

## **The Age of Discoveries and the Space Age: A Comparison**

**By Bernardino Palma**

The sea, the never ending sea.

The universe, the infinite universe.

So different and yet so much alike in their immensity, their depths, and their darkness.

What separates or differentiates the questions that lurked in the minds of ancient sailors, from today's space explorers?

Not much.

What's out there?

Are there other worlds?

Can we reach them?

And in the end and always, the only possible answer to this questioning:

Without attempting to navigate through it, be it the sea or the universe mankind would, and will, probably never know.

So, how can we not compare the space age with the age of discoveries?

Space to us, with its vastness and its mysteries, is what the sea represented to mankind eons ago. Dark, unknown, huge and mysterious.

The question of what might be out there prevailed in people's minds.

And still we repeatedly mention this human curiosity for the unknown, but tend to forget the more than human feelings of independence and freedom, one would experience when out at sea or, as a matter of fact, out in space, in addition to the perceptiveness of our smallness in face of the greatness of the ocean, and the immensity of the universe.

The appeal of the sea back then, and the appeal of space nowadays can be rationally explained by the desire for new discoveries, new opportunities and, why not, new businesses, meaning new solutions to some old problems.

But what's really underneath that rational, and one could say, mercantile way of thinking, are some old age questions that have haunted us over and over again, since the beginning of man's ability to reason.

Who are we?

Where do we come from?

Where are we headed, and what's out there?

To someone living on the seashore, both elements of water and air, sea and sky, are so closely intertwined that one almost has the feeling they are, in some magical way, one and the same.

Looking out into the horizon, there are times when one of these elements seems to be the natural extension of the other.

On a clear and still night, when the darkness of the sky speckled with a myriad of stars, is reflected on the dark waters of the ocean, an intriguing and bewildering illusion is created, making us almost believe that what is below is the mirror image of what is above.

Or at dawn, when the universe itself reflects on small shallow pools, left by a low tide among the rocks, comprising a palette of colors ranging from clear and light greens, to cobalt blues, surrounded by wisps of violet.

To those ancient people that lived close to the sea, the sight of the fiery orange-redness of the sun plunging into the cold silvery-blue waters of the ocean, turning those same waters into a golden colored road, stretching from the slowly disappearing solar disk, and changing into a Bordeaux causeway before invading the wet and hard sand of the shoreline, must have affected and spurred up their imagination, comparable in a much similar way to our bewilderment and awe, when faced with today's beautiful and inexplicable images of far and distant galaxies, interstellar clouds and quasars, taken by powerful telescopes.

Looking up to the skies and across the waters, they realized that they were surrounded by something grand, something too extensive and too beautiful to be truly understood and, most of all, something not to be ignored.

Tales, stories and myths were born.

And so were dreams.

But there were still many questions to be answered,

Mankind was still inhabited by fears, and the seas enclosed by darkness.

On one hand there was the curiosity of what might lie beyond, as tales and fables of faraway lands and distant worlds became common. On the other, there was the constant fear of sailing into uncharted waters, inaccessible rough seas, and not knowing what to encounter.

There were talks about extreme temperatures, where the heat of the sun was so strong that it caused the ocean water to boil. Or the opposite, where the waters

were practically frozen over, littered by icebergs as big as the highest mountains. And then there was the ever present and horrible fear, of potentially falling prey to attacks by an infinite number of sea creatures and monsters, invented and fantasized by man's own inability to explain natural phenomenon.

Curiosity, adventure, ambition, fear, and superstition, ran side by side.

Should they risk and initiate a new type of journey, or should they stay in their homelands, accommodated to a simple but much safer life?

That was the question back then, and that was still the question not long ago.

There was a chant of the mermaids then, as there is a pulse of the stars now.

It's in our nature to sit, observe, and wonder, as ancient mariners did. But it's also deeply imbedded in our brains to question, and to try to find answers to newer question that always arise, after solving some old problems.

To me, that was the beauty of the age of discoveries, and that is the beauty of today's space age. Questioning, so that one can find new answers, and new worlds, for the world.

In the late thirteen hundreds, and early fourteen hundreds, a new breed of men started to emerge. Men with a more scientific view of the world surrounding them. Men that made questions.

In Portugal men like Prince Henry, the Navigator, and later on king

John II had the foresight to understand that only by bringing together people with innovative ideas, and by testing out those same ideas, could there be an evolution and a change in their way of life. Probably a change for the better.

Of course one might argue that they were dreamers.

Maybe they were.

But they were dreamers with a constant need for information, with a desire to solve any problem that could arise, not only nautical, but in any field, be it architectural, hydraulic, medical, or military.

The technological element became as essential to these true men of the Renaissance, as it is today.

With Prince Henry of Portugal renounced to the old ways of sailing, always within site of the coast and, instead, entered into the unknown.

All of this did not happen by chance, of course. Not much does, really.

Going back in time we now realize that work was being done, leading into that specific direction. An extraordinary effort was put into this, for to organize a quest of this magnitude was no easy task.

Sailing manuals had to be devised, with the newest astronomical and nautical instruments put into practical use. The top cosmographers, geographers, and mathematicians in Europe were employed, starting the process of charting lands and oceans.

But more questions aroused.

Ptolemy's and Eratosthenes's geographies had to be wrong: they didn't make sense. And there were still memories and talks of early Phoenician and Carthaginian Argonauts, like Psametic and Hannon, sailing around Africa.

Maybe it was possible.

To these early men of science, this questioning of what might exist across the waters became a fixed idea. To Prince Henry, it became his lifelong challenge. Though he surrounded himself with the top scholars and sailors of his day, he knew it would be no easy job. Criticism abounded. Especially from some clerical fields. And the political weight of religion, in those days, was extreme. Diplomatic efforts had to be taken, to ensure the success of the endeavor.

This breed of men, who looked with different eyes at the stars and at the sea, who found themselves surrounded by an immensity of blue and depth, above and below, felt that they could not be shackled to the old world. With time they realized that the dangers implied, and the price one would have to pay, would be high. They understood that this would be a process of trial and error. And yet they continued, against so many odds, for to dream was not enough. They had to fulfill that dream.

Among the new arising problems was the impossibility of sailing, using the stars as your guide, once you've crossed over the line of the equator, to the south. The sky was different, and the stars were different. There was no Polar or Northern star to be seen. Before them, at night, stretched a whole new universe. Astronomers and mathematicians came up with the idea of calculating the height of the sun, at mid-day, therefore creating declination tables, to ease the work of sailors and explorers.

More and more men took to the water, especially young ones. With so many of them being tempted by the sea, a shortness of able labor, specifically in the highly rural economy of the period in question, became more and more perceptible.

During the "Cortes" (periodically held meetings, attended by the king, the high clergy, the nobility, and representatives of the common people) of 1481-1482, King John II received a petition from the major landowners and noblemen of the country, soliciting the prohibition of their sons working in what they considered better paid "mechanical jobs", so as to bind them to their land, and to continue with the sort of noble work their ancestors had led for ages.

John II, who had an acute liking for all sorts of technology, replied that access to the so-called mechanical jobs should be denied to no one, not just because it was of human nature to seek a better life, but because it meant the country, in this way, would enter a modernization mode, due to that technological element.

We know, today, he was right.

To the higher classes of the day, this reasoning must have seemed like sure madness. To leave the old and secure farming and cattle raising methods, and embark, literally, on the gamble of reaching new lands, new worlds, establish new trading routes and, most likely, not discovering anything worth discovering, not coming back, and probably succumbing to some anonymous and unfortunate fate.... No, the king was suffering from delusions.

But the king's way prevailed.

The crown took it upon itself to create "files", of the "wisest men in the country, on whose authority and sentences it might rely." This allowed the king the possibility of knowing on whom to question, on whatever matter he might have doubts, at any time. It also supplied him with a circle of trustworthy and highly knowledgeable people, integrating them into an innovative, but successful, team working spirit.

Within a few years, and due to this "think-tank," new designs and new rules were applied to shipbuilding, now dependent on predetermined mathematical grids, based on scientific equations, ascertaining weight/dimension, thus allowing vessels of over one thousand tons to be built. Greater tonnage meant more room and space to accommodate goods and commodities. One thing led to another, and with a greater amount of trade, another problem appeared on the horizon: maritime commercial law. By 1488, the first systematic insurance treaty on sea trade was devised.

During the age of discoveries, geometry was one of the most, if not the most, important discipline to be studied. Particularly in architecture, this discipline became of extra importance. New systems representing new spatial configurations of forms, as seen from every conceivable angle, gave another perception regarding earth's geography. The first maps and charts depicting latitudes are from this period.

It's also interesting to note that this desire for knowledge in every area led to the point of very strict royal orders being issued to the captains of the vessels sailing in exploratory expeditions, of having to take extremely precise notes on everything they saw or witnessed, every day, mile after mile, so that these notebooks could be analyzed by the royal court immediately upon their arrival.

These were no ordinary log books.

Thus, not only did people find out, and marvel at, what had been discovered in faraway lands, but they were able to know the truth about the fabled and imaginative perils they had believed in, that came along with these voyages.

Newer problems were forever arising, and newer solutions had to be found. In part because of this, the concept of technological assistance was revived, being unheard of since the fall of the Roman Empire. For example, new and more efficient water pumps, and new and more sophisticated types of rigging were being devised, along with technicians capable of installing them. Maintenance, not only technology, became a priority.

This great period brought a gathering of top scientists in the search for new technologies, concern for maintenance, and an acute perception of what quality control should be like. People's lives depended on this.

Does any of this sound familiar?

Someone said, a long time ago, that there was nothing new under the sun. In a certain perspective, one might say it is so.

But is it?

Didn't the age of discoveries prove the contrary?

Are we not, in this space age, doing the same?

In the term "astronaut", and in its eastern European terminology "cosmonaut", the root "naut" is present.

Naut. A man that is involved in some form, or way, in a nautical process. A sailor.

An astronaut, or a cosmonaut as a matter of fact, is a sailor of the stars, of the cosmos. There can be no better description for someone who, after all, is sailing through space, into the unknown. Now, as then, our search for that vast unknown continues, and is forever present.

The sea was there to sail. The universe is here to navigate.

The dream that existed back then, is the same dream that exists today, set in a different, but just as perilous environment.

It was time then, as it is now, to fulfill it.

That dream lives on.

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**About the Author:** Mr. Bernardino Jose Palma is a Portuguese Age of Discovery Historian, who gave Dr. Bob and Sue Krone a tour of Cabo de Roca, on the Atlantic Coast of Portugal, where Age of Discovery ships departed from 1394 to 1580. It was this tour that stimulated the founding of the *Journal of Space Philosophy* in the Fall of 2012. Readers can find a short video of Mr. Palma at [www.youtube.com/watch?v=azC6DX2Jr\\_g](http://www.youtube.com/watch?v=azC6DX2Jr_g).



**Editors' Notes:** We thank Mr. Bernardino Jose Palma for this second historical addition to the *Journal of Space Philosophy*. ***Bob Krone and Gordon Arthur.***