



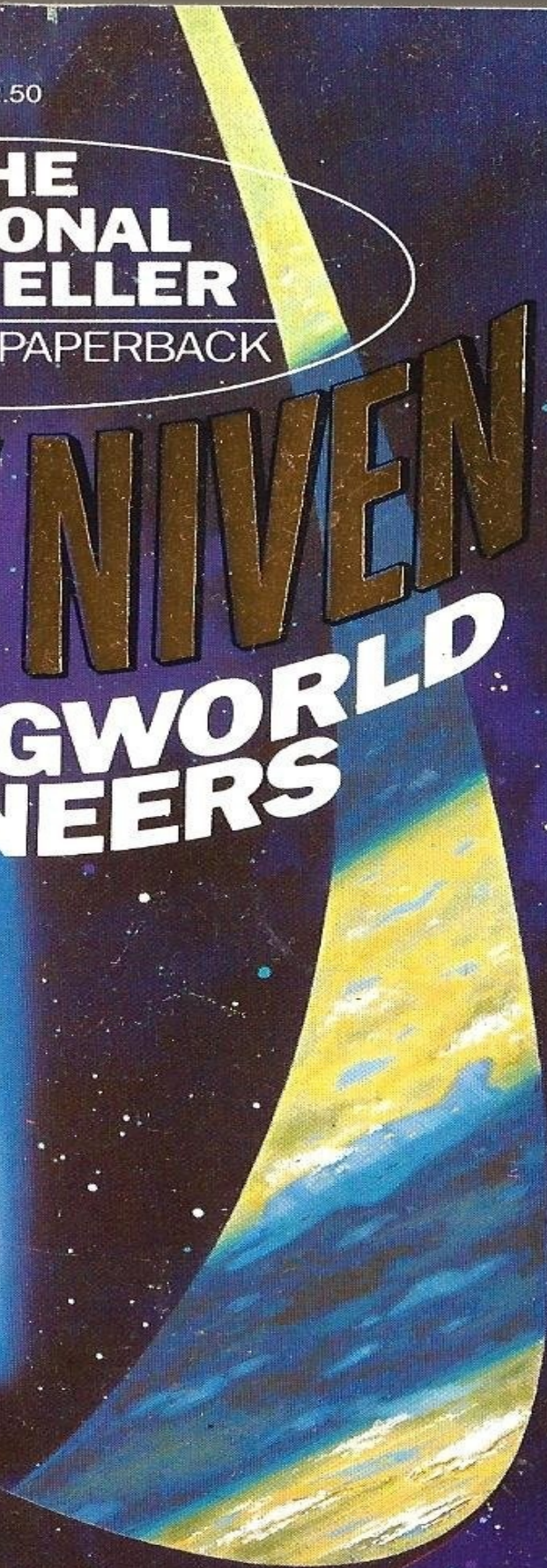
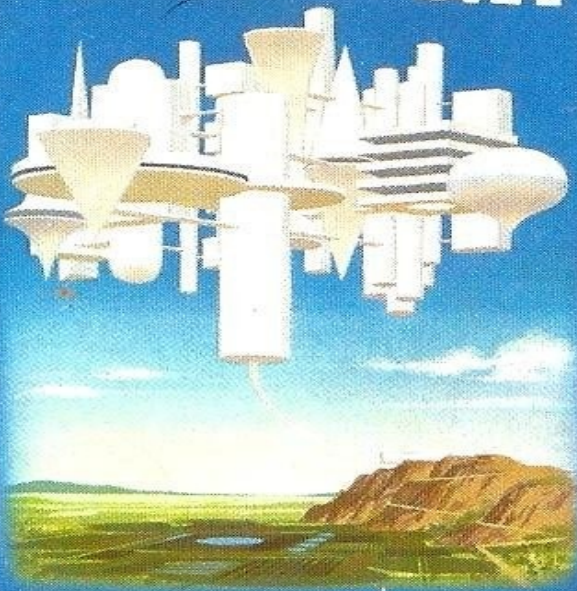
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AT LAST IN PAPERBACK

LARRY NIVEN

THE RINGWORLD ENGINEERS



The Ringworld Engineers
by Larry Niven

Dedication

Ringworld is ten years old; and I have never stopped getting letters about it. People have been commenting on the assumptions, overt and hidden, and the mathematics and the ecology and the philosophical implications, precisely as if the Ringworld were a proposed engineering project and they were being paid for the work.

A man in Washington, D.C., sent me a full proofreading job on the first edition of Ringworld, with the title “The Niven-McArthur Papers, Vol. I.” It was of enormous help to me. (If you own a first paperback edition of Ringworld, it’s the one with the mistakes in it. It’s worth money.)

A Florida high school class determined the need for the spillpipe system.

From a Cambridge professor came an estimate for the minimum tensile strength of scrith.

Freeman Dyson (Freeman Dyson!) has no trouble believing in the Ringworld (!), but can’t see why the engineers wouldn’t have built a lot of little ones instead. Wouldn’t it be safer. I hope the answer I’ve given in this book is satisfactory.

Of course there are no petrochemicals on the Ringworld. Frank Gasperik pointed out that any civilization at our level would be based on alcohol. The Machine People would be able to use the vegetable sludge for other purposes, up to and including a plastics industry.

During a speech in Boston someone in the audience pointed out that, mathematically, the Ringworld can be treated as a suspension bridge with no endpoints. Simple in concept; harder to build.

From all directions came news of the need for attitude jets. (During the 1971 World Science Fiction Convention, MIT students were chanting in the hotel hallways: THE RINGWORLD IS UNSTABLE!) but it took Ctein and Dan Alderson, working independently, several years to quantify the instability. Ctein also worked out data on moving the Ringworld.

Dan Alderson was kind enough to work out the parameters for the Ringworld

meteor defense for me ... and that was the only piece of information I actually solicited.

You who did all that work and wrote all those letters: be warned that this book would not exist without your unsolicited help. I hadn't the slightest intention of writing a sequel to Ringworld. I dedicate this book to you.

Part One

Chapter 1 - Under the Wire

Louis Wu was under the wire when two men came to invade his privacy.

He was in full lotus position on the lush yellow indoor-grass carpet. His smile was blissful, dreamy. The apartment was small, just one big room. He could see both doors. But, lost in the joy that only a wirehead knows, he never saw them arrive. Suddenly they were there: two pale youths, both over seven feet tall, studying Louis with contemptuous smiles. One snorted and dropped something weapon-shaped in his pocket. They were stepping forward as Louis stood up.

It wasn't just the happy smile that fooled them. It was the fist-sized droud that protruded like a black plastic canker from the crown of Louis Wu's head. They were dealing with a current addict, and they knew what to expect. For years the man must have had no thought but for the wire trickling current into the pleasure center of his brain. He would be near starvation from self-neglect. He was small, a foot and a half shorter than either of the invaders. He—

As they reached for him Louis bent far sideways, for balance, and kicked once, twice, thrice. One of the invaders was down, curled around himself and not breathing, before the other found the wit to back away.

Louis came after him.

What held the youth half paralyzed was the abstracted bliss with which Louis came to kill him. Too late, he reached for the stunner he'd pocketed. Louis kicked it out of his hand. He ducked a massive fist and kicked at kneecap, kneecap (the pale giant stopped moving), groin, heart (the giant bent far forward, with a whistling scream), throat (the scream stopped suddenly).

The other invader was on hands and knees, breathing in sips. Louis chopped at his neck, twice.

The invaders lay still in the lush yellow grass.

Louis Wu went to lock his door. At no time had the blissful smile left his face, and it did not change when he found his door fully locked and alarmed. He

checked the door to the balcony: bolted and alarmed.

How in the world had they gotten in?

Bemused, he settled where he was, in lotus position, and did not move again for over an hour.

Presently a timer clicked and switched off the droud.

Current addiction is the youngest of mankind's sins. At some time in their histories, most of the cultures of human space have seen the habit as a major scourge. It takes users from the labor market and leaves them to die of self-neglect.

Times change. Generations later, these same cultures usually see current addiction as a mixed blessing. Older sins—alcoholism and drug addiction and compulsive gambling—cannot compete. People who can be hooked by drugs are happier with the wire. They take longer to die, and they tend not to have children.

It costs almost nothing. An ecstasy peddler can raise the price of the operation, but for what? The user isn't a wirehead until the wire has been embedded in the pleasure center of his brain. Then the peddler has no hold over him, for the user gets his kicks from house current.

And the joy comes pure, with no overtones and no hangover.

So that by Louis Wu's time, those who could be enslaved by the wire or by any lesser means of self-destruction had been breeding themselves out of the human race for eight hundred years.

Today there are even devices that can tickle a victim's pleasure center from a distance. Tasps are illegal on most worlds, and expensive to make, but they are used. (A dour stranger wanders past, rage or misery written in the sour lines of his face. From behind a tree you make his day. Plink! His face lights up. For a moment he's got no worries at all ...) They don't generally ruin lives. Most people can take it.

The timer clicked and switched off the droud.

It seemed to pass in front of him. He reached across his mouth and to the

Louis seemed to sag in upon himself. He reached across his smooth scap to the base of the long black braid, and pulled the droud from its socket beneath the hair. He held it in his hand, considering; then, as always, he dropped it into a drawer and locked it. The drawer disappeared. The desk, which seemed a massive wooden antique, was actually paper-thin hullmetal, with endless room for secret compartments.

It was always a temptation to reset the timer. He'd done it routinely in the early years of his addiction. Neglect had made of him a skeletal rag doll, constantly dirty. Finally he had gathered what remained of his ancient dogged determination, and he had built a timer that took twenty minutes of nitpicking concentration to reset. On its present setting it would give him fifteen hours of current and twelve hours for sleep and for what he called maintenance.

The corpses were still there. Louis had no idea what to do about that. If he'd called the police immediately, it would still have attracted unwanted attention ... but what could he tell them now, an hour and a half late? That he'd been knocked unconscious? They'd want to deep-radar his head for fractures!

This he knew: in the black depression that always followed his time under the wire, he simply couldn't make decisions. He followed his maintenance routine like a robot. Even his dinner was preprogrammed.

He drank a full glass of water. He set the kitchen. He went to the bathroom. He did ten minutes of exercise, pushing himself hard, fighting depression with exhaustion. He avoided looking at the stiffening corpses. Dinner was ready when he finished. He ate without tasting ... and remembered that once he had eaten and exercised and made every move with the droud set in his skull, delivering a tenth of normal current to the pleasure center. For a time he had lived with a woman who was also a wirehead. They had made love under the wire ... and played war games and held pun contests ... until she had lost interest in everything but the current itself. By then Louis had regained enough of his natural caution to flee Earth.

He thought now that it would be easier to flee this world than to dispose of two large, conspicuous corpses. But if he were already being watched?

They didn't look like ARM agents. Large, soft in the muscle, pale from a sunlight more orange than yellow, they were certainly low-gravity types, probably Canyonites. They hadn't fought like ARMs ... but they had bypassed

his alarms. These men could be ARM hirelings, with friends waiting.

Louis Wu disarmed his balcony door and stepped out.

Canyon does not quite follow the usual rules for planets.

The planet is not much bigger than Mars. Until a few hundred years ago its atmosphere was just dense enough to support photosynthesis-using plants. The air held oxygen, but was too thin for human or kzinti life. The native life was as primitive and hardy as lichen. Animal had never developed at all.

But there were magnetic monopoles in the cometary halo around Canyon's orange-yellow sun, and radioactives on the planet itself. The Kzinti Empire swallowed the planet and staffed it with the aid of domes and compressors. They called it Warhead, for its proximity to the unconquered Pierin worlds.

A thousand years later the expanding Kzinti Empire met human space.

The Man-Kzin wars were long over when Louis Wu was born. Men won them all. The kzinti have always had a tendency to attack before they are quite ready. Civilization on Canyon is a legacy of the Third Man-Kzin War, when the human world Wunderland developed a taste for esoteric weapons.

The Wunderland Treatymaker was used only once. It was a gigantic version of what is commonly a mining tool: a disintegrator that fires a beam to suppress the charge on the electron. Where a disintegrator beam falls, solid matter is rendered suddenly and violently positive. It tears itself into a fog of monatomic particles.

Wunderland built, and transported into the Warhead system, an enormous disintegrator firing in parallel with a similar beam to suppress the charge on the proton.

The two beams touched down thirty miles apart on Canyon's surface. Rock and kzinti factories and housing spewed away as dust, and a solid bar of lightning flowed between the two points. The weapon chewed twelve miles deep into the planet, exposing magma throughout a region the size and shape of Baja California on Earth, and running roughly east and west. The kzinti industrial complex vanished. The few domes protected by stasis fields were swallowed by magma, magma that welled higher in the center of the great gash before the rock congealed.

The eventual result was a sea surrounded by sheer cliffs many miles high, surrounding in turn a long, narrow island.

Other human worlds may doubt that the Wunderland Treatymaker ended the war. The Kzinti Patriarchy is not normally terrified by sheer magnitude. Wunderlanders have no such doubts.

Warhead was annexed after the Third Man-Kzin War, and became Canyon. Canyon's native life suffered, of course, from the gigatons of dust that dropped on its surface, and from the loss of water that precipitated within the canyon itself to form the sea. In the canyon there is comfortable air pressure and a thriving pocket-sized civilization.

Louis Wu's apartment was twelve stories up the side of the north face of the canyon. Night shadowed the canyon floor as he stepped outside, but the southern face still glowed with daylight. Hanging gardens of native lichen dripped from the rim. Old elevators were silver threads standing miles high against the cut stone. Transfer booths had made these obsolete for travel, but tourists still used them for the view.

The balcony overlooked the belt of parkland that ran down the center of the island. The vegetation had the wild look of a kzinti hunting park, with pink and orange blended into the imported terrestrial biosphere. Kzinti life was common throughout the canyon.

There were as many kzinti as human tourists down there. The kzinti. males looked like fat orange cats walking on their hind legs ... almost. But their ears flared like pink Chinese parasols, and their tails were nude and pink, and their straight legs and big hands marked them as toolmakers. They stood eight feet tall, and though they scrupulously avoided bumping human tourists, carefully tended claws slid out above black fingertips if a human passed too close. Reflex. Maybe.

Sometimes Louis wondered what impulse brought them back to a world once theirs. Some might have ancestors here, alive in frozen time in the domes buried beneath this lava island. One day they'd have to be dug up ...

There were so many things he hadn't done on Canyon, because the wire was always calling. Men and kzinti had climbed those sheer cliffs for sport, in the low gravity.