The Cosmic Game

The Complete Works of Douglass A. White, Ph.D. Volume 1

宇宙遊戲

白中道博士全集 第一册



AWAKENED LIFE 覺醒的生命 SACRED SCARAB INSTITUTE 聖甲蟲學院

The Cosmic Game and The Senet Game Text of Ancient Egypt

The Complete Works of Douglass A. White, Ph.D.

Volume 1

宇宙遊戲與古埃及神圖遊戲經文 白中道博士全集 第一冊

Author: DOUGLASS A. WHITE (白中道博士)

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Douglass A. White, Ph.D. 1941~2021

He was born in Chicago in 1941, and he graduated from Harvard University in 1964 with Bachelor of Oriental Languages and Literature, after that he entered Taiwan University and began to study the Chinese literature of the former Qin Dynasty in 1965. In 1968, he completed his master's thesis on "Research on Zuo Chuan Quote Poems". Later he returned to Harvard University in the United States to complete his Ph.D. in Oriental Languages and Ancient Civilizations, and wrote the dissertation the Interpretation of the Central Concept of "The Book of Changer" by Scholars in the Han $\$ Song and Ming Dynasties.

The content of all his works: 1) Research on the wisdom of ancient civilizations, including ancient Egypt, China, Buddhism, Judaism, India, etc., 2)Dialyze the authenticity of physical science from the perspective of an observer to connect with the spiritual, 3) Inspiring spirituality Wisdom to continue earth civilization. There are 24 books in total.

白中道博士於 1941 年出生於美國芝加哥,1964 年完成美國哈佛大學的東方語 文學士畢業後,1965 年進入台灣大學開始研究前秦中國文學,於1968 年完成了 "左傳引詩研究"的碩士論文;後來又回到美國哈佛大學完成東方語言與古文明 博士,論文寫"漢、宋、明代學者對易經中心觀念的解釋"。他畢生所有著作內 容型態:1)古文明智慧研究,包括古埃及、中國、佛學、猶太、印度.....等等, 2)以觀察者角度來透析物理科學的真實面貌以與心靈接軌, 3)啟發靈性智慧以 延續地球文明。總共著作 24 本。

[The Complete Works Catalogue of Douglass A. White, Ph.D.]

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The Cosmic Game

Secrets of the Senet Oracle Board is a curious book. Is it science or art? Is it ancient high technology or a madman's fantasy? Is it fiction, or cosmic truth? Is it real or imaginary? Is it an oracle or a game? Is it a spoof, or the long-lost secret key to the universe? You will have to read it and decide.

This book and the one below (The Senet Tarot of Ancient Egypt) are Dr. White's unique gifts to the world, celebrating the wonder of the Internet. But be careful. It could change your life in unanticipated ways. Enjoy. This automatically qualifies you as a "Senetor", one of those elite few who have the inside scoop on the Cosmic Game played by the ancient Egyptians.

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So long, and thanks for all the Wales.

The Cosmic Game: Secrets of the Senet Oracle Board





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Caveat Lector (Let the Reader Beware)

There is a genre of books in which authors from outside the academic establishment explore mysterious relics of the ancient past and propose various theories and interpretations that range from alien visitations, to lost Atlantean civilizations, and ancient conspiracies. Critics often assail such works as "pseudoarchaeology" or "fringe science" in an attempt to discredit them despite the fact that such works often contain a large amount of interesting and sometimes accurate material researched with great gusto from the author's pet viewpoint, much of which may be considered either cranky or creative.

Up front in this prefatory note I announce that the following monograph is an unabashed work belonging to this fringe genre of pseudoarchaeology, because I deliberately do not follow the canons of professional archaeology. I meander to the syncopated beat of a distant African drum. The artifacts I discuss are genuine. The measurements and data that I present are accurate (barring possible typographical errors or mistakes in calculation.) The experiments are probably doable -- but perhaps not exactly in the way I suggest, and I do not have ironclad proof that such experiments ever occurred in ancient times. Therefore much of my evidence for ancient science is circumstantial or speculative. I intend my theories and interpretations mainly as doorways opening to new realms of exploration that may awaken your imagination to possibilities that can take you beyond your current assumptions about the reality of the ancients and the reality in which we currently reside.

In short you may read this work as a serious scientific investigation, as pseudoscience, or as a flight of fantasy into the world of science fiction. It probably contains a bit of all these viewpoints. My hope is that you find the material entertaining and possibly able to pique your curiosity to wonder whether our world might contain realities that stretch far beyond the standard interpretations.

In this work you will find lots of numbers and symbols, some of which invite you to follow some easy calculations. If you wish to follow along, for the most part you won't need more than a pocket calculator. If you are not the calculating type, you can skip through the numbers and equations. Just focus on the discussions of the data.

Throughout this essay I cite the **Wikipedia** many times. Before we start exploring I would like to express my gratitude to the contributors who have made such a wonderful online resource available to the world as a shared treasury of knowledge. I have also tried to document all other sources that I made use of and hope interested readers will go study the sources I mention and/or quote from for more details. As for the interpretations I create and present in this essay, they are mine and you will have to decide where to file them in your reality. In any case I will clarify, update, and amend this work as time permits and welcome your comments and suggestions.

Douglass A. White, Ph.D. Fairfield, IA 2012

From a Story told in the Middle Kingdom about the Old Kingdom

... Prince Hordadef stood before the king [Khufu, builder of the Great Pyramid during Egypt's Fourth Dynasty], and he said: "Your Majesty has heard tales regarding the wonders performed by magicians in other days, [Lichtheim translates: "of the skills of those who have passed away ... one cannot tell truth from falsehood"] but I can bring forth a worker of marvels who now lives in the kingdom."

King Khufu said: "And who is he, my son?"

"His name is Dedi," answered Prince Hordadef. "He is a very old man, for his years are a hundred and ten . . . and he knows the secrets of the habitation of the god Thoth [Lichtheim translates: " he knows the number(s) of the secret chambers of the sanctuary of Thoth"], which Your Majesty has desired to know so that you may design the chambers of your pyramid." (The name Dedi can also be read as Jedi, Jeda, or Jed-jeda.)

King Khufu said: "Go now and find this man for me, Hordadef."

[Prince Hardedef finds the magician Dedi and brings him to the court of Khufu. During his audience with King Khufu Magician Dedi performs a sleight-of-hand in which he apparently cuts off the head of an animal and then restores it. After seeing this demonstration . . .] *His Majesty then spoke to the magician and said: "It is told that you possess the secrets of the dwelling of the god Thoth."*

Dedi answered: "I do not possess them, but I know where they are concealed, and that is within a temple chamber at Heliopolis. There the plans are kept in a box," [Lichtheim translates: "Please, I do not know their number, O king, my lord. But I know the place where it is." Said his majesty: "Where is that?" Said this Dedi: "There is a chest of flint in the building called 'Inventory' in On. It is in that chest."] "It is no insignificant person who shall bring them to Your Majesty."

"I would fain know who will deliver them unto me," King Khufu said.

[Dedi tells King Khufu it will be Userkaf, the first king of the next dynasty who will bring the chest.... Unfortunately, the story goes on to tell about the birth of Userkaf and his two brothers, the first three kings of Dynasty Five, but the story then breaks off and we never learn what happened to the box that contains the number(s) of the secret chambers of the sanctuary of Thoth.]

The city of On was called by the Greeks "Heliopolis" (City of the Sun), and was located in what is now modern Cairo. There is a mystery here, because Khufu would not have been alive when the location of the box was revealed according to the magician's prediction and the Great Pyramid would have already been finished.

The information contained in the box would be the secret numbers that encode the structure of the universe. Khufu wanted to use these numbers in the design of his Great Pyramid. We now know that the successors of Userkaf and his brothers were Wenas [Unas, the last of

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the Fifth Dynasty pharaohs], and the early Sixth Dynasty pharaohs who had the magnificent **Pyramid Texts** carved on the walls of their pyramids, and these contain many of the Secrets of Thoth and may be relevant to the story.

Nevertheless, I believe that the missing portion of the story in the damaged Westcar Papyrus relates how Khufu found a way to gain access to the box and its secret information. The Egyptians loved humor and liked to keep their most important secrets openly and repeatedly -- but discreetly -- displayed in public awareness in the form of elaborate interlocking artistic and architectural conventions. In a word, I believe that the story alludes in an elaborately contorted and humorous way to the well-known Senet Board. The statement that it was held in a temple's inventory building tells us that Khufu was interested in the sacred and much more secret Senet Oracle Board rather than the profane Senet Game Board that was widely used by the public for amusement and gambling. The layout of the deities on the Oracle Board contains important keys to the numbers and the geometry that encoded the essence of ancient Egyptian science.

This book is about that Senet Oracle Box, the sacred artifacts it contains, and the numbers encoded in its geometry that reveal the secret chambers of the sanctuary of Thoth -- i.e. our physical universe. The story that contains the passage I quoted above may be found in Papyrus Westcar (P. Berlin 3033). The papyrus dates from the Hyksos period (Middle Kingdom) and is written in classical Middle Egyptian, but relates a series of linked stories that supposedly go back to the time of Pharaoh Khufu, builder of the Great Pyramid and his successors. You can find the complete translation that I quoted excerpts from in italics online at :

http://www.reshafim.org.il/ad/egypt/texts/westcar_papyrus.htm.

The brief comparison passages that I quoted in regular type face are from Miriam Lichtheim's translation that is published in Ancient Egyptian Literature, Volume I: The Old and Middle Kingdoms (Berkeley and Los Angeles: University of California Press, 1975.) Below is my version of the essential statements about the box.

Awef rekh tennu apetu net Wenet net Jehuti.

"He knows the numbers of the chambers that comprise the rectangular box that is Thoth's."

Aset weresh Hem en Suten Baty Khufu Ma@kheru

It happened that His Majesty King Khufu the Truth Speaker had been looking out $\mathbb{P}_{\mathbb{R}} \otimes \mathbb{R} = \mathbb{P}_{\mathbb{R}} \otimes \mathbb{P}_{\mathbb{R}}$

 $= \frac{1}{2} \frac$

Said Jed-jeda: "Praise you, but I do not know the numbers -- may you have life, strength, and health."

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The above is my transcription of the text with my transliteration and translation. As you can see, different translators interpret the details of the text quite differently -- although the general drift of the story is quite clear. The glyphs I transliterate with the symbol @ are pronounced like a grunt deep in the throat, such as when you say "Africa" with a strong emphasis on the first syllable. The term "Wenet" is glossed as a room, chamber, or square box. The Senet Oracle Box is rectangular in shape and consists of 30 square "chambers". The Oracle Board is incised on top of the box and divides it into chambers. These are the houses or temples of various deities. The "numbers" (tennu) would be the measurements involved in the various dimensions of the box. Khufu wants to use the measurements of the box in the design of the chambers in his Great Pyramid. Jed-jeda explains that the box has the name of the Chamber of Judgment (@t Sapety) carved on it. The word "Des" is a knife, to carve, or flint. However, it also can be used to indicate a portal in the Dewat (subconscious realm), suggesting that the box is a portal leading into the deep regions of mental and physical space. This information also tells us that the box contains the proper layout of the Judgment of the Heart Tableau that is well known from the Book of the Dead. From this we know that the box is not the Game Board, but the Oracle Board. The Game Board contains a sequence that represents a clock or calendar. The Oracle Board contains the symmetrical relationships of sacred geometry that explain how the physical world organizes itself in space. The City of On (Awen) was a sacred city dedicated to Ra and Tem that was located near the Giza plateau where Khufu was building his Great Pyramid. Jed-jeda tells us that the box with this layout was kept in a temple at On by a special priest. The kingly children will be born of the wife of Lord Ra (Hemt W@b en Sakhbu. the priest of pu R@, Neb Sakhbu \mathcal{O} \mathcal{O} of Ra in On. The eldest of the sons will become high priest in On $(\gtrsim 1)$ Werma em Awen).

The magician's name $(\frac{1}{2})$ $\frac{1}{2}$ Jed-jeda "My Double Pillar") is written with the pillar of Osiris doubled. The pillar glyph stands for stability. Its doubling suggests the paired quantization of physical phenomena. The two pillars also suggest the name of Baba, the first son of Osiris. Baba is the archetypal shaman in ancient Egypt and is a form of

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Thoth, suggesting that the magician may be an avatar of Thoth communicating with Khufu. The prince's name suggests that he is an avatar of Horus, the second son of Osiris. We may then surmise that Khufu represents Osiris and will be embodied as such eternally in his Great Pyramid.

If this all sounds puzzling, read on. This book will unravel some of the mystery. For more details read my two-volume work, **The Senet Tarot of Ancient Egypt**.

What If . . . ?

"This is my box, this is my box. I never travel without my box "

-- Kaspar

"Amahl and the Night Visitors" operetta by Gian Carlo Menotti

In Menotti's operetta Amahl is a crippled child who lives in poverty with his mother. Three kings named Melchior, Balthazar, and Kaspar have discovered through their studies of the stars that a remarkable child has just been born. They set out to visit the child, and one night on their journey they happen to stop for a rest at the humble dwelling where Amahl and his mother live. Amahl is curious about a special box that King Kaspar carries about with him wherever he goes.

Kaspar tells Amahl, "This is my box, this is my box. I never travel without my box." Then he explains that inside the box there are three drawers. The first drawer contains seven types of colored stones: carnelian, moonstone, red coral, lapis lazuli, jasper, topaz, and ruby. The second drawer contains all kinds of beads. The third drawer contains licorice sticks.

What if the Wizard King Kaspar's magic box has on its top surface the checkerboard layout of the Senet Oracle Game Board? The seven types of stones may then represent the seven playing pieces and the seven chakras of a person's body (suggested by Kaspar's belief in their ability to preserve health). The first drawer could contain two sets of the seven stones, each set having a special shape, so they can be used as the pawns in the game. The prayer beads then represent the mantras of the various gods and their houses They are probably strung together and used during the cycle of on the game board. meditations practiced throughout the calendar month. The third drawer then contains the game's throwing sticks (an ancient form of dice). In this case the sticks are made of licorice root. Four or five slivers of licorce root can be used for generating the moves in the game and the indications of the oracle. The root slivers can also be chewed on to enjoy their sweet flavor. The name Kaspar (Caspar) comes from "Gizbar", an ancient Mesopotamian word for a Treasurer and retains that meaning in Hebrew to this day. Kaspar lives up to his name as the bearer of the treasure box that contains precious stones, precious knowledge, sweet snacks, and endless fun and games.

The Cosmic Science of the Ancient Egyptians Encoded in the Senet Oracle Game Board

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"This is a Neolithic itinerary whereby the Megalithic could achieve what it did without later mathematical methods. The hypothesis *requires* an evolution of metrology so as to notate counting, develop counts as accurate lengths, find differences between astronomical periods, and develop geometrical techniques to identify numerical relationships between these periods. This *requirement* then fits with the evidence within monuments and their geometries containing exactly the right measures and system of metrology."

-- Richard Heath

"A Proposed Itinerary for Megalithic Astronomical Development" (2009)

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Summary

In this monograph I examine a well-known artifact that has survived among the remnants of ancient Egyptian civilization -- the Senet Oracle Game Board. Tutankhamen's tomb contained four such Senet Boards or Boxes. Tombs and papyri contain many depictions and descriptions of the important role this small item played in Egyptian culture in its dual role as a game and a divination tool. I will explore the possibility that the Senet Board encodes in its geometry and symbology profound insights into the science and technology of Egypt's megalithic culture as well as a quintessential expression of its spiritual tradition. Using modern science to peer into the distant past we can only wonder "what if". Nevertheless, the primary data I bring to light in this paper exist in the artifact, regardless of how we interpret them. Perhaps my speculations will lead to the uncovering of new or previously overlooked evidence that will further illuminate our understanding of the ancients and unfold new insights into our contemporary investigations of the universe.

General Introduction to the Senet Oracle Game Board

For several decades I have been collecting Tarot decks as one of my hobbies. Having also acquired a taste for exploration and a modest talent at research, I often wondered why no authors in all the books I read about the Tarot could produce convincing evidence that the deck went back further than the Middle Ages despite the persistent claims that Tarot was somehow deeply connected to the Jewish Qabbalah and even went back to ancient Egypt.

During the first decade of this century I began searching for evidence of the early development of the Tarot in ancient Egypt. To aid in that project I set about learning ancient Egyptian and eventually translated several of the surviving texts that seemed most relevant to my research as an aid to more deeply understanding them. Eventually I wrote a book in two volumes reporting my discoveries that I called **The Senet Tarot of Ancient Egypt**. I also designed and published a Tarot deck based on my research into ancient Egyptian civilization. Those works will serve as a background to this monograph, and readers interested in knowing more details about the Tarot and its antecedents in ancient Egypt should consult those works, as they cover a lot of material that is not included in this work but is nevertheless quite relevant to the contents of this work.

In this monograph I will focus primarily on certain details of the Senet Oracle Game Board as we know it existed in ancient Egypt and as I have reconstructed it in some detail through my research. My arguments for this paper will depend on what is known for certain about the Senet Board from surviving artifacts. The information added by my reconstruction of the Game Board's missing details may serve to add further highlights, but is not essential to the basic thesis. To what extent the scientific information I find and interpret in the Senet Board based on our present-day "hindsight" was actually understood or used by ancient Egyptians will have to await further research. Nevertheless, what I have uncovered so far is real data directly or indirectly embedded in the artifacts and holds tantalizing promise of further possible revelations.

For those who are not yet familiar with my earlier works and want to move on quickly into this paper, here is a brief summary of the Senet Oracle Game Board hypothesis. The name of the game in Egyptian means passing, going beyond, or transcending. A secondary meaning is an image, copy, likeness, or archetype. Other connotations include smelling, kissing, embracing, and adoring; a foundation or a beginning. Chapter 115:7 of the **Book of the Dead** describes Senet as "The Passing of Ra" [through his archetypal forms]. The Egyptian glyph for the Senet game board — (men) goes back at least to the first dynasty and grids for game boards are attested from the Old Kingdom up to the Ptolemaic period. The game gradually lost popularity after Egypt was assimilated into the Roman Empire and first Roman, then Christian, and finally Muslim culture was imposed on its people.

The glyph for the board means "foundation" and is the main root of another word (a-men) that means invisible or hidden, but that word also can be analyzed as "dear foundation". The name of the game (Senet \overleftarrow{a}) means to pass beyond, but also has a secondary connotation that suggests an image or a replication. The two slanted lines on the oval glyph may suggest duality or two of a kind.

Some Senet boards were simply grids consisting of a rectangle containing 30 squares arranged in three rows of ten squares each with no symbols embedded in them. Others had symbols inscribed on a few squares, and occasionally boards had symbols on each square, although no complete example survives -- the two such remaining decorated boards being considerably damaged. However, by using a surviving Egyptian text about the game as a primary source plus some guesswork based on knowledge of the Tarot, I have made a tentative reconstruction of the glyphs and intended inscriptions on the missing squares. However, the contents of the reconstructed portion of the Game Board squares is not necessary information for this study. As the glyph for the Board shows, the game often took the form of a rectangular box in which the pawns and the dice or throwing sticks could be stored.

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The Senet Oracle Game Board Glyph "Men"

A Senet Game Board with Several Symbols

An Unmarked Senet Board with Pawns on a Fancy Table



							Path of Pawns
Squares 1-10							│
Squares 11-20			9				│
Squares 21-30			₩		-Co-	\odot	★ →

A Reconstructed Senet Game Board with Symbols on Each Square



A Senet Game Board with Symbols Represented as Corresponding Deities



The symbols that survive on some Senet Game Boards correspond to standard deities in the Egyptian pantheon and were used by Egyptians as shorthand mnemonics instead of drawing the full figures as I show them above. Each deity (called a "net-er" transcendental being) represents a nature archetype, and the layout as a whole represents

10 Cosmic Game © Douglass A. White, 2012 v151207

a voyage of adventure and evolution from life to death, to resurrection, and apotheosis as an immortal transcendental light being.

As the Senet Game evolved, people began to use it also for divination. Apparently a number of different layouts were developed, and one (or a group) of them represented the Judgment of the Heart Tableau that was central to the sacred book that is popularly known as **The Book of the Dead**, but was known to ancient Egyptians as **The Ascension into the Light of Day**. Using standard formats from that book plus the **Amduat** text illustrating the afterworld journey I produced a demonstration Senet Oracle Board. Although no Senet Board with such a layout has survived, there is considerable circumstantial evidence that such boards once existed. Of course the Game Board layout could also be used as a divination tool.



A Model of a Senet Oracle Board

My Senet Oracle Board arrangement is based on the ritual list of deities hailed at the beginning of the **Senet Game Text**, which more or less corresponds to lists and illustrations in standard versions of the **Book of the Dead**.

The four mummy kings in the middle of the middle row represent the four states of the elements (sons of Horus) and can be seen in miniature on the lotus table in front of Osiris (middle row, 2nd from right) and also represent the traditional four canopic jars. A first century CE oracle board, probably used in the Temple of Isis in Rome, survives and contains many of the same deities, but in yet another sequence, suggesting that various temples and cults designed their own Oracle Boards and there probably was no absolute standard.



The Judgment of the Heart Tableau in the Papyrus of Ani The ten thrones in the upper panel correspond to the Senet Oracle Board row of heaven. Compare this Drawing to my Senet Oracle Board Layout (p. 10) and the Standard Cubit Ruler (p. 81).



(The lower panel is a continuation of the upper panel in the scroll.) Horus Guides Ani to the Chapel where Osiris in Mummy Wrappings Sits on His Throne The 4 canopic mummies of the elements stand on a lotus table before Osiris. Isis and Nephthys stand behind Osiris to support him.

The middle row of the Senet Oracle Board roughly matches examples of passengers and retinue often found in traditional depictions of the Solar Boat (see drawing below).



Solar Boat Designed by Ptolemy IV at Edfu (Ra is the Solar Disk on the Horizon with a Flying Scarab)

Ra is the "secret" identity of Osiris. Fetal Horus sits on the bow of the boat. Behind him we find Horus as a young adult wielding a harpoon to protect the boat, Opener-of-Ways (as human-headed jackal), Maat, Hathor, and Thoth. In the stern Net, a stand-in for Osiris, adores the Solar Disk, and Horus as the Pilot steers the boat. Pharaoh and the Lords of the Four Senses stand in adoration pose facing the bow and stern of the boat. Pharaoh offers a small image of Maat (Truth) to Ra and his retinue.



Solar Boat from the <u>Amduat</u> (Ram-headed Ra-Awef Stands under the Canopy) In front of Ra we find in the bow Opener-of-Ways (in human form), Lord of Touch, and Hathor (Love and Light). Behind Ra we find Horus of Adorations, The Energy of Air (Lord of Hearing), Awakener (Lord of Vision), Lord of Taste, and Horus as the Pilot of the Boat.

Although I can not produce a surviving example of a Senet Oracle Board with my exact layout drawn on it, the figures and sequences in the top and bottom rows are familiar in the funerary texts and the figures in the top row also closely match the sequence of deity names on the cubit rule that I show on page 81 below.

Egyptian Senet Boards often had only a few symbols or none at all. The upper row stood for the Realm of Heaven, the bottom row was the Realm of Earth, and the middle row was the Realm of Magic. The Egyptians described the Realm of Magic in the **Amduat**. It includes sleep, dreaming, meditation, bardo states, alchemy and other forms of material or spiritual transformation.

The Senet Oracle Game Board was a treasured part of Egyptian culture from the beginning of the Old Kingdom and perhaps even predynastic times. The young and obscure pharaoh Tutankhamen had 4 Senet Boards in his very small tomb along with thousands of other amazing artifacts, so we can imagine what treasures must have been cached in the vast tombs of great pharaohs such as Sety I and Rameses II before they were looted.

The Council of Thirty and Unity

The Senet Board is divided into 30 Houses, and each House is like a Temple or a Palace for one of the archetypal nature deities. The Egyptians referred to the nature archetypes on the Board as the Thirty Elders or Thirty Judges $\cap \cap \stackrel{\text{le}}{\nearrow}$ (Ma'byu). Sometimes they used the deity determinative with the number 30 ($\cap \cap \stackrel{\text{le}}{\longrightarrow}$). The Senet Oracle Board symbolized the court in which the Council of Thirty sat: $\cap \cap \cap \stackrel{\text{le}}{\longrightarrow}$ (Ma'byt), a term that punned on "Ma' Beyt" (House of Truth).

Ironically the word \checkmark "ma'ba" means harpoon. This same glyph, given the pronunciation "wa@", means one. (The @ sign stands for a short grunt deep in the throat). Thus the name of the Thirty could also mean One. We can take that as meaning 30 + 1 = 31 or that the Thirty form a Unified Wholeness. I suspect that both senses were involved, partly because there was sometimes reference to a "President" of the Thirty $\square \square \square \square$ (Pet Ma'biu), who could be one of the Thirty or an extra one who presided over the Thirty. He could be called the Great President of the Thirty (Pet Wer Ma'biu) and was sometimes spoken of as being in the South. This to me suggests Menew (also known as Amen), who had major temples in Karnak and Akhmim.

The evidence to support Menew as the President of the Thirty is found in the fact that his name is written with the Senet Board Glyph, suggesting that he somehow represents the whole Senet Oracle Game Board and thus unifies all Thirty of the archetypes. The name Menew means "Foundation" and the form Amen means "Hidden". The name of the Game played on the Board is Senet, which means "Transcendence". The purpose of the game was to move pieces across the Board until they passed beyond the Board into the Transcendental Realm of Amen. In other words the Game was a model for the process of creation and evolution. Players put their pawns on the Board, moved them through all the Houses, and then made them pass beyond the Board in order to win.

With this brief introduction, we are ready to begin our exploration of the science in the Senet Board. As we proceed in our discussion refer back to these Senet Board images.

A Brief Introduction to Ancient Egyptian Mathematics

Now we are ready to penetrate into one of the secrets of ancient Egyptian mathematics that contains the key to their understanding of Unified Field Physics. Once you understand it, the myths of Egypt become clearer as does the significance of the Scale of Judgment and something we will call the Senet Spiral and discuss in detail later.

First we will look at the usual way Egyptians multiplied numbers. For example, if you want to multiply 37×65 , write the two numbers at the top of two columns. Then write the powers of 2 under 37 up to the largest result that does not exceed 37. Opposite each power of 2 under the 65 heading write that power of 2 times 65 -- in other words first write 65 and then double it for each power of 2 in the left column. Then start with the largest power of 2 that does not exceed 37 (i.e. the bottom number in the left column and subtract that power of 2 from 37. Then subtract from the remainder the largest power of 2 that does not exceed the remainder. Continue until you have subtracted away all of 37. The powers of 2 that you used are the components of your answer, so check off those

particular items in the power of 2 column. Then add up the corresponding numbers in the doubles of the 65 column. The sum will be your answer.

37	65
*1	65
2	130
*4	260
8	520
16	1040
*32	2080

37 - 32 = 5; 5 - 4 = 1; 1 - 1 = 0.

So we star 1, 4, and 32 and add the corresponding numbers in the right-hand column: 2080 + 260 + 65 = 2405, which is the correct answer. As an exercise you can switch the order of the multiplier and multiplicand and see if you get the same answer. You can also try multiplying other numbers this way until the process is easy and natural for you.

From this example it is clear that the Egyptians wrote numbers with base 10 but did calculations with base 2. For most daily calculations they did not have to go over 64 in the powers of 2, so this naturally comprised the Egyptian "Book of Changes".

Now we will turn to the problem of scaling in mathematics. According to Egyptian mythology, after Set murdered Osiris, Horus wanted to avenge his father Osiris and went to war with Set. The battle went back and forth, and during the struggle Horus made use of something mysterious called a "Na'r" from which he shot a harpoon at Set and wounded him in the testicles. Later Set injured an eye of Horus with a beam of fire (a laser?). Finally an accord was reached under which Horus ruled Upper and Lower Nilotic Egypt and Set ruled the desert lands.

Later after a long period a king called Mena (written with the Senet Game Board glyph) and also called by his Horus *serekh* name, Na'r mer $\textcircled{}{}$ unified Egypt and became the first ruler of the first dynasty of classical Egypt. The word "na'r" is generally taken to mean a cuttle fish or a catfish. However, the glyph was often borrowed to mean a baboon. Presumably from the association of the baboon with the scribal totem as a form of Thoth-Baba, the glyph was also associated with a reed pen. "The Harpooner" is one of the epithets of Horus. This can refer to the weapon that Horus uses against Set when he castrates him. On the other hand it can be a reed pen provided by Baba the Baboon as an even more powerful weapon. Perhaps Thoth in the guise of Horus' elder brother Baba convinced him that the pen is mightier than the sword, and a well-put epigram is more effective than a well-won battle.

We recall that the glyph for a harpoon has an alternate reading (wa') with the meaning of One. Egyptians often represented the battle between Horus and Set with an image of their two heads on a single body. The more they fight as enemies the more they simply harm themselves and demonstrate the inseparable unity of all phenomena.

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The subtle connection between the Thirty Divine Judges and the concept of Unity expressed by the harpoon glyph, brought to mind the idea that Horus was bound to win because he fought for the Unity of Egypt. The Universe is a Unity at its Foundation, no matter how diverse it may seem to be. Set is the archetype for the illusion of diversity.

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Horus and Set on a Single Body

This mythical drama suggests a clue as to how the Egyptians described the Universe mathematically. We have seen that they expressed numbers in a base 10 system. They also expressed fractions as portions of a wholeness. In other words, with a couple of special exceptions, fractions always had a numerator of 1. This tells us that they considered fractions to be the inverse of whole numbers. The notation for a fraction was simply to place the mouth radical over a whole number and that transformed the whole number into its inverse.

If we think of this as a symbolic representation of the struggle between Horus and Set, we realize that if Horus, the restorer of wholeness, represents whole numbers, Set, the fragmenter of relations and the dismemberer of Osiris, represents fractions. The irony is that no matter what fraction Set removes to destroy wholeness, Horus chooses the inverse whole number that restores wholeness. For example, if Set removes 1/27th of wholeness, then Horus chooses 27 as his weapon against that fraction and unity returns when they "clash" in multiplication. Thus the inverse multiplication of ratios in Egyptian was easy.

Originally Horus ruled the North and Set ruled the South. Horus rules numbers above the mouth radical, and Set ruled numbers below the mouth radical.

The fulcrum point of the battle was at Hermopolis, the city of Thoth where the Baboon lives. On the Scale of Judgment we find the Na'r, a little golden baboon, sitting right over the fulcrum. The formula for the operation of the Scale expresses the mathematics of the reciprocal operations.