

Integrated Pest Management of Manifestations as Infestations or, Angels Are Insects*

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Abstract - Angels are commonly represented as winged humanoids, with two arms, occasionally two feet suggesting the presence of legs, and two wings (often feathered). An examination of comparative anatomy quickly reveals that this is not a possible vertebrate structure. If angels are in fact invertebrates, then their presence in churches and other historic structures must be considered to be pest outbreaks, as no other invertebrates are given free rein in such structures. A range of agents of deterioration must be considered in association with outbreaks of angels. Manifestations are infestations, and some suggestions for integrated angel management (IAM) are given.

Introduction

Several years ago, one of the authors visited a Mexican gift shop in early November, when the Dia de los Muertos retablos of skeletons in life had not yet been taken off the shelves, but the creche scenes for Christmas had already been added. Musing about the possibility of combining the concepts, the author was struck² by the observation that, if one were to reduce the characters in the typical Christmas creche to their skeletal natures³, all would be rendered as typical standing vertebrate skeletal mounts--except for the angels.

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struck⁴ by the observation that, if one were to reduce the characters in the typical Christmas creche to their skeletal natures⁵, all would be rendered as typical standing vertebrate skeletal mounts--except for the angels.

Angels are commonly represented as winged humanoids, with two arms, occasionally two feet suggesting the presence of legs, and two wings (often feathered). An examination of comparative anatomy quickly reveals that this is not a possible vertebrate structure. The capacity for flight has arisen in three separate vertebrate lineages--pterosaurs [Reptilia], birds [Aves], and bats [Mammalia]--and has never in any of those resulted in the addition of limbs. All three groups have wings derived from some element of the forelimbs. The forelimbs are dedicated to flight functions at the expense of some typical uses in the general vertebrate plan, but are never supplemented by additional limbs.

Angels therefore cannot be vertebrates or derived from vertebrate stock. The implications of this are profound (Figure 1). The only invertebrates with the capacity for flight are insects [Insecta], the largest

* Profuse apologies to A. S. Byatt.

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**** Nom de elytron.

² Or should have been.

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 future IPM strategies.

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taxon on earth (or, apparently, anywhere else). Insects are hexapodal and may have 1-2 pairs of wings, for a total of 8-10 "limbs." Angels thus may represent a highly derived insect group with reduction of limbs, derived from a hexapodal ancestry (Figure 2).

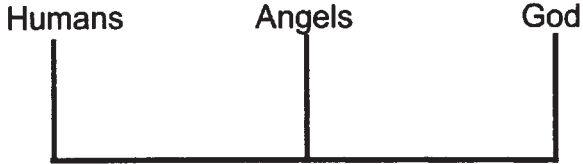


Figure 1. Traditional perception of the relationship of angels to God and humans.

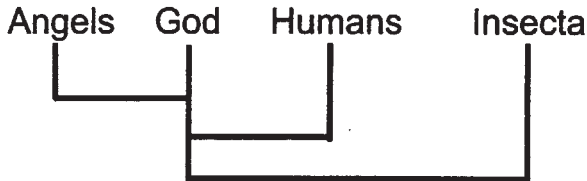


Figure 2. Traditional phylogenetic placement of angels in correspondence with the Insecta.

Thus revision to our view of angels necessarily implies that:

1. Angels cannot have feathers on their wings, because feathers are limited to a single vertebrate group [Aves] without exception (Figure 3). Future artistic interpretations must take into account the chitinous nature of all insect structures and depict angel wings as translucent structures with venation (cf. cicadas) or as covered with scales (cf. butterflies).

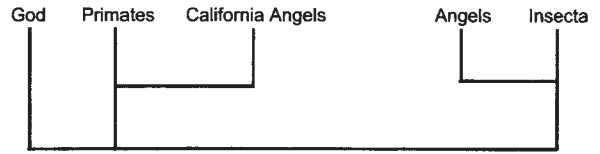


Figure 3. Phylogenetic arrangement of the angels based on wing morphology.

2. Angels must be considered to have exoskeletons rather than endoskeletons. Leaving aside the question of metamorphosis and moulting (and the possibility of shed angel skins, or exuviae, as a nuisance factor in conservation), this means that angels must have a highly derived, lightweight exoskeleton in order to avoid violations of the square-cube law⁶.

3. 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 primates⁷ show incompatible grafts or additions of wings that are improbably joined 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.

Recent phylogenetic analysis has shown that, contrary to traditional thought, the Angelia are probably a polyphyletic group. We began by examining the relationships among the angelia and related taxa (Figure 4), but in doing this analysis, we discovered that angels are not, in fact, monophyletic. Traditional angel systematics has recognized nine orders of the

⁶ It's not just a good idea—it's the law.

⁷ See accounts of Daedalus and Icarus; also see *The Wizard of Oz*.

angelia arranged in three hierarchies (Table 1). However, pioneering work by Simmons and Shelton (*in press*) has revealed many problems with this arrangement, for example, the first hierarchy includes taxa with radially different wing morphologies (seraphim have six wings configured in three pairs, cherubim have four wings configured in two pairs, thrones do not have wings at all but rather firey wheels, etc.). Other arrangements, based on better data sets than have previously been available, are presented in Figures 5, 6, and 7.

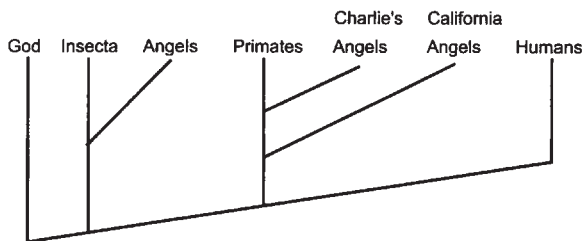


Figure 4. Phylogeny of angels and cryptoangels in relationship to God and the Insecta.

Table 1. Traditional classification within the Angelia.

Hierarchy Order	
First	Seraphim
	Cherubim
	Thrones
Second	Dominions
	Virtues
	Powers
Third	Principalities
	Archangels
	Angels

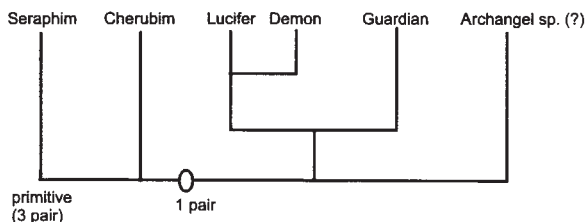


Figure 5. Rigorous phylogenetic arrangement of taxa within the angelia based on wing morphology and other data. Note that the data set is incomplete due to lack of properly preserved material in collections.⁸

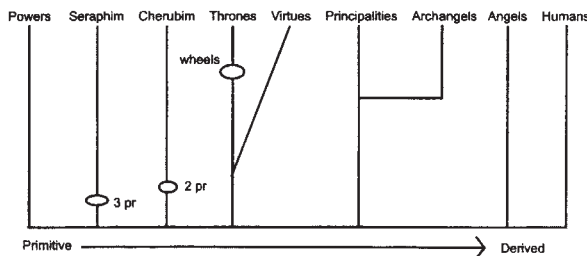


Figure 6. More parsimonious phylogenetic depiction of angelic relationships, recognizing that the Angelia is a polyphyletic group.

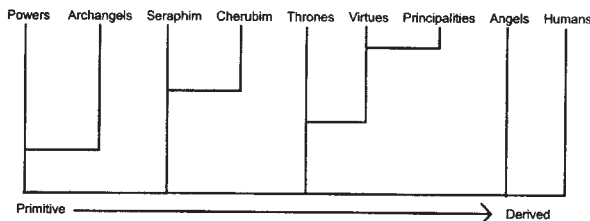


Figure 7. Alternate, even more parsimonious phylogenetic group with respect to humans.

⁸ The only existing type series (holotype and eight paratypes) are presumed to be in the small systematic museum in the basement of the Vatican Library. Distantly related specimens are available, but are commonly disarticulated and incomplete.

For conservators, the very serious question is that of 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 CCI-approved secret agents of deterioration likely to be triggered:

1. Frass (scales from wings, huge exuviae, angel dust, etc.) as a source of particulate pollution, food source for other invertebrates, and general contaminants.
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)⁹.
3. Noise pollution (angels are commonly described as brass instrument players, shouters of praise and glad tidings, members of choruses, etc.). Noise pollution is particularly bad when an uncontrolled population of angels expands to become a host of Angelus. Noise produced by the angelia can be easily differentiated from noise produced by the Angelus however, as the latter is only evident at 0600 hr, 1200 hr, and 1800 hr daily, and always takes the form of a peeling bell.
4. Passive vandalism and physical damage (manifestations involve disruptions of the space-time continuum, causing sonic-type booms, and are very hard on the fabric of historic buildings). This can lead to a separate line of study of artefact 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 depend today). Angels may also be bioindicators of worse pest problems, e.g. plagues of frogs, locusts, and rivers turning to blood.

6. Fire hazards. Although no direct angel-caused fires have been reported in recent literature, the prevalence of flaming swords, pillars of fire, and fire wheels among the angelia does pose a potential fire hazard. However, anecdotal reports in the older literature indicate that such fires may not, in fact, cause damage (e.g., bushes have been reported to burn without being consumed).

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

IAM must also take into account the religious nature of the buildings in which insects 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 service without unduly upsetting the faithful. Depending on the specific order of worship involved, approaches may include the following:¹⁰

1. Incense: censers can be adapted to waft a fine spray of a selected fumigant or 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.

⁹ 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.

¹⁰ Note that these can be freely combined.

2. Attraction via coloured light: regardless of their highly derived nature, angels must respond reflexively to fundamental stimuli stemming from their insectoid heritage, meaning, among other things, that they will be attracted to lights in ever-diminishing spirals and wind up fluttering helplessly around them. Modification of wavelengths via selective replacement of stained glass will provide a precisely lit area in which angels can be attracted to an out-of-the-way area for humane trapping and release. It has been suggested that the wavelengths in the blue range of visible light will work best, so 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 damages 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 (Vox Sasquatch) may work. This requires willing organists to work in shifts depressing¹¹ the appropriate keys on the appropriate manuals to yield a steady subsonic drones. Tibetan monks on contract may also work.

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 released. The disadvantage here is that the struggles and resulting scale loss of trapped angels may be quite disruptive to services in progress. They should be taken down before worship services, weddings, funerals, etc.

5. "Ser-Off" and "Cheru'B'Gon:" two new proprietary aerosols, based on the fumigant principle used in censers (but unconsecrated), effective in discouraging angels yet safe enough to be used routinely by any cleaning crew.¹² "Angel Dust," which has previously been widely used for the control

of the angelia as well as certain demons, is not recommended. It is a biohazard, addictive, and illegal in most markets.

6. Structural heat treatments will certainly work given the preferred habitat for angels is directly related to aversion of elevated temperatures, as found in the Fires of Hell. Facultative adaptation to heat is only documented in one case for *A. satani* (G.). Control of this species has been extensively developed in works by several authors and is outside the scope of this paper.

The main IAM problem is that standard physical barriers offer no protection against manifestations. 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 Macarena on the head of a pin. Unlike bats or wasps, angels cannot be simply controlled by waiting for them to fly out and then covering up the exits. Accounts of wrestling with angels also indicate that they are difficult to control through sheer force¹³, making IAM necessary as a long-term strategy and commitment.

Acknowledgements

No matter how much they may deny it, the following people were connected with the development of this paper and are going to be thanked in print whether they like it or not: Edward Bryant, Kyle Davies, David Faulkner, Kate Menaul, Geary Rachel, and Rick Toomey.

Annotated Hagiography

Isaiah Walton, "The Compleate Angeler", Machina Press, 1932. - Reveals the monastic supercollider program of the last millenium determined the energy yield of manifestation as Deification = Masses x Consecration² or $D=MC^2$.

¹¹ As it were.

¹² Manufacturer cannot assume responsibility for divine retribution. Patent pending. See advertisements in this issue.

¹³ Jacob was apparently the first conservator to apply integrated pest management principles to the control of the angelia rather than chemical treatments or live animal sacrifices.