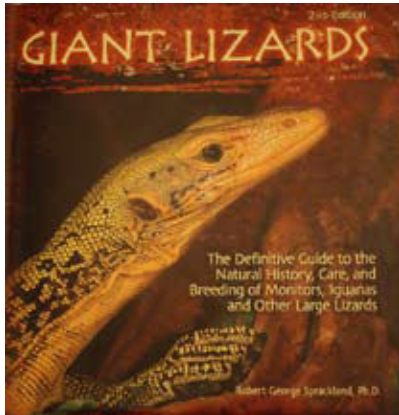

BOOK REVIEWS

A 21st Century Book Written for 20th Century Herpetoculture



Giant Lizards: The Definitive Guide to the Natural History, Care, and Breeding of Monitors, Iguanas and Other Large Lizards

ROBERT G. SPRACKLAND

TFH Publications, Inc. Neptune, New Jersey, USA. 2009. 335pp.
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One of my earliest introductions to herpetological literature as a teenage reptile enthusiast was Robert G. Sprackland's (1991a) book entitled *Giant Lizards*, which I came across one day in a local pet store. Back then, as a budding hobbyist who knew absolutely nothing about herpetological natural history, taxonomy, or husbandry, I considered the book to be an excellent resource for educating myself about lizards. But as time went on and my interest in reptiles and knowledge of their biology and husbandry grew, I began to notice a number of mistakes in the book, whether they were outdated and potentially hazardous husbandry advice, mislabeled photographs, or photographs of taxidermied museum displays being used to depict living specimens (see Fig. 1). Today, the book has lost its value, but serves as a slight reminder of my early years as a young reptile enthusiast.

Despite the poor composition of *Giant Lizards*, and my disappointment with the author's (2001) book entitled *Savannah and Grassland Monitors* (very critically reviewed by Bennett, 2002), I was excited to learn that TFH Publications would be publishing a new and completely revised edition of Sprackland's *Giant Lizards* in 2009, this time incorporating written contributions from several successful and esteemed lizard breeders. Would this second edition be as disappointing as the original, or would the author constructively learn from

and build upon its mistakes and errors, and criticisms from others? Would the new book benefit from the input of these invited authors? Subtitled as "*The Definitive Guide to the Natural History, Care, and Breeding of Monitors, Iguanas and Other Large Lizards*", the revised edition of *Giant Lizards* would surely have its work cut out for it just to afford such a designation.

Reading this book has left me with a dissatisfying sense of déjà vu. Despite seeking to present new material on the larger lizard species of the world, this revised edition suffers from many of the same types of mistakes seen in the original 1991 version, but also includes many new mistakes and questionable material; all of which I will discuss in detail below.

The Second Edition

Printed in a smaller size than the original version, the second edition of *Giant Lizards* resembles a coffee table book on account of its square-ish shape. Judging the book by its hard cover, which depicts a beautiful *Varanus melinus*, it would seem as though the publisher invested significant time and resources into producing this publication. Inside, the book's pages are glossy and of high quality, and printed in full color. The book features more than 260 color photographs and hand-



Fig. 1. A taxidermied display of *Varanus komodoensis* at the American Museum of Natural History, New York. A photograph of this display is used on p. 52 in the original 1991 edition of Sprackland's *Giant Lizards* to depict a live dragon eating a wild boar. The same photograph also appears on p. 26 in Coborn (1997).

drawn illustrations, and 13 tables.

The book begins with a brief preface and introduction which explain the motivation for the new edition, offer acknowledgements, and a brief overview of the history of herpetoculture. The book is then divided into two main sections before concluding with a glossary, references, resources section, and index. The first major section is comprised of individual chapters dealing with a number of topics relevant to the biology and husbandry of lizards including anatomy, physiology, taxonomy, acquisition and care, reproduction, veterinary care, laws, and herpetoculture. The following section is comprised of individual species accounts, divided into four chapters highlighting "giant" members (species reaching over .9 m in total length; although some species below the .9 m mark are also included [e.g., *V. prasinus*, *V. keithornei*, *V. tristis*] and some over the mark aren't [e.g., *V. reisingeri*, *V. spinulosus*]) of the Gekkota (1 species), Iguania (33

species), Scincomorpha (9 species), and Anguimorpha (43 species). Each species account covers etymology, distribution, maximum size, captive suitability, natural history, captive care and breeding, and includes a list of relevant publications. Included within some sections are brief accounts on the captive husbandry and reproduction of certain species written by invited authors. Bert Langerwerf (*Physignathus lesueurii*; *Ophisaurus apodus*), Gunther Kohler, A.J. Gutman and John Binns (*Ctenosaura*), Robyn Markland and Chad Brown (*V. albigularis*), Paul Rodriguez (*V. salvator*), and Ben Aller and Michaela Manago (*V. dumerilii*) contribute information based on their personal experiences with certain species. The glossary defines a total of 90 terms which also appear bold-faced within the text, and the references section provides a bibliography of published works cited throughout the book as well as sources for further reading. The resources section lists a number of

herpetological societies and informational websites, and is followed by an index.

Comments

Knowing the Audience

Before I express my thoughts on this book, I feel it is necessary to point out that since TFH Publications, Inc. identifies itself as “the source for authoritative books on your companion animals” as per the company’s website (<http://tfhpublications.com>), the target audience of this book is most likely beginner and marginally-experienced pet reptile-keeping hobbyists, probably those belonging to younger age groups. These assumptions are further evidenced by the colorful and playful “tribal-like” borders, fonts, and artistic designs used throughout the book, which I feel would deter more serious enthusiasts and herpetological professionals from thumbing through its pages or purchasing.

What immediately stands out when reading the first chapter on lizard anatomy, physiology, and taxonomy, is the author’s “textbook-like” treatment of the material. While this information may be useful and relatable to a more informed audience, I feel that much of it is beyond the comprehension level of the book’s major audience despite the layman’s definitions accompanying technical terminology throughout the chapter. On page 29 the author provides a list of bones found in the lizard skull. While potentially useful to someone with an educational backing in anatomy, I am doubtful that the average pet lizard keeper will retain knowledge that the basioccipital, epipterygoid and septomaxilla bones are part of the upper skull, whereas the prearticular and surangular bones are part of the lower jaw. Another example can be found on the following page, where several bones of the skull are individually sketched. Without a diagram in the book referencing all of the bones found in an articulated lizard skull, an illustration of a lone premaxillary is of no use to an uninformed reader since it can be extremely difficult to visualize where the bone is actually located in the skull. Semi-technical discussions on circulatory physiology, lung function, taxonomy and the rules of zoological nomenclature, and chromosomal sex determination systems (as well as CITES, and other wildlife trade laws presented in a later chapter) are also likely to escape the majority of the book’s readership. Similar to my thoughts on certain sections of Bayless’ (2006) book on *V. exanthematicus* (Mendyk, 2008), I get the impression that the author attempted to create a semi-technical work for the wrong audience. The following

chapters read more in line with what would be expected for a beginning keeper audience; for instance, on page 245, *V. yuwonoi* is said to “resemble the Velociraptors of Jurassic Park in temperament and behavior”.

In addition to material that is likely beyond the comprehension level of most readers, the book also presents material which I find irrelevant to the subject matter. The most obvious example is a full-page table presenting the Greek alphabet system with a pronunciation key (p. 303). Greek terminology, using Greek letters, also appears in some species accounts when considered relevant to a particular taxon’s etymology. While the author states on pages 116-117 that he has received feedback from others interested in herpetological etymology, I wonder how useful could the Greek alphabet be to the average reptile keeping hobbyist, and what proportion of readers will actually take interest in such a resource?

Photographic Quality

One of the more upsetting yet perplexing aspects of this book is its shortage of crisp and brilliant photographs. I would estimate that more than 1/3 of the photos in the book appear to be at least 15 to 20 years old, evidenced by their dull, grainy and faded appearances, with many of them terribly out of focus (e.g., p. 62, 173, 184, 188). Additionally, I recognize several photos from previously published pet hobbyist books and popular pet magazine articles of the 1990s. The book does contain some nice photography (mostly appearing on the title pages of some chapters); however, the abundance of dreadful photos detracts from any real enjoyment or appreciation of the photography in this book.

I consider the overall photographic quality to be highly unacceptable for any contemporary book of this nature, and cannot believe that a publisher would print seemingly decades-old, recycled, faded, and out of focus material given the advent and widespread usage of digital photography. Quality photographs of most lizard species are no longer difficult to come by, thanks to online search engines and photo hosting websites. Today, anyone with a computer and working internet connection can easily access high-quality digital images of reptiles from around the world, and I am confident that most amateur photographers would be delighted to contribute their digital images to a book of this nature, gratis. While I doubt these issues are the fault of the author, since the publisher does have a well-known history of reusing photographs in many of its reptile and amphibian titles, I question whether those responsible for the photographic

content of this book have ever heard of the internet, or if they were just lazy?

Editing

Just like the original edition of *Giant Lizards*, this version has its share of poor editing. In one example in a sidebar discussion on page 25, “1980s Scotsman” should read “1780s Scotsman”, otherwise the entire section is historically incorrect and fails to make any sense. On the title page of chapter two and in all subsequent page headings in the chapter, “acquisition” is misspelled as “aquisition”. Similarly, in all page headings throughout chapter five, “herpetoculture” is misspelled as “heptoculture”. Redundancy is also an issue. For example, the change in coloration of *V. beccarii* from hatchling to adult is mentioned twice in the same species account (p. 231-232); similarly, the long-distance eyesight of *V. giganteus* is also discussed twice in the same account, in successive paragraphs (p. 271).

Editorial mistakes are not limited to proof reading and fact-checking errors; poor layout and design are also common throughout the book. The placement of sidebar discussions, tables, and photographs in a chapter often has nothing to do with their actual content. For example, a sidebar discussion on page 32 discussing a veterinary procedure for extracting blood appears within a section on teeth, limbs, and tails. An illustration depicting head pattern diversity in several varanid taxa appears in a section dedicated to parietal eye and behavioral control (p. 40). A sidebar discussion highlighting the homology of the human hand, bat wing, and whale fin mysteriously appears in a section on skin and scales (p. 45). While these are just a few examples, several additional instances of poorly-placed objects occur throughout the book which might confuse, or be missed by readers.

Taxonomy and Natural History

Natural History Information

There are a number of claims made throughout the book pertaining to varanid natural history which are dubious and lack literature citations to verify their validity. I will focus on just a few that I feel are likely to misinform or mislead readers.

On page 245, the author states that *V. yuwonoi* is “known to forage on the beach and swim in the ocean”. There are no published reports documenting a coastal occurrence or sea-going behavior in this species, and

according to its original description, which remains the only published account on its occurrence to date, *V. yuwonoi* is known only from inland forested areas of Halmahera (Harvey and Barker, 1998). The author also lists several preferred prey items for *V. yuwonoi*, yet no dietary studies of wild or museum specimens have been conducted on the species to date.

A statement which immediately caught my attention is a claim on page 295 that *V. salvadorii* is often referred to as “death from above” by local people because of “the lizards’ tendency to drop from a tree and kill hunting dogs and to sometimes attack people”. I am unaware of any authenticated reports documenting such a behavior, and while this claim is undoubtedly a case of folklore, the way in which it is presented and implied in the text will cause naïve readers to believe that this is indeed a natural habit of *V. salvadorii*.

In the natural history section of the *V. salvator* species account on page 254, the author states that a “well-fed” *V. salvator* may weigh 68 kg (150 lbs). This is almost three times the maximum weight reported for the species (25 kg/ 55 lbs) by Gaulke and Horn (2004). Although specimens of *V. salvator* in captivity frequently become obese, I am unaware of any authenticated report or record which documents a captive specimen weighing anywhere in the vicinity of 68 kg. A photograph in the first edition of *Giant Lizards* (Sprackland, 1991a; p 127; but also included again in the second [2009] edition, p. 104) purportedly depicts a 59 kg (130 lbs) *V. salvator*, however judging by the size of the animal, this is most likely a gross embellishment. Regarding size records, the author also states that *V. komodoensis* holds the maximum length record for any living lizard. While *V. komodoensis* certainly attains longer average lengths than any other species, the current authenticated record for the longest lizard is held by a Sri Lankan *V. salvator* which measured 3.21 m in total length (Randow, 1932).

Taxonomic Conventions

Although this book is intended for pet reptile hobbyists and is by no means a taxonomic treatise, there are a number of taxonomic conventions used by the author which are incorrect or invalid. I fear that these misnomers will cause readers to accept invalid taxa and confuse those who have read other accounts which use different, or conflicting taxonomic conventions.

On page 231, the author refers to the taxonomy of *V. caerulivirens*, *V. cerambonensis*, and *V. juxtindicus* as controversial and suggests that they may represent examples of normal variation within *V. indicus*; however,

no explanations or supportive evidence are given. Several additional statements about the taxonomy of the *V. indicus* complex are equally as dubious. *Varanus cerambonensis* is also incorrectly identified throughout the book as “ceramboensis”.

I am bothered by the author’s use of “Teri’s monitor” as one of the vernacular names of *V. keithhornei*. The name “Teri’s monitor” originates from Sprackland’s (1991b) description of *V. teriae* (named after his wife, Teri), a species which had already been described six years earlier as *V. keithhornei* by Wells and Wellington (1985). Since *V. keithhornei* had taxonomic priority over *V. teriae*, the latter was dropped and deemed invalid; thus, so should its associated vernacular name.

The author fails to acknowledge *V. kordensis* as a distinct taxon from *V. prasinus*, despite its elevation to species status in 2002 (Jacobs, 2002) and widespread recognition and usage of *V. kordensis* in current literature (Jacobs, 2004; Eidenmüller, 2007; Eidenmüller and Philippen, 2007; Böhme, 2003; Ziegler *et al.*, 2007). The author also rejects the validity of subspecies within *V. albigularis*, citing a taxonomic revision of his own published in a non-peer reviewed popular pet hobbyist magazine (Bayless and Sprackland, 2000a,b).

Varanus ocellatus is surprisingly treated as a valid taxon despite its long synonymization with *V. exanthematicus* (Mertens, 1942a,b,c), also citing the same hobbyist magazine revision as before (Bayless and Sprackland, 2000a,b). Modern authorities follow Mertens’ (1942a,b,c) treatment and fail to recognize *V. ocellatus* as a valid species (Böhme, 2003; Pianka and King, 2004).

The most problematic taxonomic treatment in the book is the recognition of *V. rubidus* as a valid species. Cited by the author in the ‘*rubidus*’ species account, Storr (1980) described *rubidus* as a subspecies of *V. panoptes*, not a distinct species. Unless a mistake, the author’s treatment of *rubidus* most likely follows Wells and Wellington’s (1985) controversial taxonomic revision of Australian reptiles which raised *rubidus* to specific rank without providing any supportive evidence or explanation why. Due to a number of problems associated with Wells and Wellington’s (1985) report, many of its proposed taxonomic changes were never adopted, including the elevation of *rubidus*. Interestingly, the author has heavily criticized the Wells and Wellington (1995) report in the past for its taxonomic questionability and lack of adequate research when arguing for the conservation of his *V. teriae* and the suppression of their earlier-described *V. keithhornei* (Sprackland *et al.*, 1997).

Photo Identifications

Much like the original version of *Giant Lizards*, there are several misidentified species in the book’s photographs. On page 14, a *V. salvator* is incorrectly identified as *V. niloticus*. On page 241, a photograph depicting a green and patternless specimen of a presently undescribed species belonging to the *V. indicus* complex (Bayless, unpub. ms.), is labeled as *V. juxtindicus*. On page 252, a “sulphur” water monitor (*Varanus salvator*) is identified as *V. cumingi*. On pages 254 and 255, three of the four photographs are mislabeled or incorrectly identified. Instead of reading *V. s. marmoratus*, *V. s. komaini*, *V. s. togianus*, and *V. s. salvator*, the photographic captions should read *V. cumingi*, *V. togianus*, *V. nuchalis*, and *V. s. salvator*.

Captive Husbandry

I am very disappointed with the captive husbandry and breeding information presented in this book. Although the written contributions from the invited authors are a welcoming addition since they present useful and progressive information based solely on first-hand knowledge and experience, they quickly become overshadowed by the author’s own recommendations. In addition to pushing many of the same outdated standards and practices from some of his earlier herpetocultural publications, there is also an abundance of contradictions, inconsistencies and questionable material presented throughout the text which will undoubtedly misinform, mislead, and confuse readers, and in turn adversely affect captive specimens.

Captive Suitability

For determining the captive suitability of a particular species, the author has devised a numerical rating system purportedly based on the disposition, hardiness, and breeding potential of a species. A suitability rating of 1 represents a species considered to be extremely difficult to keep, potentially aggressive, and unsuitable for captivity, whereas a rating of 5 represents a “beginner’s-level species easy to care for and not difficult to breed”. Suitability ratings for all varanid species presented in *Giant Lizards* are given in Table 1.

I find most of the suitability ratings assigned to varanids in this book to be preposterous, and question the author’s familiarity with the species in captivity. Many of the ratings appear to have been randomly

generated and are not at all representative of species' dispositions, hardiness, or ease of breeding in captivity. For example, *V. exanthematicus* is given the highest possible rating of 5, deeming it a worthy beginner-level species. Since few *V. exanthematicus* live long lives in captivity, with more specimens dying at the hands of inexperienced beginner keepers each year than any other varanid species, it cannot be considered a hardy captive. Captive reproduction of *V. exanthematicus* has also been extremely rare with respect to the sizeable numbers of specimens being kept in captivity. Only a few published reports on its successful breeding exist, most of which report on single hatching events rather than consistent and repeatable success; an indication that *V. exanthematicus* is indeed difficult for most people to breed in captivity. Given this overall lack of success with *V. exanthematicus*, I fail to see how anyone can consider it a species suitable for beginner keepers.

Despite clearly stating that *V. niloticus* is unsuitable for private collections on page 226, the author assigns it a suitability rating of 4 later on in the book. Of the dozens of varanid species currently available in the pet trade, I cannot think of many other species which are less suitable for captivity than *V. niloticus*. Having only been bred a few times in private collections, it is not an easy species to maintain or reproduce in captivity. Furthermore, *V. niloticus* attain very large adult sizes (up to ca. 2 m) and can be extremely defensive, posing serious safety risks to the keeper. Their inexpensiveness and diminutive size as juveniles have led to countless impulse purchases by inexperienced keepers over the past several decades. As a result, most captive *V. niloticus* do not survive to adulthood, and those that do are often dumped off on rescue groups or sometimes released into the wild when they become too large or unmanageable (*V. niloticus* is now established in parts of southern Florida, US [Enge, *et al.*, 2004]). Suggesting that *V. niloticus* is a semi-acceptable species for beginners by ranking it a 4 is ridiculous and also highly irresponsible.

Another rating which disagrees with the species' history in captivity is that given to *V. nebulosus* (*V. bengalensis nebulosus*). Despite the author claiming it to be a beginner-level species (5), captive breeding of *V. bengalensis nebulosus* has been extremely rare with few, if any records documenting successful reproduction or long-term keeping of this species in existence. Also attaining a large adult size (ca. 1.7 m), it is well-known for its defensive nature in captivity (M. Cota, pers. comm; M. Bayless, pers. comm.), and can pose serious safety risks to keepers.

Most shocking of the rankings is that assigned to

Table 1. Suitability ratings of varanid species from Sprackland's (2009) *Giant Lizards*. 1 = least suitable for captivity; 5 = most suitable for captivity

Taxon	Suitability Rating
<i>albigularis</i>	3
<i>exanthematicus</i>	5
<i>ocellatus</i>	4
<i>niloticus</i>	4
<i>ornatus</i>	3
<i>griseus</i>	4
<i>yemenensis</i>	3
<i>beccarii</i>	3
<i>boehmei</i>	3
<i>keithhornei</i>	3
<i>macraei</i>	2
<i>prasinus</i>	2
<i>doreanus</i>	2
<i>finschi</i>	3, 2
<i>indicus</i>	3
<i>jobiensis</i>	4
<i>melinus</i>	4
<i>yuwonoii</i>	4
<i>caerulivirens</i>	3
<i>cerambonensis</i>	3
<i>bengalensis</i>	4
<i>nebulosus</i>	5
<i>flavescens</i>	3
<i>cumingi</i>	3
<i>salvator</i>	3
<i>dumerilii</i>	5
<i>rudicollis</i>	4,3
<i>mabitang</i>	1
<i>olivaceus</i>	4
<i>giganteus</i>	3
<i>gouldii</i>	4
<i>panoptes</i>	5
<i>rosenbergi</i>	4
<i>rubidus</i>	4
<i>spenceri</i>	4
<i>glebopalma</i>	4
<i>tristis</i>	4
<i>mertensi</i>	3
<i>varius</i>	4
<i>komodoensis</i>	2
<i>salvadorii</i>	1

V. olivaceus (4). As one of only two fruit-eating dietary specialists within the genus, it has proven to be very difficult to maintain and breed in captivity (Card, 1995a), with just two live offspring produced in captivity to date (Card, 1995b; M. Yuyek, pers. comm.). To assign *V. olivaceus*, a large (ca. 2 m) and highly endangered species notoriously difficult to keep and breed, the same suitability rating as *V. tristis*, a small (to 80 cm), easily-manageable species which has been successfully kept in captivity for decades and bred to multiple filial generations (Eidenmüller, 2007; Husband and Bonnett, 2009), is ridiculous.

Inconsistencies in suitability ratings occur between closely related taxa with identical or near-identical husbandry requirements. For example, despite being nearly identical in size, morphology, habit, diet, disposition, husbandry requirements, and breeding biology, members of the *V. prasinus* complex are given different suitability ratings; *V. macraei* and *V. prasinus* are given lower ratings than *V. boehmei*, *V. beccarii*, and *V. keithhornei*. For reasons unknown, *V. prasinus* is ranked as one of the lowest in the group in terms of captive suitability, yet has been kept longer and bred more frequently and consistently than any other member of the complex, to multiple captive generations. Within the *V. indicus* complex, *V. doreanus* is ranked two grades below *V. yuwonoi*, yet both species attain similar sizes, have similar morphologies and dispositions, require similar husbandry parameters, and all known captive specimens originate from the wild. Other members of the *V. indicus* group, whose size, husbandry, and disposition do not differ substantially from one another (e.g., *V. indicus*, *V. finschi*, *V. cerambonensis*, *V. caeruleivirens*, *V. jobiensis*, *V. melinus*), are given a range of scores which are not at all representative of their hardiness, disposition, or history of reproduction in captivity.

While I do not think any large lizard species is suitable for beginner keepers, which certainly undermines the concept of this book, I do agree with the author in that *V. panoptes*, *V. gouldii*, and *V. tristis* make hardy captives. Since specimens of all three species maintained in captivity outside of Australia are captive bred, they tend to be hardier, have generally calmer dispositions, and are more likely to reproduce than wild-caught species. I also agree that *V. salvadorii* makes a terrible captive, but since the author's rating for this species is based on its potential dangerousness, why not extend the same rating to *V. komodoensis* and other truly giant species such as *V. salvator*, *V. niloticus*, or *V. giganteus* which are equally as formidable?

These rankings are also disappointing because they

promote and endorse the wild-caught reptile trade. Since successful captive breeding has been absent or extremely limited in *V. exanthematicus*, *V. niloticus*, *V. jobiensis*, *V. melinus*, *V. yuwonoi*, *V. bengalensis*, *V. dumerilii*, *V. rudicollis*, and *V. olivaceus* (level 4 and 5 species according to the author), specimens in the pet trade are almost entirely of wild-caught origin. Promoting these species as easy or relatively-easy to keep will encourage inexperienced, beginner hobbyists to purchase wild-caught specimens, further sustaining the wild-caught trade. I cannot see how anyone can look at the numbers of wild-caught (or "captive-hatched", which is even more ecologically-destructive) *V. exanthematicus* imported into the United States alone each year (ca. 25,000 in 2007, ca. 23,000 in 2008; CITES trade database) and fail to see a problem with recommending the species to inexperienced keepers.

If these wild-caught species were identified and promoted as poor, unsuitable captives, the demand for specimens would decrease, and fewer animals would have to be removed from the wild each year to supply the pet trade. Beginner keepers should be introduced to captive-bred species which are hardier, and where deaths caused by keeper inexperience will not affect wild populations. Wild-caught species should be left to experienced, dedicated keepers and breeders who are more likely to succeed in establishing captive-bred lineages.

Husbandry Recommendations

Prior to reading this book, I assumed that 21st century herpetoculture had advanced well beyond the primitiveness of feeding processed meats and dog food to captive reptiles, and that those days were now a thing of the past. I was wrong. On numerous occasions throughout the book, the author condones feeding beef (p. 54, 187, 241), cooked turkey sausage (p. 133, 139, 201, 211, 219, 234, 241, 246, 260, 270, 274), and dog food (p. 133, 187, 196, 201, 208, 238, 246) to lizards. Also advocated is the feeding of bananas to *V. prasinus*, *V. macraei*, and *V. boehmei*. Improper and lazy dietary items such as these can easily become adopted by beginner hobbyists who don't know any better, and can adversely affect the health of captives. I am not aware of a single report of long-term keeping or reproductive success which documents or advocates the feeding of beef or dog food to varanids. These are potentially hazardous, unnatural dietary items which mainstream herpetoculture has done away with many years ago, for good reasons.

The author's support for a number of unnatural substrates in this book is equally as appalling. Although he does recommend deep soils for *V. albigularis*, *V. exanthematicus* and *V. griseus*, which would seem to be a progressive departure from some of the advice given in his earlier works, these suggestions are negated by his endorsements of bare wood, glass and concrete floors, wood shavings, shredded newspaper, rabbit food pellets (alfalfa), paper towels, and brown butcher paper as acceptable substrates elsewhere in the book (p. 61). These suggestions conflict with advice given by highly successful long-term varanid keepers and breeders such as Vincent and Wilson (1999), Eidenmüller (2007), and Husband and Bonnett (2009), who understand that terrarium substrates serve more purposes than just collecting fecal material. Unnatural substrates serve absolutely no benefit to the physiological or behavioral requirements of lizards and should have no place in herpetoculture.

Another major problem with the book's captive husbandry information is its lack of consistency between species accounts. For some accounts, recommendations for enclosure sizes are outlined, but for others they aren't. Suggested dietary items are given for some taxa, but not for others. Incubation temperatures, humidity levels and durations are given for some, but not for others. What I especially find strange is why many closely related taxa, such as members of the *V. prasinus* complex, have different husbandry guidelines. Why is the recommended diet for *V. macraei* different than *V. prasinus*, considering their near-identical morphological and ecological similarities? Another example is the difference in feeding frequencies recommended for *V. cumingi* and *V. salvator*, two very similar species which were once considered the same species. Why is *V. cumingi* to be fed daily, but *V. salvator* just twice weekly? Inconsistencies and contradictions like these occur for many other species in the book (not just varanids) and give the impression that these sections were hastily assembled in a random, unorganized manner. It also begs the question of where is the information coming from?

Many of the species accounts fail to cite or incorporate important information from published husbandry and breeding reports, and instead present questionable material from outdated or unknown sources. For example, despite a number of detailed and informative publications existing (e.g., Biebl, 1993; Dedlmar, 1994; Bosch, 1999; Polleck, 2004; Baldwin, 2006), the species account for *V. prasinus* does not cite a single report of successful long-term keeping and

breeding of the species. Instead, the author refers readers to dated articles of his own on the keeping of *V. prasinus* in captivity (Sprackland, 1989, 1991c). Even when successful published accounts are cited for a species, the information is sometimes mixed together with and skewed by questionable material from other, unknown sources. An example of this can be found in the *V. boehmei* species account (p. 232), which cites the only published report on the successful husbandry and breeding of the species (Reisinger and Reisinger-Raweyi, 2007). Nowhere in Reisinger and Reisinger-Raweyi (2007) do the authors report or advocate the feeding of bananas, yet they are included by the author as a suggested dietary item in the book's species account. Another example demonstrating a poor grasp of herpetocultural literature can be seen in the *V. macraei* species account, which states that there are no published reports on captive bred offspring of *V. macraei*, yet two such reports (Jacobs, 2002b; Dedlmar, 2007) are cited in the account's references section.

Occasionally, the author compares the husbandry requirements of one species to a non-related species originating from an entirely different environment. For example, little information is given on the husbandry of *V. varius* (p. 287); instead, the author suggests that its husbandry should mimic that of *V. salvator*. *Varanus varius* and *V. salvator* inhabit vastly different environments, have different habits (e.g., *V. salvator* is semi-aquatic; *V. varius* is semi-arboreal), and differ in their reproductive biology (e.g., *V. salvator* often nests in the ground; *V. varius* in termite nests). In another example, the author recommends that the husbandry of *V. nebulosus* (*V. bengalensis nebulosus*), an inhabitant of open forests and disturbed environments of southeast Asia, should be the same as that for the African grassland-dwelling *V. albigularis*.

On more than one occasion, the author recommends dangerously high ambient temperatures which can be deadly to any reptile maintained under such conditions. For example, on page 271, he claims that captive *V. giganteus* "do best if kept at temperatures above 43.3 °C and given several options to escape the heat". In virtually every conceivable captive situation, particularly indoor enclosures, cool areas to escape extreme heat would be extremely difficult if not impossible to provide if the enclosure's ambient temperature was being maintained near or above 43.3 °C. Unless the author is wrongly referring to basking temperatures of 43.3 °C, extended exposure to these excessive ambient temperatures will quickly kill a reptile. Similarly, on page 249 the author recommends seasonal increases in "daytime temperature" to 39.7-45 °C for *V. bengalensis*. Like

the excessive ambient temperatures recommended for *V. gignatus*, these markedly high temperatures will quickly kill captive reptiles when cool temperatures are unable to be provided. Beginner keepers can easily misunderstand the concept or importance of cool refuge sites when providing hot ambient temperatures, and will quickly overheat and kill their captives if they follow these suggestions.

Many of the book's photographs depict outdated husbandry practices and inadequate enclosure designs. To use the expression, "a picture is worth a thousand words", I fear that beginner hobbyists flipping through this book's pages will see some of the pictured lizard enclosures, substrates, hide spots, and furnishings, and adopt them for their own captives. There are several photos which depict lizards housed in screen cages or enclosures with large wire ventilation areas (p. 59, 62, 108, 239, 247). Since most keepers do not live in tropical regions with consistently high humidity levels, these types of enclosures promote low humidity levels and can cause chronic dehydration, related illnesses, and eventually death. Although the author briefly discusses the importance of proper humidity levels and hydration in the text, he does not address the humidity issues wire screening will cause. Moreover, the photos of inadequate enclosures are more likely to be noticed by readers, and can be devastating to the health of captives. On page 61, a young *V. komodoensis* is pictured in its enclosure. The image's caption discusses the importance of shelter in reducing stress levels in varanids; however, the half log-type hide depicted in the photo is too large and vacuous to provide any real sense of security for the animal. Inappropriately-sized hide areas occur in several photographs (p. 60, 65) and may give readers the wrong impression about what suitable refugia should look like and provide.

Non-Varanid Material

Though I have clearly focused my attention on the varanid-related content of the book since this review is appearing in a varanid-specific publication and because its varanid content makes up almost half of the book's species account section, I did find some errors in non-varanid related sections as well. One of the more noticeable mistakes occurs in the chapter on agamids where the author repeatedly refers to *Hydrosaurus pustulatus* incorrectly as "pustulosus" (p. 135-137). *Hydrosaurus "pustulosus"* is also claimed to be the most heavily-exported member of the genus based on United States CITES records (p. 136); however, no members of

Hydrosaurus are listed in any of the CITES appendices, therefore, the source for this statement is incorrect and the claim dubious. Many of my concerns regarding the husbandry advice given for varanids also apply to other taxonomic groups discussed in this book. Given the poor quality and accuracy of information in sections pertaining to *Varanus*, I have no reason to believe that other areas of the book do not suffer in similar ways.

Conclusions

To be blunt, I feel that *Giant Lizards* 2nd ed. is one of the worst books of the last two decades to cover the natural history and captive husbandry of varanid lizards. My criticisms outlined in this review, although numerous, do not represent frivolous or trivial mistakes, but serious flaws which affect the accuracy, credibility and educational value of the book, and are indicative of its overall quality. Its poor composition, careless mistakes, informational inconsistencies and contradictions, unsupported statements, questionable taxonomic conventions, dreadful photography, and appalling captive husbandry advice render this book the antithesis of anything worthy of being considered a "definitive guide".

Of my many criticisms, I consider the biggest disappointment to be the information and advice given on captive husbandry and breeding. From the information presented in this book, I am convinced that the author has very little, if any practical experience with varanids in captivity, much less the 41 species he has provided husbandry and breeding advice on. Admittedly having no experience or interest in breeding lizards (p. 7), the author clearly lacks the qualifications necessary to be offering recommendations on their long-term care and reproduction in captivity.

Although lacking the product placements which were rampant throughout the first edition that undoubtedly helped boost reptile product sales in pet shops worldwide, the second edition of *Giant Lizards* is destined to become a new personal favorite of pet shop owners if their customers can afford its \$79.95 USD suggested retail price (I have been told this price has recently been lowered to around \$50 USD). Not only does it encourage readers to purchase wild caught species, which have a much higher retail markup value than captive-bred species, but inexperienced keepers are also likely to return to the pet shop to purchase a replacement animal once his or her current specimen dies as a result of some of the poor husbandry advice outlined in this book. Lastly, one mustn't forget the

book's dietary recommendations of canned dog food for lizards, which will also require returning trips to the pet shop.

Sadly, instead of improving herpetoculture, as any new book on the subject should, *Giant Lizards* sets varanid keeping back more than a decade with its outdated and potentially harmful husbandry recommendations, some of which will kill captives if adopted. The author ignores many of the significant advancements and breakthroughs made in varanid herpetoculture over the past decade which have enabled specimens to live longer, healthier lives and possibly reproduce in captivity. This is now the author's third poorly-written book reporting on the captive husbandry of varanid lizards, which I consider to be a great disservice to the progression and advancement of herpetoculture.

Due to its poor educational value and overall quality, I cannot in good conscience recommend this book to anyone, not even for its photographs, as I have done for others in the past (Mendyk, 2008) since a sizeable percentage of them are poor in quality. For current and progressive information on the keeping and breeding of varanids in captivity, I recommend *Monitor Lizards: Natural History, Captive Care and Breeding* by Eidenmüller (2007), *The Savannah Monitor Lizard: The Truth About Varanus exanthematicus* by Bennett and Thakoordyal (2003), and *Keeping and Breeding Australian Lizards*, edited by Swan (2007). For detailed information on the biology and natural history of varanids, I recommend Pianka and King's (2004) *Varanoid Lizards of the World*.

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