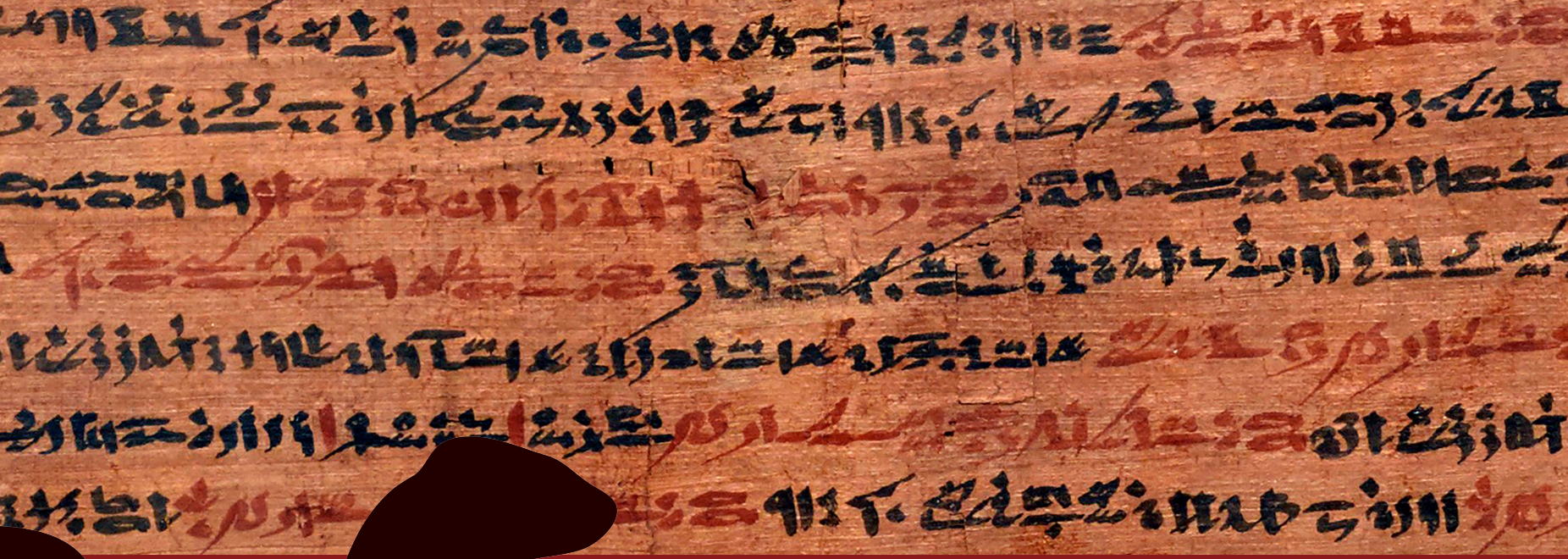

Snake Identification in the Ancient Egyptian Brooklyn Medical Papyrus

A New Study of the Twenty-Four Extant Registers of the "Snakebite Papyrus"

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Dedicated to the scribes of yesterday and the researchers of today, with the hope that the following historical and cultural review underscores the vital importance of this papyrus devoted to snake identification for the ancient Egyptian physician.

Contents

Figures

Tables

Foreword

This extensively researched, well-documented, and lavishly illustrated new interpretation of the Brooklyn Museum Medical Papyrus (also known as the Snake Papyrus) is a welcome addition to the literature on ancient Egyptian medicine.

When most Egyptologists and lay people think of snakes in Egypt, the cobra and horned viper readily come to mind. With a little more thought, the fabled asp that allegedly killed Cleopatra comes to mind. The Egyptologist might then think of the dreaded Apep, who nightly threatened the Sun God as he traveled through the night. Then we go blank, so it is somewhat of a shock to find that this ancient manual to recognize and treat snake bites lists thirty-eight different reptiles!

Gonzalo Sanchez, neurosurgeon and independent scholar of Egyptology, together with Edmund Meltzer, a leading philologist, worked through the papyrus to provide a description of each snake and the nature of its bite and the treatment and prognosis. They had previously collaborated to publish the definitive modern interpretation of the Edwin Smith Papyrus. Dr. Sanchez prepared to tackle this work by earning an Advanced Snake Identification Certificate from the African Snakebite Institute of South Africa. Then he recruited a team of three prominent herpetologists to review the translation. Based on their knowledge of the coloration, physical characteristics, loci, behavior, and reported effects of envenomation, they were able to make reasonable identifications of the species for all but three. They also could show that due to coloration variants, the same snake could be counted as two different snakes by the ancient observers. Most fascinating to me was their compelling evidence for identifying the snake behind the mythological Apep serpent, which I believe is done here for the first time. I will not spoil it by telling you here.

The Snake Papyrus is a pragmatic manual, which would have been an important reference for the doctors on military campaigns and at construction sites. For this purpose, it needed to include snakes that dwelled in territories that the Egyptians conquered as well as those native to the lower Nile Valley. The authors also had to consider the effects of climate change over the millennia. Many animals that graced the Nile in ancient times have been relentlessly forced to move south deeper into Africa. Reptiles are no exception.

This papyrus was first translated into French by Serge Sauneron and published posthumously in 1989. Unfortunately, the papyrus is missing the data on the first thirteen and there are some lacunae in documentation for others, but there is adequate data for the remaining twenty-four. The original was written in hieratic script. Dr. Meltzer transcribed it into hieroglyphs, and for ease of comprehension has published them to read from left to right. He documents the points in which his translation differs and explains his reasoning. This is a useful feature for his fellow philologists. The trio of herpetologists also collaborated well to use all the

available clues to identify the most likely snake or snakes that could fit in each case.

Ancient Egyptian medicine showed an extraordinary degree of pragmatism in fields where the cause of illness was obvious, as in the cases of the Edwin Smith Papyrus and in the Snake Papyrus. The difference here is that there was little effective treatment for snake bites, so the physicians invoked magic. Specific gods were called upon to assist with specific snakes in most cases. This seems to be based on how dangerous the snake was as well as the prognosis. The latter may have been the most useful element of this manual for the ancient physicians.

Those who share my passion for ancient medicine as well as those interested in the environment of ancient Egypt will find much to engage them in this important work.

W. Benson Harer, Jr. MD

Preface

Though most individuals are intrigued by snakes, especially the dangerous ones, often it is a love-hate relationship. Among the 3,700 or so extant species, roughly 600 (16 percent) are classified as venomous. Familiar to most, the vipers and elapid snakes (cobras, mambas) of Africa and Asia typically draw the greatest interest. Why? They can be large, deadly—and exciting. The mambas, which are distributed throughout tropical Africa, are large (the black mamba can exceed twelve feet in total length) and, under some circumstances involving humans, are bold and formidable. Moreover, they have extremely powerful neurotoxic venoms to back up their bravado. Bites from any of the four mamba species are likely to be fatal without medical intervention. Fortunately, human–mamba interactions do not appear to be common.

The African and Asian vipers, some of them called asps, also can attain large sizes (several species can exceed ix feet in total length) and deliver large amounts of powerful venom. Nonetheless, it is the small and abundant species, such as saw-scaled vipers, that often cause the largest loss of life. Curiously, their venom is quite potent and can pack a lethal punch to humans.

But the magnificent and showy cobras are the stars of the show. They are large, alert, and potentially lethal. Despite being a source of death and morbidity, they have played a critical role in human worship and intrigue. They appear as deities and statues, are worshiped and revered, and are often mentioned in ancient texts. Indeed, it would seem that we humans have had a long and complicated love-hate relationship with dangerous snakes.

Our book is about snakebite and snake identification in ancient Egypt. We have attempted to provide a new examination to the first part of the Brooklyn Medical Papyrus, also called the Snake Papyrus, which is a pragmatic medical treatise concerned with snake identification, snakebite and its treatment. Though its place of origin is unknown, it is generally attributed to the area of Heliopolis near Cairo. The dating of this document remains questionable, but generally is considered to be 700 to 330 BCE. It may, however, go back much earlier. It resembles the structure of the medical trauma treatise known as the Edwin Smith Papyrus, ca. 2200–2000 BCE, recently updated by Gonzalo Sanchez and Edmund Meltzer (2012). Importantly, the Snake Papyrus is the first-known structured treatise on snakebite from antiquity.

Serge Sauneron, a French Egyptologist, was commissioned to reconstitute and translate the Snake Papyrus in 1966. His efforts were completed in 1970 and published in French in 1989. The first section describes the snakes and their bites, and the last line states that there have been descriptions of thirty-eight snakes and their bites, of which the descriptions of the first thirteen are lost (unfortunately, this part of the document is missing). Accordingly, owing to the lost section, the papyrus names twenty-four snakes and the appearance of their bites, and sometimes information on their habits. The papyrus was intended to enable the healer to identify the snake from the

description given by the patient and apply appropriate prognosis and treatment. Given that the translation and interpretation of the Brooklyn Medical Papyrus was done over three decades ago, with renewed attempts for snake identification from 1996 to 2012 by Serge Sauneron (1989), David Warrell (cited by Nunn 1996), Christian Leitz (1997), Nicole Pierrette Brix (2011), Sydney H. Aufrère (2012), and Wendy R. J. Golding (2020), we felt that a fresh perspective was needed, especially with the major advances in fields such as biogeography, climate and niche modeling, and linguistics. Also, snake systematics has grown tremendously over the past thirty years. In all, we provide a critique of Sauneron's opinions of snake identification to further clarify this remarkable historical document. We hope that our new analysis is more than mere embellishment.

Today, not unlike in ancient times, snakebite remains a leading source of human mortality despite technological advances in treatment. This unfortunate outcome is common in tropical regions where bitten individuals may have little or no access to modern medical facilities. Globally, there are an estimated 421,000 envenomations each year (1 in 4 snakebites) and 20,000 deaths, but snakebites often go unreported. The World Health Organization (WHO) considers snakebite as one of the leading neglected tropical diseases (www.statnews.com/2017/06/12/snakebite-who-priority/).

As described by Dr. Harer in the foreword of this book, there was little effective treatment for snake bites in ancient Egypt, so healers often invoked magic. Specific gods were called upon to assist with specific snakes, especially the deadliest cases. In remote tropical villages, incantation practices are still used, perhaps out of fear of modern medicine, though tradition and culture also must play a role. Perhaps this book of ancient snakebites and their treatments will lend insights to the range of responses used today. History is almost always our best teacher.

Gonzalo M. Sanchez, MD
Edmund S. Meltzer, PhD
Wolfgang Wüster, PhD
Nicholas R. Casewell, PhD
Gordon W. Schuett, PhD

Introduction

The Brooklyn Papyrus is a medical treatise from ancient Egypt dealing with snakebite. Its date and place of origin are unknown, but it is generally attributed to the area of Heliopolis near Cairo. Purchased from an unknown source by American journalist and Egyptologist Charles Wilbour in 1889, it was donated to the Brooklyn Museum by Wilbour's daughter Theodora in the 1930s.

This papyrus, also known as The Snakebite Papyrus, was written in the hieratic script. Its proposed date of origin ranges from 2200 BCE (Dynasty 6), to 700 BCE or even later to around 300 BCE (Dynasty 30).

In 1966 French Egyptologist Serge Sauneron was commis–sioned by the museum to reconstitute and translate the papyrus. The document's translation into French was published posthumously in 1989 by the Institut français d'archeologie orientale du Caire as *Un Traité Égyptien d'Ophidiologie* (*TEO*) Sauneron recognized the papyrus was in two fragments. It is housed under catalog numbers 47.218.48 and 47.218.85 at the Brooklyn Museum.

The first section of the papyrus (which we deal with in this work) comprises a systematic account of snakes and their bites and originally contained descriptions of thirty-seven snakes and one chameleon and their bites. The information on the first thirteen snakes and the first portion of the fourteenth snake (*k3nʿy*) in numbered paragraphs, or registers, is missing. Sauneron concluded that this was information on snakes that is unfortunately lost but he deduced from the treatment portion of the papyrus the following names of snakes that potentially may have been included: *sẖtf*, *ḥby*, *mʿdy*, *ḳ3dy*, *g3rš*, *ḥf* (*3w*) *rr*, *msw-bdš*, and *bṯt* (*TEO*, 165). With the addition of these names there are a total of thirty-two snakes in need of identification, but the incomplete data make that goal not easily attainable.

An intriguing example is one of the thirteen snakes that is missing at the beginning of this papyrus, named *g3rš*, for which only scattered pieces of information can be found in the Brooklyn Papyrus. Sauneron noted that the name *g3rš* was related to the word "scales" in Ugaritic, and in Akkadian ("*kursimtu*," *TEO*, 162). He concluded that the Egyptian application of the term *g3rš* to a snake was likely connected to its most prominent physical characteristic, which in this case would apply to the Palestine viper (*Montivipera bornmuelleri*), the blunt-nosed viper (*Macrovipera lebetina*), and the Moorish viper (*Daboia mauritanica*). We consider *g3rš* to be the Lebanon viper (*Montivipera bornmuelleri* (*SENAME*, 322–23; see fig. 3.29 and ch. 4.3). This example illustrates the level of knowledge the original authors and users of the Brooklyn Papyrus must have possessed in ancient Egypt.

The paragraphs to which we have access in the first section of the papyrus name twenty-four snakes (and one chameleon) providing a brief description of the snake, sometimes its habits, the appearance of its bite and the effects on the victim. Prognosis and recommended treatment usually follow. As indicated in

the preface, the papyrus was intended to enable the healer to identify the snake from the description given by the patient and to offer appropriate prognosis and treatment. The format for the remedies is strictly pragmatic, and most are based on the species of snake responsible for the bite, or on the symptoms suffered by the victim.

The rest of this papyrus (which we do not deal with) is devoted to snakebite treatments, ending in Register 100. In this section there are no prescribed treatments for lethal snakebites. Our work deals strictly with the relevant issues of snake identification and how that was determined and utilized. Such identification in the Brooklyn Papyrus is difficult and uncertain in some cases, owing to incomplete information, absence of images, lack of familiarity with ancient terms, and translation idiosyncrasies of the text.

The snake identification results from the Brooklyn Medical Papyrus by Sauneron, Leitz, Brix, Aufrère, and Golding are highly variable, likely due to employed methodologies and personal bias. Aside from the intrinsic interest of its subject matter, this papyrus claims our attention for several reasons and compels us to devote a new study to the snake identification, despite the various works already available, starting with the excellent edition by Sauneron, *Un Traité Égyptien d'Ophidiologie* (1989). Our rationale is based the on lessons learned in our prior work on the medical trauma treatise known as the Edwin Smith Medical Papyrus (ca. 2200–2000 BCE; Sanchez and Meltzer 2012)—namely, the advances in understanding from both the scientific and the Egyptological-linguistic points of view. The Brooklyn Papyrus bears structural resemblances to the Edwin Smith Papyrus. In its manner of presentation and organization of cases it invites comparison with the trauma treatise of the Edwin Smith Papyrus, which survives in a much earlier manuscript.

The other major reason for us to engage in further work on this project is recent developments in scientific-herpetological research. An example is the new identification of a snake mentioned in the papyrus text with a species that has only been discovered fairly recently by herpetologists, the *Naja nubiae* (see Register 32).

The general approach taken to translating the Egyptian text is the same used for the Edwin Smith Papyrus, as explained in the philological introduction to our edition of that work.

Our work on snake identification based on the ancient Egyptians' descriptions raises the question of whether to trust in their assessment of the individual snake's physical characteristics and behavior. In her study on animal behavior in Egyptian art, Linda Evans (2010, 1656–66) notes that animals were a primary feature in Egyptian life, using their images to "illustrate and inform," often rendering considerable morphological details, including reptile scales and feather patterns, sufficiently accurately to identify individual species, thus "capturing the definitive physical attributes of the many creatures with which they interacted." Animal behavior was learned by observation, particularly as related to dangerous snakes sharing their habitat.

This recording of the behavioral repertoire of dangerous species, often being species-specific, can be used toward identification.

Symptom analysis of each snakebite and the prognosis in each case has facilitated our identification process. We have also observed that the deity in which the patient trusted for help ("stands in need of"; see ch. 2.8), may have had a geographical and environmental connection with certain snake types. As tenuous as these relationships are, together they provide valuable hints contributing to snake identification.

Prior published results of snake identification in the Brooklyn Papyrus by Serge Sauneron (1989), David Warrell (cited by Nunn 1996), Christian Leitz (1997), Nicole Pierrette Brix (2011), Sydney H. Aufrère (2012), and Wendy R. J. Golding (2020) are listed in table 9.

Serge Sauneron identified snakes in the Brooklyn Papyrus (*TEO*, 164–65) by classifying them as "probable" or "possible"; as venomous or inoffensive; and sometimes simply as being in the snake family. Table 1 summarizes Sauneron's primary identifications. From his results, we surmise an overall confidence level of "probable" species identification in 55 percent and identification level as to family in only 20 percent.

Various later studies aimed at further elucidation of the snakes' identities emerged based on Serge Sauneron's translation of the Brooklyn Papyrus. The conclusions of David Warrell, professor of tropical medicine and infectious diseases, Oxford University, are cited in John F. Nunn's *Ancient Egyptian Medicine* (pp. 185–86). From his results, we can surmise an overall identification confidence level of 50 percent, but agreeing with Sauneron in only 20 percent of his choices.

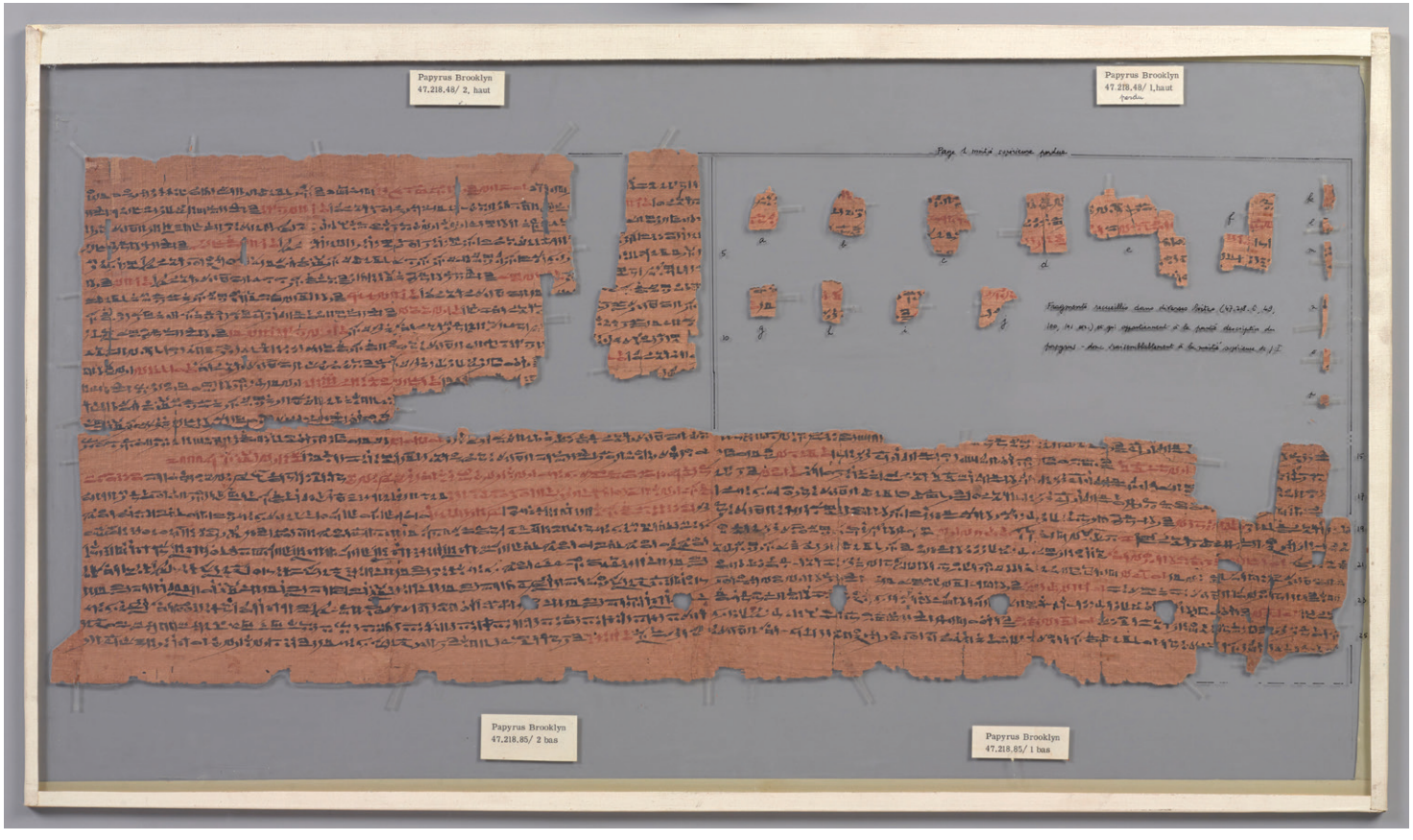
Christian Leitz in 1997 published his work on snake names in the Egyptian and Greek venom books (*Die Schlangennamen in den ägyptischen und griechischen Giftbüchern*) with the assistance of Prof. Dr. Heinz-Josef Thissen, who encouraged the author to analyze the ancient texts, and of Dr. Wolfgang Böhme, head of the herpetological department of the Zoological Research Institute Museum König in Bonn. He also credited the work of Serge Sauneron. Leitz acknowledges the two most important classical texts about poison, the *Alexipharmaca* of Nicander and Philumenus's *On Poisonous Animals and Their Remedies* (Wellmann 1908), as well as subsequent works by various authors through 1986. From Leitz' results we can surmise his confidence level of snake identification as 83 percent as to species. Leitz agrees with Sauneron in only 24 to 37 percent of cases, attributing such discrepancy to his death before he was able to complete his edition.

Nicole Pierrette Brix's 2011 study included current herpetological information coupled with ancient Egyptian iconography and texts, and considered snake species that had been modified by the disappearance of a variety of biotopes and human population expansion. She claimed to be able to prove that there were ophidian species in ancient Egypt that herpetologists did not know were in northeast Africa at one time. Her combined

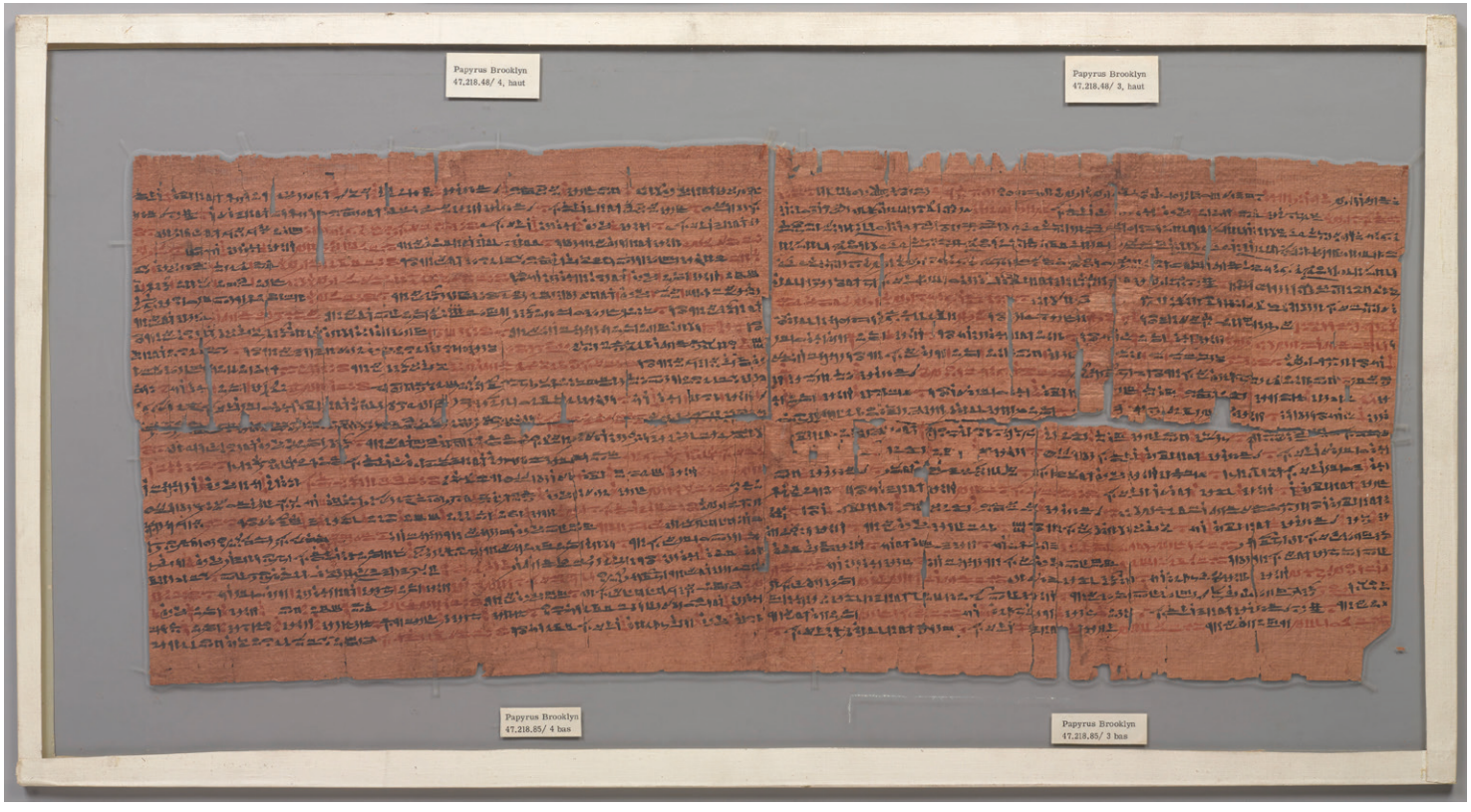
methodology, she believed, allowed for better understanding of the Egyptian drawing conventions in snake representations and of their religious significance. Brix postulated that snakes were represented close to their real appearance in Old Kingdom Egypt, evolving into "composites," which acquired new characteristics as mythological ophidians. Such is the case with the snake Apep. In her snake identification she lists several snakes that have disappeared from the territory of modern Egypt. From Brix's results we surmise a confidence level of 95 percent. Brix's concordance with Sauneron's identifications is only 29 percent.

Sydney H. Aufrère carried out his 2012 epistemological study of the symptomatology of the snake bites described in the Brooklyn Papyrus. He described: (1) the snake; (2) the symptoms of the bite; (3) prognoses; (4) medico-magical techniques; and (5) the associated divine force between the animal and a deity. He stressed that snake identification can only be expressed in terms of probability, from very large to zero. From Aufrère's results we surmise an identification confidence level of 70 percent: 33 percent with regard to species and 37 percent with regard to family. His concordance agreement with Sauneron is 46 percent, of which 17 percent is in snake species and 29 percent is in snake family.

Wendy R. J. Golding published her doctoral thesis at the University of South Africa (2020) entitled "The Brooklyn Papyrus (47.218.48 And 47.218.85) and Its Snakebite Treatments." This work included all one hundred Registers in the Papyrus. Chronologically Golding's work and ours overlapped. Both Golding's work and ours employed similar methodologies for our respective studies in snake identification. Dr. Golding's results reveal the highest level of concordance with ours as compared with those of the other authors publishing on this subject. An analysis of her work is the subject of appendix 2(2).



Papyrus Brooklyn 47.218.48/ (above); 47.218.85 (below); 1&2 (right to left). Via Wikimedia Commons.



Papyrus Brooklyn 47.218.48 (above); 47.218.85 (below); 3&4 (right to left). Via Wikimedia Commons.

Papyrus Brooklyn 47.218.48 (above); 47.218.85 (below); 5&6 (right to left). Via Wikimedia Commons.

Abbreviations

AEM	Nunn, John F. *Ancient Egyptian Medicine*. Norman: University of Oklahoma Press, 1996.
CDME	Faulkner, Raymond O. *A Concise Dictionary of Middle Egyptian.* Oxford: Griffith Institute, 1962.
DSA	Spawls, Stephen, and Bill Branch. *The Dangerous Snakes of Africa.* London: Southern Book Publishers, 1995.
Gardiner	Gardiner, Alan H. 1957. *Egyptian Grammar: Being an Introduction to the Study of Hieroglyphs*. 3rd ed. London: Griffith Institute.
JAC	*Journal of Ancient Civilizations*
JARCE	*Journal of the American Research Center in Egypt*
JSSEA	*Journal of the Society for the Study of Egyptian Antiquities*
NS	new series
OEAE	Redford, Donald, ed. *The Oxford Encyclopedia of Ancient Egypt*. 3 vols. Oxford: Oxford University Press, 2001.
SENAME	Geniez, Philippe. *Snakes of Europe, North Africa and the Middle East: A Photographic Guide*. Translated by Tony Williams. Princeton: Princeton University Press, 2018.
TEO	Sauneron, Serge. *Un traité égyptien d'ophiologie: Papyrus du Brooklyn Museum No 47.218.48 et .83.* Cairo: Institut français d'archéologie orientale, 1989.
Wb.	Erman, Adolf, and Hermann Grapow, eds. *Wörterbuch der ägyptischen Sprache*. 12 vols. Berlin: Akademie, 1926–1961.
Wb. der med. Texte	Deines, Hildegard von, and Wolfhart Westendorf. *Wörterbuch der medizinischen Texte.* 2 vols. Grundriss der Medizin der Alten Ägypter 7. Berlin: Akademie, 1961
WCH	"WCH Clinical Toxinology Resources." University of Adelaide. http://www.toxinology.com.