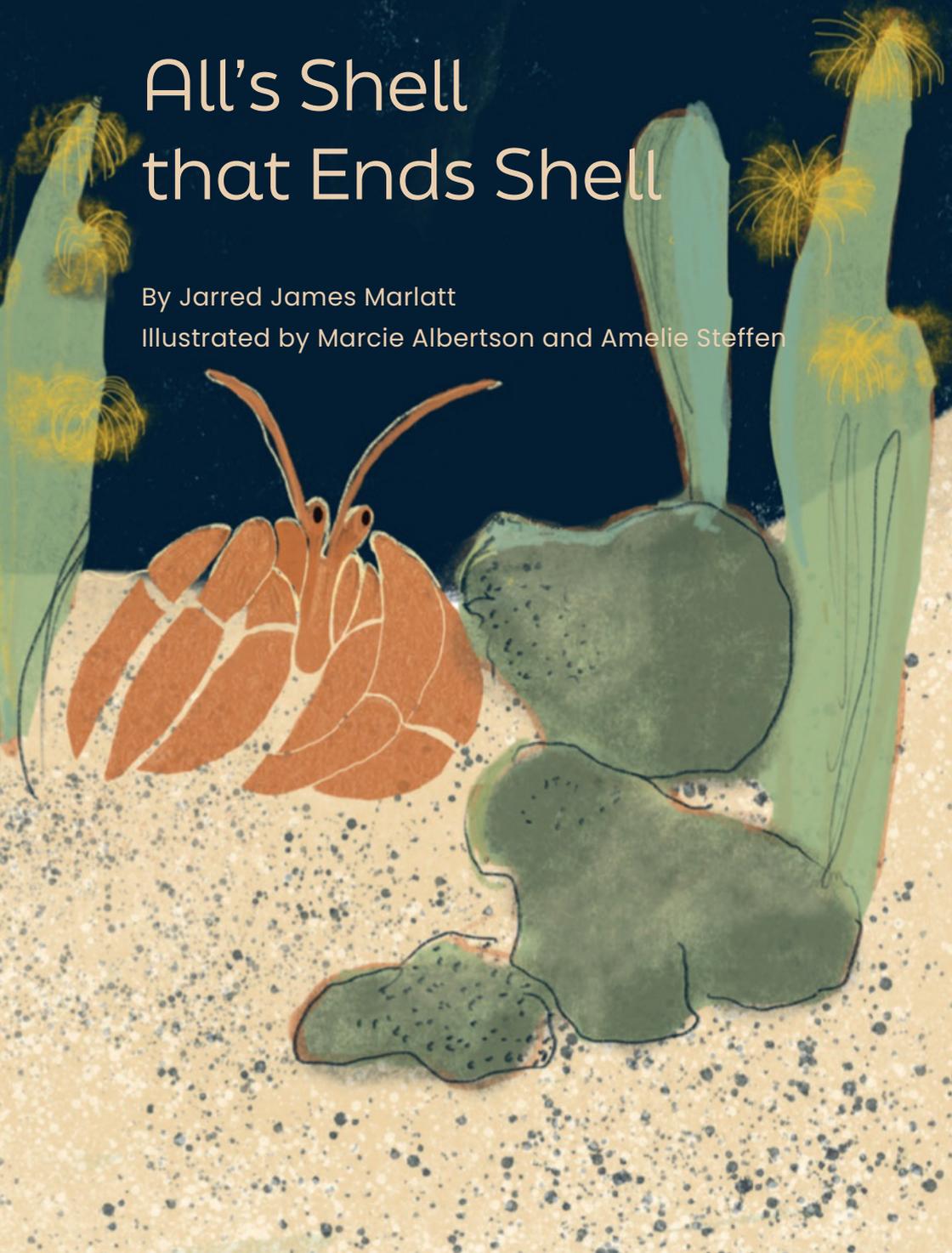


All's Shell that Ends Shell

By Jarred James Marlatt

Illustrated by Marcie Albertson and Amelie Steffen



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This book has been developed within OptiWohn – a project within the framework of RES:Z (Resource-efficient Urban Districts for the Future), an initiative of the Federal Ministry of Education and Research (BMBF).



Project coordination: Wuppertal Institut für Klima, Umwelt, Energie gGmbH

Project stakeholders: City of Göttingen, City of Köln, City of Tübingen,
University of Oldenburg, werk.um architekten

Heinz Siedler was the happiest hermit crab on the beach. As he emerged from the sand with his shiny new skin, he knew wonderful things were on the horizon.

Even before he crawled back into his old shell, Heinz knew it wouldn't fit anymore. He was a brand-new crab, and he needed to find a home that fit his big dreams. He was sure that today was his day!

He was equally sure his best friend would find a way to ruin it with her boring, rule-following ways. Gitti Glotz never seemed interested in Heinz's exciting adventures. As far as he could tell, her idea of a fun time was organizing her sand collection. He took the opportunity to point this out to her again, for roughly the sixty-third time.

Gitti just stared at him and kept her opinions to herself.





Hi, kids!" Heinz's grandmother waddled over, huffing and puffing from the weight of her big, outdated shell.

"We're not kids," Heinz muttered.
"Hi, Oma Siedler," Gitti said.

"I want to congratulate you both on your new skins," Oma Siedler said, "and to offer you my shell, Heinzi. You're a growing boy, and your little shell won't fit you forever. This one is too big for me, anyway."

Heinz didn't know what to say. He wanted a bigger shell – *needed* a bigger shell – but the last thing he wanted was to be seen in his grandmother's boring old clunker.

"Thanks, Grandma," Heinz said. "But I'm old enough to find my own shell."

Before Oma Siedler could respond, a crowd of young hermit crabs skittered past to check out a new shell that had washed up on the beach. Some said it was the most beautiful shell in the world!



That was all Heinz needed to hear.
He joined the parade of hermit crabs
heading for the new shell.

Gitti offered Oma Siedler a little smile, shrugged
her crabby shoulders, and followed after her friend.

The shell was more beautiful than Heinz expected.
It didn't have any cracks or scuffs, and it
had to be almost twice the size
of their current shells. It was
one of a kind, and it
had everything
Heinz had ever
wanted in
his first
adult
shell.



The background is a light beige color with a pattern of small, scattered blue and brown dots. In the center, there is a large, dark brown, circular shell with a white spiral pattern on its top. To the left of the shell, a crab is depicted in a stylized, flat, orange-brown color. The crab's body is segmented, and its legs are also segmented. One of its large claws is raised. The crab's eyes are small black dots. The overall style is simple and illustrative.

It was also the site of a massive brawl! Over a dozen crabs pinched and pushed and scrambled over each other to claim the shell as their own. Whenever one crab tried to move in, two or three others yanked them out, and the fight continued.

Heinz got trampled beneath the weight of two larger crabs. Right when it felt like his big claw was about to break in half, Gitti shoved the other crabs aside and pulled Heinz out from the scuffle.

Thanks," Heinz said, panting, "but I think I could have taken them."

"Oh I could tell," Gitti said. "You were really letting them have it."

She watched the fight over the shell for a moment, then shook her head. "You're all acting like a bunch of soft-shells."

Heinz started to say something, but Gitti cut him off. "Can we go now?"

Heinz took one last look at the beautiful shell, but it was hopeless. He sighed and caught up to his friend.





Heinz and Gitti found a nice, quiet stretch of beach. They sat down in the shade of a palm tree.

It wasn't long before Gitti noticed something poking out of the sand. She and Heinz started digging until they uncovered two new shells.

One of them was dull and plain and only a little bit bigger than the shells they already had. It might have been the most boring shell Heinz had ever seen.

"It's not boring," Gitti said. "It's sensible."

"Sensible!?" Heinz shouted in disgust. "That's just as bad! Sensible *is* boring!"

"I think you need to work on your vocabulary," Gitti said. She poked the new shell with her big claw.

"So you won't mind if I take this one?" She jumped in before Heinz finished shaking his head. It fit, with a little room to spare.

Heinz had his eyes on the other shell. It was perfect – even bigger than the beautiful shell, and he didn't have to fight anyone for it!

He scrambled out of his old shell and moved in.

An illustration of a hermit crab on a dark, textured rock. The crab is orange-brown with long antennae and legs. It is positioned in front of a large, light-colored, textured shell. The background is a dark blue/black area with white, swirling, ethereal lines that suggest water or wind. The overall style is artistic and somewhat abstract.

Heinz was so excited by his discovery that he didn't notice how heavy it was. It had to weigh more than Oma Siedler and her shell combined! He tried to take a step toward the water, but the shell barely budged. Gitti sighed and lifted the back of the shell with her big claw.

With a lot of effort and only a little help from Gitti, Heinz managed to lug the new shell down the beach. He plopped down on a sunny rock at the water's edge and closed his eyes in the midday sun.

They hadn't been there long before the tide started coming in. His new shell filled with water. Heinz was too exhausted to move it again.

A wave crashed down and swirled him around. Soon the tide would be strong enough to pull the shell along with it.

Heinz had to abandon it and scurry away just to avoid being swept out to sea!



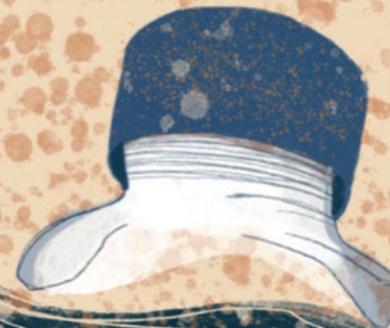
Heinz and Gitti scuttled back to the palm tree to look for his old shell, but it was already gone.

“Hermit’s Law,” Gitti said. “If you leave a shell, someone else will take it.”

“I know Hermit’s Law!” Heinz snapped. Now he had no shell at all!

Heinz and Gitti searched the beach, but they couldn’t find any new shells. After an hour, Heinz was hot, dry, and burned red. That was no small accomplishment, because he was pretty red to begin with!

The closest thing to a shell they could find was an old plastic cap from a soda bottle.



It was smelly and dirty and barely big enough for him to fit. If he moved too quickly it popped off his back and left him naked again. It wasn't great, but it blocked the sun. He figured it was better than nothing.

"Well," Gitti said, "at least it isn't too sensible."

A few girls in pretty summer shells laughed at Heinz as they passed. Heinz got even redder. He realized he was wrong – it would have been better wearing nothing at all!

Gitti suggested they go find Oma Siedler.





Heinz crept along after his friend, dejected and exhausted. The promise and excitement from the morning had faded from his mind completely.

"Heinzi!" Oma Siedler called. "Gitti! What a pleasant surprise."

"What a terrible day," Heinz said. "I should have just listened to you. Now I've got no shell and no future and everything is ruined."

"Calm down, Heinzi," Oma Siedler said. "Can either of you guess how I got to be so old?"

Gitti raised her big claw as if she was in class, but Heinz just shook his head.

"Come on," Oma Sielder said.

"I want to show you something."

She led them under a big rock where dozens of crabs traded shells. Young, growing crabs moved into bigger shells and old, shrinking crabs moved into smaller ones. A whole group of crabs formed a line from biggest to smallest, and each one moved into the next biggest shell. Instead of fighting, they worked together so that everyone ended up with the shell that fit just right.

"This is the shell exchange," Oma Siedler said. "I've been organizing this for years, and I haven't had to fight over a shell once."

"Sounds *boring*," Gitti said.

Heinz made a silly face at her, and she made an even sillier one back.





Heinz turned to find his grandmother smiling behind him. She wore his previous shell! It looked much more comfortable on her than her antique shell had.

Her old shell still sat unclaimed. Maybe it wasn't so bad, after all. There were plenty of things Heinz could do to make this shell his own.

"I guess I can try it," Heinz said quietly.

Heinz moved in. It was old, sure, but it was much better than anything else he found.

And it fit him perfectly.



The More You Know,
the More You Grow!

Did you know that there are over one thousand species of hermit crabs? And the ones you see on the beach or in the pet store are less than half as many as the hundreds of species that live under water!

Whether on land or in the ocean, all hermit crabs breathe through gills, like fish. Hermit crabs have sensitive backs and bellies, so they need a house to protect themselves. Because they can't grow a house of their own, they have to borrow it from another species. These houses are usually abandoned snail shells, but hermit crabs can also live in coconut shells, parts of plants, and even human garbage, like bottle caps – although, like Heinz, they don't like that very much.

Hermit crabs grow by shedding their skins, or exoskeletons, in a process called molting. When they molt, hermit crabs leave their old skin behind and grow a new, bigger one. As they grow, they need to move into bigger and bigger shells.

When there aren't enough big shells for a group of hermit crabs, they will fight for ownership of the shell.

But crabs of different sizes will often work together to trade their shells. They form "vacancy chains," like the shell exchange in our story, so everyone can move into a bigger shell. And if there aren't any big shells around, hermit crabs are one of the only species on the planet that can actually shrink down to a smaller skin in order to find a suitable home.

Humans might not live in shells, but we can learn from hermit crabs, too. People can – and do – organize similar home exchanges to what Oma Siedler set up. Through house-swaps and renovation, we are able to re-use and remodel older homes into exciting spaces for a new generation!

When choosing a home, it's important to always remember Oma Siedler's advice. By only taking what you need and making the most of the space you have, you can ensure that there will be enough for everyone else!

Information on the research project

OPTIWOHN

The average size of family living space has been increasing in Germany for decades. As a result, more and more buildings are built, natural areas are sealed off, and the dwindling natural resources are used up. Given the increasingly limited supply of living space in metropolitan areas, rents often exceed the reasonable limit for low-income earners. In response to this problem, politicians always seem to promote the same solution: funding new construction.

A large part of this supposed housing crisis could be solved through a better and more efficient use of the buildings we already have. For example, when people experience major life changes, such as children moving out, they could decide to move into smaller living spaces or alternative living concepts. So far, however, there has been a lack of suitable housing to fit these new living situations, and the housing market actually discourages sensible downsizing.

The OptiWohn Project therefore addresses the question of how best to promote an optimized use of living space. They plan to achieve this by meeting the following objectives:

- establishment of municipal housing agencies
- investigation of new, economically-viable models for space-sharing and housing management
- evaluation of the space-efficient use and conversion of existing buildings
- initiation of apartment swaps
- publication of beautiful stories from nature, such as hermit crabs, that can show us how it is done

OptiWohn hopes these initiatives will bring some movement into what remains a very rigid housing market.

Imprint

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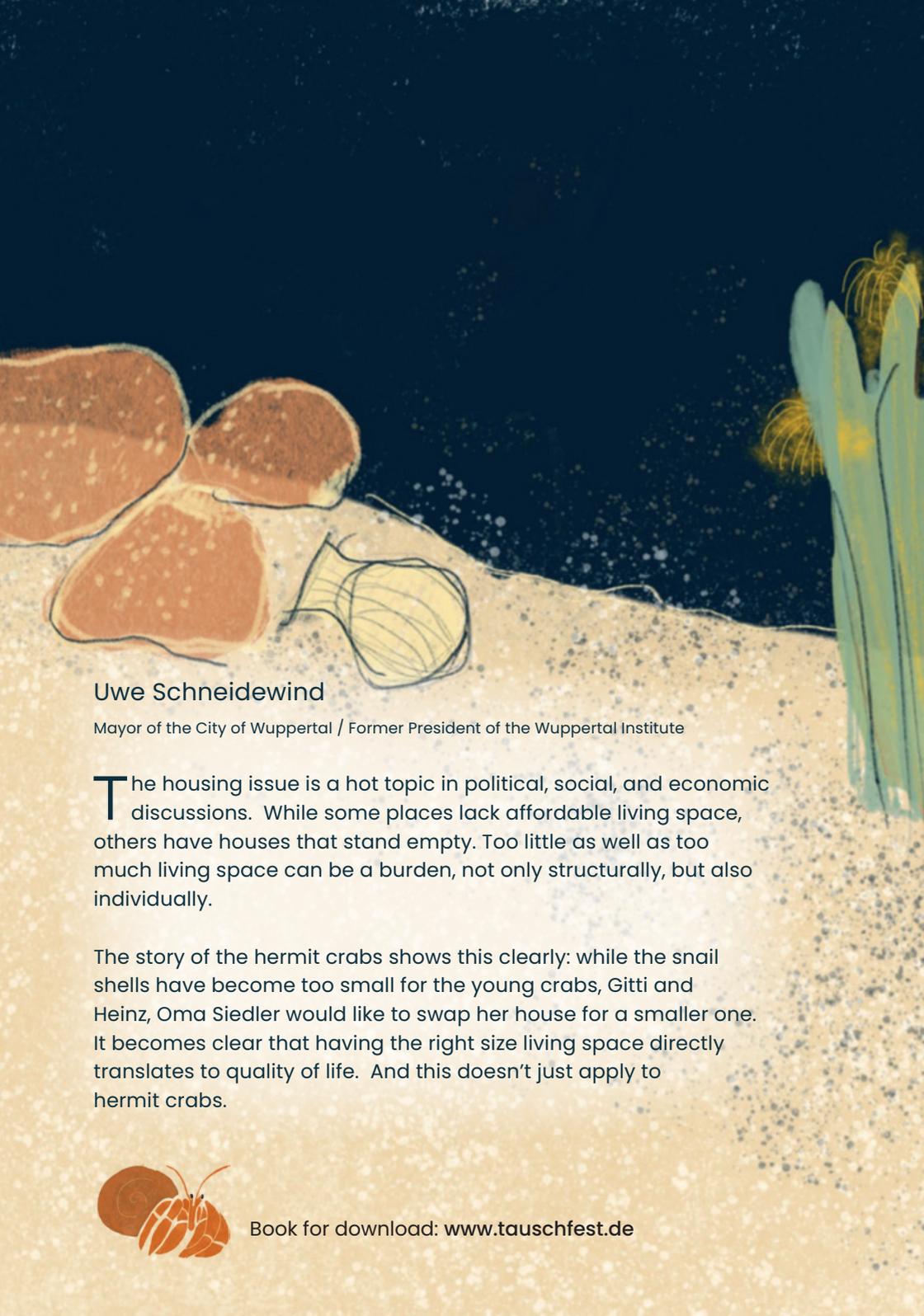
PRODUCTION

Umweltdruckerei Lokay e. K., Reinheim

PUBLISHED

March 2022

Published in the framework of Research
for Sustainability, FONA (Research for
Sustainable Development)



Uwe Schneidewind

Mayor of the City of Wuppertal / Former President of the Wuppertal Institute

The housing issue is a hot topic in political, social, and economic discussions. While some places lack affordable living space, others have houses that stand empty. Too little as well as too much living space can be a burden, not only structurally, but also individually.

The story of the hermit crabs shows this clearly: while the snail shells have become too small for the young crabs, Gitti and Heinz, Oma Siedler would like to swap her house for a smaller one. It becomes clear that having the right size living space directly translates to quality of life. And this doesn't just apply to hermit crabs.



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