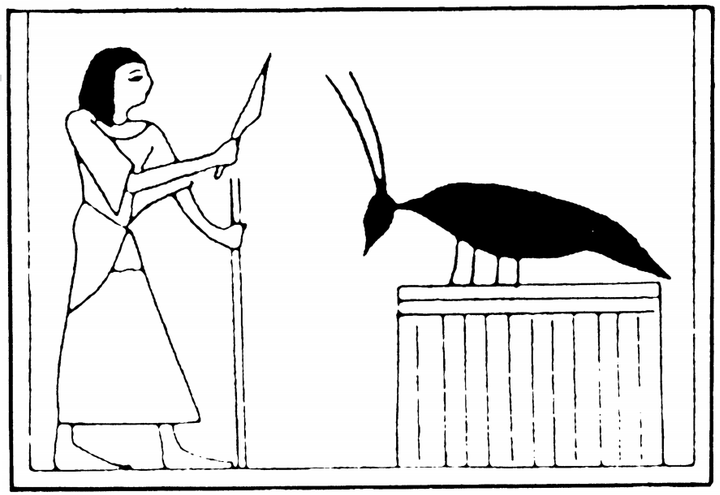
Magic Spells to Combat **Pests**

Relations between humans and insects have a long (scientific) history. In addition, however, insect researchers **Prof. Hermann** *and* **Dr. Anna Levinson**, *formerly of the* **Max Planck Institute for Behavioural Physiology** *in Seewiesen, have been investigating the historical-cultural significance of insects, which fluctuates between religious veneration and pest control. The first place the scientists struck lucky was in the ancient Orient, and in particular among the Egyptians.*



Vignettes from the Egyptian Book of the Dead: mummy-defiling animals being warned off.

Fig.: Spixiana

"Stay far away from me, you who have jaws that bite!" This saying from the Egyptian Book of the Dead points to the fear the ancient Egyptians felt towards insects that ate mummies and the edible burial objects placed alongside them. According to ancient Egyptian belief, death was merely a transitional phase on the way to life in the hereafter, and so from the reign of King Djoser until the end of the Roman Empire (about 2667 BC to 395 AD), the bodies of rulers and other important figures in Egypt were mummified. The bodies of the deceased were to be protected by incantations written either onto the walls of the grave or buried along with the mummy as papyri. These incantations were later gathered together in the Egyptian Book of the Dead.

The mummies were given ample food supplies to accompany them inside the grave so that they would have nourishment in the hereafter. But how can mummified people as well as the living – and their food – be protected from the effects of ravaging by insects? It is among the ancient Egyptians that the first evidence of this problem of protecting food stores appeared. The issue of protecting food stocks became an important issue, independently of issues around mummification and burial objects, ever since the people of the ancient Orient started to plant cereal in large quantities (around 4000 BC) and to store provisions for times of scarcity (from about 2500 BC).

The first means of protection from pests the ancient Egyptians came up with was a mythological one: these harmful animals were to be deterred by drawings and spells painted on the inside of the burial chambers. However, depictions of leaf-horn beetles, weevils, or cockroaches being speared or threatened was meant – according to Hermann and Anna Levinson – only symbolically, as in the ancient Egyptians' scheme of belief all animals were recognised as equal beings in creation, and killing them was considered a grave sin.

The protection of grain stores occurred along somewhat more rational lines and was invented, according to tradition, around 1600 BC by Jacob's son, Joseph. Genesis, the Qur'an and the story of Joseph in the Sepher Hayashar ("Book of the Righteous") all state that Joseph, who was in charge of food stores in Egypt, had large granaries built throughout the land and filled with the grain that was left over from the harvest. This is the first time the storage of unthreshed grain had been used as an effective means of protecting supplies: in the 12th sura of the Qur'an it says, "... then what you reap leave it in its ear except a little of which you eat". The "Book of the Righteous", a Venetian Bible commentary from the 17th century, states that the floors of the granaries were to be covered with the dust from the fields in which the grain

was grown. The soil of the Nile valley, when dry, became a fine, extremely sticky dust. This is an astonishingly modern insight, as mineral dusts are usually deadly to numerous insect pests because they disrupt the insects' water balance and cause them to desiccate. Insects that threaten supplies are also scared off by fine soil dust, because the dust causes severe irritation to their sensory hairs. Other warm-blooded animals are also familiar with this effect, such as dogs and sparrows who roll or "bathe" themselves in dry sand in order to get rid of parasitic insects and mites.

Human beings have also tried to protect themselves from parasitic pests that made life difficult for them. In his histories, Herodotus tells of a means of protection against mosquitoes invented by the ancient Egyptians. People who lived upland of marshy areas built airy platforms on which they could sleep, as gnats and mosquitoes and so forth had difficulty flying up that high on account of the wind. Those living in the marshy areas themselves, on the other hand, had a different method: at night, says Herodotus, "every one of them has a net, with which he catches fish by day, and at night he sets it around the bed where he rests, then creeps under it and sleeps. If he sleeps wrapped in a garment or cloth, the mosquitoes bite through it; but through the net they absolutely do not even venture".

The ointment cones worn on the head by Egyptian women at celebratory events were probably intended partly to promote hygiene and partly for the sake of elegance: in the course of the evening the cone melted, perfuming and greasing the hair and scalp. The ointment cones were made from cattle or sheep's tallow and contained ethereal oils as well as a considerable amount of myrrh resin, which repelled head lice. Such ointment cones were in use from the 18th Dynasty (around 1550 until 1295 BC). However, they only provided temporary protection from pests – some eggs from head lice have been found still sticking to the hair of mummies; in spite of the zealous use of combs with a double row of teeth the lice could still not be removed.

Harvest losses due to pests must have been considerable during the period of the New Kingdom (approx. 1550 to 1069 BC), as is evident from one farmer's lament: "The worm has taken half the food and the hippopotamus the other. There have been many mice in the fields, and the locusts have fallen upon us. The cattle have eaten, and the sparrows have stolen. The remainder lying on the threshing floor has been taken off by thieves."

Prophetic witnesses of biblical plagues

There is plenty of documentary evidence especially of the disastrous effects of invading swarms of locusts in the ancient Orient. The most famous appears in the second book of Moses, where God sends ten plagues to afflict Egypt in order to hasten the release of the Hebrews from their captivity there. The biblical expression for migratory locust, "arbeh", is similar to the Hebrew word "harbeh" (= large amount), emphasising the huge numbers in which the insects appeared.

"For they covered the face of the whole earth, so that the land was darkened; and they did eat every herb of the land, and all the fruit of the trees which the hail had left; and there remained not any green thing in the trees, or herbs of the field, through all the land of Egypt." (Exodus 10:15) A passage in the Book of Joel tells of a plague of locusts in Palestine at the time of the later prophets: "... for a nation has come up upon my land, strong, and without number, whose teeth are the teeth of a lion, and he hath the cheek teeth of a great lion." The prophet is even familiar with the different larval stages of the locusts – the older larvae eat what the younger larvae have left behind!

A painted clay tile from northern Mesopotamia reveals a dignitary pleading with the god Assur, the Assyrian national god, for protection from plagues of locust swarms. In the 7th and 8th century BC, several Assyrian kings recorded on clay tiles the damage caused by locust invasions.

Whenever this sort of periodic damage occurred, it provided the Assyrians with scant consolation that migratory locusts are edible. One representation from Assyria is known in which locusts are depicted served on meat skewers at the table of the Assyrian King Sanherib (705 to 681 BC).

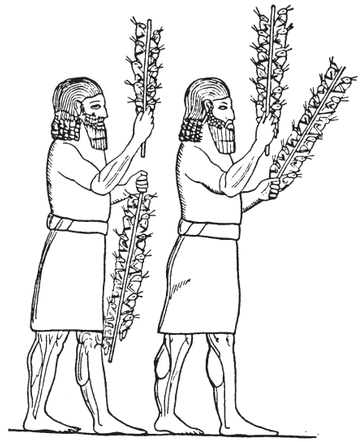
The huge numbers in which they appeared, the ease with which they could be collected and roasted, their high nutritional value (about 18 per cent protein and 5 per cent fat), and their pleasant taste all made them a popular source of food in the ancient Orient.

GOTTFRIED PLEHN

A beetle rolls the sun ball

Hermann and Anna Levinson of the Max Planck Institute for Behavioural Physiology in Seewiesen have recently published a four-part treatise "Insekten als Symbole göttlicher Verehrung und Schädlinge des Menschen", that is, "Insects as symbols of divine veneration and as pests to man" as a supplementary volume to the Journal of Zoology SPIXIANA. The key chapter in this volume is entitled "Kulturgeschichtliche Bedeutung der heiligen Käfer in Altägypten" (The cultural-historical background of the veneration of beetles in ancient Egypt). The click beetle *Lanelater notodonta*, for example, which feigns death if in danger and then "resurrects" itself afterwards, was dedicated to the war goddess NEITH, probably on account of this characteristic, and was worshipped as a divine being from the Protodynastic Period until the end of the Fifth Dynasty (about 3200 to 2345 BC). For a long time, from about 2345 to 343 BC, scarab beetles rolling dung balls (*Scarabaeinae*) or storing dung underground (*Coprinae*) were held to be a manifestation of both god of the sunrise CHEPRI and the creator god ATUM, symbolising resurrection and creation of the universe. According to ancient Egyptian belief, a scarab beetle lifts up the sun ball from the underworld and rolls it across the firmament. The 120-page volume (SPIXIANA, Supplement No. 27) can be purchased at the price of 30 euros from Dr. Juliane Diller, Zoologische Staatssammlung München, Münchhausenstraße 21, D-81247 Munich (Fax: +49-89/8107-300, E-mail: Juliane.Diller@ zsm. mwn.de), or from Dr. Friedrich Pfeil publishing house, Wolfratshauser Straße 27, D-81379 Munich (Fax: +49-89/7242772, E-mail: 100417.1722@compuserve.com)

Fig. 2: Partial view of a banquet depicted on a Theban mural from the 18th Dynasty (around 1400 BC): women in Upper Egypt, each with an ointment cone for delousing and perfuming the hair.



Left: Assyrian clay tablet from Kalat Shergat in Mesopotamia (approx. 745 to 727 BC): a dignitary pleads with his god ASSUR to avert plagues of locusts. Right: CHEPRI, god of the sunrise and the creation of the world, in the form of a man with a scarab beetle for a head. Mural in the antechamber of the rock grave of Queen NEFERTARI (approx. 1279 to 1213 BC).

A meal of locusts in ancient Assyria: two food bearers with desert locusts lined up on skewers, as they were served at the table of the Assyrian King Sanherib (705 to 681 BC). Drawing based on a pedestal relief found in the ruins of the king's palace at Nineveh.