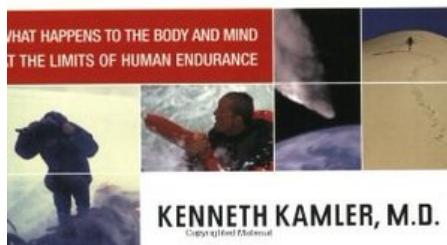




# SURVIVING THE EXTREMES



## Surviving the Extremes: What Happens to the Body and Mind at the Limits of Human Endurance

*Kenneth Kamler*

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## **Surviving the Extremes: What Happens to the Body and Mind at the Limits of Human Endurance**

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A true-life scientific thriller no reader will forget, **Surviving the Extremes** takes us to the farthest reaches of the earth as well as into the uncharted territory within the human body, spirit, and brain. A vice president of the legendary Explorers Club, as well as surgeon, explorer, and masterful storyteller, Dr. Kenneth Kamler has spent years discovering what happens to the human body in extreme environmental conditions. Divided into six sections—jungle, high seas, desert, underwater, high altitude, and outer space—this book uses firsthand testimony and documented accounts to investigate the science of what a body goes through and explains why people survive—and why they sometimes don't.

## **Surviving the Extremes: What Happens to the Body and Mind at the Limits of Human Endurance Details**

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# From Reader Review Surviving the Extremes: What Happens to the Body and Mind at the Limits of Human Endurance for online ebook

## Bernie Gourley says

The title says it all. This is a book about all that can go wrong with the human body when it's exposed to the most extreme conditions possible—including places where no human can survive without the benefit of modern technology. The medical science provides plenty of tidbits of fascinating food for thought, but it's the stories of survival (or, sometimes, the lack thereof)—many of which the author, Kenneth Kamler, M.D., was present for—that make this a gripping non-fiction read.

There are only six chapters, addressing survival in the jungle, on the high seas, in the desert, underwater (diving), high in the mountains, and in space. There's also a prologue that sets up the book with examples from Dr. Kamler's experiences at high elevation (specifically Mount Everest.) Each chapter is full of illuminating stories about the threats to human life that exist in all of the aforementioned environments. The author is a hand surgeon who made a secondary specialization through expeditions to extreme environments to deal with the maladies that are largely unknown to the average person's day-to-day existence—from pulmonary edema to exotic Amazonian parasites. A few of the chapters feature mostly stories of Kamler's own experiences. These include the chapters on the jungle, deep-sea diving, and high altitude climbing. For other chapters Dr. Kamler draws together fascinating cases of survival and perishment in extreme environments such as living in a life raft on the high seas.

Besides considering what might kill you in extreme places, this book also reflects upon a couple of other interesting tangential questions. First, what adaptations (cultural or physical/genetic) do the locals have who live at or near these extremes that allow them to live? A fascinating example of this seen in the explanation of how Sherpas of the Himalayas differ from the Andean Indians who live at high elevations in terms of their biological adaptations to elevation. These two peoples living under similar conditions share some common adaptations, but other adaptations are quite different. On a related subject, Kamler also looks at what adaptations other species have developed to allow them to be so much more successful in some extreme environments (e.g. seals in water.)

Second, the role that x-factors like belief and will to survive play are never shunted aside as irrelevant anomalies by the author. Kamler devotes an epilogue to the subject of will to survive. Dr. Kamler was at one of the camps above base camp on the day of the 1996 Everest tragedy in which 12 perished. Kamler saw and advised on the treatments of Beck Wethers and other severely frostbitten climbers. Wethers's story is particularly fascinating as he lay freezing in the snow overnight in a blizzard, apparently snow blind—though it later turned out to be an altitude related problem with an eye surgery (radial keratotomy)—before climbing to his feet and shambling into the wind (his only guide to where the camp might be.) Kamler considers the science of how Wethers neurons might have fired to get him to his feet against what seems like impossible odds, but concedes there's much we don't understand about what separates survivors from those who succumb.

I found this book to be fascinating and would recommend it to anyone interested in questions of what a human is ultimately capable of. If you're interested in medicine, biology, or survival, you'll likely find this book engaging.

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## Kristopher Swinson says

Kamler is very approachable, seeming to possess the requisite character for a doctor on tightly knit teams, including a sort of humility before greater forces and even (subtly) God. His trace of humor grew more obvious toward the very end. I was willing to put up with extensive (and unexpected) technical details for the overall surprisingly good literary style, to say nothing of the fact that one shouldn't complain about learning, or having to think, more than one had bargained on!

His fascination with evolutionary concepts begins to grate, sufferable because of its insight into the extraordinary mechanisms of the human body. He nonetheless inserts an apparent admission that the ultimate spark of life, which has startled him at a sudden and essentially impossible resurgence of will to survive, could well come from God (see 72, 280-281, 291-292).

His account does get intense, remaining practically instructive nearly every step of the way. Consider that on the side of Everest, having carefully pondered four yaks' load worth, he had "brought surgical instruments but not a cardiac defibrillator. They are heavy and bulky, and any climber needing one was probably going to die anyway" (196-197). He described some intriguing need for constant improvisation. Dude, having an Amazonian army ant snap its pincers over a wound, then twisting its head off, to serve as a suture? Unreal! (See 58-59, 79.)

In mentioning the stark environments into which man now ventures, he stated that germs subjected to space radiation "have most likely undergone frequent mutations and evolved through thousands of generations, adapting rapidly in order to ensure their own survival--not yours" (266).

Kamler concluded that "probably at least five out of six people alive today depend on society's support and protection for their existence" (278). I think this representative sample expresses the urgency behind this study:

In societies where life has gotten comfortable, the will to survive remains latent. It is perfectly possible now to cruise through life without ever taking a survival test. . . . The idea of a survival test becomes a mockery when failure means nothing more than getting dropped from contention on a TV show. . . .

One of the few settings where the ability to survive is still critically analyzed and tested is in the training of military commandos, such as Navy SEALs. Though candidates have already been preselected for strength, stamina, and intelligence, the program completion rate is only about 50 percent. Instructors say the successful candidates tend to be the quieter ones who possess the inner strength to keep their bodies and minds functioning beyond exhaustion. One Navy SEAL instructor told me that at the end of 'Hell Week,' a grueling final exam of physical and mental exercises with very little sleep in between, the sailors are allowed to collapse on the beach. He then says to them, "Okay, everyone up for a ten-mile run." There's no run, but it tests to see who has the spirit to go on. The ones who stagger to their feet are accepted as SEALs. (277)

That's why Jack Dempsey said, "A champion is someone who gets up when he can't." Either he or someone

else--sorry, I'm at the library at the moment--stated that the way to win is to simply get up, time after time. Eventually you'll outlast the opposition.

After his sections led through multiple extreme environments (i.e., jungle, high seas, desert, underwater, high altitude, and outer space), I was stoked for his experienced wisdom. In part, I'm studying this very theme, and I'd like to think I possess the true "survivor" common characteristics he boiled down (275-276): 1) knowledge; 2) conditioning; 3) luck (including keeping one's head and reducing the extent to which one must rely on "sheer" luck); 4) the will to survive.

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### **Annette Rodriguez says**

Incredible accounts very poignantly written. However, I could have done without the Mars account, since it was the only one without any research based on real experiences. We will have a book about that soon enough.

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### **Jacqueline Hartnett says**

Surviving the Extremes is an exciting, adventurous, and thrilling non-fiction book. The book title describes the whole book. This novel is about Dr. Kenneth Kamler and the different adventures he has experiences in a variety of different settings ranging from the dry, desolate, desert to one of the coldest and highest places on Earth, Mount Everest. The book goes into detail on how different environments affect the human body on a molecular cellular level. Each chapter is in a different environment and is a totally different story/ experience from the last chapter, which keeps the reader on their feet. I read this book for my honors anatomy/ physiology class in school and it was nothing like I thought it would be. It does have many facts in it but, it tells fantastic thrilling stories which made me want to keep reading. It was a great book to read for this class because it allowed us to connect what we were learning in class to real live stories. I would definitely recommend this book to anyone who is interested in the medical field and wants to learn more about the human body under extreme conditions. Surviving the Extremes is also a great adventure book and it always keeps the reader excited to read more.

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### **Lisa says**

My kind of book! I'm drawn to survival stories of all kinds. This book provided explanations for what happens to people physically and mentally in various extreme situations. This was a satisfying read for one who has enjoyed survival books from Little House in the Big Woods to Hatchet, and from Into Thin Air to Survival in Auschwitz. Guess I'm just a survival nerd.

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### **Kassilem says**

This was a fascinating book! I knew I would like it when I bought it for my 'human variation' class a few months ago. I didn't know it until just two minutes ago but Ken talks about a tragedy on Everest in this book which is actually what the book 'Into Thin Air' by Jon Krakauer is about, a book I have wanted to read for a

while. But really, what I loved about this book was the knowledge available here. There are tons of facts here about what your body goes through molecularly and macro-ly when under extreme whether that extreme pressure, not enough pressure, searing temperatures, searing cold temperatures, etc. There's some very handy advice prevalent throughout the book. There's stories of tragedies and miracles. And Ken is a pretty good writer as well. The only quirk I noticed that stuck with me is that the first chapter on the Amazonian jungle felt more like a memoir while the rest felt like what I had expected – humans surviving in extremes. There was too much narrating his own experience in the jungle. But that was the only chapter that I thought it was too much. The book is highly readable in my opinion. I would recommend it to anyone interested in the human body, the human will to survive, and/or the world's extreme environments. I feel this book can offer a lot to a lot of different people.

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### **Bret Dougherty says**

From survival in the depths of a South American jungle, to episodes of starvation and desolation of the high seas, to the vast range of extreme heat and cold desert temperatures, this read forces you to realize the challenges that the body and mind can overcome.

I gained a ton of knowledge nuggets from this book. I have to admit that the tales of survival and the ability to forge ahead when all else upends glued my attention throughout the read...(How to survive in a jungle hit me the most.) This book is an intense yet fun read for survival in the elements, knowledge, and for uncovering facts about the extremes that a body can endure.

When the mind believes something strongly enough, the mind can will the body to make it so. Whether you're bonking deep into the running stage of a triathlon, or squandered in loneliness and desolation of working a deal filled with obstacles, the mind will overcome...and your body will follow.

Double thumbs-up for this read.

-BD

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### **► M I A says**

The only reason I dropped this from a 4 star to a 3 star is because I felt like I couldn't take a breath through the span of each *massive* chapter (if you can even call them chapters). Because there wasn't a lot of breaks and not a lot of methodical organization, I found myself zoning out or getting lost in Kalmer's endless descriptions and (for lack of a better phrase) word vomits. The content was fascinating and quite enjoyable to read, but not in such exhausting density. I felt like I was reading excerpts of a high school anatomy and physiology text book at times. Kalmer obviously is a doctor/scientist/adventurist first, and a writer second. Nevertheless, for a book I had to read for school, it wasn't half bad.

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### **Lizz B says**

Surviving the Extremes is exactly what it sounds like-- a book about the extreme. From the coldest mountains in the world to the swampy, muggy areas of the Amazon rainforest, to the great vastness of space,

the author took us from place to place, describing events that had happened to unfortunate human beings who survived despite the odds. This book was both intriguing and terrifying; I didn't know humans could survive for days/weeks/months at a time in places like the desert or lost at sea, but at the same time, I NEVER want to find myself in a position to do what they did. Like the Uruguayan sports team that crash-landed in the mountains and resorted to eating the dead players? YUCK. No, thanks. Overall though, this book was an interesting read, especially from a medical perspective.

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### **Petra CigareX says**

The opening scene of the book is a man who should be dead on Mount Everest being kept alive by the Buddhist chanting of the Tibetans, which was, perhaps, vibrating at the same resonance as the electric impulses that kept his heart beating. And, perhaps, in the same way that vibrations are multiplied when that happens to a glass and it shatters, the heart muscle is strengthened to keep going.\* Reading this and the explanations of why things happen when man adventures to extreme zones, is so interesting. And it's not at all heavy - in fact it's unputdownable. (\* glass breaking video)

There are five sections and a Conclusion. Some chapters I could relate to more than others. The first section was on the Amazon jungle where the author was participating in a crocodile survey. His description of going out hunting with an Indian in a canoe at night, catching crocodiles was spot on, except they used a lasso and I used my bare handies.

In my sailing days, I was lucky that the little yacht I was on sailing across the Atlantic on didn't get wrecked in the storm the night I was on the helm and it blew us 24 hours distance in just 9. I'd reefed in the sails, the boat was on autopilot, so I put on my lifeline and lay down to be entranced by the pod of 12 or so dolphins playing around the boat. I related to that chapter, the High Seas, with OMG would I have known what to do?

The third chapter was on the desert. I had only one bad experience in the desert and it wasn't of the nature of being lost, as in the book. No, I was camping in the Sinai at an oasis on the Red Sea and I had on a rather small bikini held together by a ring on the top and one on each hip. I fell asleep in the sun under some shade, but as time passed the sun moved and when I woke up, I had terrible burns where the metal rings were and on the creases of my buttocks and thighs. The Bedouin told me that in order not to have cracked skin the next day - which would have meant I wouldn't be able to stand up - I should put on a layer of thick, drained yoghurt a couple of times in the night.

I couldn't move to go back to our camp so I just lay there and my friend cut off my bikini to slather my bare bottom, hips and thighs with thick yoghurt. As evening drew in, campers and Bedouin from all around came to gather for a drink. My white ass, gleaming in the light of the full moon, made me a beacon. Everyone, but me, had fun that night.

The next chapter of the book is on undersea, the most hostile environment on Earth. Astronauts train for months on end down there, living in a little watertight container and going on 'space' walks. There was a funny story about pile drivers building bridges way back when who worked in wooden tunnels. Because of the build-up of nitrous oxide as they worked, they experienced the raptures of the deep and ended each day in very good moods singing and cracking jokes. I bet that was a popular job. I don't scuba dive as I get very bad cramps, I just snorkel which isn't the same thing at all.

The penultimate chapter is on high altitudes. The author climbed Everest as a doctor the same year, 1996, as

Jon Krakauer did and wrote his book, *Into Thin Air*, of that disastrous season when 15 climbers died. It was another perspective of the same event and tremendously interesting. I've never climbed mountains. I once went up Teide in Tenerife, the Canaries, in a cable car, getting out to climb the last 500'. I got a terrible headache and couldn't breathe, after about twenty yards, altitude sickness. So I went down one level and sat in the mountain lodge sipping hot chocolate topped with cream and nuts while I waited for my friends to puff on back down.

Outer space, a trip to Mars is the last chapter and this is a far more serious and interesting, detailed explanation of what it's really like and, physiologically, why, compared to Mary Roach's rather dumbed-down but still very enjoyable, *Packing for Mars*

There was also some amusing trivia thrown in, like the fact that you see women astronauts with the ultimate big hair from the lack of gravity. It's only for the cameras. The rest of the time, for safety, they have to wear hair nets. Another one: space craft are smelly places. The reduced air pressure means that gas expands, including the gas in the body, and it has to come out. I wonder if they include dehydrated baked beans on the 120-item menu?

The Conclusion is a round-up and interpretation of the author's experiences as a doctor, a participant, a scientist and an interested visitor to ethnic cultures and non-traditional medicine. It's a wonderful read. I bought it hardback and I'm so glad, it's a book I want to own.

Read Jan 12, 2011. One of the best books of the year. Review edited (a lot) March 2014 on rereading some of it.

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### **Sydney says**

I read this book for a biomed class at my school, and it surpassed every expectation I had for it—namely, that it would be boring, or purely factual. What I found instead was a novel with intriguing ideas which came from a synthesis insightful pieces of philosophy, incredible true stories of both survival and tragedy, and exceptional descriptions of scientific fact. It was a book I expected to trudge through at best, and so it was a really pleasant surprise for me to enjoy it wholeheartedly. I'd recommend it for any perspective medical student, or just someone looking for a suspenseful nonfiction read.

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### **Melanie Forstrom says**

Very interesting interwoven tales that tell compelling survival stories, and give you a better understanding of the human body as well as evolution like the gem below. Prob would have given a 5 except I HATED the way the chapter from outer space was written.

“In temperate climates, air temperature is generally lower than body temperature , and as a result, body heat is constantly being given off into the space around it ( radiation). The rate of heat loss depends upon the temperature differential between the environment and the body. When the air is 16 degrees F cooler than the body, the rate of heat production is exactly offset by the rate of heat loss. This means that the human body will be in optimum heat balance when the outside temperature is 82 degrees F. That's the average temp on the African plains; one solid piece of evidence that human life evolved there.”p 128.

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### **Skyelar McQuillar says**

I recommend this book strongly to anyone interested in the medical field or someone who loves to learn about how the body works during intense conditions like being stranded in the desert or on sea. I reached my reading goal because book was over almost 100 on my lexile score.

Reading goal: read a book at or above my exile score.

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### **Paul Ison says**

I really enjoyed this book. It may be because this is the perfect merging of two of my favorite interests - the science of the human body and stories of extreme adventure. Written by a surgeon who has explored and experienced many interesting adventures himself, this book deals with the frailty of the human body and the various ways we can perish in extreme environments. Traveling through the Amazon, to climbing above the death zone at Everest, to free diving, and traveling in space, the author uses his own experiences to explain what allows us to survive in each situation. Well written, informative but not too technical, this book was one that I couldn't put down.

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### **Sunflower says**

Another book I'm writing about several weeks after finishing. Each chapter of this book is a different "extreme" including altitude and depth including hyperbaric environments, and extreme heat vs cold. The author has been at a number of high profile places and events, including working on Mt Everest during the disaster where several people died. Interesting career.

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