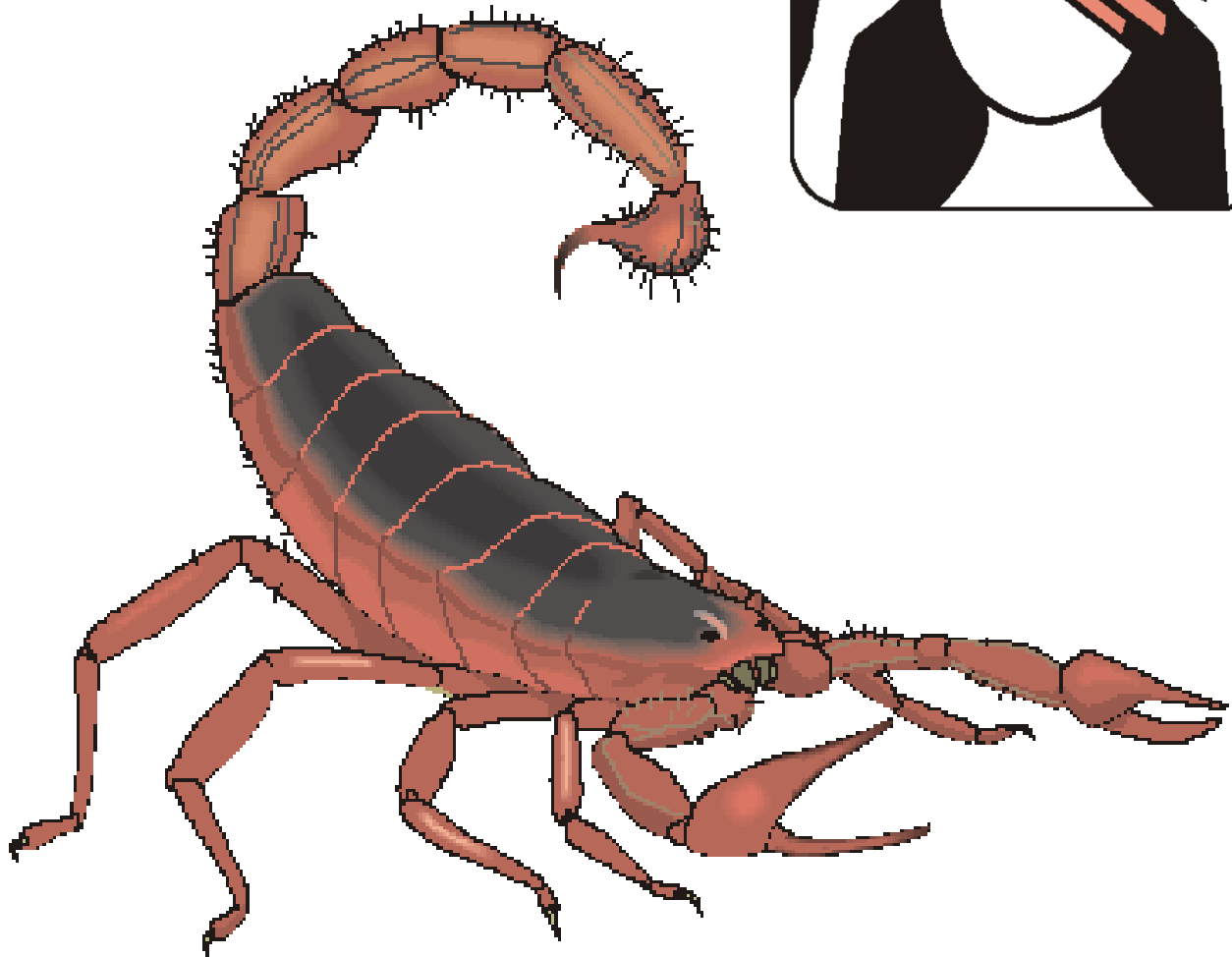


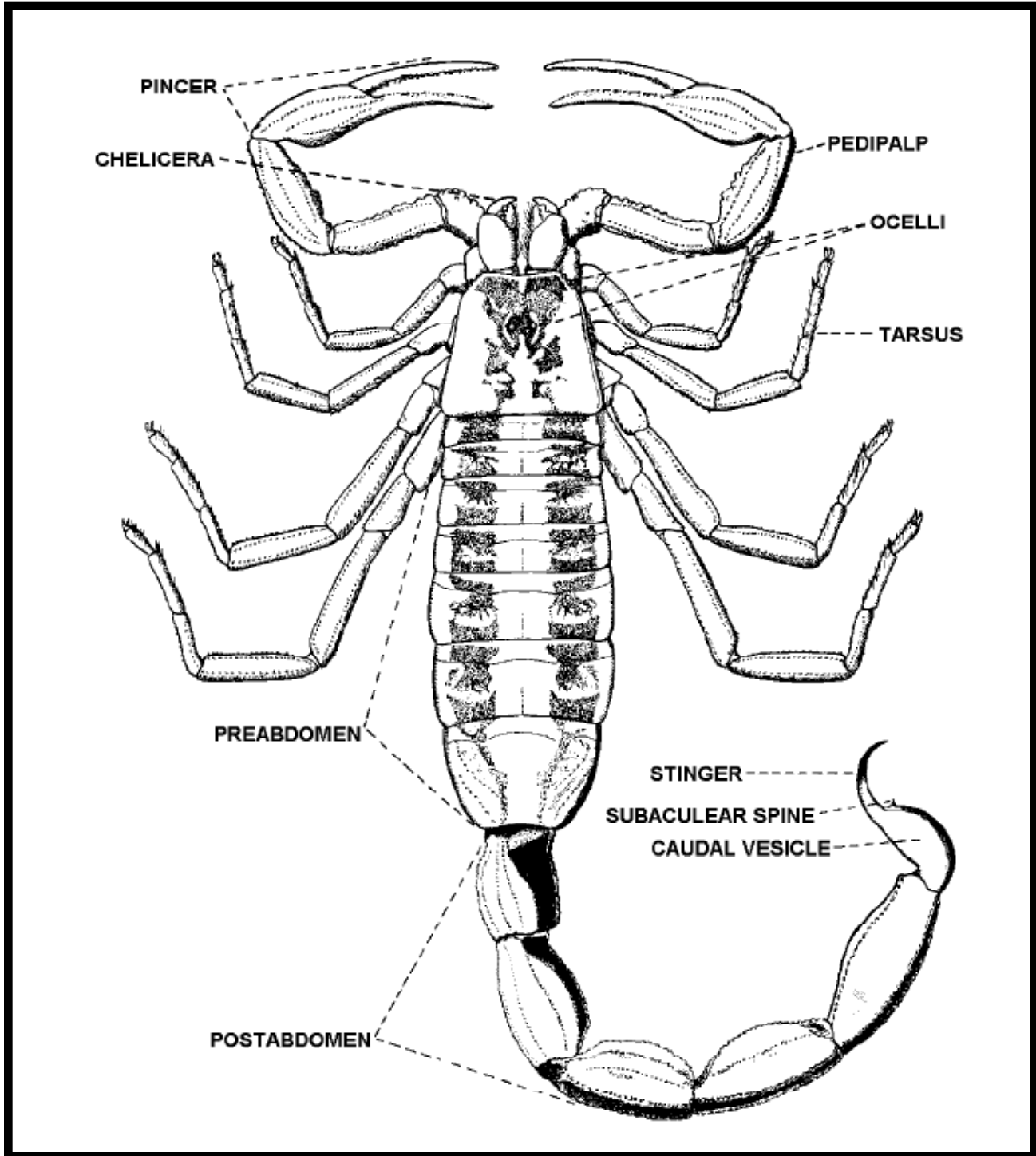
CHAPTER 25

THE BEST CONTROL FOR SCORPIONS AND IMAGINATION



What's Bugging You?

DIAGRAM OF A SCORPION



There are over 1500 known species of scorpions, all are carnivorous and have venomous stingers, but only 25 species have enough toxin to kill a human; only 1 of the 25 lives in the U.S.A. The venom has up to 30 different neurotoxins, each designed to attack a different type of prey. After knocking out their prey, scorpions spit out enzymes to dissolve the prey into a broth they can suck into their mouths. They can live 15 - 25 years, longer than any other known insect or arachnid. They can live for a year without eating because their metabolic rate is lower than a growing carrot! Install some free-range chickens and/or Guinea fowl outside.

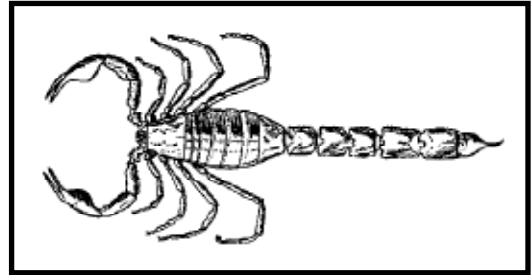
SCORPION OVERVIEW

Phylum- Arthropods, Class - Arachnida, Order - Scorpionida

Family - Various, Metamorphosis - Simple/Gradual

Although many people who live outside the arid southwest United States may never see a live scorpion, its shape (crab) is well known, and these 8-legged arachnids can be found as far north as British Columbia. There are at least 40 species in Arizona. See <http://www.ub.ntnu.no/scorpion-files/> and

<http://www.lib.uiowa.edu/hardin/md/scorpions.html> The scorpion's body form is characteristic, cephalothorax (fused head and thorax) elongate and dorsally shield-like, with an abdomen distinctly segmented with the last 5 segments tail-like ending in a stinger usually curved upward.



The most common scorpion is the small, striped scorpion, *Centruroides vittatus* (Say) family Buthidae. This small arachnid is only about 1½" long, tan, with two broad dark stripes running lengthwise down the body. It is distributed across the southern states and can be commonly found under rocks on south hill slopes in Virginia, Kentucky and Missouri. Non-fatal, poisonous species occur in Florida and in the semi-arid Southwest. They navigate by starlight and become sluggish at temperatures below 70° F.

Two species are known to cause fatalities when they sting: *Centruroides gertschi* (Stahnke) and *C. sculpturatus* (Ewing) commonly called the Deadly Sculptured Scorpion or Bark Scorpion (the only scorpion that can climb). These *scorpions* are from the family Buthidae are found in southern Arizona and neighboring states of California, New Mexico, and Texas. Actually *C. gertschi* is only a color variation of *C. sculpturatus*. There are about 40 species of scorpions in the U. S. - all of which can sting! Scorpions are most common in rural areas and new subdivisions. Scorpions are nocturnal. They hide under boards, rocks, rubbish and litter during the day. Scorpions are nocturnal feeders, so they forage at night, detecting slight air movements and/or minute vibrations, seeking insects, and sometimes, small mice. They can normally withstand starvation for 4 - 5 months. Scorpions blindly grab their prey with front, crab-like claws and quickly and repeatedly sting, whipping the stinger over their back. Scorpions can not see ultraviolet light, but ultraviolet light makes scorpions fluoresce - so, go out at night with a black light and carefully hunt this pest. In dinosaur days, scorpions were 3 feet long or more!

Despite the scorpion's usual occurrence in dry climates, scorpions need access to water, or some moisture. Because they do need to drink water, their nocturnal feeding habits and tendencies to inhabit shady crevices and areas reduce the evaporation or loss of their body fluids. The crevices they hide in may be extended down to the moist areas of the soil. They can sense an insect walking 3 feet away even with very poor eyesight!

Scorpions also find daytime hiding places in dark, secluded places, e.g., crawl spaces, attics, closets, and hollow block fences. They enter occupied rooms, especially kitchens looking for water. Scorpions avoid temperatures over 100° F. and when the attic gets too hot they move downward into the laundry, bathrooms and/or kitchen where water is available. So, make some water traps. **Seal and weatherstrip all doors and thresholds.**

Inspection - Thoroughly soak an area near the foundation with water and diluted Safe Solutions Enzyme Cleaner. Then cover with a piece of OSB board, plywood, paneling or heavy cardboard with a rock on top - check this "shelter" for several days for scorpions hiding under there and remove them or make a trap of diluted Safe Solutions Enzyme Cleaner in a shallow tray under the cover. Conduct a nighttime flashlight (or better still a black light - they glow a fluorescent green color) inspection. Place hands carefully when searching in scorpion habitats. Wear high boots, heavy gloves and long sleeved shirts and then:

- Carefully, look under outside harborage and in crawl spaces and attics.
- Scorpions avoid temperatures over 100° F. and when the attic gets too hot - they simply move *downstairs* into the laundry, bathroom and/or kitchen areas where moisture is also available.
- Inspect kitchen sink cabinets and bedroom closets.
- Scorpions fluoresce under ultraviolet or black light; (they can not jump) so control is easy.
- Ground scorpions frequently burrow into sandboxes where they can remain without food and water for up to 6 months - you may have to screen the sand to protect the kids.
- Scorpions tend to lie still and blend into their surroundings.

Habitat Alteration

- Practice proper sanitation.
- Maintain an 18" vegetative free band around the perimeter of the building. Routinely mow the grass.
- Tighten, weatherstrip and/or caulk all points of entry. They usually enter by way of wall voids, so seal all visible openings. Install doorsweeps. Store firewood, lumber and garbage up off the ground. Strip palm tree stubs.
- Remove harborage, e.g., piles of wood, debris and/or trash around buildings and homes. Shut garage doors. Lower the temperature below 70° F.
- Repair plumbing leaks and ventilate moist areas. Seal under stucco walls. Fill holes in lawn.
- Install screened vents or fans and/or a dehumidifier and/or a non-leaking air conditioner. Put plants on stands. Lightly dust susceptible areas with food-grade DE. Spray Not Nice to Bugs® or diluted Safe Solutions Enzyme Cleaner with Peppermint.
- Insects are their principle food, so control the insects and you control the scorpions.
- Install free-range chickens outside.

Exclusion

- Repair door thresholds, door, vent, and window screens, caulk and/or seal all utility openings and cracks.
- Put crib legs in clean wide-mouthed jars, pull beds away from walls, shake all clothing before putting it on - remember, scorpions tend to cling to loose objects.

Intelligent Pest Management® Control - Remember, they are fantastic pest predators.

- Dampen a burlap bag or piece of heavy, coarse cloth and spread it on the ground in the evening. Scorpions will crawl under it during the night and can be easily collected the next morning.
- Use a black light and a mirror and vacuum dry crawl spaces, attics, and hollow block fences. As a last resort have caring certified applicators dust under kitchen sinks and in closets where scorpions are seen with desiccating dusts or try talcum powder or medicated body powder to baking soda or Comet®.
- Foam/seal/caulk all cracks and crevices and/or voids (e.g., under stucco walls and hollow cement blocks).
- Chickens will search out and destroy this pest outside. Now, the Mexican government even puts ads on TV advocating chicken control.
- Cats usually of little value in mice control can be quite effective in controlling scorpions, but they must be trained how to do so safely!
- Water baits with boric acid, borax, diluted Safe Solutions, Inc. enzyme cleaner or sodium borate or water/soap traps placed where scorpions can reach them (but children, pets and wildlife cannot) will work.
- No commercial baits are available, but you should experiment with the above materials.
- In dry places, scorpions will congregate under moist burlap placed on the ground in areas of suspected activity. Carefully inspect and control the moisture seekers.
- Routinely clean and mop with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint or the concentrated enzyme cleaner powder, and/or borax and/or lightly dust with food-grade DE.
- Install free-range chickens outside.

PEST DISCUSSION

Scorpions are close relatives of ticks, mites and spiders, but they do not look like any of these insects. Scorpions are dryland or arid creatures that occur over three-fourths of the continental United States; however, most are restricted to the southwest with the majority in Arizona, California, Texas, Utah and Nevada. No two scorpions are ever exactly alike. Scorpions are nocturnal (they become active at night) and have very poor eyesight.

Scorpions are predaceous on various small invertebrates (insects, arachnids and related arthropods) and vertebrates (small lizards and rodents). Scorpions can withstand long periods of starvation (five months to over a year!) without any noticeable effect. In areas where there are occasional subfreezing temperatures scorpions will hide in warmer rock and bark crevices (Ebeling 1975). Scorpions become inactive both at low temperatures of 40°-50° F. and again at extremely high temperatures.

Scorpions give birth to live young. Immediately following birth, the young scorpions crawl onto the back of their

mother where they remain 5 - 15 days. The young scorpions are white and soft during this time. Following pigment development (tanning), they young scorpions will leave their mother's back and begin to forage for food. Scorpions may live for several to many years depending on the availability of food/water and predator pressure.

Young - Following an elaborate mating process lasting from 24 to 36 hours, the female undergoes a gestation period ranging from 5 months to over a year. Female scorpions have pouches where the young develop for a time period. About 30 young are born alive in semi-transparent sacs. Once the young scorpions free themselves from the thin wrapper, they are capable of stinging; they climb onto their mother's back and remain there for 5 - 15 days until they molt; then they leave the mother and begin to fend for themselves. When scorpions reach maturity (after they molt 6 or 7 more times) is dependent on available food. It may take one year to seven years or longer to reach adulthood. The young always resemble the adult in appearance, but not in size.

Adult - Fertile males and females occasionally parthenogenesis (reproduction without fertilization) occurs in scorpions. All scorpions have four pairs of legs and two large pincer-bearing arms (pedipalps) in front. Scorpions have small eyes but are nearly blind. They are nocturnal feeders and detect and capture prey (mostly insects and spiders) by their sense of touch and their well developed sense of hearing. **Scorpions hide** under stones, bark of fallen trees, wood or other objects on the ground where they wait or search for prey. Their chief foods are small insects, rodents, spiders, centipedes, other scorpions and earthworms, which they paralyze with their sting. Once they capture their prey, the large pincers crush and draw it toward the mouth. The body juices of the prey are then sucked out by the scorpion. It normally takes 3 - 4 years to mature.

Geographic Distribution

In the United States, scorpions are most abundant in the arid and semi-arid regions of the Southwest. No scorpion species occur in the Rocky Mountains, North Central, or Northeastern United States. Only one species which occurs throughout most of the Southeastern United States, and one species occurs in northern Florida, while three species occur in southern Florida. Southern Nevada, southeastern California, and central Arizona have the highest diversity of scorpion species in the United States (Polis 1990).

The Bark Scorpion, *Centruroides exilicauda* (formerly =*sculpturatus*) Ewing, which is normally considered the only American species of scorpion whose sting may be life-threatening, occurs primarily in the southeastern part of Arizona, but may also be found in southern New Mexico, Texas, Mexico and southern California. However, a related but less venomous species, the **Common Striped Scorpion**, *C. vittatus* (Say.), occurs in Texas, especially in Big Bend National Park, and in the southeastern United States from South Carolina south to Florida and west to New Mexico. (*Centruroides vittatus* was formerly divided into three species, *C. vittatus*, *C. partherienois*, and *C. chisosarius*). And there is the **Giant Desert Hairy Scorpion**, *Hadrurus arizonensis*, is the largest scorpion in North America, reaching lengths of 6 inches. They are found in deserts in California and Arizona. Their bodies are brown, with yellowish pinchers (pedipalps) and legs. Their common name comes from the brown hairs that cover their bodies. These hairs are used to detect ground and air vibrations. They have a long tail (telson) that is tipped with a bulb-like poison gland and stinger as well as large pinchers (chela) and four pairs of legs. Although a common pet species, these scorpions are considered aggressive and will sting frequently. Although the sting is painful, their venom is considered mild and has little effect on most humans. As with all stings, medical attention should be sought if the victim shows signs of allergic reactions, such as breathing difficulty, excessive swelling or prolonged pain. Commonly thought to be insects, scorpions are actually in the same family as spiders, ticks and mites. Like all scorpions, they fluoresce a greenish blue under black (UV) lights.

TYPE OF MOUTHPARTS - Chewing.

DISEASE ASPECTS - None known, but scorpions can inflict a painful sting if handled or disturbed. It is estimated a scorpion could sting you 15 - 20 times as they fall 18". The sting occurs from a poison gland that all scorpions have at the end of the tail. Scorpions in Texas produce only moderate reactions in most people since the poison does not affect the nervous system. However, as mentioned previously, Arizona does harbor *two* dangerous scorpion species: *Centruroides sculpturatus* (Ewing) and *Centruroides gertschi* (Stahnke) (remember this latter "species" is now considered to only be a color variant of *C. sculpturatus*) that inject a poison which affects the nervous system (neurotoxin). A sting from either of these scorpions can be fatal, especially to small children, but the majority of these signs can now be treated by an anti-scorpion serum. When administered early, the serum

has saved many lives. A person who is stung by a scorpion should be watched closely for adverse reaction and taken for medical attention. An ice pack or piece of ice or can of frozen juice applied to the affected area will relieve some pain. Especially if the swelling and/or pain persists or if breathing difficulty occurs, seek medical attention immediately. Do not make incisions at the site of the sting. Do not take chances, especially if a small child is involved. **See a doctor now!**

DESCRIPTION

Adult - Adults are between ½" - 7" long with 2 - 12 eyes. They have an elongated, segmented abdomen which ends in a stinger. Color ranges from brown (non-lethal) to yellow-green (lethal). Has a spine on the base of the stinger, eight legs, a pair of large, crab-like pincers and a small pair of mouth pincers. The common striped scorpion in Texas, *Centruroides vittatus* (Say) is about 2½" long. All scorpions are characterized by a long, slender body (covered with wax) with a 5-segmented tail that is arched over the back and ends in a bulb-like poison gland. Scorpions sting by rapid, forward tail movements. Regeneration of lost appendages can take place in all scorpions, but sometimes the regenerated part is malformed. All scorpions have poor eyesight, good hearing and a good sense of touch. Body hairs are used to detect air and ground vibrations.

Young - Same as adult in general appearance, but smaller in size. Gestation takes up to 1½ years.

LENGTH OF LIFE CYCLE - 3 - 25 years, young mature between 3 - 7 years.

HABITAT - They can hide virtually anywhere inside or outside your home or building, so carefully look very closely under debris, loose bark, logs, wood piles, boards, rocks and under all objects on the ground; in attics, crawl spaces, washrooms, kitchens, and any other place (from ground to roof) where they may find moisture and can feed upon garbage, small insects and spiders and/or each other. They will migrate downward from the attic once it becomes too hot up there.

Scorpions are nocturnal and hide in dark, secluded crevices and shaded areas during daylight hours, to avoid predators and to reduce loss of moisture. A scorpion's glow under ultraviolet light is visible for 20 feet. Even during evening hours, scorpions spend most of their time in burrows or hiding places. Despite occurring in arid regions, scorpions need to drink water in addition to obtaining moisture directly from their food. Because of their need for moisture, scorpions may be more common near natural and artificial sources of water at night. During seasons when scorpions are active, most desert scorpion species are most active during the early hours of the evening (prior to midnight). During daylight hours, scorpions hide in areas where protection from daytime heat and sun, and water are available. Unfortunately, areas occupied by humans in arid regions are also associated with natural and artificial water sources, increasing the likelihood of human-scorpion encounters. **Install fans and dehumidifiers; caulk, dust with desiccants, e.g., food-grade DE, Comet® or talcum or medicated body powder.**

The bark or deadly sculptured scorpion is almost always found associated with trees, especially in riparian habitats. This species is commonly found in mesquite, cottonwood, and sycamore groves. It is a climbing species and is almost never found hiding in burrows, except during periods of hibernation. Its climbing habit distinguishes it from all other scorpions in its geographic range.

Scorpions are attracted to water sources in buildings, e.g., bathrooms and laundry rooms, so repair/correct all moisture problems. Bathroom and kitchen areas are the most frequent places scorpions can be found at night in buildings. During the day, scorpions will seek out hiding places such as cracks and crevices in the floor, cabinets, attics, wall voids, and crawl spaces. Scorpions are most often a problem in buildings in newly developed areas (within three years). This is attributable to the disturbance or destruction of the scorpion's territories. Additionally, buildings near arroyos or dry riverbeds may experience an influx of scorpions during periods of rain as the scorpions seek out higher ground. Scorpions in buildings are not likely to meet their normal requirements of temperature and prey density (Smith 1982). **Remember, scorpions are not afraid of anyone or anything.**

PUBLIC HEALTH IMPORTANCE - Caution: Every scorpion sting should be considered dangerous. The more dangerous scorpions are in the family Buthidae and have a neurologic venom. Always consult a medical professional. Children, chemically-sensitive people, people with heart problems and/or elderly people are especially susceptible to the scorpion's poison. Call a doctor or emergency room immediately and cover with ice or im-

merse the bitten area in ice cold water. Scorpions sting when touched, rolled over on when sleeping, stepped on, or otherwise provoked. **See a doctor at once, if bitten.**

Monitoring and/or inspecting for scorpions - The presence of scorpions in an area can be detected by trapping and visual scouting. Blunder traps (glueboards or duct tape placed sticky-side up) and/or pitfall traps (a small hole dug into the ground and covered with a board, rock, etc.), although not scorpion specific, may help to identify the presence of scorpions. For best results a trap or glue board should be set near water sources and checked during daylight hours while wearing leather gloves. This is when scorpions may be hiding in the trap, except for the bark or deadly sculptured scorpion which hides under bark on trees during daylight hours. Visual scouting for scorpions can be done during both daylight and dusk (or early evening) hours. During daylight hours a visual search under rocks, loose bark, and other debris (while wearing leather gloves) can also confirm the presence of scorpions. At night, the inside of buildings and outside areas may be searched using a ultra-violet fluorescent light fixture. **Scorpions glow brightly under black or ultraviolet light like a psychedelic poster and are extremely conspicuous and visible even from yards away.**

Usually non-lethal - Usually only causes a burning sensation, drowsiness, abdominal cramps, blurred vision, muscle twitching, partial paralysis, numbness, hyperactivity, salivation and/or a local swelling, high blood pressure, rapid heart rate and/or pain at site of sting; occasionally can cause syncope, dysphonia, dysphagia, or even convulsions with respiratory distress. **Brush them off - do not swat them!** Never put an unprotected hand or foot anywhere you eye can not see! One deadly species (*Centruroides sculpturatus*) which lives above ground in southern Arizona and neighboring California and New Mexico (some live above; others live below ground); this terrible scorpion can inject a poison which acts as a nerve poison, causing restlessness and often a convulsive state in the victim. See a doctor or emergency room immediately. Immobilize the injured part; use a tourniquet only if the symptoms indicate an anaphylactic shock. If you do not see a doctor A.S.A.P., respiratory distress may develop and you may have to give artificial respiration. The physician may administer anti-venom. Try removing some of the irritation by washing with soap and water or with Safe Solutions, Inc. enzyme cleaner or an ice cube until you see the physician; prolonged exposure to ice and all exertion should be avoided. In Morocco it is estimated the number of scorpion stings, many with life-threatening potential, is estimated to be 40,000 per year.

INTELLIGENT PEST MANAGEMENT® CONTROLS - Use some chickens, glue boards, a blacklight and a dehumidifier. Remember, scorpions are normally found outdoors and search for food at night. During the day they may be found under the bark of trees, rocks or in moist areas under boards or debris. They may invade homes in search of moisture and hide during the day in bathrooms, closets, garments, shoes or bedding. An effective barrier can be constructed of smooth sheet metal, imbedded in the ground so it forms an unbroken fence at least 6" high. Cover/protect the sharp edges and remove any debris that the scorpions can climb on. **Sanitation is the first step in scorpion control.** Loose boards, wood piles, rocks and debris should be eliminated from areas about buildings, particularly near foundation walls. Medicated body powder, talcum powder or food-grade DE may be lightly dusted or Not Nice to Bugs® or diluted Safe Solutions Enzyme Cleaner with Peppermint and/or borax may be mopped or may be sprayed in such areas. This will also reduce populations of insects fed upon by scorpions. Scorpions may also be trapped under moist burlap and later destroyed. Make and safely place boric acid or sodium borate or protease enzyme treated water baits so scorpions can reach them but kids, pets and wildlife can not. **Great care should be used in handling boards or other objects under which the scorpions may be hiding.**

Programs to educate the public should be implemented in areas where scorpions are known to occur. These should include identification of scorpions, especially recognition of the dangerous scorpion species occurring in the region. People should be encouraged to avoid risky activity in areas where dangerous scorpions have been observed. The program should also educate the public about the beneficial role that scorpions play in the ecosystem, and the importance of scorpions as natural enemies of other arachnids and insects. Lastly, preventative behaviors should be outlined and the groups of people most at risk identified.

Additional precautionary methods that should be included in your scorpion education program are: (1) wearing leather gloves when moving objects and collecting firewood at campsites or in outdoor areas, (2) when camping, invert and shake out clothes, sleeping bags and other items that have been in contact with the ground or trees, and shake out shoes before putting them on, and (3) always wear shoes when walking at dusk or at night.

The best methods for controlling scorpions are (1) those that alter the areas where human contact is likely in order to make it less suitable for scorpions and (2) the creation of artificial barriers that restrict the movement of scorpions into buildings and into those areas where human/pet contact is likely. Cultural methods such as sanitation and elimination of habitat and/or harborage have been found to be effective in reducing scorpion numbers. Erecting barriers to stop the movement of scorpions into dwellings can also be effective in reducing human/pet exposure to scorpions. Barriers for scorpion exclusion include caulking windows and holes and crevices around plumbing. Repellants can be applied like lime, talcum powder, Comet®, medicated powder or food-grade DE. **Fossilized scorpions from 300 million years ago still gleam under ultraviolet light.**

Sanitation and removal of rocks, trash and debris are also the primary methods recommended for the control of scorpions. Firewood should be stored away from the sides of buildings and off the ground. Other debris such as loose boards, rock piles, and trash should also be moved away from buildings or properly discarded. Shrubs and vegetation should be pruned so that they do not touch the exterior of buildings.

Elimination of sources of open water may also reduce the occurrence of scorpions. Proper maintenance of toilets and plumbing and air conditioning and exterior water sources to reduce leaks and coating the inside lip of toilets with petroleum jelly will reduce access of scorpions to water. All drains should be screened or plugged when not in use to prevent access from the outside. Remember to check on the dripping air conditioner.

In order to create barriers to scorpion movement into dwellings, install a barrier strip of gravel around the entire foundation. All doors, window frames and screens should be periodically checked for holes large enough for scorpions to enter through. Screens should be repaired and window frames caulked to fill all gaps. Baby cribs and cots can be protected by placing the legs into clean wide-mouth jars (scorpions cannot climb clean glass surfaces). **Any opening, crack or hole associated with wiring and plumbing should also be caulked to fill all gaps.** Duct tape (sticky-side up) or double-sided carpet tape should be properly installed.

There is little evidence that chemical (volatile, synthetic pesticide poison) control tactics have been or ever will be effective against scorpions and they are dangerous to people and pets, so they should be only considered as a last resort. **Remember, scorpions will usually walk away if they can do so!**

Do not try to control scorpions with one kind of control alone. The best control in a dwelling is to construct barriers and to modify the area surrounding the building by several means and several alternatives:

- Practice proper sanitation and properly install doorsweeps.
- Install a dehumidifier, fans, a non-leaking air conditioner and/or fans, and then routinely clean/spray with Safe Solutions Enzyme Cleaner with Peppermint and/or borax or Not Nice to Bugs®.*
- Remove all trash, logs, boards, stones, bricks and other objects from around the home.
- Keep grass closely mowed near the home; construct a sheet metal "fence".
- Store garbage containers in a frame that allows them to rest above ground level.
- Never bring firewood inside the home until ready to be turned.
- Weather-strip around loose fitting doors and windows. Fill in the voids of block walls.
- Plug weep holes in brick veneer buildings with pieces of nylon scouring pad or small squares of screen wire. Repair all leaking plumbing, air conditioners and/or refrigerators.
- Caulk around roof eaves, pipes and other cracks into the home.
- Keep window and door and vent screens in good repair.
- Make water traps for them to fall into and/or install sticky "blunder" traps or duct tape or carpet tape.
- Dust areas with talcum powder or medicated body powder or lime or Comet®, food-grade DE or other desiccating dusts.
- Install free-range chickens or Guinea fowl outside.

INTELLIGENT PEST MANAGEMENT® CONTROL SUMMARY - Remember that your initial inspection must be done very thoroughly. Scorpions can live for over 6 months without food or water and can hide for months after eating their fill. Carefully look all over - very thoroughly. Scorpions usually breed outside or under the building, possibly in the attic, but in most cases will be found in the crawl space, under logs, timbers, rocks, debris, or similar material. Thoroughly clean and caulk the entire building area so there will be no hiding places left for the scorpions. Thoroughly inspect at least an area for ten feet around the outside of the building and remove all debris, boards, rocks, firewood, etc. If you prepare boric acid or sodium borate water baits and they

evaporate - simply add more water to the container - the boron products will still be there waiting to go back into the solution. Do not add any more boron to the bait container unless you first wash it. **Note: Chickens and Guinea fowl love to search out and destroy scorpions.**

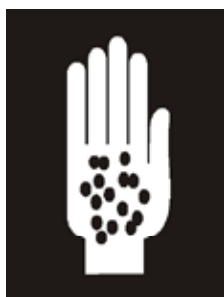
Inside the building, remember scorpions can and do hide anywhere, so carefully look everywhere in bathtub traps, in seldom worn shoes and boots, in areas under appliances, under sinks, in closets, and in similar dark or damp hiding places. All of these areas can be vacuumed and/or spot treated with lime, talcum powder or medicated body powder or Comet®, boric acid, silica gels and/or food-grade diatomaceous earth for effective control. **Routinely clean with Safe Solutions Enzyme Cleaner with Peppermint and/or borax.**

Be sure to correct all leaks, routinely and thoroughly vacuum and clean the premises, use dehumidifiers apply food-grade DE, silica gels, boric acid, Comet®, lime, talcum powder or medicated body powder lightly in all cracks and crevices, then caulk with silicone all openings. If you must use poison, follow the labeled product directions exactly and vacate the building for at least several days and thoroughly air out before re-entry.

About 300 B.C., Theophrastus, in book 9 of his Enquiry to Plants, noted that wolfsbane, or scorpion plant (*Aconitum anthora*), kills scorpions if it is shredded over them. Pliny in book 20 of his Natural History, written in the first century A.D. advised that a mallow leaf (*Malva*) “placed on a scorpion paralyzes it.”

Final Note: Use a black light inside and out. Chickens love to eat them let - let 3 to 4 chickens clean the exterior area for you for real innard-grated pest management. Diluted Safe Solutions Enzyme Cleaner with Peppermint and sodium borate and/or borax or, as a last resort, contact insecticides, e.g., pyrethrum, in an oil-base spray will kill scorpions when directly contacted. Remember, if you live in an infested area, put bed legs in wide mouth jars as scorpions can not climb on clean glass. Beds should not touch walls. Do not walk without shoes or at least sandals. Look underneath all objects you pick up and take out: clothes, bedding, footwear before getting into them. **Turn on lights when getting out of bed and watch where you step and touch.** Routinely clean, mop, and/or spray with diluted Safe Solutions Enzyme Cleaner with Peppermint and/or borax. Pick them up with forceps. **Use food-grade diatomaceous earth in attics, cracks, wall voids, blocks, etc. Double-sided carpet tape or duct tape positioned sticky-side up and held in place at the edges with a little masking tape makes an effective barrier/trap.** Spray them with Not Nice to Bugs®.

IMAGINARY ITCHES



Imagination is the wonderful ability to form a mental image and/or to experience something that is not real or actually present. Sometimes it is not so wonderful. For example, when it is the source of imaginary itches that are attributed to pests, the itch can be very real, but the “pest” is not. Everyone experiences an occasional itch on their skin that feels like crawling insects. A close look confirms that either an insect is present or that the mental image was not real. These imagined feelings can be very troubling. Concern that the cause of the obvious itch cannot be seen, and may be a microscopic parasite or “pest” can be overwhelming. This idea affects some people so strongly that it can and does inhibit their ability to function. Imaginary insect-related problems can be separated into three groupings: Entomophobia, Contagious Hysteria and Delusions of Parasitism.

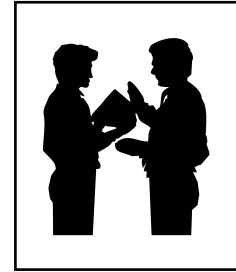
ENTOMOPHOBIA - Taken alone, the term entomophobia can be defined as an admitted fear of insects. This is not to mean a fear of imaginary insects, but an exaggerated, illogical, unexplained fear of actual insects. A fear of insects occurs to a minor extent with a majority of people who have been taught “bugs are bad.” In an extreme form, when the fear inhibits normal functioning, help from professional counseling is needed. Group treatment has been found to be very successful.



“Entomophobes” rarely have real pest problems requiring pest control technicians. However, their excessive desire for preventive pesticide poison applications may be encountered when occupants attempt to coerce you to use volatile, synthetic pesticide poisons unwisely. Such pressure should be resisted; you should remain firm and apply IPM controls **only**. The only time we advise the use of non-volatile pesticides or even pestisafes® is when professionally indicated by real/dangerous pest infestations. [The term, entomophobia, is used sometimes generically to include all imaginary insect-related categories.]

CONTAGIOUS HYSTERIA - As the terminology implies, imaginary “pest” infestations sometimes upset a whole group of normal people. This hysteria can be contagious in that it is passed along or accepted by others. Contagious hysteria can occur in an office work force or school. Factors usually connected with the contagious hysteria include:

- a feeling of being unappreciated,
- crowded conditions,
- overtime work,
- excessively detailed or boring tasks,
- changing climate,
- changing seasons,
- paper handling,
- perceived unfairness of working conditions caused by people or physical arrangements in the work space.



Classically, a few individuals including a “leader or spokesperson” begin feeling “bites” and discover rashes and other skin eruptions. These individuals identify certain portions of rooms where the “pests” are common and demand immediate poison control. Supervisors usually do not believe there is a pest problem, since they are usually unaffected by the contributing conditions, but they may become “believers” as pressure for results or “controls” or “relief” mounts. This is really becoming a problem in areas where one “bug” is actually seen because many people believe all “bugs” are “bad” and all pesticides are “safe or protect”. The Author has noticed many people in his audience begin to scratch when he lectures on lice and scabies. This is very normal.

Inspection

- Install sticky (blunder) traps to check if the problem may have a real pest infestation basis.
- Look for tiny pest infestations such as mites infesting stored products or populations of psocids and fruit flies that may cause entomophobia.
- Inspect for fiberglass filaments and for insect parts that could cause allergies or rashes or “bites”.
- Do not allow obvious miscellaneous insects to become “important” for the sake of coming up with an answer.
- Carefully inspect the entire work area - the non-targeted part as well as the identified part.
- Listen to workers explain the “pest” situation fully; arrange for management not to refute or ridicule their statements. Not having a hearing or a chance to “sound off” entrenches feelings of unjust treatment.
- Ask if the “pests” are ever seen biting; ask to see the “pests”.
- Leave alcohol vials, tweezers, and a small brush so any subsequently visible *pests* can be collected if they are seen by the occupants after you leave.

Notice the differences between the “pest”- affected and non-affected parts of the work place.

- Check the relative humidity, previous pest control activities (in house), the air conditioning, air filtering, previous pesticide applications, work space furniture, amount of window space, lighting, immediate supervisors, temperatures, new carpeting, type of work, proximity to duplicating equipment, availability of refreshments, and compare the two areas. Where there is an apparent discrimination, bring it to the attention of the supervisors. Different work conditions influence different worker feelings.

Problems with contagious hysteria may erupt during periods of seasonal change. Changing climate results in changing humidity and the need for the body to acclimatize to different atmospheric conditions.

- Notice static electricity around duplicating machines, and check the relative humidity of the office air. Low humidity dries skin and increases static electricity. This results in skin sensitivity, causes paper fibers to jump and electricity discharges that snap and sting people, as well as cause the hair to move on the skin, giving the impression, of crawling insects and/or “bites”.
- Periods of changing clothing styles, e.g., winter to spring, summer to fall, find people more restive. Changing climate and changes between heating and air cooling results in dry or humid air. Seasons can create financial or work related pressures creating “dis-ease”.

Habitat Alteration - Simply increasing sanitation may act like a placebo.

Responses to the “pest” problem are needed. Install more sticky (blunder) traps around the “pest”- affected area. By the time responses are carried out, the condition often is rectified. Discuss observations with management and workers. Suggest patience. Request physical changes in the environment.

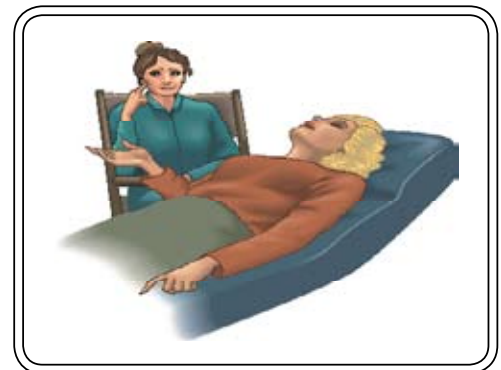
- Inquire whether a pesticidal lotion has been prescribed by a physician. If this has happened, and it often does, strongly recommend that the use of this toxic lotion use be discontinued especially if no skin eruptions are seen and substitute a non-pesticidal lotion. People also react to pesticidal poison applications.
- Inquire about the possibility of fiberglass insulation, synthetic pesticide applications, new carpeting or furniture, recent remodeling or painting, or any different or new activity or recently added item in the “infested” area(s). Many products or poisons “off-gas” and create real health problems.
- Recommend that the workers at the center of the affected area be dispersed, that desks and furniture in that area be wiped down with non-irritating, hyper-allergenic disinfectants or enzyme cleaners or peppermint or natural soaps, and that intensive vacuuming or carpet cleaning be done. Leave the area empty for a time if possible.
- Balance air cooling or heating. Bring relative humidity back up to 65%.

Intelligent Pest Management® Controls

Unless there is real evidence of dangerous pest problems, NEVER even spot apply even Pestisafes® or least-toxic pesticides. Do not make false statements relating to *control* of non-existent *pests*. Vacuuming produces immediate and very clear results that can be seen, but NEVER pretend you are vacuuming up non-existent *pests*.

Follow up - Monitor the area periodically with sticky (blunder) traps and talk to the occupants/staff. Explain the importance of the appearance of captured objects on the sticky surfaces are, e.g., small flies, dust, lint, cockroaches, etc.. Identify any specimens or objects occupants or staff have collected in the sticky traps or placed in alcohol vials. Use hand lens or microscopes, and let the people view the “specimens”. After taking the steps outlined above, often simply demonstrating to occupants/staff that you are on the job and concerned about their welfare, proves you are competent and informed about intelligent pest management®, and is more than an adequate solution. If you find a real pest problem, call the Author or a physician for advice.

DELUSORY PARASITOSIS - This is a serious condition where an individual has delusions of parasitism, this can be an extremely emotional and sensitive situation. Sufferers can experience depression, loss of sleep, anxiety, frustration and can even become suicidal when the person can find no answer or solution to their “pest” problem. An inspection of the “problem” environment and an examination of specimens alleged to be the pest or parasites may affirm or contradict the occurrence of a pest problem or infestation to you, but rarely to the occupant. Not every person that suffers from delusory parasitosis is “nuts”. The Author believes people when they feel itching, have skin with crawling sensations or find unexplained bumps or sores, etc. are really being reasonable when they suspect a biting pest problem.



Often people troubled by these delusions will have been referred from one or several physician(s), to a dermatologist, to a psychiatrist, to entomologists, to health department sanitarians, pest control companies, ad infinitum. The amount of time that must be expended by each consultant soon becomes excessive and very expensive, and the patient experiences repeated rejections of one type or another — not to mention additional strain due to expenditure of time and money.

In any situation there is a good possibility that the complainant has a medically treatable condition. There have been cases in which volatile pesticide poisons, alcohol or drug abuse, or conflicting drug prescriptions for patients being treated for several health problems, elicit such manifestations. The trouble is there is little that can be done by anyone but a competent medical diagnostician with experience in the cause of delusions.

Always be completely honest in answering everyone's questions; do not simply agree to "seeing pests" that are not there even if it is easier to do so. NEVER apply pestisafes® or pesticides or any controls in these situations. Remember to communicate with all people that pesticides are extremely dangerous and should only be applied by certified applicators trained in Intelligent Pest Management® and then **only** when active pest infestations have been identified, evaluated and all other pestisafes® and alternative IPM non-toxic controls have failed. **Many medications can cause "biting" symptoms.**

SUMMARY

Biting pests are not as commonly encountered as many other urban pests. When real or imagined pest infestations are found or suspected, however, they can and do elicit fear: fear of being parasitized as well as fear of the unknown. Calm, professional, authoritative and well communicated advice is very important for you to use in situations involving biting pests. **The Author never advises the use of any volatile, synthetic pesticide poison. These volatile poisons hurt people, pets and the environment and do not control pests as well as pestisafes®.**

Psychiatric Sequel to Organophosphate Exposure

Organophosphorus compounds are also known to cause mental disturbances. There have been an ever increasing number of reports of psychiatric sequelae from organophosphorus poisoning... these reports have been received with skepticism by some authors who claim that no definitive connection has been established. The authors who denied the possibility of psychotic behavior were and are, interestingly often employed by the poison "industry". All of the cases where there was shown to be a correlation between mental disease and chronic organophosphorus exposure that Bruce Haney investigated, exhibited one reoccurring mental symptom: depression. In all of the cases, lack of memory, difficulty with concentration, apathy, or irritability were so great that professional help was sought. Also of note is that none of the people Bruce investigated in the U. S. sought treatment for acute organophosphorus toxicity, and consequently, no blood cholinesterase evaluation was ever made. One common denominator is evident that is all were chronically exposed to organophosphorus insecticide poisons for an extended period of time; two to fourteen years.

There is a similarity between these U. S. cases and a study done in 1961 on sixteen individuals in Australia. Eleven people in this study had been acutely poisoned by OP's. One, who recovered from the effects of acute toxicity twice, continued to work with cholinesterase inhibitors, and after a delay of two years, was admitted to the hospital suffering from mental confusion and on more than one occasion, a fugue. He was released from the hospital after a stay of four weeks with blood cholinesterase level of 60% of normal and his condition essentially unchanged. In this study, schizophrenia was also in evidence in five of the cases. Additionally, there are individual case histories that suggest pilots who apply organophosphorus insecticide poisons by aircraft suffered lapses of attention or judgment leading to accidents. Of twelve crop duster pilots tested whose planes had crashed, blood cholinesterase levels and other laboratory evidence showed measurable OP contamination.

Psychiatric problems would appear to be clearly manifest after chronic exposure to organophosphorus compounds. The United States Environmental Protection Agency has revealed that even occasional contact with OP insecticides leads to damage of myelin substances and that this type of neurotoxicity persists for months or even years. The insecticides associated with this chronic illness include some whose acute toxic potential is low and there appears to be no relationship between acute toxicity and the likelihood of a chronic neuropathic effect. This information can only raise the probability of psychiatric sequelae after chronic organophosphorus exposure.

Organophosphate Conclusion: The most logical conclusion is really no conclusion at all, but rather in reality, a series of questions.

1. If man is the most susceptible of all the vertebrate species to organophosphorus compounds, and if a poison's LD₅₀ numbers can only be extrapolated to man, what is the actual acute toxicity level of the various compounds that man can withstand?
2. Since chronic exposure to low levels of organophosphorus insecticides produces long term or permanent neurological damage, what is the tolerable level of exposure and for how long?
3. Because these poisons have been shown to potentiate their effects when combined, what is the

- multiplied effect of the various toxic combinations on the environment, including man?
4. Knowing that exposure to organophosphorous compounds induces toxic psychosis with maniac or bizarre behavior, at what level of exposure is this psychosis likely to be triggered?
 5. Given the facts that organophosphorus compounds are at times known to be stored in fat tissue, that all humans have the presence of chlorinated hydrocarbons in their bodies, and that it is proven chlorinated hydrocarbons have an intense antagonistic action on the acute effects of organophosphorus compounds, could the psychiatric sequel not be a sequel, but rather a retoxication manifesting itself as the body metabolizes chemically contaminated fat?

At this point, no better words can be found than those of Albert Einstein: "Concern for man himself and his fate must always form the chief interest of all technical endeavor."



Compare this with the 1997, Eighth edition of Mallis' Handbook of Pest Control on page 865, "Insecticides and the Environment." (Rachael) Carson (1962) wrote a provocative book on the effect of insecticides on the environment. Many of her statements, though not based on fact, did lead to political action to the almost complete banning of DDT in the United States, though fortunately not in countries with a more rational decision making process." **Obviously, if the poison "industry" gets its way, we will get DDT back!**



The only thing necessary for evil to triumph is for good people to do nothing.
— Edmund Burke



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