elaphe

ABSTRACTS

05/2020

Dear DGHT members,
in 2020 we started to summarize some of the main articles of our elaphe journal in English, for our non-German speaking members. These summaries have been compiled by Beate Pfau.

Main topic: The German maze of rules and regulations for herp keeping

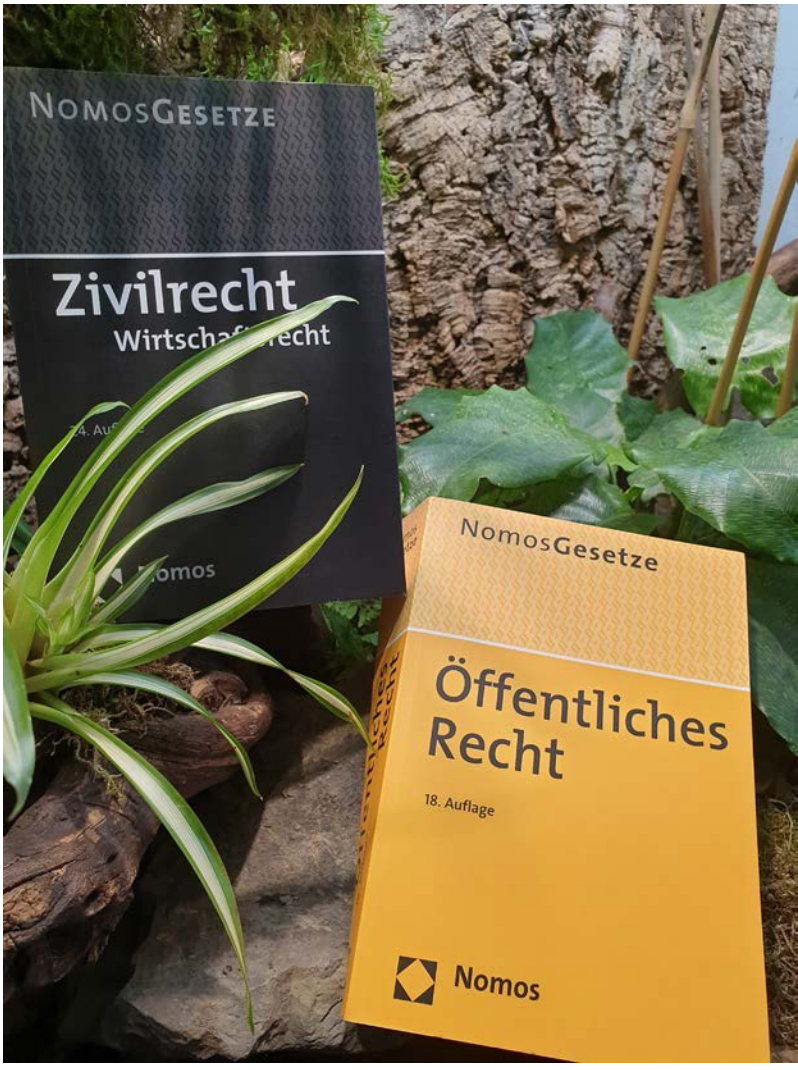
Article series by Oliver Witte

Oliver Witte is the corporate counsel and the advisor for expertise trainings in herpetoculture of the DGHT. He has to know all the rules and regulations in Germany and also the current legal interpretations when it comes to keeping and breeding amphibians and reptiles. Here he will guide the elaphe readers through this maze concerning their hobby.

In the first article, the relevant German laws are summarized: There are the public laws and the civil laws. The main public law is of course the constitutional law, which protects the natural resources and, since 2002, also animal welfare. The Animal Welfare Act ("Tierschutzgesetz", abbreviated below as TierSchG) is the most important German law for herpetology and herpetoculture, and it contains not only special regulations, but also penal and fine provisions. Its main goal is that animals (vertebrates, but also invertebrates) must be kept in a species-appropriate manner. There are regulations about the expertise of the animal keeper, and in special cases even the necessity of a certificate for competence. Special rules relate to animal keeping and breeding, commercial trade, transport and transfer, and also to killing animals.

Other relevant German laws, especially for herpetoculturists, are the Federal Nature Conservation Act ("Bundesnaturschutzgesetz") and the Endangered Species Protection Act ("Bundesartenschutzgesetz") which relate to international laws and regulations like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the European Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein, the fauna and flora directive, and to the federal state's nature protection laws. Some federal states have enacted laws that apply to keeping and breeding dangerous animals, and in the German Administrative Offences Act ("Ordnungswidrigkeitengesetz") deals with penalties, administrative fines and costs when violating laws, especially the law on dangerous animals, no matter whether intentionally or negligently.

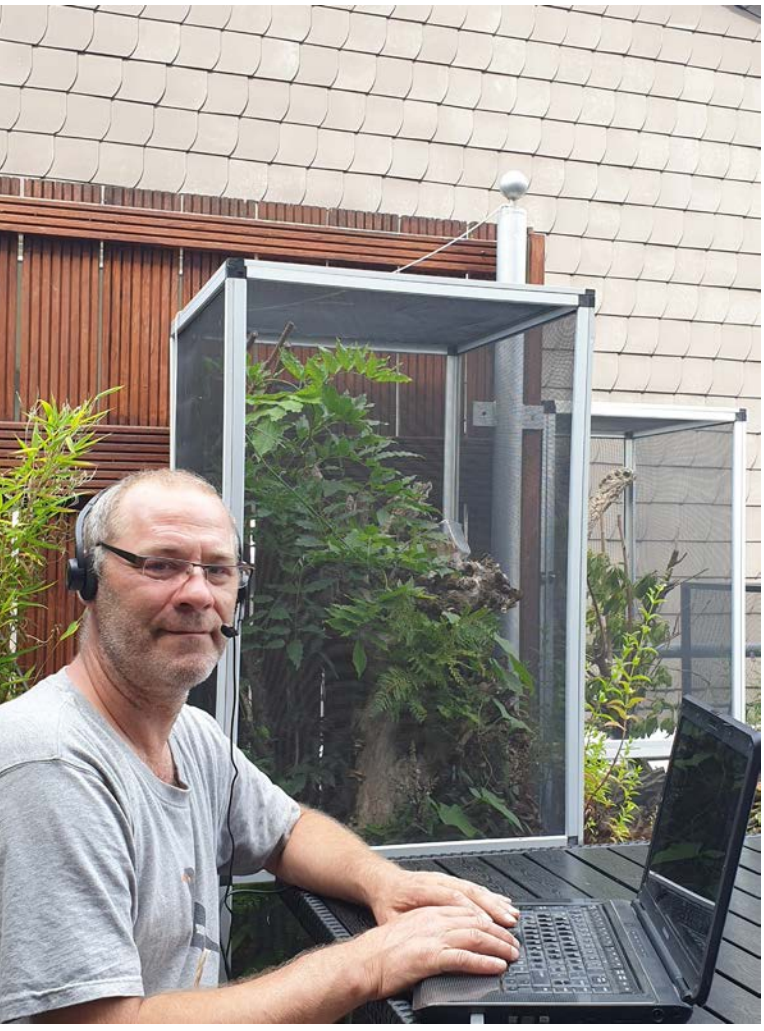
The next article deals with residential tenancy law. In Germany, keeping small pet animals in a rented flat is generally permitted, and most terrarium animals fall into this category. The animals have to be kept in closed terraria and they must not be able to disturb or annoy other residents in the same house – keeping frog species that call loudly might well be disturbing and can therefore be for-



Maze of rules and regulations in Germany Photo: O. Witte

bidden, but keeping non-poisonous snakes is generally not a problem, even if other tenants in the house disgust these animals. Keeping "too many" terrarium animals may cause problems with the owner, and there is no clear definition on how many animals are "too many". Keeping

dangerous animals is usually not permitted, exceptions have to be fixed in a contract which can be revoked by the owner at any time. "Dangerous terrarium animals" are not only poisonous snakes, but also crocodiles and alligators, very large snakes or lizards, or even aggressive spiders. The same regulations as for rented flats also apply for owner-occupied flats, and the other unit owners of the house may demand the removal of the animals.

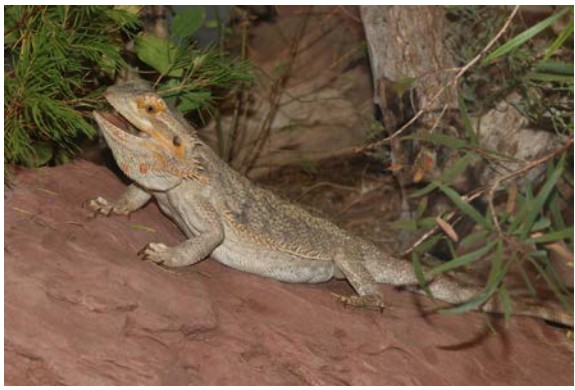


Oliver Witte during online training session Photo: O. Witte

Keeping dangerous animals is regulated by federal states laws, and nearly every state in Germany has own rules and regulations. It is highly recommended, and in some states it is even mandatory, to participate in a training on how to handle dangerous animals, and to acquire the expertise certificate.

In Germany the DGHT (German Society for Herpetology and Herpetoculture) and the VDA (Verband Deutscher Vereine für Aquarien- und Terrarienkunde – translates approximately as "Union of German Associations for Aquarium and Terrarium Science") jointly offer expertise trainings for specialized aquarium and terrarium keepers (according to § 2 TierSchG), for commercial keepers like shops or trade businesses (§ 11 TierSchG). These trainings include instructing lessons and a test for acquiring the certificate. At first the instruction lessons were held in zoo schoolrooms or at specialist meetings, but now there is also an offer for online participation, and the test is taken in a one-to-one online session or (for the trainings for commercial keepers obligatorily) in a physical meeting which is now being organized according to a COVID-19 hygiene concept. Of course, the additional training for keeping and handling dangerous animals needs personal presence in a certified training centre.

The last article in this series illustrates the German approval procedure for a private reptile rescue and rehoming centre. There are many good-hearted people who would like to help those poor, abandoned reptiles (mainly tortoises), but establishing a rescue centre needs more than good will. First of all, in Germany the law on animal welfare, § 11 TierSchG, applies for such a facility. Before planning the facility, the further operator should consider whether he/she has enough outdoor and indoor space available, preferably in his/her own possession, to accommodate the terraria/enclosures, and also to provide a well-separated quarantine area. The next point is whether the financial resources will be sufficient, because in most cases no public funding will be provided. Operating such a facility is certainly not possible for one person, at least one surrogate person should be named, and additionally several already trained persons should be deployable, for example in case of absence or in emergencies. Certainly not "each and every animal in need" can be accepted in a private reptile rehoming centre, and before starting it should be specified which species will be accepted and which species cannot be kept, and also the conditions for acceptance should be specified.



Often found in private reptile rescue centres: *Pogona vitticeps* Photo: A. Kwet

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The most important point for a rescue centre is whether a nearby specialized veterinarian has already accepted to take care of the rescued animals. It is recommended to make an appointment with the responsible person at the veterinarian inspection office first, and talk this plan over before requesting a (chargeable!) licence according to § 11 TierSchG. The application forms can be downloaded in most cases, and there is also an information on the required fees for the licence. It may be challenging to prove that the responsible persons of the planned rescue centre have the necessary expert knowledge, and it is always a good idea to participate in the appropriate trainings and acquire the certificate of expertise (see above.) Nevertheless, the responsible veterinarian inspector will perform an on-site inspection and compare the specifications in the application form to reality. Of course, there is a legal obligation to keep records, and when a herpetophile is visiting a rescue centre, or when he/she is considering to donate money, it is advisable to take a closer look at the paperwork there, to avoid supporting "black sheep" who just want to make money with abandoned reptiles.

Herpetofauna observation trip to eastern South Africa

by Volker Harport & Jens Reissig

In spring 2020, the authors travelled to South Africa for a herpetological and arachnological observation trip. The tour started in the Mpumalanga province, in Graskop, where they found, in a forest nearby, some colourful and well-camouflaged Dwarf Chameleons, *Bradypodion transvaalense*, already on their very first evening. Several other species observations in the area are listed, too, but it is difficult to take good photos when the animals are shy and not used to visitors. An early morning trip into the Blyde River Canyon revealed a nice population of African flat lizards, *Platysaurus orientalis orientalis* that were obviously used to being photographed by the many tourists who came there. During a trip to the Moditlo Private Game Reserve in Limpopo province an approximately 2.4 m long Black mamba (*Dendroaspis polylepis*) was seen through the car window, which then climbed quickly up into a tree and could be photographed.

The next seven days were spent in Kruger National park, and a night trip with UV flashlight near the Mopani camp was successful, because many scorpions, *Parabuthus transvaalicus*, could be found, and during the next nights, here and near other camps, also other scorpion species were seen. The park is famous for its mammals and birds, and the authors give recommendations on where and how to go observing them.

The next destination was the Umkhumbi lodge near the town Hluhluwe in KwaZulu-Natal. The hosts of this lodge are passionate reptile lovers, the guest house is located in a private sanctuary, and the staff knows where to send the guests for seeing snakes and lizards. During a nightly tour the authors tried to find frogs near the waterholes, but they heard nothing, until all of a sudden a nearly deafening African reed frog concerto began, produced by different species (*Hyperolius argus, H. pusillus,* and *H. viridiflavus*), that had started trilling simultaneously. Nearby, at the waterhole shores, *Ptychadena anchietae, P. mascareniensis, Kassina senegalensis,* and *Phlyctimantis maculatus* could be seen. For the day a trip to the Indian Ocean, Sodwana Bay, brought some relaxation and on the way back several specimens of the well-hidden *Bradypodion setaroi* could be spotted in the bushes and trees.

The next highlight was the Ithala Game Reserve, where Elephants, White Rhinos and Giraffes were seen, and several Swazi Dragon lizards (*Smaug swazicus*, a new species, which was described only after the end of this trip) could be observed when basking near their rock shelters. The last excursion goal was observing the Giant Girdled lizard,

Adult *Smaug giganteus* Photo: V. Harport

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Smaug giganteus, in central South Africa, but this species is getting rare and most of the animals were shy and could only be seen from great distance. On the way back, on a dirt road, a youngster with the characteristic yellow, orange and black coloration could be photographed. In summary this two-week spring trip to South Africa had yielded observations of 40 reptile and 14 amphibian species, and some unforgettable impressions.

Reference: Bates, M.F. & E.L. Stanley (2020): A taxonomic revision of the south-eastern dragon lizards of the *Smaug warreni* (Boulenger) species complex in southern Africa, with the description of a new species (Squamata: Cordylidae). – PeerJ 8(e8526): 1–41.

The miniature Pitcher-plant breeding frog from Borneo – *Microhyla borneensis* – gets its scientific name back after 86 years

by J. Maximilian Dehling

In elaphe 4-2020, the little Matang narrow-mouthed frog was presented under the scientific name *Microhyla borneensis*, and it was mentioned that a former name of this species was *M. nepenthicola*, which translates as "living in Pitcher plants" (*Nepenthes*). In July 2020, a new publication compared the different museum specimens of *Microhyla* and resolved the considerable taxonomic confusion by using genetic methods. It could be shown that there are two species, which show weak but constant differences in coloration and pattern, living in close proximity in western Sarawak: *Microhyla borneensis* lives in a karstic region near Bidi, while the little frog which was portrayed in the last elaphe issue is in fact *M. nepenthicola*, which lives on sandstone soils in the Kubah and Bako National parks and their surroundings. Populations of *Microhyla* from other parts of Borneo have shown to be genetically different from these two species, and in consequence, more species descriptions of nepenthicolous frogs are to be expected.

The tadpoles of *Microhyla*, and also the tadpoles of some *Kalophrynus* and *Philautus* species, as well as some insects, mainly Dipterans, and some spiders and crabs, are Nepenthebionts, which means that they are specialized in living in the *Nepenthes* traps. The fluid in these traps will dissolve the bodies of drowned organisms, but the intact skin of the specialized animals protects them from the acidic fluid with the digesting enzymes. An advantage of living in these traps is the general absence of predators, but the author of this paper could find some snakes near the *Nepenthes ampullaria* plants, which would certainly prey upon frogs and tadpoles, and the Javan tubercle snake (*Xenodermus javanicus*) has been observed to hide in the plant traps and will submerge completely when feeling in danger.

Microhyla nepenthicola in a *Nepenthes* trap at the type locality in Kubah National park Photo: J.M. Dehling

Reference: Gorin, V.A., E.N. Solovyeva, M. Hasan, H. Okamiya, D.M.S.S. Karunarathna, P. Pawangkhanant, A. de Silva, W. Juthong, K. D. Milto, L. T. Nguyen, C. Suwannapoom, A. Haas, D.P. Bickford, I. Das & N.A. Poyarkov (2020): A little frog leaps a long way: compounded colonizations of the Indian Subcontinent discovered in the tiny Oriental frog genus *Microhyla* (Amphibia: Microhylidae). – PeerJ 8(e9411):1-47.

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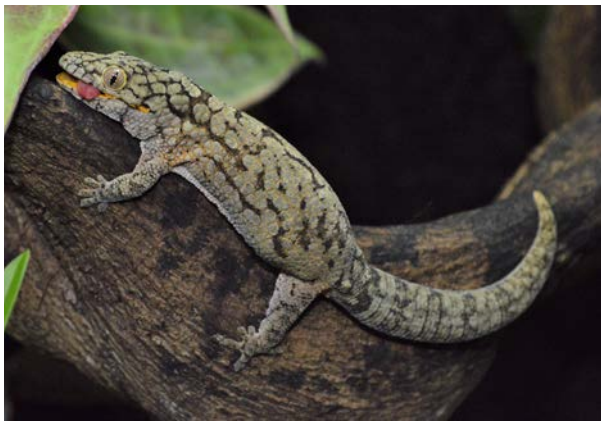
Experiences in keeping and breeding the Western Chameleon gecko (*Eurydactylodes occidentalis*) – with comments on the *Eurydactylodes* species

by Sebastian Frank

The genus *Eurydactylodes* actually comprises four species; it is endemic to New Caledonia. *Eurydactylodes occidentalis* has been described in 2009; it is restricted to two very small areas in the central west coast of Grande Terre, and is listed as "Critically Endangered" in the IUCN Red List, because of its highly restricted distribution and severely fragmented and degrading habitat. That is why it is important that this species is being bred in captivity, and fortunately breeding groups are already getting established among engaged herpetoculturists.



Eurydactylodes occidentalis, female Photo: S. Frank

These geckos have a peculiar defence behaviour: They are able to emit a sticky, foul-smelling secretion from glands, which are located on the sides of the tail. This defence is only used in dire emergency, and in most cases, the animals will show their spectacular threatening posture instead, arching their backs and opening their mouth very widely to show the bright yellow mucosa.

A slight sexual dimorphism is already visible in subadult animals: The females appear sturdier and often have larger heads because of their extracranial endolymphatic sacs. The males remain smaller and thinner. The sexes can be discriminated already at the age of a few months: When looking at the underside with a magnifying glass the enlarged femoral pores of the males can be seen. They are positioned in four to five rows and have 60 or more pores. Adult males have enlarged hemipenis pockets and postanal tubercle scales.

Like all Chamaeleon geckos *Eurydactylodes occidentalis* are diurnally active to some extent, they move slowly and rely on their camouflage. Most of the time they rest in the open, on twigs or large leaves. They can be kept pairwise in rather small terraria, but the author keeps one male together with several females in glass terraria 40 x 50 x 60 cm (length x width x height). The terrarium contains at least living plant, mainly *Asparagus falcatus*. For cleaning and as additional food isopods are always present. The animals are fed with commercial fruit food for geckos or self-made fruit pulp with vitamin-mineral preparations added. Temperature is maintained by LED light tubes, which are turned on for 12 hours in summer, yielding day temperatures of 22–28 °C, which drop to 20–23 °C during the night. In winter, lighting is reduced to 10 and later 8 hours, and the temperatures are 20–23 °C by day and 17–20 °C by night. Short time drops of temperatures down to 15 °C are well tolerated. For hibernation, the male is separated from the females. Mating could not yet be observed, egg laying starts four to five weeks after the end of hibernation. The females produce five to six clutches of two eggs each, which are hidden under bark, leaves or moss. The eggs are transferred to separate containers and incubated in moist Seramis. Hatching occurs after 60–90 days at 21–28 °C. They grow fast and can reach sexual maturity at about 8 months.

This paper also summarizes the habitat features for Chamaeleon geckos and describes and illustrates the distinguishing characters of the four *Eurydactylodes* species.

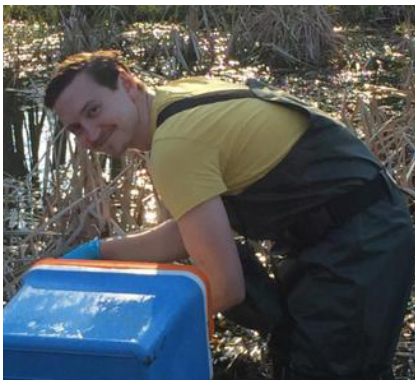
Among researchers: Chemical communication of tadpoles

by Konrad Lipkowski

Everybody knows that frogs communicate by sounds, but it is obvious that they also have an elaborate chemical communication. Tadpoles can "smell" predators and their development and behaviour may change in the presence of these enemies, but they are also able to emit alarm substances when frightened or hurt, and their conspecifics will be able to adjust their behaviour accordingly. The substances themselves and the mechanism of their emission had not yet been investigated. It had been assumed that the origin of these substances was in the tadpole skin.

To find out more a series of experiments was designed, involving different tadpole behavioural types. Some anurans, like the Common toad (*Bufo bufo*) produce great numbers

of eggs in one waterhole, and the tadpoles form large aggregations, while others, like the Poison Dart frogs (Dendrobatidae) produce only a few eggs at a time, and there are only very few tadpoles (which may even be cannibalistic) in a water body – the alarm substances will certainly benefit aggregation forming tadpoles, but not those that live singly. The experiments should therefore compare the alarm substances and their effect in tadpoles of Common toads, Common frogs (*Rana temporaria*), and two South American Poison Dart frog species (*Ameerega hahneli* and *Ranitomeya sirensis*). The tadpoles of these species differ in aspects of clutching, parental care, schooling behaviour, toxicity and habitat preferences, and they enable conclusions on the evolution of this specialized chemical communication. In this research project, the anatomy of the skin and the olfactory system, as well as the chemical composition of the alarm substances should be investigated.



The author in the field Photo: A.Mai

In earlier investigations on alarm substances, the tadpoles had been killed and homogenized, but for my experiments, there was no permit yet for injuring or even killing the animals, and now it should be examined whether Common toad and Common frog tadpoles would react differently to alarm substances of their conspecifics of the other species. To induce the tadpoles to release these substances, a group of 10 tadpoles of one species was put in a beaker, either with 200 ml of normal water, or with 200 ml of a weak (5 mM) potassium chloride solution, which would probably not harm the animals, but depolarize the membranes of the skin and thus release the substances. Twenty minutes later the tadpoles were put back into their aquariums. The behavioural reaction of other tadpoles of these two species to these solutions was not consistent, and it could not be ruled out that already the approach had stressed the tadpoles so much that they all had released either alarm substances or other materials like urine, and thus concealed specific behaviours of the test tadpoles to the conspecific "warnings". There was no possibility to analyse the water or the solution and find out which substances has in fact been released.

The next experiments will be designed to better obtain the alarm substances from the skin of the tadpoles. In an old experiment, the tadpoles had been stung with a needle to elicit alarm substance release, but some of them had been anaesthetized before. This design had led to a differentiated reaction of the test tadpoles: Those tadpoles that were exposed to water, in which conscious tadpoles had been punctured, showed alarm reactions, while tadpoles that were exposed to water in which anaesthetized tadpoles had been punctured, did not. The conclusion had been that the punctured tadpoles had released their alarm substances only when feeling pain. Since the experiments here have to be pain-free, an anaesthetic has to be found, and the obviously most used substance for fish and tadpoles is Tricaine, but the side effects are stress reactions and aversions, and perhaps the test tadpoles would react to the Tricaine rather than to any alarm substances from the punctured tadpole's skin. Other possibilities could be the extraction from skin homogenates under liquid nitrogen, to find out more on these substances.

This research project has been partially sponsored by the DGHT's Wilhelm-Peters-Fond. This is a progress report on the first experiments for the author's doctoral thesis in the workgroup for Wildlife-/Zoo-Animal Biology and Systematics at the Goethe-Universität Frankfurt am Main.

IMPRESSUM

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