣𓫤𓫥𓫦𓫧𓫨𓫩𓫪𓫫𓫬𓫭𓫮𓫯𓫰𓫱𓫲𓫳𓫴𓫵𓫶𓫷𓫸𓫹𓫺𓫻𓫼𓫽𓫾𓫿𓬀𓬁𓬂𓬃𓬄𓬅𓬆𓬇𓬈𓬉𓬊𓬋𓬌𓬍𓬎𓬏𓬐𓬑𓬒𓬓𓬔𓬕𓬖𓬗𓬘𓬙𓬚𓬛𓬜𓬝𓬞𓬟𓬠𓬡𓬢𓬣𓬤𓬥𓬦𓬧𓬨𓬩𓬪𓬫𓬬𓬭𓬮𓬯𓬰𓬱𓬲𓬳𓬴𓬵𓬶𓬷𓬸𓬹𓬺𓬻𓬼𓬽𓬾𓬿𓭀𓭁𓭂𓭃𓭄𓭅𓭆𓭇𓭈𓭉𓭊𓭋𓭌𓭍𓭎𓭏𓭐𓭑𓭒𓭓𓭔𓭕𓭖𓭗𓭘𓭙𓭚𓭛𓭜𓭝𓭞𓭟𓭠𓭡𓭢𓭣𓭤𓭥𓭦𓭧𓭨𓭩𓭪𓭫𓭬𓭭𓭮𓭯𓭰𓭱𓭲𓭳𓭴𓭵𓭶𓭷𓭸𓭹𓭺𓭻𓭼𓭽𓭾𓭿𓮀𓮁𓮂𓮃𓮄𓮅𓮆𓮇𓮈𓮉𓮊𓮋𓮌𓮍𓮎𓮏𓮐𓮑𓮒𓮓𓮔𓮕𓮖𓮗𓮘𓮙𓮚𓮛𓮜𓮝𓮞𓮟𓮠𓮡𓮢𓮣𓮤𓮥𓮦𓮧𓮨𓮩𓮪𓮫𓮬𓮭𓮮𓮯𓮰𓮱𓮲𓮳𓮴𓮵𓮶𓮷𓮸𓮹𓮺𓮻𓮼𓮽𓮾𓮿𓯀𓯁𓯂𓯃𓯄𓯅𓯆𓯇𓯈𓯉𓯊𓯋𓯌𓯍𓯎𓯏

## Discussion Questions for Tutankhamun’s “Astronomical Instrument”:

- When assessing an ancient object, how do we determine what it is and what it was used for? What evidence have scholars in the readings assembled to determine that this was an “astronomical” instrument?
- How do we know where this object came from? What aspects of its provenance do you think complicate this story? What does the dedicatory text imply about Tutankhamun’s family lineage and the historical context of the late 18<sup>th</sup> Dynasty?

## 2. *Water Clock (Clepsydra)*

OIM E16875 | Roman | Purchased in Egypt, 1933 | H: 52.5 x D: 67 cm

Bibliography: [Ritner 2016](#), pp. 361–389; [Green and Teeter 2013](#), pp. 108–109; [Teeter 2003](#), pp. 107–108, no. 55.

Links: [Object Record](#); [Berlin Water Clock Project](#)

Description: This limestone basin was inscribed was designed as a water clock (clepsydra), but its construction was never finished. Such water clocks worked by filling the basin with water that slowly drained through an exit hole. Calibrated marks on the inside of the basin would indicate the nighttime hour at different seasons of the year as the water drained. Clepsydrae were not just practical time management devices, but also ensured that important religious events took place at the proper time.



## Discussion Questions for the Water Clock:

- How can we tell that this water clock was never finished? Why are there multiple sets of calibration holes on the inside of the basin? How does it relate to the ancient Egyptian calendar?
- When was this object made? What evidence has been used to determine its date?

## 3. *The Biography of Amenemhat*

Theban Tomb C. 2 | New Kingdom, Dynasty 18, Reign of Amenhotep I (1525–1504 BC)

Bibliography: [von Lieven 2016](#).

Description: Around 1500 BC, a man named Amenemhat had his tomb inscribed with texts describing accomplishments he supposedly made during his lifetime. The text is fragmentary and now largely lost, but a unique and fascinating episode is related about the constructing of a time-keeping device. In the text, there is reference both to a clepsydra (like the example in #2 above) as well as a *merkhet* shadow clock (like the example in #1 above). Although scholars have often cited this text as demonstrating the invention of the water clock, Alexandra von Lieven has recently argued that the text presents Amenemhet making improvements to the water clock design, including, perhaps, mechanical *automata* of figures moving up and down on strings.

Partial Translation: “[... I] studied(?) by reading in all the writings of the god’s words. [...] 14, while the night in the summer consists of twelve hours. [...] month by month, subtracting month by month. [...] the movements of Re, the chief of the hours, through their words. The presentation [...] likewise [...] before him, an *ankh*-sign and *was*-sign in her hands according to the instructions. [...], when he moves close to Nekhbet, she goes before Re on [...] which is in her hands to the nose of his majesty. Then she descends on strings [... Re is] rejoicing when he sees these goddesses going up and down in front of him. I made a shadow clock (*merkhet*) calibrated to the year. It was beautiful for the king of Upper and Lower Egypt, Djoserkare, justified. [It was des]igned for each of its seasons. Never had the like been done since the primeval time of the land. I made this exceptional vessel through the favor of the king of Upper and Lower Egypt, Djoserkare, justified, divided into half [and in third(?)]. It was calibrated(?) when entering summer, during the harvest, in the phases of the moon, which arrives at its time, each hour according to its day, while the water flows out through one pipe.”

## Discussion Questions for the Biography of Amenemhat:

- How does this narrative text relate to the shadow and water clocks above?
- What conclusions can we make about Amenemhet’s claims from the fragmentary text and what kind of device do you think he was describing?

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ORIENTAL INSTITUTE MUSEUM  
Featured Object Number One January 1985  
THE TUT-ANKH-AMUN ASTRONOMICAL INSTRUMENT  
(Oriental Institute 12144)



Ebony; length: 27.0 cm; reign of Tut-ankh-Amun, 1334-1325 B.C.; from Thebes

### Early History

If "wonderful things" had not been discovered in the tomb of Tut-ankh-Amun in 1922, his name would be almost completely unknown to the world. Egyptologists would know him chiefly as the ephemeral young king who initiated the conservative reaction against the unsuccessful religious revolution of his predecessor, the heretic Pharaoh Akh-en-Aten. By his third regnal year, Tut-ankh-Amun had begun in earnest a program of reconciliation and restoration. Neglected temples were re-opened, new statues of the gods were carved, and projects abandoned under Akh-en-Aten were completed. Among the many "monuments" which Tut-ankh-Amun commissioned was an inscribed wooden object, now Oriental Institute 12144, which was dedicated to the memory of Tuthmosis IV, an earlier king who had been dead for more than fifty years.

According to ancient Egyptian beliefs, each Pharaoh had a sacred responsibility to maintain Order against the constant threats of Chaos and Evil. By perpetuating the name of a revered predecessor, the reigning king drew spiritual strength from the power of the deified Royal Ancestors. In the inscription on this diminutive "monument" Tut-ankh-Amun named Tuthmosis IV as "the father of his father."

Nothing definite is known about the fate of this inscribed object between the time of Tut-ankh-Amun and its re-appearance about a century ago. Its "modern" history can be traced to the winter of 1886-1887, when it was acquired "in the neighbourhood of Thebes" by the Reverend Greville Chester, an Englishman who frequently wintered on the Nile. Chester sold the wooden rod to F.G. Hilton Price, a knowledgeable English collector who published a brief description of it, including the text of the hieroglyphic inscriptions, in a letter to the Society of Biblical Archaeology, dated November 12, 1887. The mysterious artifact was incomplete when Chester acquired it. Puzzled about its nature, Hilton Price suggested that it might once have been a pedestal for a statuette or a fragment from a piece of furniture.

In 1911, two years after the death of Hilton Price, his collection of Egyptian antiquities was sold at auction. In the sale catalogue, the enigmatic object was described as "A Scribe's Palette." It was purchased by the Reverend William MacGregor, another well-known British collector, who owned the piece until 1923, when financial reverses forced him to liquidate some of his assets. He sold the piece to Spink & Son Ltd., a London antique dealer.

On July 21, 1923, Professor James Henry Breasted, founding Director of the Oriental Institute, purchased the object for the Museum. While in Egypt the previous winter, Breasted had been invited by Howard Carter to examine the seal impressions in the recently discovered tomb of Tut-ankh-Amun. Stopping to browse in the London antique shop on his way home, Breasted's attention was drawn to the Tut-ankh-Amun object for its unique inscriptions which named both Tut-ankh-Amun and Tuthmosis IV. In one other dedicatory text, Tut-ankh-Amun called Amun-hotep III "his father." Here Tuthmosis IV (the father of Amun-hotep III) was referred to as "the father of his father." Breasted wondered if Tut-ankh-Amun's family relationships, disputed among Egyptologists, could now be established. Did the inscriptions on the wooden rod confirm the previously unknown parentage of King Tut-ankh-Amun? Breasted's excitement over this possibility was to be repeated several days later when he suddenly realized what the object really was!



A series of seemingly unrelated circumstances now enabled Breasted to identify the original purpose of the unusual inscribed rod. In the 1890s, Breasted had examined a complete ancient Egyptian astronomical instrument set in Berlin (Aegyptisches Museum, Inv. Nr. 14084 and 14085). The only one of its kind then known, the set was made between 685 and 525 B.C., during the rule of Dynasty 26. In 1916, Breasted used a line drawing of this equipment as an illustration of ancient Egyptian technology in the first edition of his textbook, Ancient Times.

More recently, in the spring of 1923, Breasted had met his old friend, George Ellery Hale in Egypt. Hale, an eminent astronomer, was working on a manuscript about early astronomical instruments; ancient Egyptian astronomical instruments became a topic for lively discussions between the two friends.

The inscriptions on the Tut-ankh-Amun object did not give any clues about the nature of the object itself, and because the object was incomplete, Breasted did not even know what he had bought until several days later. Then, the similarity to the astronomical instruments in Berlin struck him, and he realized that he had purchased for the Oriental Institute a part belonging to one of the oldest astronomical instruments known to have survived from antiquity, over 600 years older than the set in Berlin!

### Description

Breasted identified his acquisition as a decorated handle used for holding the plumb line of an astronomical instrument. The dark, close-grained hardwood can only be ebony, imported into Egypt from tropical Africa, a material which is well-represented among contemporary objects found in the tomb of Tut-ankh-Amun.

One-line hieroglyphic texts are carved into the two long sides of the handle. Some hieroglyphs still retain traces of the yellow pigment with which they were originally filled, and at least one sign contains a bit of red. The pigments are probably ocher, commonly used by Egyptian artists and craftsmen for these colors.

A rectangular mortise was cut into the top of the handle near one end to receive the projecting tenon of a small vertical block, lost in antiquity, which served as the attachment of the plumb line. When the object was prepared for exhibition in May, 1933, the missing attachment block was replaced with a plain, modern replica, based on the design of an original block of this type, also in Berlin (Aegyptisches Museum, Inv. Nr. 14573). The Berlin piece, decorated for Amun-hotep III, is nearly contemporary with the Oriental Institute handle.

## Translations of Inscriptions and Commentary

### Side "A"

"The Good God who acted with his two hands on behalf of his father Amūn,  
who placed him upon his throne,  
King of Upper and Lower Egypt  
(Neb-kheperu-Rē<sup>c</sup>),  
Son of Rē<sup>c</sup>  
(Tut-ankh-Amūn, Ruler-of-Upper-Egyptian-Heliopolis):  
**renewing the monument of the father of his father,**  
King of Upper and Lower Egypt (Men-kheperu-Rē<sup>c</sup>),  
Son of Rē<sup>c</sup> (Tuthmosis IV), Glorious-of-Diadems),  
given life like Rē<sup>c</sup> forever and ever."

### Side "B"

"The Good God,  
Lord of the Two Lands, Lord of Action, Lord of Diadems,  
(Neb-kheperu-Rē<sup>c</sup>),  
Son of Rē<sup>c</sup>, of his body, his beloved, Lord of every foreign land,  
(Tut-ankh-Amūn, Ruler-of-Upper-Egyptian-Heliopolis):  
**renewing the monument of the father of his father,**  
Lord of the Two Lands (Men-kheperu-Rē<sup>c</sup>),  
Lord of Diadems (Tuthmosis IV), Glorious-of-Diadems),  
given life, stability and dominion,  
so that he is joyful together with his Ka like Rē<sup>c</sup> forever."

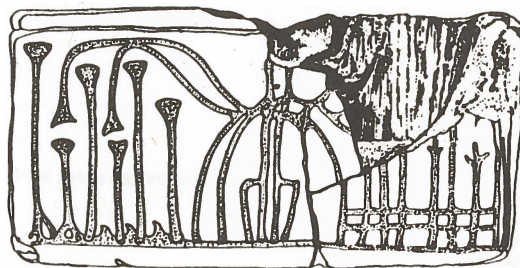
The Egyptologists of the Oriental Institute's Epigraphic Survey have discovered eight new texts in which Tut-ankh-Amun calls Amun-hotep III "his father" in the Colonnade of Luxor Temple. Tut-ankh-Amun's inscriptions on the astronomical instrument, naming Tuthmosis IV as "the father of his father" would seem to lend further support to this relationship, since Tuthmosis IV was the father of Amun-hotep III. Despite these important bits of evidence, these texts do not settle the vexing question of Tut-ankh-Amun's parentage. We know that he was indeed a king's son, but there is still no known inscription which gives the name of his father in a completely unambiguous way. The Egyptians employed few kinship terms; "father" can mean "grandfather," and "father of his father" can mean "ancestor" in a general sense. In the context of a dedicatory inscription like this one, these terms can designate a predecessor who is not even a blood-relative. The discovery of an inscription naming Tut-ankh-Amun as the son of King "X," **of his body** (the ancient Egyptian way of expressing paternity), would settle the question once and for all.

In a dedicatory inscription, the "monument" is the thing upon which the inscription appears, usually a building or a part of a building. A small, portable "monument" like the astronomical instrument would have been made for use in a building. The texts associate it with Tuthmosis IV. Breasted believed that this "building" was his tomb, No. 43 in the Valley of the Kings, and that the object had been placed there by Tut-ankh-Amun during a restoration of the tomb after robbers had broken into it. An ancient graffito indicates that the plundered tomb of Tuthmosis IV was restored in the reign of Hor-em-hab, but there is no evidence for an earlier restoration under Tut-ankh-Amun. The buried tomb of Tuthmosis IV was discovered in 1903, by Howard Carter. Since we know that the astronomical instrument had surfaced by 1887, it can only have come from the tomb if we posit an ancient robbery after which the thieves discarded objects of little intrinsic value **outside** the tomb. Hilton Price learned of the Theban origin of the piece from Chester, but the exact findspot cannot be established now with certainty. The well-preserved wood must have lain in a place which was safe from the destructive waters of the annual Nile inundation, perhaps the ruins of the Mortuary Temple of Tuthmosis IV where Petrie found a plumb bob in 1896, or another site on the West Bank.

Researched by  
John A. Larson, Oriental Institute Museum Archivist  
Photograph by Jean Grant

Developed by the Oriental Institute Museum Education Office  
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One end of the object is decorated with the sm3-hieroglyph, depicting the lungs and windpipe of an animal and meaning "to unite." This sign is intertwined with the two heraldic plants which symbolize the semi-legendary Predynastic kingdoms of Egypt: the papyrus for Lower Egypt (on the left side of the drawing) and the white water-lily for Upper Egypt. This emblem signifies the "Union of the Two Lands" of Upper and Lower Egypt.



Drawing by Joan Hives

### Use

The ancient astronomical instrument set to which this handle belonged was a simple sighting device that enabled the observer to determine the moment when a given star crossed his meridian, an imaginary north-south axis using the North Star and the observer's location as its points of reference. A Y-shaped sighting stick was held close to the eye to provide a notch through which the observer squinted in order to sight the star. The plumb line, a cord weighted at the bottom with a plummet or plumb bob, enabled the observer to determine the vertical to his meridian, and thus afforded slightly greater accuracy of observation by providing a precise line at which the crossing of the star could be noted.

Our replica of a sighting stick is modelled after the intact example in Berlin (Aegyptisches Museum, Inv. Nr. 14084). The hieroglyphic inscription down the front of the Berlin piece identifies it as "an indicator (literally, a 'watching stick') for determining a festival and for placing all men in their hour(s) . . ." The plummet on exhibit, O.I. 10648, was acquired separately from the Tut-ankh-Amun handle; the two are displayed together with the replica of the sighting stick in order to suggest how a complete set might have looked. A pictograph showing the handle, cord and plumb bob of a complete set served as the hieroglyphic sign at the end of the Egyptian word for astronomical instrument, "mrh.t" (merhket).



Using simple tools such as these, and by keeping careful records of their star-observations, Egyptian astronomers were able to predict when a particular star would cross a meridian. The successive "hours" of the night, which varied in length according to the seasons, were marked by the appearance of certain bright stars, which were seen to cross the observer's meridian at a given time of the night. These observations could be used to determine the proper date for a festival to occur, as well as for telling time for the beginnings and ends of work-shifts, or "watches," in the temples on a twenty-four hour basis, so that "all men (could be) placed in their hour(s)."

With the help of instruments such as this one, the night sky served as a giant clock for the ancient Egyptian star-gazer. Their word for "astronomer" was "wnwty" (wenuty), literally, "hour-watcher." It is interesting to note that, in our own age of quartz and digital mechanisms, we refer to our portable timepiece as a "watch."



## ASTRONOMICAL INSTRUMENT OF TUTANKHAMUN

Instrument: Wood, paint (with modern string and restoration)  
 Purchased in London, 1923  
 New Kingdom, Dynasty 18, reign of Tutankhamun, ca. 1336-1327 BC  
 E12144

Plumb bob: Faience  
 Purchased in Paris, 1919  
 Late Period, Dynasty 26(?), 664-525 BC  
 E9977

Egyptian astronomy directly influenced modern divisions of time: the 365-day year, the 30-day month (adopted but then distorted by the Romans), and the 24-hour day, with 12 hours for both day and night. While sundials or shadow clocks could track the movements of the sun and hours during the day, at night time was reckoned by the stars. A stargazer tracked the movement of specific bright stars whose positions in the sky signaled the change of hours. The astronomical observer held two instruments at right angles to determine a star's appearance: a Y-shaped vertical sighting stick through which the star was viewed and, to ensure that stick's proper orientation, a leveling device consisting of a horizontal handle supporting a plumb line. With the use of these instruments, the night sky served as a natural clock. The instrument shown here is a leveling device that was dedicated to the cult of Amun by the pharaoh Tutankhamun. The cord and plumb bob complete the appearance of the tool, but are not original to the piece. Hieroglyphic inscriptions on both long sides of the ebony handle record Tutankhamun's names and titles and stress his return to religious orthodoxy after the turbulent Amarna period. The king is said to have "acted with his two hands on behalf of his father Amun, who placed him upon his throne." The instrument is significant also for Tutankhamun's family history, since this is said to be a replacement for an earlier example donated by "the father of his father" Thutmose IV, who was more likely his great-grandfather. The skipped generation may be an early attempt to suppress the memory of his true father, Akhenaton. RKR



D. 28975



D. 15972

## GAME OF TWENTY SQUARES

Wood, faience, copper alloy  
 Egypt, possibly from Akhmim  
 Purchased in Egypt, 1894-95  
 New Kingdom, Dynasties 18-20, ca. 1550-1069 BC  
 E371A-C

The game of twenty squares was popular throughout the ancient Mediterranean world. One of the oldest examples, from Mesopotamia, dates to about 2600 BC. It was played by two opponents, each of whom had five markers. The goal of the game was to move one's playing pieces down the side squares and up the middle, blocking one's opponent with a barrier of two or more markers. Moves were established by throw sticks, knucklebones, or dice. This game board is made of a solid piece of wood, its top carved with a pattern of squares, and a rectangular recess cut in its side to accommodate a drawer. The resulting hole in the side of the board was once covered with a piece of wood attached with glue along a miter joint. The drawer for storing the playing pieces is also made of a solid piece of wood into which a cavity was hollowed. A copper alloy loop on the front of the drawer served as a handle. In Egypt, scenes of people playing board games could be references to their desire to vanquish the powers of evil in order to be reborn in the afterlife. ET

55.

**WATER CLOCK** (Clepsydra)

Ptolemaic Period, reign of Ptolemy II, 284–246 B.C.

Limestone, carnelian beads

H: 20 1/2; D (top): 26 1/4 in

(52.5 x 67 cm)

OIM 16875



THE EGYPTIANS CAREFULLY recorded time for state, economic, agricultural, and sacred functions. For much of Egyptian history, most events were tied to the civil calendar that was made up of three seasons of four months each. Each month had thirty days, with five additional days added to the calendar to equal the 365 days of the earth's rotation about the sun.

Time was measured by observation of the sun and stars, and also with measuring devices like this water clock—a vessel that equated a volume of water with a specific length of time—much as an hourglass measures time with sand. The earliest reference to a water clock is in a biographical text of the courtier Amunemhet who claimed that he made one for King Amunhotep I (ca. 1526 B.C.). The oldest surviving example (now in Cairo), dates to the reign of Amunhotep III, some 200 years later. Water clocks continued to be used in the Far East into recent times.

The exterior of this water clock is decorated with twelve panels, each representing a month of the calendar. The first month of inundation and three of the four months of summer are explicitly labeled, while the other months of the year are identified only by the deities associated with each month. A large figure of a seated baboon representing the god Thoth, the reckoner of time, sits at the front. The gods and months clockwise from the Thoth are: Tehy (month 1 of inundation); Ptah (month 2 of inundation); Hathor (month 3 of inundation); Sekhmet (month 4 of inundation); Mut (month 1 of winter); Min-Kamutef (month 2 of winter), Ta-weret (month 3 of winter); Renenutet (month 4 of winter); Khonsu (month 1 of summer); Sekhmet

Excerpt from: Emily Teeter. **Ancient Egypt: Treasures from the Collection of the Oriental Institute, University of Chicago. Oriental Institute Museum Publications 23.** Chicago: Oriental Institute of the University of Chicago, 2003.



(month 2 of summer); Ipet (month 3 of summer); and Re-Horakhty (month 4 of summer). The second month of winter is usually personified by a hippo-type creature or by a jackal, rather than by Sekhmet.

The interior of the water clock is drilled with holes against which the water level was measured. These holes are arranged in twelve vertical rows separated by large *ankh* or *djed* hieroglyphs. Twelve separate calibrations were necessary because the length of the night, and hence each hour, was shorter in the summer months than in the winter.

Some water clocks worked on an outflow system in which the water flowed from the container, while others measured the level of water as it entered the container at a specified rate. Since the uppermost hole in each row is at approximately the same level from the rim, and the holes stop about two thirds from the bottom of the vessel, this clock must have worked on an outflow system. However, this water clock lacks any sort of drain hole, suggesting that it was never finished. The brief hieroglyphic text for the second month of inundation suggests that this clock was a cult object, perhaps a votive, non-functioning clepsydra used in the cult of the deified Queen Arsinoe II (see no. 54).

## Oriental Institute Museum Notes 16: Two Egyptian Clepsydrae (OIM E16875 and A7125)

ROBERT RITNER, *The Oriental Institute of the University of Chicago\**

### I. Clepsydra OIM E16875

#### *I.1 Introduction*

The limestone clepsydra OIM E16875 was purchased in Egypt for the Oriental Institute Museum during the spring of 1933 by then-Director James Henry Breasted. Designed as a hollow basin with flat bottom and flaring sides, the water clock measures 52.5 cm in height with a maximum diameter of 67.0 cm. The instrument was designed as an “outflow clock” to be provided with a drainage hole so that time could be measured by declining water levels calibrated by internal markings. The method of use for such clocks was concisely described by R. Parker in 1950:

It was filled to the brim at sunset. When the water, flowing out slowly through an outlet in the bottom of the clock, had dropped in level to the first mark of the appropriate month-scale, the second hour of the night began.<sup>1</sup>

\* I thank John A. Larson, OI Museum Archivist, for accession information and all photographs used in this article. This article continues the series from Robert Ritner, “Oriental Institute Museum Notes No. 15: A Coptic Lintel from Qustul,” *JNES* 67/2 (2008): 107–15; see n. 1 there for information on previous Museum Notes.

<sup>1</sup> Richard A. Parker, *The Calendars of Ancient Egypt*, SAOC 26 (Chicago, 1950), 40 §208. Additional overviews of the forms and

Although the interior calibrations were completed, the drainage hole was never carved, and the exterior decoration was also left unfinished (see Figures 1–4, below). Work on the clock was abandoned before it could serve its intended sacerdotal function of determining the hours for temple rites and festivals. Its ultimate use as a temple “votive object” is possible, but the late date and unfinished condition of the piece suggest a different explanation for its state. The mirrored dedication text along the outer upper lip of the vessel was halted after only three initial words, and the low relief panels for the twelve months were crudely carved, with errors in spelling and (probably) design. Only four of the twelve months are specifically indicated, and these inconsistently: month one in the primary relief panel adjacent to the month deity and months 10 to 12 in the upper right corner of the

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use of clepsydrae include: Robert W. Sloley, “Ancient Clepsydrae,” *Ancient Egypt* 1924 (1924): 43–50, and “Primitive Methods of Measuring Time, With Special Reference to Egypt” *JEA* 17 (1931): 166–78 and plates XVI–XXII; A. Pogo, “Egyptian Water Clocks,” *Isis* 25 (1936): 403–25; and D. Devauchelle, “Wasseruhr,” *Lexikon der Ägyptologie*, vol. VI (1986), cols. 1156–57. Sloley’s designation of these clocks as “shaped like a flower pot” (p. 43) is echoed by Pogo (p. 414) and others, and derives from B. P. Grenfell and A. S. Hunt, *The Oxyrhynchus Papyri, Part III* (London, 1903), 142, papyrus 470.

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Extract from (full text available online): Robert K. Ritner. “Oriental Institute Museum Notes 16: Two Egyptian Clepsydrae (OIM E16875 and A7125).” *Journal of Near Eastern Studies* 75, no. 2 (2016): 361–389.

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**Figure 1** — OIM E16875 Center of Exterior Decoration with Thoth Baboon between months 1 and 12 (§§ I.1–I.2). OIM photo archives N.11752 = P.22523 and T-1 color.tif.

otherwise blank panel below the relief figures. Best carved is the high relief figure of Thoth as a baboon, but as noted above, the expected drainage hole below the figure was not drilled.

Clepsydra E16875 has been incompletely, and incorrectly, published several times between 1971 and 2013. Despite its acquisition in 1933, the water clock was ignored by Parker in both his 1950 study of the Egyptian calendar (cited above) and his 1969 collaboration with O. Neugebauer, which gathered several other clepsydrae.<sup>2</sup> The first publication of the Chicago

<sup>2</sup> O. Neugebauer and R. Parker, *Egyptian Astronomical Texts*, 3 vols. (Providence, RI, 1969) (hereafter *EAT*). Other clepsydrae are

discussed in *EAT* III, 12–14 (Cairo), 42–44 (Tanis), 60–61 (Florence), and plate 22.

clock, by J. Quaegebeur, was limited to a single panel illustrating the second lunar month and selected due to a supposed mention of the deified Arsinoe Philadelphos. This supposition led to the dating of the piece to the reign of Ptolemy II with a likely Memphite provenience.<sup>3</sup> Although the reading of “Arsinoe” was

discussed in *EAT* III, 12–14 (Cairo), 42–44 (Tanis), 60–61 (Florence), and plate 22.

<sup>3</sup> See Jan Quaegebeur, “Documents Concerning A Cult of Arsinoe Philadelphos at Memphis,” *JNES* 30/4 (1971): 239–70, esp. 259–62 and plates I–II.



Figure 2—OIM E16875 Exterior Side Decoration months 2–4 (§ I.1).

acknowledged as an error by Quaegebeur in 1980,<sup>4</sup> subsequent popular publications by E. Teeter in 2003 and 2013 perpetuate the more than 40 year-old misreading and analysis.<sup>5</sup> The correct reading of the lunar month panel follows in the text translations below,

<sup>4</sup> Jan Quaegebeur, “Une épithète méconnaissable de Ptah,” *Livre du Centenaire 1880–1980*, MIFAO 104 (Cairo, 1980): 61–71, esp. 62–64.

<sup>5</sup> Emily Teeter, *Ancient Egypt: Treasures From the Collection of The Oriental Institute The University of Chicago* (Chicago, 2003), 107–108; and Jack Green and Emily Teeter, *Our Work: Modern Jobs - Ancient Origins*, (Chicago, 2013), 106–109. The old error is also repeated in Devauchelle, “Wasseruhr,” cols. 1156–57, even while citing the Quaegebeur retraction (n. 10).

and the question of dating will be reserved for the conclusion of the article.

### I.2 Center

An incomplete mirrored text begins at the center, continuing left and right. The single ʿnh in the middle is to be read twice:

ʿnh ꜥr, “Long live the Horus . . .”

Had this uppermost inscription been completed, the text would have specified the names and epithets of the ruler in whose name the clypsedra was dedicated, as is the case with the fragmentary OIM A7125,



Figure 3—OIM E16875 Exterior Rear Decoration months 6–8 (§ I.1).

clearly commissioned on behalf of Ptolemy II.<sup>6</sup> The unfinished state of the dedication inscription corre-

sponds to the empty cartouches in each month panel, a situation that necessitates a stylistic dating for the water clock.<sup>7</sup>

<sup>6</sup> On a clepsydra fragment in the Hermitage (inv. 2507 a) the mirrored inscription naming Alexander (I) is placed directly below the panels of the months, beginning on either side of a hacked out high relief figure of Thoth on a *djed*-column: ‘nh ntr nfr nb ir h.t s3 R<sup>c</sup> 3rksindsr ir.n=f [n mnw=f (?) . . .], “Long live the good god, lord of ritual action, son of Re, Alexander. [As his monument(?) he made [. . .].” For the piece, see Andrey Bolshakov, *Ancient Egypt at the Hermitage: Recent Discoveries* (St. Petersburg, 2011), 96–99 [in Russian], and “Fragment einer Wasseruhr,” in Herbert Beck, Peter C. Bol and Maraike Bückling, eds., *Ägypten Griechenland Rom: Abwehr und Berührung* (Tübingen, 2005), 548–49. The fragment preserves most of the panel for month twelve, with the king and Neith(?) standing before Re-Horachty, and the right edge of month one, with a figure of Maat to the right of the lost king and Tekhyt.

A similar clypsedra fragment dating to Alexander I in the British Museum (EA 933) also places the dedicatory text below the month panels; see Carol Andrews, “Fragment of a black granite clepsydra,” in Susan Walker and Peter Higgs, eds., *Cleopatra of Egypt: From History to Myth* (London, 2001), 38; and Paul E. Stanwick, “Wasseruhr mit dem Namen Alexanders des Großen,” in *Ägypten Griechenland Rom*, ed. Beck, Bol and Bückling, 547–48: [. . .] di(?) ‘nh nb hr=f snb nb hr=f ny-sw.t bi.ty Stp-n-R<sup>c</sup>-mry-<sup>3</sup>Imn s3 R<sup>c</sup> 3rksindsr ‘nh d.t [. . .]: “[. . .] given(?) all life before him and all health before him, the king of Upper and Lower Egypt, Setep-en-re-meri-amon, son of Re, Alexander, living forever [. . .].”

<sup>7</sup> Note, however, that both Alexander water clocks (Hermitage and British Museum) have blank cartouches in the individual month



Figure 4—OIM E16875 Exterior Side Decoration months 9–11 (§ I.1).

An empty band below the *ankh* features a raised relief figure of Thoth as a sitting baboon with a *djed*-column incised below. In two Oriental Institute catalogues, the Thoth baboon is described as the reckoner/keeper of time, who “sits at the front,” while the current museum label states that Thoth “sits in the middle of the twelfth panel, framed by a representation of a temple doorway.”<sup>8</sup> In fact, Thoth is placed in an independent

panel between months one and twelve. Nor is the frame of his panel a temple doorway, as parallels from the reigns of Necho and Alexander I indicate.<sup>9</sup>

On the earliest surviving water clock, dating to Amenhotep III, a seated figure of Thoth in baboon form once occupied a thin panel between months one and twelve, sitting above the outflow hole of the clock. The god is now lost on the preserved fragments

panels, and in Ptolemaic-era reliefs, empty cartouches may be present in scenes even when the accompanying body of the text has completed cartouches (cf. The Satrap Stela, S, Cairo JdE 22182, with discussion and references by R. K. Ritner in W. K. Simpson, ed., *The Literature of Ancient Egypt*, 3rd ed. (New Haven, CT, 2003), 392–97.

<sup>8</sup> Contra Teeter, *Ancient Egypt*, 107; and Green and Teeter, *Our Work*, 109. For simplicity of reference in following corrections to

the published record, these sources will be styled “Catalogue 2003” and “Catalogue 2013.”

<sup>9</sup> See P. Montet, “Inscriptions de basse époque trouvées à Tanis,” *Kémi* 8 (1946): 37–38 and plates I and II; Parker and Neugebauer, *EAT III*, p. 43 and plate 22 B (Necho, baboon within a niche); Bolshakov, *Ancient Egypt at the Hermitage*, 97, and “Fragment einer Wasseruhr,” 549 (Alexander, baboon in an open space).





Figure 22—OIM A7125 Rim with Text Fragment (§ II). OIM photo archives N.46286 = P.67510

Ptolemy II clepsydrae follows the Amenhotep style with simple lines and no interior modeling. The Ptolemy II examples are also comparable to a fragment from Florence dated to the early Ptolemaic period.<sup>99</sup> What is clear, however, is that they are all quite distinct from one supposed clepsydra of Ptolemy II, OIM E16875.

### III. Dating OIM E16875

Differing in material, representational style, poorer quality of workmanship, design flaws, textual corruption, and random sign reversal, OIM E16875 cannot be contemporary with known Ptolemaic examples. While its use of figures with internal modeling vaguely recalls the style of the much earlier clocks of Alexander, the execution of its figures and text signals a much later production. One indication

for date is the phonetically-spelled epithet of Ptah, *i-ir-snf.w*, previously misused as a dating criterion to the reign of Ptolemy II. As noted above, this epithet is common only in the Memphite area during Ptolemaic times, but widely dispersed in Roman Egypt. The style—and errors—of OIM E16875 correspond more closely with Roman-era work, and this redating would make the Chicago piece the latest known Egyptian clepsydra. A later Roman date for the clock would also offer an explanation for its abrupt abandonment after a considerable outlay of effort and time. The temple for which it was intended may itself have been abandoned, the victim of Roman funding policies that unintentionally doomed the great institutions of ancient Egyptian religion.<sup>100</sup>

<sup>99</sup> Parker and Neugebauer, *EAT* III, 60 and pl. 22d (no. 45).

<sup>100</sup> For discussion of this phenomenon, see R. K. Ritner, “Egypt under Roman Rule: the Legacy of Ancient Egypt,” in Carl Petry, ed., *Cambridge History of Egypt* (Cambridge, 1998), 1–33.

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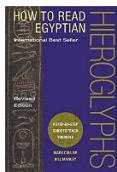
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Instructor: Foy Scalf is Research Associate and Head of the Research Archives at the Oriental Institute. He received his Ph.D. in Egyptology from the University of Chicago. In his published work, he has made contributions to the study of ancient Egyptian religion and sacred scripture, language and linguistics, and the cultural contexts for textual transmission. He is dedicated to bringing the ancient world to the public through continuing education, outreach, and public scholarship.