



Epilogue

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In theory, scientific work should be detached from emotions. Science belongs in the realm of objective knowledge, the field of irrefutable truths, the space of testable hypotheses, the universe of demonstrations and theorems. Emotions, in contrast, reside in the impetuous terrain of passions and subjective feelings. But what is reality if not the result of perceptions? What meaning does the natural world have if it is not seen through the eyes of commitment, if it is not sensed with eagerness, if it is not lived with emotion?

Perhaps because of this apparent contradiction between scientific objectivity and the passionate commitment for nature conservation, the day we finished our expedition we were all feeling a lump in our throats, and some had their eyes moist with emotion. We had lived some of the most intense weeks of our lives, surrounded by strange and wonderful life forms that perhaps we were not going to see ever again, and the group had worked with a commitment and a dedication that we had rarely seen before. The richness of the creative interaction between the group and the submarine world we had entered took over our feelings.

Biology often teaches us that evolution is a matter of supremacy between organisms, of competition between species, of killing or being killed. We often see evolutionary change chiefly as the result of nature red in tooth and claws. But in the sea mounts, however, life seems to be rather a feast of cooperation and symbiosis. During our expedition we could see the dance of fishes in large reproductive aggregations, we dived among them and could observe closely their living frenzy. A whale shark followed us for two days,

coming to our encounter each time we dived; two species in direct contact in a biological interaction that seemed more about rejoicing than it was about aggression.

And we saw the waterfalls descending from the high peaks of the Sierra de la Giganta, sparkling and glittering under the sunset light after Tropical Storm Julio brought its pulse of life and nutrients down into oases and estuaries and coasts and mangroves. The desert and the coast changed in just a few hours to cover themselves in green.

We saw crabs that looked as if made out of porcelain, sheltered within the branches of corals and protecting the health of their hosts by driving away any predator that dares to approach. And small shrimps that mimic exactly the color of the coral that gives them refuge, feeding on the mucus that is secreted by the polyps while cleansing the surface of the colony from potential infections from microbial diseases.

And we dived among multitudes of reef fishes, with the most extraordinary colors one may imagine; cryptic colorations with which they hide from predators, dazzling hues that signal reproductive preparedness and attract the best mates, thousands of designs and patterns and forms used to seduce sexual partners, to hide from possible assailants, to attract beneficial species. Forms, colors, chemical messages, and ritual choreographies that send other individuals unmistakable signals, attract reproductive individuals to the aggregation, motivate a couple to spawn together, or disguise organisms in a camouflage so perfect as to become undistinguishable from their surroundings. Subtle signals that guide the swimming of fish or direct the vertical movement of small crustaceans floating in the water column.

The seamounts vibrate in a communication web of their own.

We often see nature as a universe of death and conquest, but visiting the seamounts of the Gulf of California it became apparent to us that the survival of life on earth is based on cooperation as much as it is in struggle and contest. In the seamounts, the flow of life is fundamentally the result of interactions for survival and reproduction.

Or, putting it in direct terms; of symbiosis and sex.

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Whale shark *Rhincodon typus*.
Photo © Octavio Aburto-Oropeza.

We collected new species that will keep expert taxonomists busy for years. We measured densities, we counted species, we estimated the biodiversity, and we organized archives of images and video as a baseline to monitor environmental changes in the future. But in only ten days, we could only but glance into a fraction of this wonderful, unknown universe. So many species remained to study in more detail, so many environments to explore deeper, so many things to learn, so many questions to answer.

But we were able to understand that these seamounts are sites of immense biological richness, degraded by depredatory overfishing but with the potential of recovering, and still treasuring this unique fraction of our planet's evolutionary richness.

In extension, the seamounts and coastal rocky reefs of the Gulf of California occupy only a hundred square kilometers, less than a thousandth of the entire Gulf's area, but provide reproduction havens for a disproportionate amount of fish species of great commercial value. Together with mangroves, where myriad open-sea fishes spend their juvenile stages; the upwelling areas of the Midriff Islands, which support the large Gulf fisheries of sardines and anchovies, and the rich tidal flats of the Upper Gulf, which maintain the fisheries of shrimp and corvina, the seamounts are a keystone habitat of the Gulf's large marine ecosystem. Here is where open sea species find food, here is where they find habitat for reproduction, here is where a large fraction of the Gulf's reef life finds refuge,

There was a time in which humans were also a functional part of nature, of this chain of symbiosis and passion of the senses. A time in which we made our houses with mud and stone and plant remains, in which we dyed our fabrics with the purple secretions of the murex snails, in which we painted our houses with the spotless white of kilned limestone, formed by millions of years of accumulated marine sediments. A time in which we were able to obtain our food from the sea without devastating and razing the sea bottom into an underwater desert. A time in which we protected the desert oases to water our crops with green vegetated ditches, in which we shared water with the rest of live species instead of ransacking it from the entrails of the earth. A time in which mangroves lived with

lived with the freshwater that flowed down the rivers and delivered their richness of fish and larvae and nutrients into the open sea. Until only a few centuries ago humans were unquestionable part of the immense living network of the natural world, indivisible part of the complex web of life. There was a time, to conclude, in which we understood the signs and messages of the rest of nature and we spoke the language of the earth. Then came the indiscriminate looting of the seas and, with it, the collapse of global fisheries: cod in the North Atlantic, sardines in California, anchovies in Peru, blue fin tuna in the Mediterranean, sharks in all seas, and the decline of the big fishes.

The expedition to the seamounts led us to try to articulate again that ancestral language of life, to vibrate in synchrony with the immense network of living signals of the reef.

We could appreciate firsthand that our seas and our coasts, so highly productive and so rich in resources, are also immensely fragile. Like submerged islands, like underwater oases, the life spawned by these ecosystems disperses throughout the Gulf of California and perpetuates the entire marine ecosystem.

The conservation of the seamounts is vital. As sites of reproduction and spawning they ensure the health of the whole marine ecosystem, and indispensable step in ensuring the viability of the whole region. But the conservation of the seamounts is also a moral obligation, an issue of pride and belonging, a responsibility of Mexico with its natural legacy.

The submarine richness of the Gulf of California opened its doors to our visit, but upon seeing the beauty of deep life we could also see, with some fear, our own selves and our destructive capacity. And we could understand the immense responsibility that rests upon our shoulders.

Over the breathtaking background of a sunset over the Sierra de la Giganta, the DeepSee submersible returns to its nurse boat Argo after the last dive of the day on Bajo San Marcial.
Photo © Lorenzo Rosenzweig.

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Evening twilight in Bajo Las Ánimas: yellow groupers *Lutjanus argentiventris* and a blue-chin parrotfish *Scarus ghobban* search for a safe place to spend the night, while the orange cup-corals start to open their polyps to feed from the rich nutrients suspended in the water column. Photo © Octavio Aburto-Oropeza.





