The secret of long life

TRASSIC TRASSIC

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A documentary of 52 minutes by **LUIGI CAMMAROTA**



Produced by sci cinematografica

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▶ INTRODUCTION

TRIASSIC PARK "The secret of a long life" _{by}

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Luigi Cammarota

Concept and collaboration Maria Giovanna Reggiani

mages of a vanished world re-emerge into the sunlight from the depths of the Earth under the Italian Dolomites in the Southern Alps. In one of the most exclusive and fashionable mountain locations in the world, a group of European researchers have found traces of amber from the Triassic period. An amber among the oldest on the planet.







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► INTRODUCTION

It is our own world, 225 million years ago!

Amber, known to the Greeks as "electron", was considered a mythical substance, a remedy for diseases, a talisman. In reality it is a vegetable resin produced by plants to defend themselves against external attacks which, through a process lasting millions of years, became a natural plastic.

It is the most ancient witness to life on Earth to come down to us in organic form!

Scientists have found a fragment of amber containing a unicellular organism "imprisoned for eternity" at the moment of

reproduction. It is a snapshot of a moment of life on earth, printed 225 milion years ago.

But the scientists want to probe much deeper.

With a scanning electron microscope it is possible to penetrate the structure of the substance, pushing beyond the limits of our knowledge of the mechanisms that regulate the path of evolution.

What could these drops of Triassic amber contain?

A simple and disconcerting truth

Today's most elementary organisms such as algae, fungi and protozoa have remained identical to those 500 million years ago. These "beings" have managed to survive all intervening environmental catastrophes – unlike the more evolved and complex species such as the dinosaurs, the sabre-toothed tiger and, sooner or later, humans.

Could the secret of eternal life perhaps be found in mere simplicity?







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I - LIFE'S REMOTE PAST

An underwater shot. A deep ocean bed in the tropics populated by miniscule, unidentified beings, algae, plankton, micro-organisms, molluscs, tiny invertebrates, unknown fish, worms.

From above, falling through the calm waters of the sea bed and settling on the sandy bottom, transparent golden spheres, gleaming in the rays of the sun that strike the ocean surface.

"When we talk about 'life' we mean a chemical and physical process, a "something' that appeared on the Earth about 3 billion years ago! For a billion

and a half of these years this 'something' was working out the rules of the game. But it was only 500/600 million years ago that life exploded on the planet in an infinite variety of organisms in continuous 'evolution'. For 500 million years there has been a great deal of life on our planet, but what do we really know about the history of the oldest living

creatures and of the key episodes in this epic story?

Suddenly, an enormous three-toed foot plunges into the calm waters, a dinosaur foot. The water becomes cloudy as the marine life is rudely disturbed. Chaos reigns. From below the surface of the murky water, we see the silhouette of the great reptile moving away.

"Even today, the cause of the sudden extinction of the dinosaurs isn't completely clear. But even more mysterious is the dynamic of their APPEARANCE..."

If we compare the age of the Earth to a twenty-four hour day, Homo Sapiens Sapiens appeared at the beginning of the last second before midnight, and the invention of the microscope in the last nanosecond. It is only in the last few centuries that man has begun to answer some of the questions regarding the remote past. But there is still a very long way to go."

2 - THE STONE THAT STOPS TIME

Night. The silent, deserted streets of an old European city with Renaissance palaces and porticoes. We are in Padua, in the northeast of Italy, and the architecture reminds us that we are not far from Venice.

"What remains today of the life that populated this place two hundred and thirty million years ago, when we estimate that the first examples of what we call "mammals", our ancestors, appeared?

An old little black dog trots alongside an elderly lady under a dimly lit portico. The little dog looks up at its owner. A young couple with their arms around each other, walking agilely and laughing, cross paths with the old lady.

The old lady is carrying a box of takeaway pizza. She opens a door and goes inside, followed by her dog.

The young couple continue walking and then stop in front of an illuminated shop window in the old town centre. It is a jeweller's shop, displaying an impressive collection of finely worked amber necklaces.



The substance glows with a golden light that seems to come from the distant past.

ZOOM inside a piece of amber, composed of slight veins with miniscule particles visible between them.

"Only humans feel such a strong, almost religious, attraction to their own past and the remains of existences that preceded us; searching, cataloguing and preserving even the most insignificant finding."

The "voyage" inside the piece of amber accelerates rapidly and "explodes" into a greatly magnified and highly coloured form of a

frightening, apparently primordial organism. But the flash only lasts

for a few frames, before plunging into darkness.

3 - THE TRIASSIC LANDSCAPE

The camera explores the rooms of a palaeontology museum, in the ancient buildings of Padua University. In the semi-darkness slashed by the headlights of the cars on the road the 17th century frescoes decorating the high vaults of the library emanate a strange and mysterious fascination. Knowledge has been stored here for centuries, when science was no more than empirical superstition.

The enormous botanical fossil hall reproduces the habitat as it must have been outside, in the region now dominated by skyscrapers, cars and aeroplanes, where life is accompanied by the low hum of computers: a wild tropical swamp, infested with giant reptiles and species long since extinct, in a tangle of lush vegetation made up of palms, monstrous plants, huge ferns, conifers, Equisetum, and araucarias. The horizon was flat and far away, very different from the Dolomites now dimly visible in the hazy dawn.

Graphic animation: how the Planet Earth looked in the Triassic age, with the super-continent Pangaea, the deep beds of the Tethys Sea, where now we find the Eastern Alps and the Dolomites. From the graphic animation to the reality of the rocks of the Tofana mountain in winter. On a snowy slope, a man wearing skis is looking at the surrounding countryside. The snow highlights the strata of rocks from the various geological eras, including the San Cassiano Formation, more recent than the Triassic, with the fossils of the Megalodon. The man is Prof. Guido Roghi, paleobotanist and passionate Alpinist.

"In the ancient tropical sea of an internal gulf of the Panthalassa, the immense ocean that surrounded Pangaea, millions of now extinct living creatures developed and died. The strata on the most marvelled at rock walls in the world constitute the fossil memory of those forms of life.

But even earlier than the Megalodon, at the beginning of the Triassic period, 90% of the species that had existed on the planet up to that point had already disappeared for ever, leaving the way open for the massive spread of seed plants and later the development of the dinosaurs."



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4 - THE TRIASSIC LANDSCAPE TODAY

Coastline of Belize, Central America, day.

Here it is, the environment of the northeast Italian Alps, reproduced today on the coast of this small tropical country. Impenetrable mangrove forests hide relics of prehistoric times like crocodiles, water snakes, mud fish, unknown insects, a tumultuous biodiversity that has come down from the ancient primordial soup.

The evolutionary process is still underway on the Caribbean coast. The resin slowly seeps out of the wounded bark of a tree, including

microorganisms and the occasional tiny unfortunate insect it comes across on its journey

"In millions of years time this insect will probably still be perfectly preserved and perhaps someone will be fascinated to study one of the species living in the 2 l st century of the long ago Quaternary era."

As happened in the far distant past in the area around Cortina d'Ampezzo.

5 - A TREASURE CHEST OF TIME

Eugenio Ragazzi is a pharmacologist, a professor at the University of Padua. We meet him for the first under time under unusual circumstances: a free climbing contest in an indoor climbing centre. He is here to watch a competition involving his son, an emerging champion of this discipline. The agility and athleticism of these climbers is the most evolved that a living organism can express, because all aspects of the body work in perfect synergy.

Prof. Ragazzi has dedicated most of his career to studying amber. And this may not be an accident: Padua is a symbolic place and it is more than a coincidence that has brought us here. This elegant town is located at the centre of the ancient amber trade routes.

From the shores of the Baltic Sea, the largest source of amber in the world, merchant caravans took the pebbles of fossilised resin given up by the sea in all directions. A precious commodity because people have been fascinated with amber for at least 5000 years. Warm to the touch, gleaming, fluorescent, electric, it often contains traces of life, even little animals fixed for eternity in the middle of a movement, an act of prey.

People have been fascinated with amber ever since the very first time someone touched this strange, gleaming stone, slowly worn smooth by the sea and gathered on the shore along with other stones. And it was here that the myth of amber began. Other stones were cold, but this, having excellent insulation properties, returned the warmth of the hand that held it. A magic stone could only come from the sun, preserving its heat. Because of its special properties, amber was part of the ancient



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pharmacopoeia. Prof. Ragazzi shows us a strange brown leaf, a bit like one of those old sticks of gum from the 70s, Brooklyn. And, in fact, it is a sort of mediaeval therapeutic chewing gum. Eugenio has faithfully reproduced a paste of pulverised amber, vegetable resins, medicinal herbs and wax. The patient kept it in his mouth, chewing slowly to spread its properties throughout the body. Amber pills were prescribed from many illnesses. And it was thought that all one had to do was wear a piece, in the form of jewellery or an amulet, to keep away the plague or other dreadful inflictions. But amber has a value that goes well beyond its commercial value. The Greeks called it "Electron", meaning born from the sun, and

> studies of its electrostatic properties not only led to its name but also played a fundamental part in the discovery of one of the four basic FORCES OF NATURE: electricity.



Amber. Memory of life, treasure chest of time

Nature sent us an extraordinary polymer, many millions of years before the invention of Bakelite and the more sophisticated modern plastics. Amber. A precursor to synthetic resins like Plexiglas, able to preserve living organisms intact inside it for hundreds of millions of years, freezing the moment of death, stopping time. Like a three-dimensional photograph, amber inclusions maintain all their organic characteristics intact, and at the disposal of today's researchers.

Arizona, USA. Petrified forest. At the time of ancient Pangaea, it was found much nearer and at the same latitude as today's Dolomites. It is full of Triassic amber.

Interview with George O. Poinar, from the United States, the world "guru" of amber. He really is a kind of "Indiana Jones" of the amber beds. Professor Emeritus of Entomology at the University of California, Berkeley, he currently works at Oregon State University, where he conducts research into amber and its biological inclusions from all over the world.





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He has written over 300 scientific works and books on amber, with titles like "Life in Amber" and "The Quest for Life in Amber". He is author with Roberta Poinar of "The Amber Forest", a marvellous reconstruction of the amber of Santo Domingo and the forest that produced it.

The amber of Santo Domingo has the most spectacular inclusions.

"But even this amber is too young, being only from 25 million years ago. It contains many organisms, but can reveal nothing about life in the Triassic, at the time of the first dinosaurs."

6 - WERE STEVEN SPIELBERG

AND MICHEL CRICHTON TELLING THE TRUTH?

The fascination and mystery of amber was further encouraged by a trilogy of blockbuster Hollywood films: Jurassic Park. Our documentary will use some clips (if possible) to deal with some of the more scientific, but no less spectacular, aspects.

The undoubted prestige of its director and the presence in the cast of a living legend of British cinema, Sir Richard Attenborough, as well as the obviously spectacular nature of the subject matter and the inventiveness of the script, have led us to believe that it could be possible to bring species that have been extinct for millions of years back to life using genetic material preserved in amber. More specifically, the story is based on a procedure that extracts blood samples of various species of dinosaurs from the abdomen of ain insect inclusion from Dominican amber. Supercomputer and genetic engineering do the rest. Paradoxically, it is the efforts to give this procedure a scientific justification that distance the film from the science-fiction genre and make it mere entertainment, creating misunderstanding and erroneous beliefs.

Starting from the raw material: none of the amber found in the Dominican Republic is more than 30 million years old. Unfortunately, the last dinosaurs became extinct 65 million years ago, 35 million years BEFORE the resin was produced by plants.

Using an amusing animation sequence to underline just how ridiculous is the idea that a mosquito could perforate the hide of a Tyrannosaurus Rex and suck its blood, it is worth briefly discussing DNA, now a kind of scientific totem, the universal solution to all problems, the key to all mysteries. This needs to be put into perspective. It is absolutely true that the double helix of the DNA molecule contains all the genetic characteristics of every living being, and is therefore an identity card, the password to every specimen, and having that, the specimen can be reproduced "artificially".

However, the problem is that the DNA molecule, outside the cell, possesses a very short "half-life": 235 days!



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After that it begins to deteriorate; the famous DNA analyses are valid, but as a statistical proof that becomes increasingly unreliable with the passage of time. A limited number of cases of recognisable DNA sequences can exist for a few thousand years and scientists speak of a "theoretical" survival time of 50/100 thousand years.

But 25, 50, 100 million years? Isn't that too much?

Perhaps not, THANKS TO AMBER! Recent studies reawaken hope, suggesting that THE HALF-LIFE OF A DNA MOLECULE PRESERVED IN AMBER could be as much as hundreds of millions of years! It is a hypothesis that has yet to be proved, but the challenge is there.

7 - A DISPLAY CASETHREETHOUSAND METRES HIGH

We are back in Padua, in the Earth Sciences Institute of the CNR where we find the work of Prof. Guido Roghi. Paleobotanist and passionate Alpinist, he is also an expert in stratigraphy, the science that reconstructs paleoclimatic changes through the study of rocks. He tells us the history of the Cortina d'Ampezzo fossil museum. In one of the world's most exclusive mountain resorts, famous for its ski slopes and conifer forests, there once lived a gentleman, Rinaldo Zardini, who loved to wander around his local mountains looking for fossils. Everyone thought he was mad. Today, the museum he founded, and that bears his name, houses one of the most extraordinary collections of neo-Megalodon fossils in the world.

Giant bivalve molluscs, some as big as a turkey, imprisoned in carbonatic rocks from the sea bed of the Norian period, 200-216 million years ago, when the Dolomia Principale, the rock that was to construct the incredible pinnacles of the Dolomites, was formed.

But the rock strata rich in megalodons that came to light as the earth's crust rose, rest on something even older. The Riabl Formation, dating from the late Carnian, and this in turn on the "Dürrenstein Formation", a thin geological stratum that provides a very clear record of one of the most complex passages in the evolution of the Dolomite environment.

It is here that researchers are concentrating their efforts.

It is the Upper Triassic layer, dating from 225 million years ago. The first expedition reaches the base of the mountain. The Italian researchers are joined by Prof. Alexander Schmidt.

A paleoecologist, he has been working for years on inclusions in Baltic amber, but amber from the Baltic is very recent, not more than 50 million years old. "At this point the Santa Croce formation, better known as the Dürrenstein Formation, looks like any muddy mountain slope, piles of stones, earth and a few mountain pine bushes. But sieving the earth, splitting the sandstone boulders, the group collects hundreds of tiny drops of fossil resin."





It is the purest amber, fossilised drops of secretions from conifers that were subjected to some form of stress, lesions, sudden climate changes, lightening. Time did the rest.

The same resin that is now kept like a precious object in phials in geological laboratories in the University of Padua. An archive houses small drops of amber, no more that a few millimetres across. These are some of the oldest pieces of amber in the world, and have been waiting for the moment to reveal their precious secret for 225 million years.

That moment has now arrived.

A preliminary examination under a traditional microscope reveals glimpses of interesting inclusions.

One of these strikes the scientists as particular promising: it contains protozoa and single-cell algae. Their age is in no doubt, unequivocally guaranteed by the amber. If this amber was found in the sediments of the Dürrenstein Formation, which dates from the Triassic age, all the organisms it contains must come from the same period.

However, for a detailed study, a normal optical microscope is not enough, it is necessary to be able to observe to levels of the order of millionths of millimetres, something only a TRANSMISSION ELECTRON MICROSCOPE (TEM) can achieve. It is the most advanced tool available for "looking inside" the material.

While a scanning electron microscope only looks at the surface of objects (giving a reflection of a beam of electrons, and thus obtaining a 3D effect), the TEM observes the structure **by means of the transmission** of the electron beam, thus using a method analogous to traditional optical microscopes, but with much greater magnification than is possible with visible light.

Thus TEM observation allows us to observe the smallest cell structure, providing additional information on the morphology of the oldest organisms.

This instrument works only on extremely thin samples of material, and thus the pearls of amber have to be "sliced". And it is here that the first problem arises.

8 - THE FIRST CHALLENGE:

DISCOVERING AN AMBER SOLVENT

Amber is a hard tomb to rob, the inclusion mechanism is total, and the only way is to slice the fragments very finely, like ham, trying to reach the exact stratum of the cell wall.

This is almost impossible to achieve without destroying the contents. So the first challenge is to find a better way of reaching the inclusion without damaging or contaminating it with microorganisms from the present.



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The particles and biological organisms enclosed in the amber are so closely amalgamated with the fossil resin that they are inseparable. So it is necessary to cut extremely fine "slices" of amber until, layer after layer, you reach the exact point to be analysed. But amber, especially when very old, is fragile and could fragment and crumble if subjected to unsuitable treatment.

The researchers must proceed very carefully. Amber is a natural polymer, with a specific weight slightly above that of water, and softens at between 150 and 200°C, and fuses at between 280 and 300 °C. It is not attacked

by traditional solvents (alcohol, ether, or acetone) but disintegrates irreparably with harsher agents. Finding the right solvent that, under the right temperature and pressure conditions and in a rigorously sterile environment, would allow researchers to get as close as possible to the organic inclusion, will be the researchers

most difficult task, undertaken in the biology laboratory of Padua University, directed by Prof. Olimpia Coppellotti. This is a task at the limits of current technical capabilities.

Tenacious, patient and creative, this phase is undertaken in an atmosphere that oscillates between euphoria and frustration.

The scientists are optimistic, there are some signs that they are on the right path, for example, using an enclosing synthetic resin that is better adapted to cutting and analysis with a scanning electron microscope, in the end the chemical-physical key to opening the treasure chest will be found.

Only then will it be possible to bombard the specimen with electrons inside the scanning microscope. And only then will the researchers be able to expand their knowledge of the mechanisms of the evolution of life on earth. But this procedure leads to a great deal of amber being wasted on unsuccessful attempts, which is why a second expedition to the

Dolomites is required to collect further sediments rich in amber.

The area lies within a protected zone, and thus the search has to be carried out in collaboration with the authorities of the D'Ampezzo Dolomites Nature Park. This time Prof. Ragazzi's son will accompany the researchers, using his freeclimbing experience to help explore the more exposed and rockier areas.





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9 - THE RIGHT WITNESS, IN THE RIGHT PLACE AT THE RIGHT TIME

We are with the scientists on the wall of the Tofana. Above and below us are millions of geological stories of our planet.

The Triassic was a crucial geological era in the history of the evolution of life on Earth.

A spectacular 3D animation sequence will demonstrate how it was at that time that the Panageaa super-continent began to separate, giving rise to what would become the continents we know today.

> It was the period between the two most dramatic mass extinctions of pre-history, the last of these, which saw the disappearance of the dinosaurs for reasons that are still not completely clear, opened the way for the development of the

mammals. But some species of proto-mammals began to appear during the time of the plants that exuded the resin that we now see in its fossilised form. Has the amber preserved something of our primordial ancestors? These drops of Triassic amber witnessed the two great extinctions, preserving clues to these dramatic events inside themselves. Traces of the terrestrial atmosphere, for example, imprisoned in the amber, could tell us a lot of interesting things about the concentration of oxygen in the air.We know that vegetation covering of the earth depends on oxygen, as do the development of aerobic organisms, and thus species that can prosper out of the water, and the thickness of the ozone layer, that conditions life by filtering ultraviolet rays.

These miniscule 225-year-old amber tears hold many secrets.

Together with an examination of the rocks in which the amber has been trapped for millions of years, away from the light and from oxygen and heat, its principal enemies, and through palynological analysis – the study of pollen – it will be possible to increase our knowledge of the botanical landscape and draw up an atlas of the animal and vegetable species that populated this corner of the earth and the relationships between them in the course of evolution, identifying, in this landscape, those that have survived down to the present day.

WHICH OF THOSE FORMS OF LIFE AROUND US DATE BACK TO THE TRIASSIC AGE? FERNS, EQUISETUM, CONIFERS, FUNGI, ALGAE, PROTOZOANS, BACTERIA.

225 MILLION YEARS AGO, DID THE VIRUSES RESPONSIBLE FOR THE ILLNESSES THAT HAVE PLAGUED HUMANS FOR CENTURIES ALREADY EXIST?



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10 - DID A "UNIVERSAL FLOOD" FAVOUR THE DEVELOPMENT OF THE DINOSAURS?

TRIASSIC AMBER WILL HELP US TO BETTER UNDERSTAND CLIMATE CHANGES: there is an experiment that we can all perform in our kitchens at home to distinguish real amber from most fakes. It consists of immersing a fragment in a 15% salt solution, more salty than the sea. If it floats, it's amber, if it sinks it's plastic or copal. Since the Cortina d'Ampezzo amber was found in lagoonal sediments from areas that were once near the sea, this could, for example, mean that at a time

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like the Triassic, which was notoriously arid, there was a brief wet period with a lot of rain.

This leads to one of the possible scenarios: the Earth's crust, under the pressure of the incandescent magma under the surface, stretched almost to breaking point.

And in fact, 220 million years ago, one of these depressed blocks of land, known as "graben" collapsed, finding itself lower than the surrounding sea. The depressed area was flooded by the water and when it evaporated it started a cycle of abundant rainfall. This "sudden" and "brief" (a million years...) climate change could have encouraged the rapid development of vegetation and thus of the large herbivorous reptiles and their predators, but also provoking a defensive reaction to climatic stress in plants, with the abundant production of resin, that, dripping and sinking into the salty water that flooded the forests, was immediately absorbed into the mud strata from the erosion caused by the water.

But before it disappeared under the water, the resin always captured some living creatures, like bacteria, algae, protozoans, fungi, spores and cysts, mainly unicellular.

THIS AMBER CONTAINS THE OLDEST TRACES OF LIFE NOW FOUND ON THE EARTH, AND EVERYTHING CONTAINED IN IT CAN BE RELIABLY DATED TO THE TRIASSIC PERIOD.

A world of precious clues, an entire ecosystem available to today's scientists, starting with the proteins, which are better than DNA at providing new information about life in the far distant past.

AND BY COMPARING THE LIVING ORGANISMS OF 220 MILLION YEARS AGO WITH THEIR DESCENDENTS TODAY, WE CAN TAKE ONE MORE STEP TOWARDS FULLY UNDERSTANDING THE RULES THAT GOVERN EVOLUTION.

A simple but disturbing truth: the fundamentals of biological of animal and vegetable life are practically immutable and immortal.



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TODAY'S MOST ELEMENTARY ORGANISMS - ALGAE, FUNGI AND PROTOZOA - ARE EXACTLY THE SAME AS THOSE OF HUNDREDS OF MILLIONS OF YEARS AGO.

These "beings" have survived every environmental disaster, unlike more evolved and complex species like the dinosaurs and sabre-toothed tiger. And, sooner or later, humans.

THIS COULD CHANGE THE VERY CONCEPT OF "EVOLUTION", FROM A WORD THAT IS COMMONLY UNDERSTOOD TO IMPLY PROGRESS AND IMPROVEMENT, TO SOMETHING CLOSER TO THE IDEA OF AN INFINITE "CIRCULAR" CHANGE, ALREADY FORESEEN IN CERTAIN ORIENTAL PHILOSOPHIES.

11 - IS SIMPLICITY THE SECRET TO ETERNAL LIFE?

What we consider the more "evolved" species would be no more than temporary forms, short-lived experiments, ephemeral whims of fate, destined sooner or later to end in distinction. Humans seem to be in a hurry to make everything extinct before its time, by provoking a sudden, unprecedented climate change that will leave traces in millions of years time in the form of tiny drops of plant resin from "our" 21st century. Fading from a pearl of amber to a 3D animation, we see the future of the Earth.

On the basis of analyses of the mechanisms of the plate tectonics that led to the formation of the continents and extrapolating from current data, Geologists believe that in 250 million years time Africa will occupy the place now occupied by Europe, Australia and the Antarctic will be attached to South Africa, China will be attached to North America, which will in turn be glued to Africa. One of the great oceans will engulf the other.

In effect, the New Pangaea, just like 250 million years ago!

And man? Will he still have a place on this super-continent?



TRIASSIC PARK

SCIENTISTS AND RESEARCHERS

Prof. Eugenio Ragazzi Department of Pharmacology and Anaesthesiology University of Padua

Prof. Guido Roghi Institute of Geosciences and Georesources, CNR-Padua, Department of Geology, University of Padua

Prof. Olimpia Coppellotti Krupa

Department of Biology University of Padua

Prof. Piero Gianolla

Department of Earth Sciences University of Ferrara

Dr. Alexander R. Schmidt

PhD from the "Friederich Schiller" Ecology Institute of University of Jena, currently a researcher at the Natural History Museum in Berlin. He works mainly in the fields of the taxonomy, paleoencology and taphonomy of micro-inclusions in amber.

GUEST STAR

George O. Poinar Jr. - USA

World's leading expert on amber. Emeritus professor of entymology at the University of Berkeley (California). Currently works at Oregon State University where he studies amber and its biological inclusions from a variety of locations in the world.

RESEARCHERS AND COLLECTORS

Paolo Fedele, Dario Bellodis, Cortina d'Ampezzo – Italy Leif Brost - Amber Museum, Holviken, Malmo – Sweden



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► THE DIRECTOR

Luigi Cammarota PROFESSIONAL EXPERIENCE

DOCUMENTARIES

Having begun as a news photographer, after considerable experience as a director of Tv commercials, he worked on drama and documentaries in Italian public service broadcaster RAI for several years.

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He is currently working full time on documentaries, mainly focussing on the natural environment and mountain inhabitants for "Geo & Geo" RAI 3. In recent years he has written and directed over twenty programmes for this documentary strand. All have achieved excellent audience figures and several have been entered in important festivals, including "Sibillini, magica armonia", which received the popular jury prize at the Eco Film Festival in Pont Canavese 2000, "Risvegli e precipizi", (which achieved a record 26% audience share), Festival di Trento del Cinema di Montagna 2001, "Alpinisti senza frontiere", Festival di Trento 2003, "Fragole e sangue", one of the few Italian films to receive an award from the Sondrio International Documentary Film Festival on Parks, special prize 2002; "Uomini e sassi", Festival di Trento and Bergfilm Festival, Tegernsee 2004. In 2002, he was awarded the coveted "La natura, l'uomo e il suo ambiente" prize of the Mostra Cinematografica Internazionale, under the patronage of the President of the Italian Republic for his work in the field.

Finally, his earlier works include: "Com'era e dov'era", on the exemplary reconstruction of Venzone after the 1976 earthquake in the Fruili region. "Tesoro Azzurro", 1980, on the marine life of the Italian seas. "Semplicemente unica", on the unspoilt nature of Monte Vulture and its waters. "La cultura dell'ulivo", for the European Union. "La terra delle sirene", on the Sorrentine peninsula as seen by the great travellers of the 19th and 20th centuries. "Vernice", on the "Tratttista" artists. "L'imperatore", a video on the art of climbing for "Tribù" (TMC). "Il Battistero dell'Imperatrice", for "Top Secret, l'altra faccia della storia" RAI TRE: from Italy to Palestine and Jordan in search of the truth about the oldest Roman baptismal font.

Other documentaries include, "L'Arte di arrampicare", two films on mountain climbing techniques, CONI prize at the Film Festival Montagna Esplorazione Avventura Città di Trento 1998.



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SD Cinematografica is an independent production Company founded in 1961.

It has worked with RAI and International Broadcasters since its foundation, co-producing films, variety programs and, above all, documentaries. More than 500 hours of programming have been produced and broadcasted.

Several nature documentaries have won major prizes at international Film festivals and have been sold worldwide. The documentary "La Pietà", on the restoration of Michelangelo's masterpiece, was **nominated for an American Academy Award**. The recent "Flying over Everest" won **18 prizes** at the main international festivals. In 2006 with "The sinking of Andrea Doria" SD Cinematografica is proud to include the American **PBS** and the German **ZDF** in its list of **international coproducers**. The documentary has been submitted to the **Emmy Awards**.

Clients are:

RAI, Mediaset, National Geographic Channels, Discovery Channels, TFI, ARTE, NHK, TSR, ARD/BR, PBS, ZDF.



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► THE PRODUCTION COMPANY

Most significanthe PRODUCTIONS of recent years

DOCUMENTARY:

THE SINKING OF ANDREA DORIA 75 min. and 52 min. RAI / PBS / ZDF / ISTITUTO LUCE

FLYING OVER EVEREST 60 min. and 2 x 45 min. RAIUNO / BR / ARTE

- 1° prize at Chamois International Film Festival (Italy 2004)
- Prix de l'exploit al St. Hilarie Coupe Icaro Film festival (France 2004)
 - l° prize at Festival internazionale del cinema naturalistico e ambientale Teramo (Italy 2004)
 - Prize "Politecnico di Bari" at Catellana Grotte International film festival (Italy 2005)
 - Prize "Sport Extreme" at Moscow Filmfestival (Russia 2005)
- Prize "Best adventure Film" at Wildsouth Film Award (New Zeeland 2005)
- Prize "Silver Screen" at US International Film e Video Festival (USA 2005)
- Prize "Best adventure Film" at Mountainfilm in Telluride (USA 2005)
- Special award at Cervino International Film Festival (Italy 2005)
- I° Prize "Man and Mountains" at Film Festival Teplice nad Metuji (Czech Republic 2005)
- Special award at Jonio International Film Festival (Italy 2005)
- Special award at Festival International du film d'aventure de Dijon (France 2005)
- I° Prize at Montreal International Adventure Film Festival (Canada 2005)
- Special award at Sport Movies & TV 2005 (Italy 2005)
- Prize "Most Inspiring Adventure Film" at Wild scenic environmental film festival (USA 2006)
- 1° prize "Leggimontagna" (Italy 2006)
- Special prize at Festival Internazionale del documentario ornitologico (Italy 2006)

THE MYSTERY OF THE WOLF 52 min. NATIONAL GEOGRAPHIC

- Special award at Bergfilm Festival Tegernsee (Germany 2004)
- Special award at Festival Internazionale della Lessinia (Italy 2004)
- Prize "Best Italian documentary" at Festival of Cogne "Stambecco d'oro" (Italy 2005)

HUNTING FOR NO	GOTTO	52 min.	NATIONAL G	EOGRAPHIC
FOCUS IN ITALY	30 x 4 min.+	20 x 2 min.	NATIONAL G	EOGRAPHIC
LA PENISOLA DEL	TESORO (for	GEO&GEO)	30 min. each	RAITRE
Including:				

- Cilento: un paradiso della natura
- Special Award at International Festival of Lessinia (Italy 2000)
- Special Award at International Festival de cinema Vila de Torellò (Spain 1997)
- Prize "Parco Nazionale del Gran Paradiso" at Eco Film Festival of Canavese (Itali 2000)
- Le ultime superstiti
- Monti Sibillini: magica armonia





THE PRODUCTION COMPANY

TRIASSIC PARK

- Tra incudine e martello
- Finalist at International Festival of Sondrio (Italy)
- Ritorno all'ombellico d'Italia
- Fragole e sangue
- 2° Prize at International Festival of Sondrio $\mbox{ (Italy)}$
- Un parco scolpito dal vento
- Il respiro della foresta
- La valle dei Walzer
 - Domus de Janas
 - Mont Avic: una montagna d'acqua
- Rosso di sera
- Risvegli e precipizi
- Finalist at International Festival of Trento (Italy)
- Lo sperone dello stivale
- Yellowstone d'abruzzo
- Miraggi d'inverno
- Circeo: Natura e magia
- Sulle tracce dell'orso
- La montagna sacra
- Sorprese d'inverno

Prize "Partha Sarathy" at International Festival of Sondrio (Italy 2002)
Prize "Cerro D'Argento" at International Festival of Lessinia (Italy 2003)

- Il soffio del vulcano
- La leggenda dei Fanes
- Sinis: acqua, terra e rosso porpora
- L'arte di Arrampicare

- Prize "C.O.N.I." at International Festival of Trento (Italy 2002)

- Mi chiamano Aspromonte
- Matese, magico intreccio di storia e natura
- Ostinatamente appassionati
- Pierino, il lupo e i segreti del tufo





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ORESTA FOSSILE DI DUNAROBBA	I 2 min.	RAITRE
ALBERI DI CITTÀ	I 2 min.	RAITRE
1EDICI DEGLI ALBERI	I 2 min.	RAITRE
ARBORETO DI VALLOMBROSA	I 2 min.	RAITRE
JOMINI SCOIATTOLO	I 2 min.	RAITRE
DSPEDALE DEI RAPACI	I 2 min.	RAITRE
LVETRO		
UNA RISORSA ECOLOGICA	I 2 min.	RAITRE
BURNING MAN	60 min.	RAIDUE
IL RISO DELLE API	60 min.	RTSI
CUOLE D'ARTE	4 x 30 min.	RAI EDUCATIONAL
AMMINISTRARE NELL'ANNO 2000	30 min.	REGIONE LAZIO
/ESUVIO: UN PARCO IN PRIMA LINEA - Finalist at International Festival of Lessinia (Italy 2000)	A 32 min.	PARCO VESUVIO
JN PARCO DA SCOPRIRE	30 min.	PAR. DOLOM. BELL.
L PARCO DEL GARGANO	30 min.	PARCO GARGANO
1AJELLA	30 min.	
	e 3x15 min.	PARCO MAJELLA

AND DURING THE YEARS:

SD Cinematografica credits also include the following major Italian television programmes:

FEATURE FILMS:

LA TECNICA E IL RITO LA SCONOSCIUTA (4 episodes) by Miklos Jancso RAI by Daniele Danza RAIUNO





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SHORT FEATURE FILMS:

ASSIONE MIA: EXIT	by Stefano Reali	RAIUNC
ASSIONE MIA: IN CERCA D'AMORE	by Aida Mangia	RAIUNC
11 MANDA LUBRANO (11 Episodes)	by Gino Cammarota	RAITRE
JLTIMO MINUTO	by Lorenzo Hendel	RAITRE

VARITY SHOWS:

MOVIE MOVIE	33 episodes x 60 min.	RAIUNO
ITALIA SERA MODA	daily	RAIUNO
ODEON	Series	RAIDUE
COLOSSEUM	Series	RAIUNO
GIROMONDO	Series	SACIS
ANIMATION:		
I SAURINI - The young dinos	Pilot	
FARHAT - Prince of the desert	Pilot	RAIUNO
DOCUMENTARIES:		

LA VIOLENZA E LA PIETÀ	60 Min.	RAIUNO
- Nomination at Oscar (USA)	and the second	
PAN - Animals of the Mediterranean	27 Eps. X 30 min	RAIUNO
- Best Exploration Film at International Festival of Tre	nto (Italy 1987)	

QUARK

IMMAGIN/

- Special Prize "Progetto Natura" at Festival of Cogne "Stambecco d'oro" (Italy 1987) - I° Prize at International Festival of Trento (Italy 1987)

A Series RAIUI	NO
	NO



TRIA

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For further information don't hesitate to contact:

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