Integrated Pest Management of Manifestations as Infestations

or, Angels Are Insects

by Sally Y. Shelton, Washington, DC, USA
John E. Simmons, Lawrence, Kansas, USA
and Tom J. K. Strang, Ottawa, Ontario, Canada

(With profuse apologies to A. S. Byatt)

The considerable body of literature about angels is cluttered, to say the least, with confused speculation that goes much beyond the facts. A simple scientific analysis of angels – one based on observation – can simplify our understanding of these much misunderstood organisms.

Entomological Biology, Evolution and Systematics of Angels[1]

Angels are most commonly represented as winged humanoids, with two arms, occasionally two feet suggesting the presence of legs, and two wings (often feathered). This six-limbed state is not a vertebrate structure, as any look at basic vertebrate anatomy quickly reveals. The capacity for flight has arisen in three vertebrate lineages – volant flight in pterosaurs [Reptilia], birds [Aves], and bats [Mammalia]; gliding flight in a range of lizards, snakes, fish and – and in NONE of those has it resulted in the addition of limbs. All three groups have wings derived from some element of the forelimbs are dedicated forelimbs. The at the expense of some to flight functions the general vertebrate typical uses in never supplemented by plan, but are additional limbs.

Angels therefore are not vertebrates or derived from vertebrate stock. The implications of this are profound. The only winged invertebrates are in the Class Insecta insects [Insecta]. Insects constitute the largest taxon on earth (or, apparently, anywhere else). Insects are six-legged (hexapodal) and may have 1-2 pairs of wings,[2] for a total of 8-10 "limbs." Angels thus represent a highly derived insect group with secondary loss of limbs, derived from a hexapodal ancestry.[3]

This reconsideration of our view of angels has implications for four major aspects of the species.

1. Wing surfaces. Angels cannot have feathers on their wings. Only birds [Aves], a vertebrate group, have feathers.[4] Future artistic interpretations must take into account the chitinous nature of all insect structures and depict angel wings as translucent structures with supporting veins (cf. cicadas), covered with scales (cf. butterflies), or with hairs (cf. caddisflies).

2. Angelic skeletons. Angels must have exoskeletons rather than endoskeletons. Leaving aside the question of metamorphosis and moulting (and the possibility of shed angel skins, or exuviae, as a major nuisance factor for cleaning crews), this means that angels must have a highly derived, lightweight exoskeleton in order to avoid violations of the square-cube law.[5]

3. The aerodynamics of angels. The question of aerodynamic stability in angels becomes much easier if it is predicated on an insect model rather than on a winged-humanoid one. Standard depictions of winged primates[6] show incompatible grafts or additions of wings that are improbably jointed at the scapula and are of insufficient size, shape, and muscular insertion to permit effective flight.

With insects, however, the questions of attachment, adequate musculature, and effective flight are resolved in several ways. It is not clear whether angels could sustain the aerodynamics of, say, dragonfly flight, but they should minimally be

capable of bee- or beetle-grade flight. We might explore the possibility of a convergence with the "rowing action" of dragonfly flight wings; this follows from the clue "Daniel, row thy boat ashore" (T. Erwin, pers. comm.).

4. The dilemma of horns. The depiction of devils with horns (which are likely to, in fact, be rudimentary antennae) suggests that "devils" could be, in fact, the larval stage of angels.[7] Devils frequently are depicted without wings. This might explain the widespread urge to get rid of devils, while angels are generally viewed as beneficial. Like caterpillars, which damage crops and other useful plants, devils create destruction when they feed. It is suggestive that this larval form prefers warm, dark areas, probably a dry environment, perhaps with a high sulfur content.

Integrated Angel Management (IAM) Strategies

For conservators, the most serious problem is dealing with spontaneous angel manifestations in religious buildings, historic structures, and the like. We must consider manifestations to be infestations, and act accordingly. (After all, how many other invertebrates are permitted to range freely in historic structures?)

An analysis of the problems associated with manifestations reveals the following additional secret agents of deterioration likely to be triggered by angel infestations:

1. Frass (scales from wings, huge exuviae, angel dust, etc.) as a source of particulate pollution, food source for other invertebrates, and contaminant in general.

2. Light/radiation damage. (We must presume that flaming swords, halos and auras encompass the entire electromagnetic spectrum unless it can be shown that angel-light is derived from a firefly-type chemical reaction.)[8]

3. Noise pollution. (Angels are commonly described as brass instrument players, shouters of praise and glad tidings, members of choruses, etc.).

4. Passive vandalism and physical damage. (Manifestations involve disruptions of the space-time continuum, which cause sonic-type booms, are very hard on the fabric of historic buildings, and can lead to a separate line of study of artifact damage by miraculous mechanisms).

5. Administrative neglect by intimidation. (The appearance of the world's largest insects in a sonic clap and spray of used-up glowing wing scales can drive away the tourist income on which many historic churches now rely.)

It seems that we must develop a line of Integrated Angel Management (IAM) strategies to cope with the nuisance of mani/infestations. We are unable to use growth hormone or radiation strategies to disrupt the life cycle of angels, as we have very little information on the physiology of angels, and cannot even reliably determine age or gender of those observed. In addition, we are unconcerned with manifestations outside churches and other structures, and so are only concerned with limiting the damage inside buildings.

IAM must also take into account the non-secular nature of the structures in which angels are most likely to appear, and adapt the typical devices and furnishings of

the building so that IAM can be accomplished within the scope of a traditional religious service without unduly upsetting the faithful. Depending on the specific order of worship involved, various approaches can be tried.[9]

1. Incense. Censers can be adapted to waft a fine spray of a selected fumigant or a pheromone. The former has the advantage of being easily re-applicable with every service; it will provide some repellent effect, persuading angels to manifest elsewhere. The latter is somewhat tricky because angels are not known to seek out members of the opposite sex through chemical cues (if there is an opposite sex), but they are known to gather in hosts and multitudes and presumably have a chemical cue to do so. Once they are gathered, they can be live-trapped for humane release elsewhere.

2. Attraction via colored light. Regardless of their highly derived nature, angels must respond reflexively to fundamental stimuli stemming from their insect heritage, meaning, among other things, that they will be attracted to lights in ever-diminishing spirals and wind up fluttering helplessly around them, manifested originally when the Number One Angel was attracted to the fires of Hell never to be redeemed.

Modification of wavelengths via selective replacement of stained glass can provide a precisely lit, out-of-the way area to which angels will be attracted for trapping and release. It has been suggested that the wavelengths in the blue range of visible light will work best; therefore, scenes of saints at night, in caves, or underwater are recommended for the furthest well-lit windows.

Angel-zappers are emphatically not recommended, as angels could cause injuries or damage as they crash.

3. Sonic control from organ pipes. Low-level vibrations can be used to make an area uncomfortable for angels (again taking advantage of their insectoid nature). Adapting the Vox Humana stop down several octaves (to the range of Vox Sasquatch) may work. This requires willing organists to work in shifts, depressing[10] the appropriate keys on the appropriate manuals to yield a steady subsonic drone.

4. "Angel-paper" or modified spider webs. In combination with incense or light attractants, various adhesive devices can be used to hold angels until they can be humanely released. The disadvantage here is that the struggles of trapped angels, and resulting scale loss, may be quite disruptive to religious services in progress. Therefore, such webs should be taken down before worship services, weddings, funerals, etc.

5. "Ser-Off" and "Cheru-B-Gon." These are two new proprietary aerosols, based on the fumigant principle used in censers. Although they are unconsecrated, these substances are effective in discouraging angels, yet safe enough to be used routinely by any cleaning crew.[11]

Controlling infestations remains, however, a difficult problem. The main IAM problem is that standard physical barriers offer no protection against manifestations. Remedies such as replacing roof tiles, caulking holes, and the like are simply not effective against beings that are variously described as being larger than humans and small enough to dance on the head of a pin. Unlike bats or wasps, angels cannot be controlled simply by waiting for them to fly out and then covering up the exits. Accounts of wrestling with angels also indicates that they are difficult to control through sheer force,[12] making IAM necessary as a long-term strategy and commitment.

Acknowledgments

An earlier version of this research was published in the journal *Recent Setbacks in Conservation*, the organ for the artificial dissemination of knowledge produced by community-service assignees at the Canadian Conservation Institute.

Notes

1. Several years ago, one of the authors visited a Mexican gift shop in early November, when the Dia de los Muertos retablos de esqueletos had not yet been taken off the shelves, but the crèche scenes for Christmas had already been added. Musing about the possibility of merging the concepts, the author was struck (or should have been) by the observation that, if one were to reduce the characters in the typical Christmas crèche scene to their skeletal natures, all would be rendered as typical standing vertebrate skeletal mounts – except for the angels. (The Infant Jesus would, of course, be represented by a bare incandescent filament.)

2. Entomological and theological experts have pointed out, independently and serendipitously, that both certain primitive insects and all seraphim have three pairs of wings. We rest our case.

3. Questions of "derivation" and "descent" here are fascinating insofar as they suggest that insects antedate angels and thus were in existence before and at the creation of the world. This has profound theological and ontological ramifications and will definitely affect IAM strategies.

4. Even if you consider birds to be dinosaurs, or vice versa, that still means that only vertebrates have feathers per se, although it has been pointed out by T. Erwin that most very tiny beetles have the wing membrane modified into plumes that for all intents and purposes is a feather.

5. It's not just a good idea – it's the law.

6. See accounts of Daedalus and Icarus; also see *The Wizard of Oz*.

7. Does the concept "fallen" perhaps refer to immature or unfinished?

8. The problem here is overcoming artistic resistance to redesigning depictions of angels so that the light is around the abdominal area, cf. fireflies, rather than the head. The concept of abdominal halos has not gained widespread acceptance.

9. Note that these can be freely combined.

10. As it were.

11. Manufacturer cannot assume responsibility for divine retribution. Patent pending. See advertisements in this issue.

12.Was Jacob the first exterminator?