

The Permian-Triassic Impact Event caused Secondary-Craters & -Impact Structures in Europe

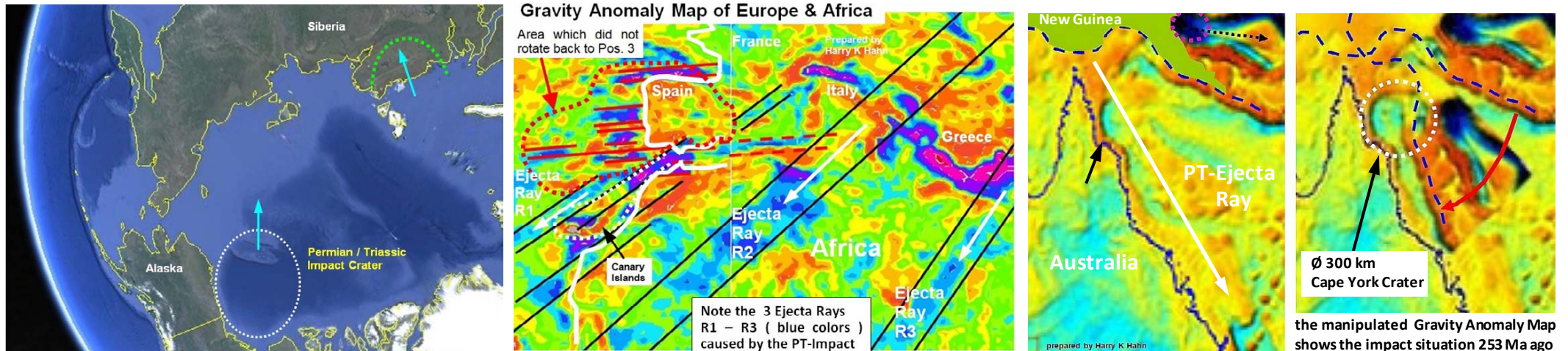
Extract from Part 2 of my study: "Global Impact Events are the cause for Plate Tectonics and the formation of Continents and Oceans"- see also: [Part 1 & 2 to 6](#)

by Harry K. Hahn / Germany - 8. July 2017 - (→ see Documentation here : www.permiantriassic.de → will be active in March 2021)
(Note : Document not allowed for commercial use ! (→my studies are also on : archive.org)

Abstract :

The large secondary -impact craters and -structures found in Europe and Africa were caused by Ejecta Material that was produced during the Permian Triassic (PT)-Impact Event in the Arctic Sea which formed the **1270 x 950 km** elliptical PT-Impact Crater. The impactor which caused the PT-Impact, an asteroid or comet in the diameter range of probably 60 to 200 km, collided with our planet at a very shallow angle. Because of this very shallow impact angle of probably less than 8° and the estimated low impact velocity of around 8 km/s, large amounts of material was excavated from Earth's crust during the impact. This excavated crust material, together with large fragments of the impactor, is the ejecta material that caused many large secondary craters & impact structures on Earth. It probably had a velocity of slightly less than 8 km/s, and a resulting impact pressure of probably < 5 GPa for most (>90%) of the excavated and ejected material. Even if the expected low impact pressure of the PT-ejecta material makes it difficult to provide the mineralogical evidence for the described global impact scenario there are a few sites in Europe where mineralogical evidence of the PT-Impact Event can be found.

In Europe and Africa powerful Ejecta Rays from the PT-Impact Event caused secondary impact crater chains with crater diameters of up to 200 km. The tracks of these crater chains are clearly visible on different gravity anomaly maps, which show the reduced thickness of Earth's crust in these areas (blue areas). It is clearly visible that these tracks of the Ejecta Rays intersect at a certain point which was the impact location of the PT-Impact at the time of impact, in the North of Siberia. The outline of Italy is a direct result of these crater chains as my drawings indicate. Some large fragments of the impactor or of the ejected material also caused a secondary impact crater chain along the NE-coast of Australia, which is a further proof for the crater-chain hypothesis. An exceptional large impact crater of this crater-chain, the > 300 km Cape York Crater caused a number of large-scale magma eruptions over a long time period, which were partly responsible for the creation of the Pacific Plate as described in more detail in **Part 1** of my study.



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- 2 Gravity Anomaly Maps indicate Ejecta Rays from the PT-Impact in Europe & Africa
- 3 PT-Ejecta Rays & -secondary craters in Europe and N-America
- 4 The Ø 130 x 110 km Bay of Lyon Crater / France
- 5 Large-scale secondary impact structures & Elliptical Crater 1.6 x 1.2 km in Spain
- 6 Elliptical secondary craters from the PT-Impact formed the Canary Islands
- 7 Epilogue
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- 9 Tectonic evolution of Europe after the PT-Impact Event described with 3 images

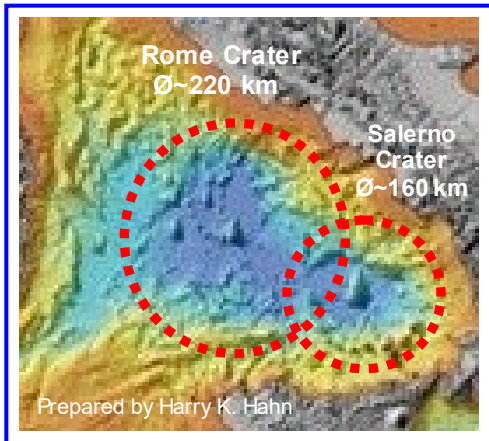
- 2 Mid of 2012 I informed ~ 10 geologists and impact researchers (e.g.
- 4 Prof. C. Koeberl, Prof. T. Kenkmann and Prof. U. Reimold) about the
- 6 discovered 300 km diameter Cape-York Crater and other possible impact
- 7 structures on Australia's East coast. In 2015 & 2017 I informed the above
- 8 mentioned+ geologists & the head office of the UNI Karlsruhe (KIT) about
- 10 the discovered PT-Impact Crater. I even went to the 16th Symposium for
- 13 "Tectonics" TSK2016 in Bonn in March 2016 and distributed copies of
- 19 my study about the PT-Impact. But the only answer I got so far (KIT) was:
- 21 My discoveries aren't explainable with the current state of geophysics

Europe was formed by ejecta of the **Permian-Triassic - Impact**, which impacted in the **Mediterranean-area ~253 Ma ago**

The following maps and information shall provide first evidence of the impact scenario which took place in the Mediterranean-area at the P/T-boundary. The shown maps describe the whole impact-related process which formed **Europe** over the last 253 Ma.

The hard evidence for the impact hypothesis are two Impact Craters in **Italy**, which are already noticeable as such on the Tectonic Map of Europe. The estimated diameter of the two craters is ~ 220 km for the western crater (**Rome Crater**) and ~ 160 km for the eastern crater (**Salerno Crater**). → See the following explanation below :

Tectonic Map showing the two impact craters

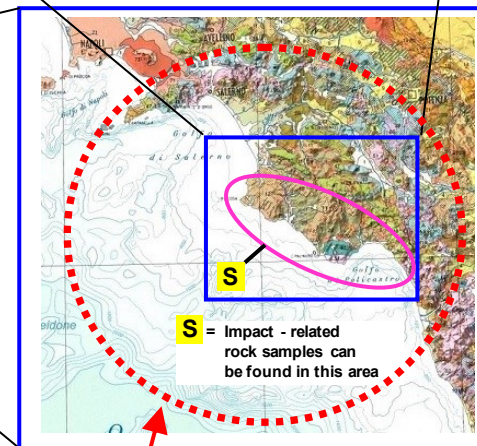
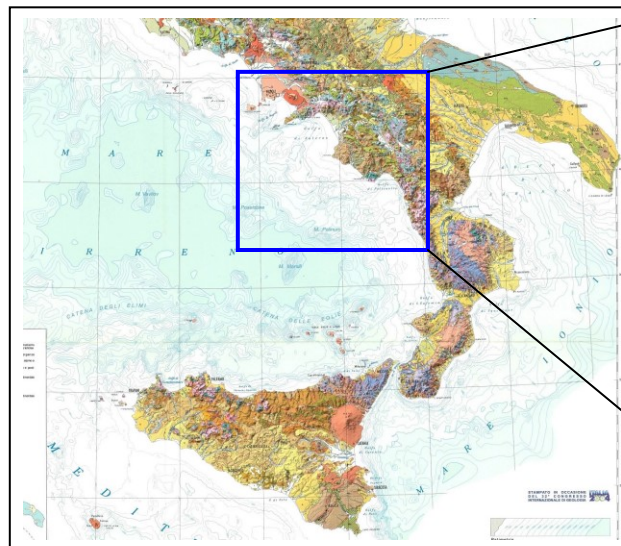
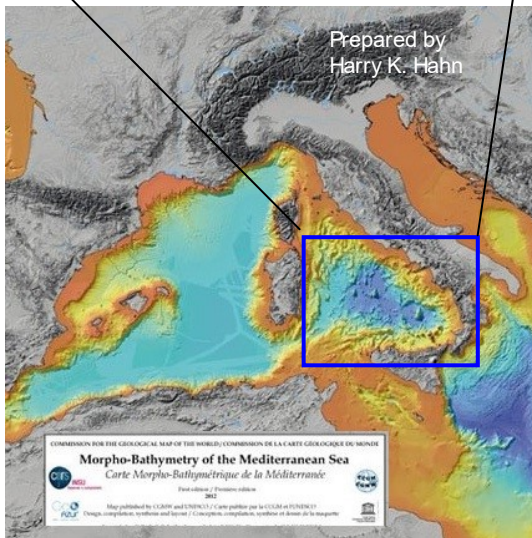
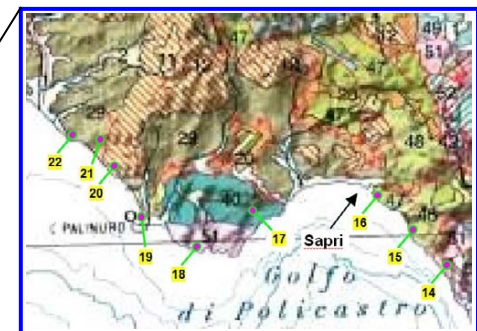
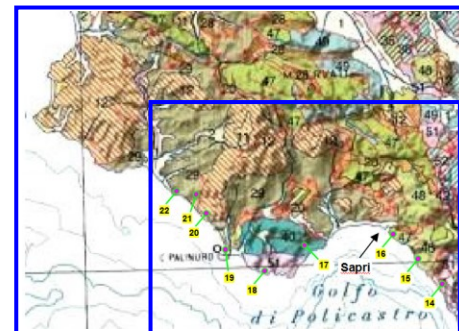


Some first rock samples which were collected close to the assumed impact center of the smaller 160 km crater provide further indication for an impact event !

Especially the samples collected on the sample sites 14 & 16 to 22 show various types of breccia, probably all impact breccia, partly with mineral glass inclusions (diaplectic glass). Sample site 21-B near Ascea shows breccia which contains mineral glass. This may be the hard evidence to confirm the described impact-crater and the impact-hypothesis !

The **geological map of Italy** is also providing first indication of a ring structure in the south-western part of Italy

The rock formations on sample site 21-B near Ascea close to the center of the Ø 160 km Salerno Crater show breccia which contains mineral glass (diaplectic glass)



Salerno Crater
estimated crater diameter approx. Ø 160-170 km.



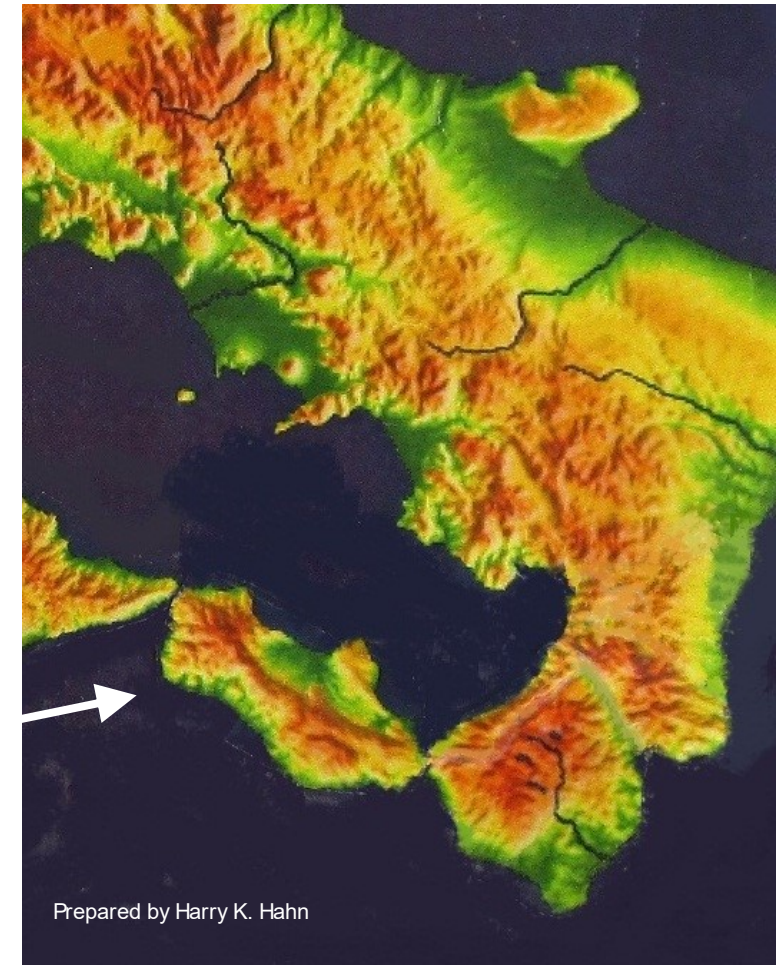
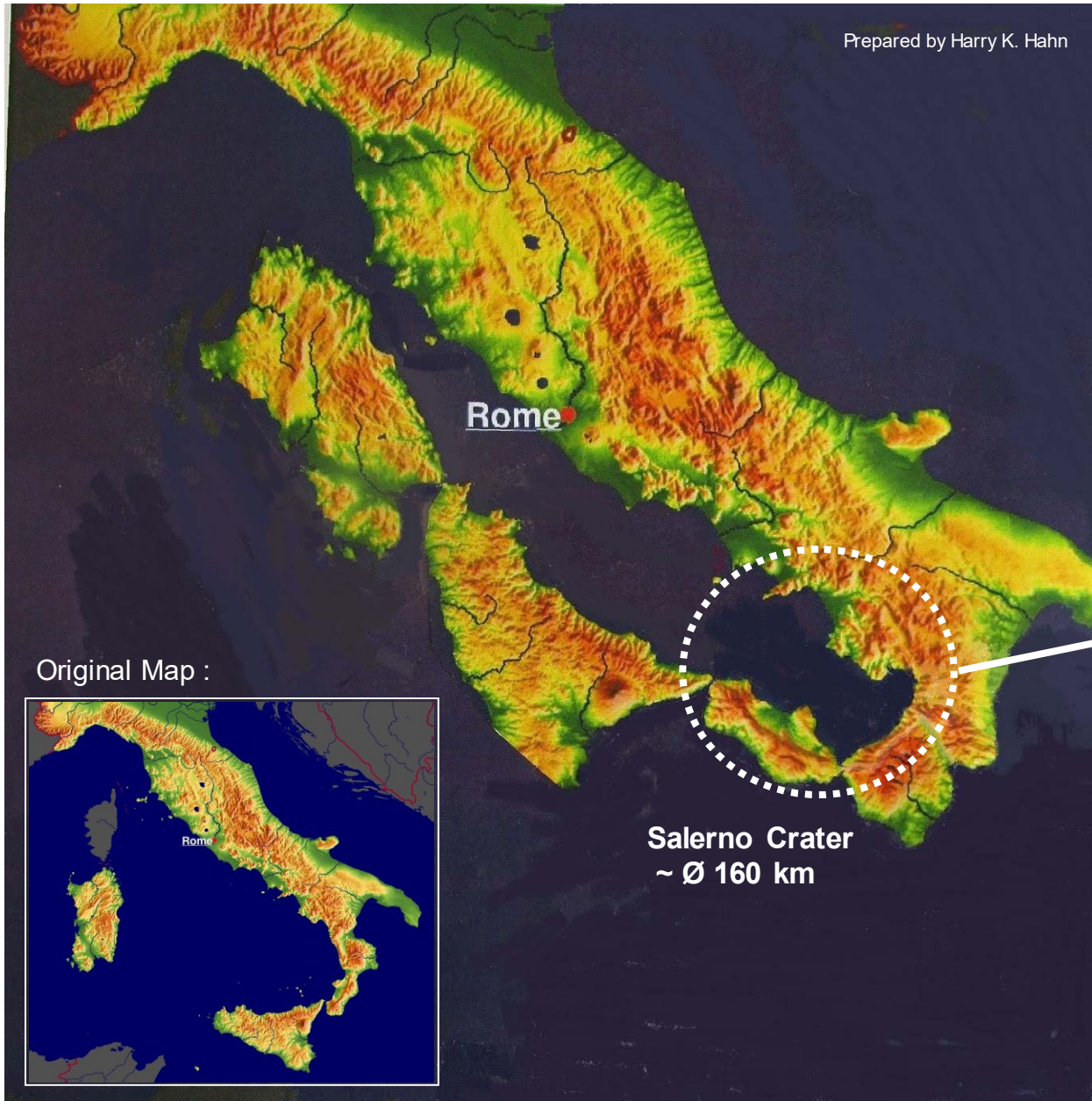
Breccia from sample site 21-B

→ Find images of all rock samples & sample sites on the websites : www.permiantriassic.at or www.permiantriassic.de

Note: These websites should be activated in April 2021

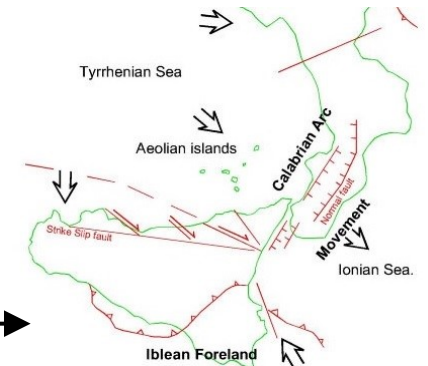
The topographic map of Italy also provides evidence for the two described impact craters

By re-arranging the different crust fragments which form Italy today, the original impact scene comes to light :



The manipulation of a topographic map of Italy and a re-arrangement of the crust fragments of Italy brings to light the original Impact Crater !

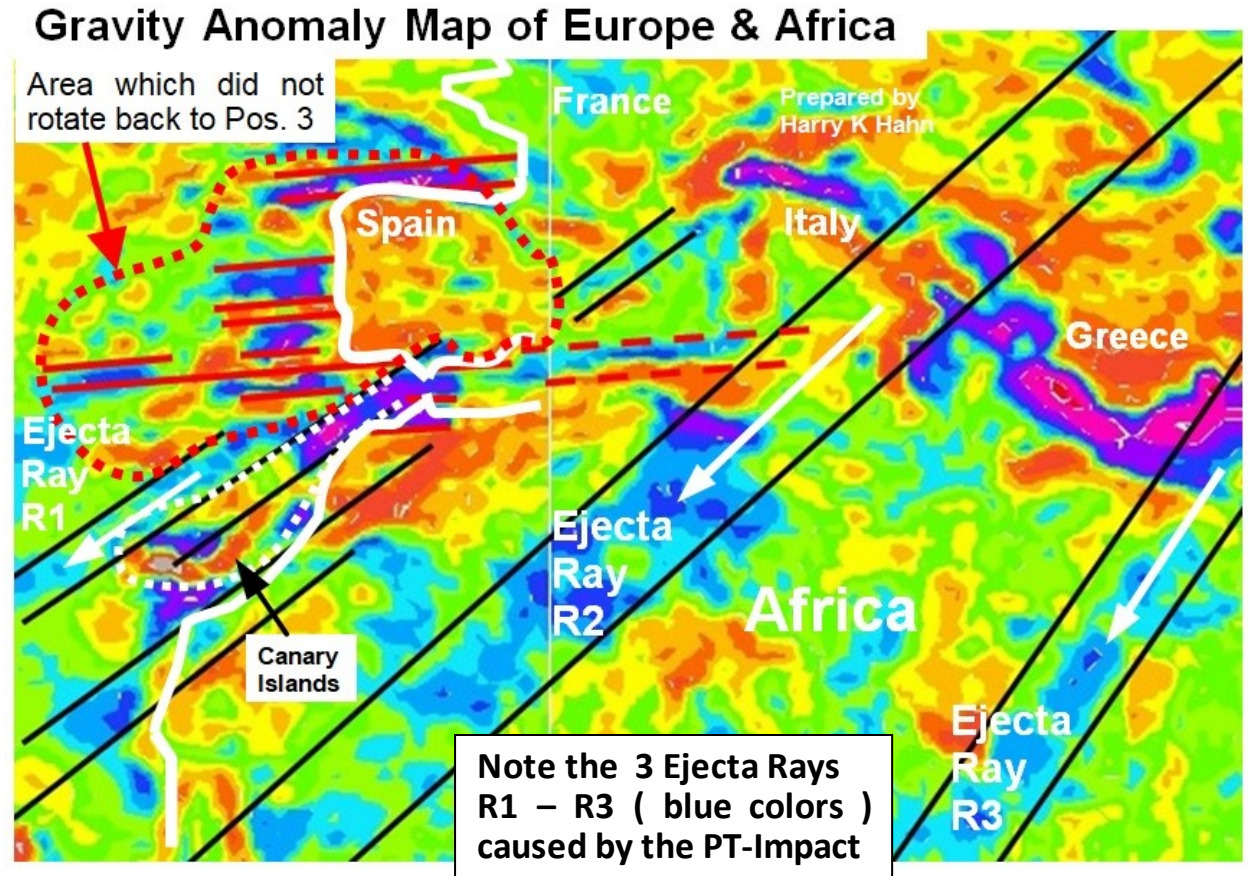
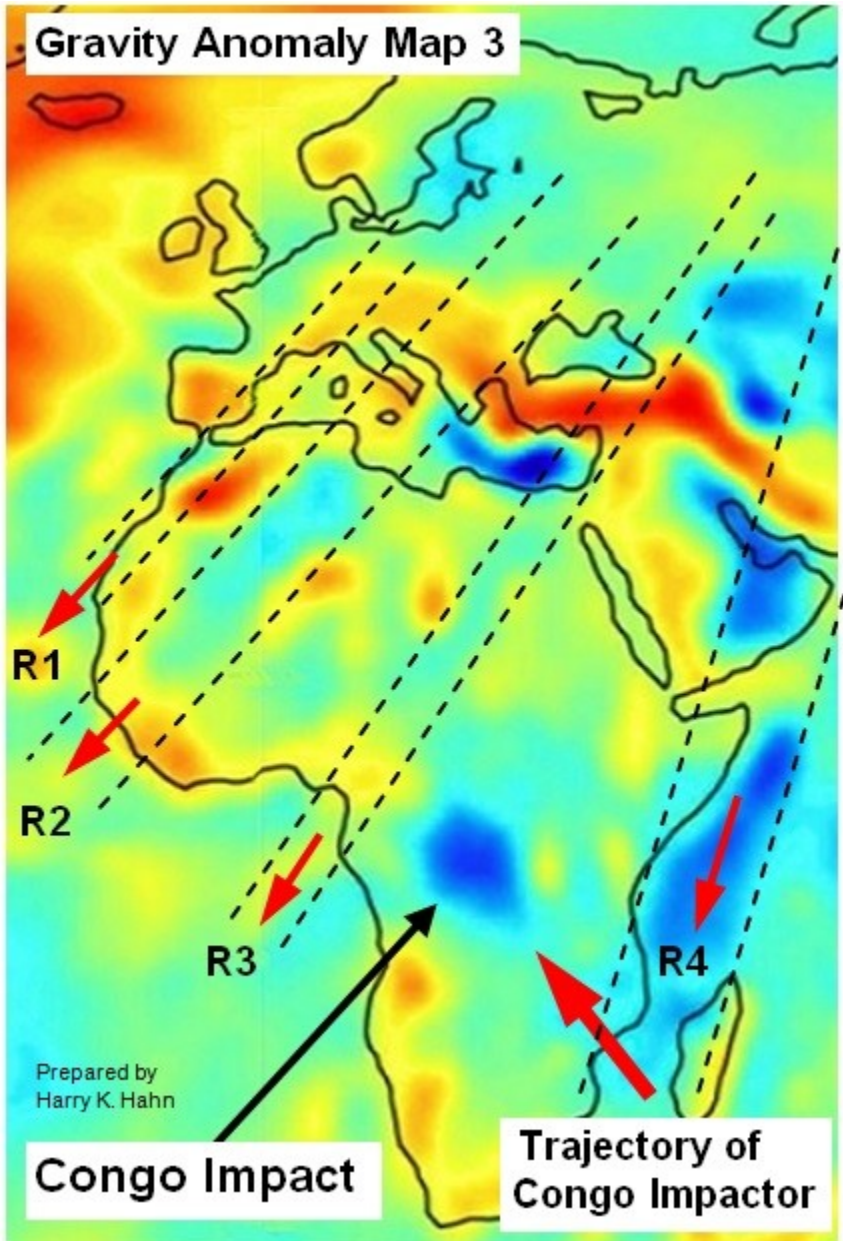
The tectonic situation near Sicily :



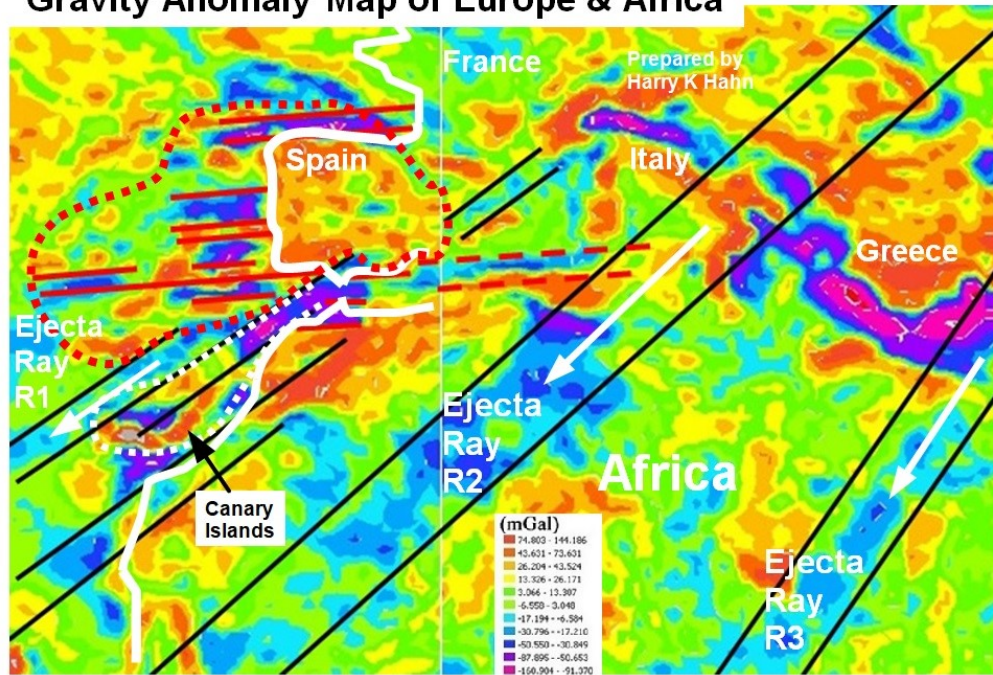
Gravity Anomaly Maps of Europe & Africa indicate Ejecta Rays from the PT-Impact Event

→ blue and green areas are negative anomalies → red and orange areas are positive anomalies

There are sets of linear structures (negative anomalies) visible which represent ejecta ray structures from the P/T-Impact

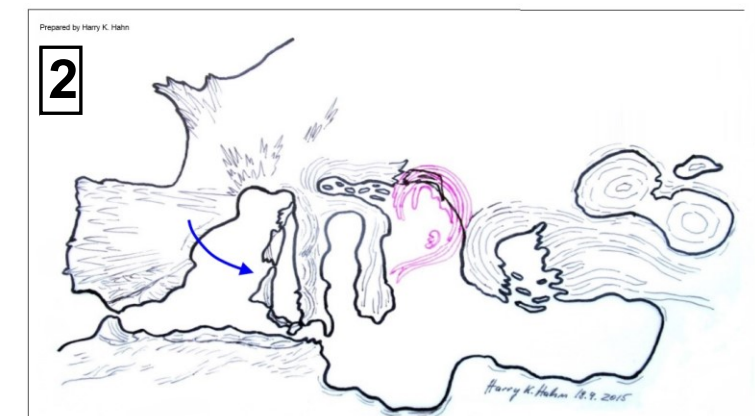
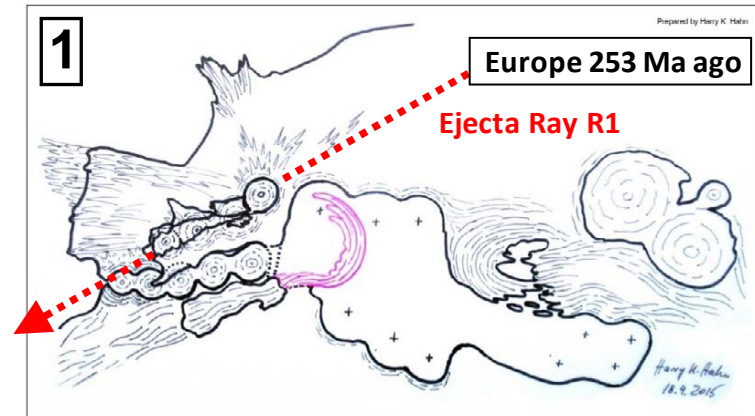


Gravity Anomaly Map of Europe & Africa



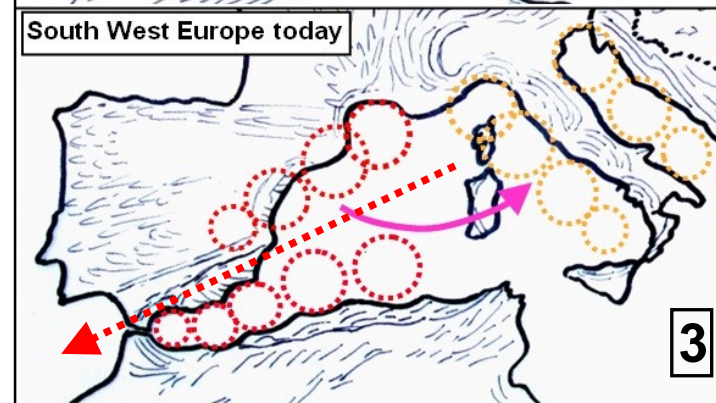
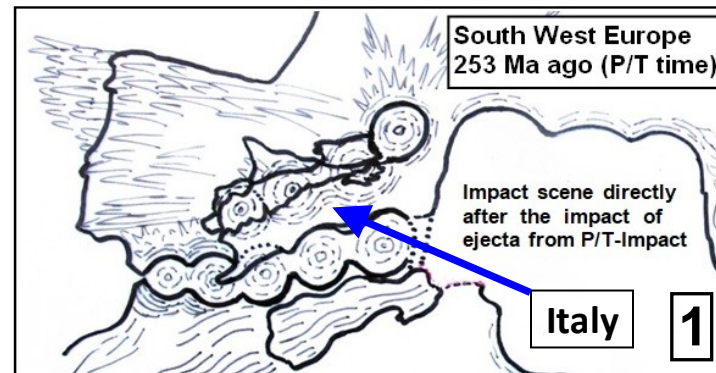
Tectonic Evolution of Europe after the P/T-Impact

→ the linear blue areas on the gravity anomaly map (on the left) indicate the impact crater chains caused by the P/T-Ejecta



Tectonic evolution of Europe after the impact of the P/T-Ejecta Ray R1 :

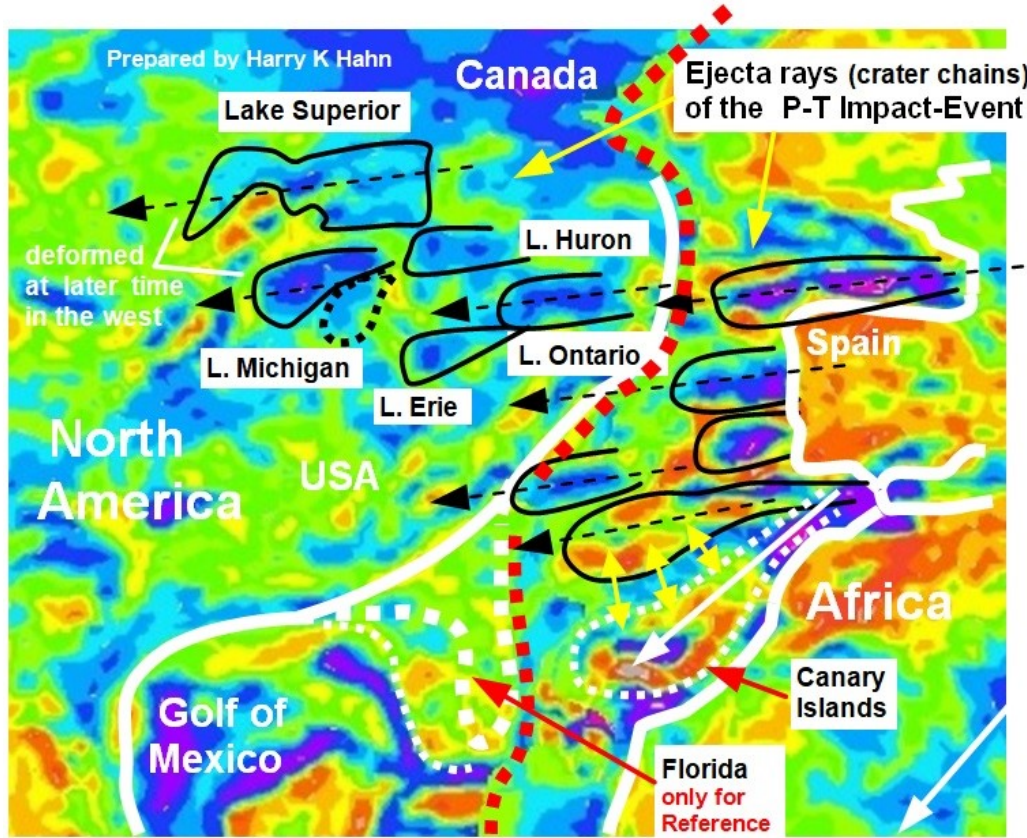
The drawings No. 1 to 3 show were ejecta material (thrown out of the P/T Impact Crater) impacted in Europe ~253 million years ago. This ejecta material (impactors with $\varnothing 10-20$ km) formed chains of secondary craters with $\varnothing 150-200$ km. These craters formed the original ocean basins.



Linear gravity anomalies in Europe, North-Africa & -America indicate PTI-ejecta-ray structures

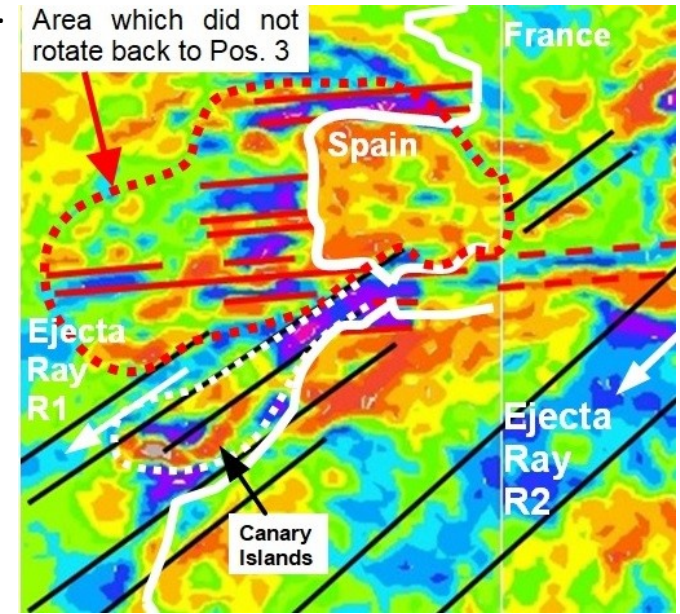
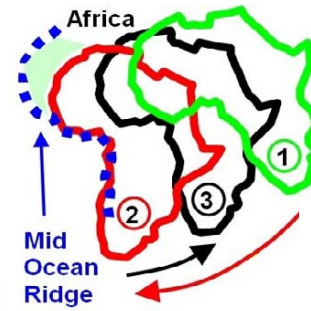
→ the Great Lakes in USA are probably also a result of impacting ejecta from the PTI.

Gravity Anomaly Map showing Europe & North-America (with Great Lakes marked) ~200 Ma ago

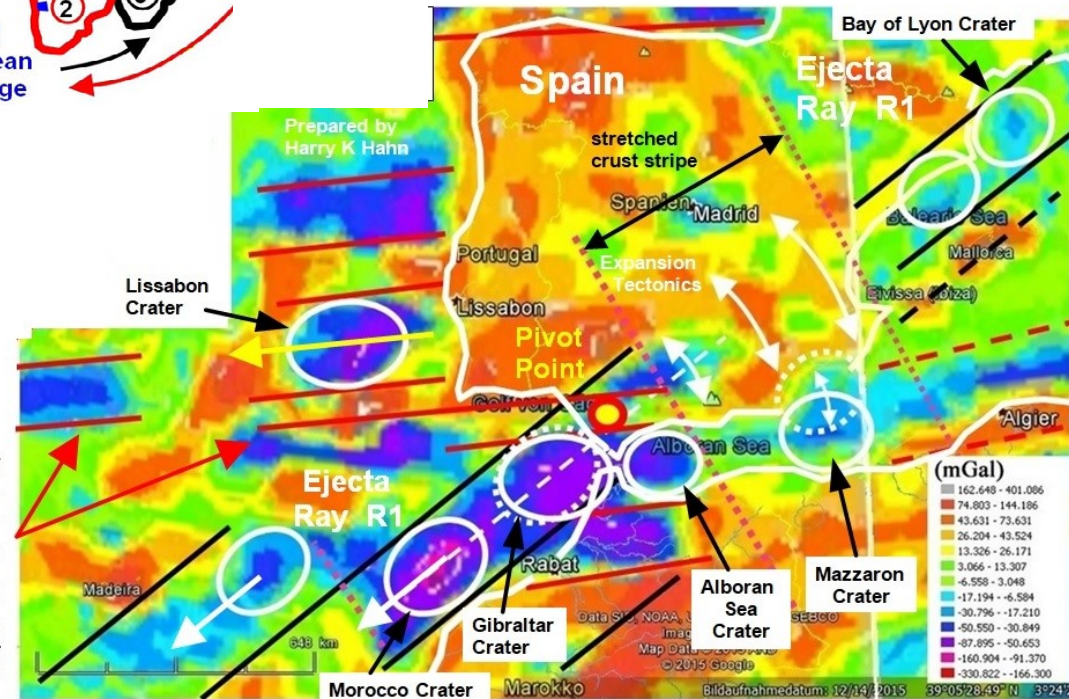


Caused by the impulse of the Ejecta Rays R1–R4 the African Plate rotated from **position 1** to **position 2** (→ see sketch).

But because Africa was still connected to Eurasia it later rotated back to **position 3**. But the majority of Spain and the ocean floor west from Spain did not rotate back to position 3 anymore.



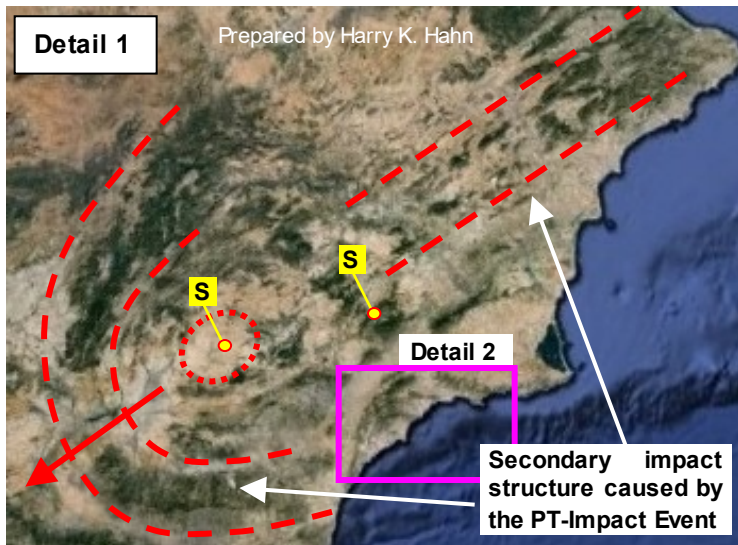
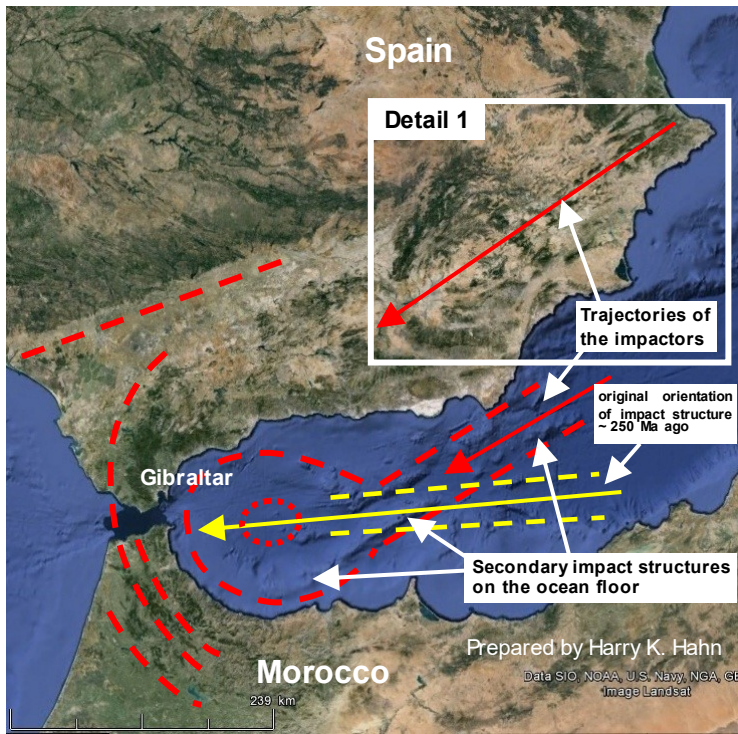
Detail View of Spain / Gibraltar



The set of gravity anomalies marked by the red lines indicates the crust area which did not rotate back to Pos 3

Further indications for a largescale impact event in Europe can be found in Spain & Portugal

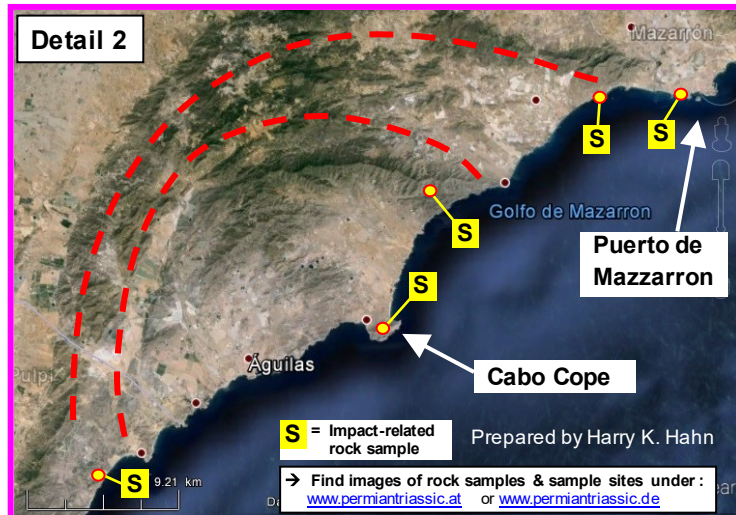
In the South and South-East of [Spain](#), and in [Morocco](#), there are large-scale secondary impact structures visible, which obviously were caused by the same primary impact event. This was in all probability the [Permian Triassic₁](#) Impact Event, which happened 253 Ma ago close to the North-Pole.



There are linear structures and bow-shaped structures noticeable on land and on the ocean floor between Spain and Morocco. The linear structures indicate the direction where the impactors came from, which probably was the area of the [PT₂](#)-Impact Crater.

The bow-shaped structures clearly indicate that the two impactors, which produced these structures, were travelling towards south-west when they impacted. The bow-shaped structures further indicate the strong compression in Earth's crust which was caused by the impacts west & south-west of the impact centers.

Because the whole area was obviously covered by flood lava directly after the impact (→ this is good visible on the 3D satellite-maps of Google Earth) only the areas which are free of flood-lava-remains will provide the impact related evidence to confirm this impact event !!



Rock samples which definitely indicate an impact event where found in the yellow marked areas shown in Detail 1 and 2 (e.g. the samples from Cabo Cope & Mazzaron) The samples show clear similarities to the samples taken in Italy. Therefore the rock samples collected near the described impact areas in Italy & Spain will confirm the evolution of Europe which I describe on the next pages :

The Rubielos Impact Structure in East-Spain :

The Rubielos Structure may be a direct result of the large secondary impacts caused by the PT-impact along the west-Coast of Spain (→ see next pages !)

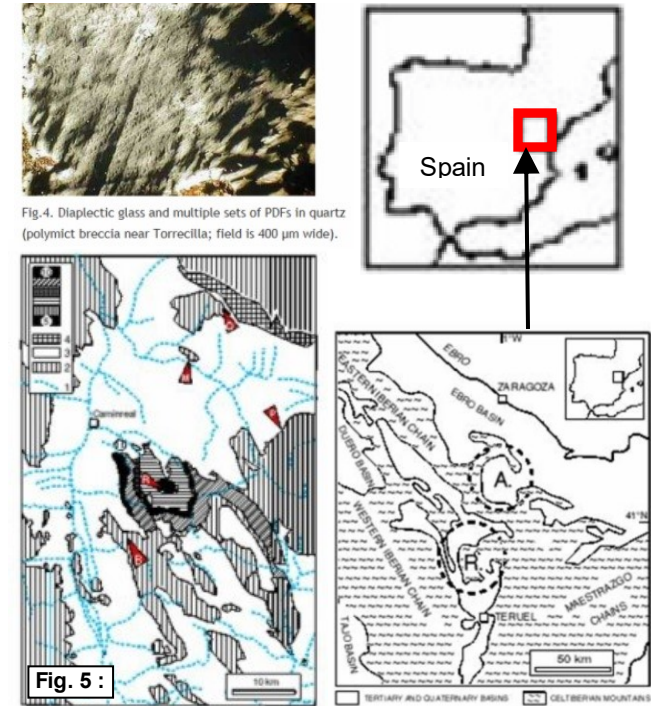
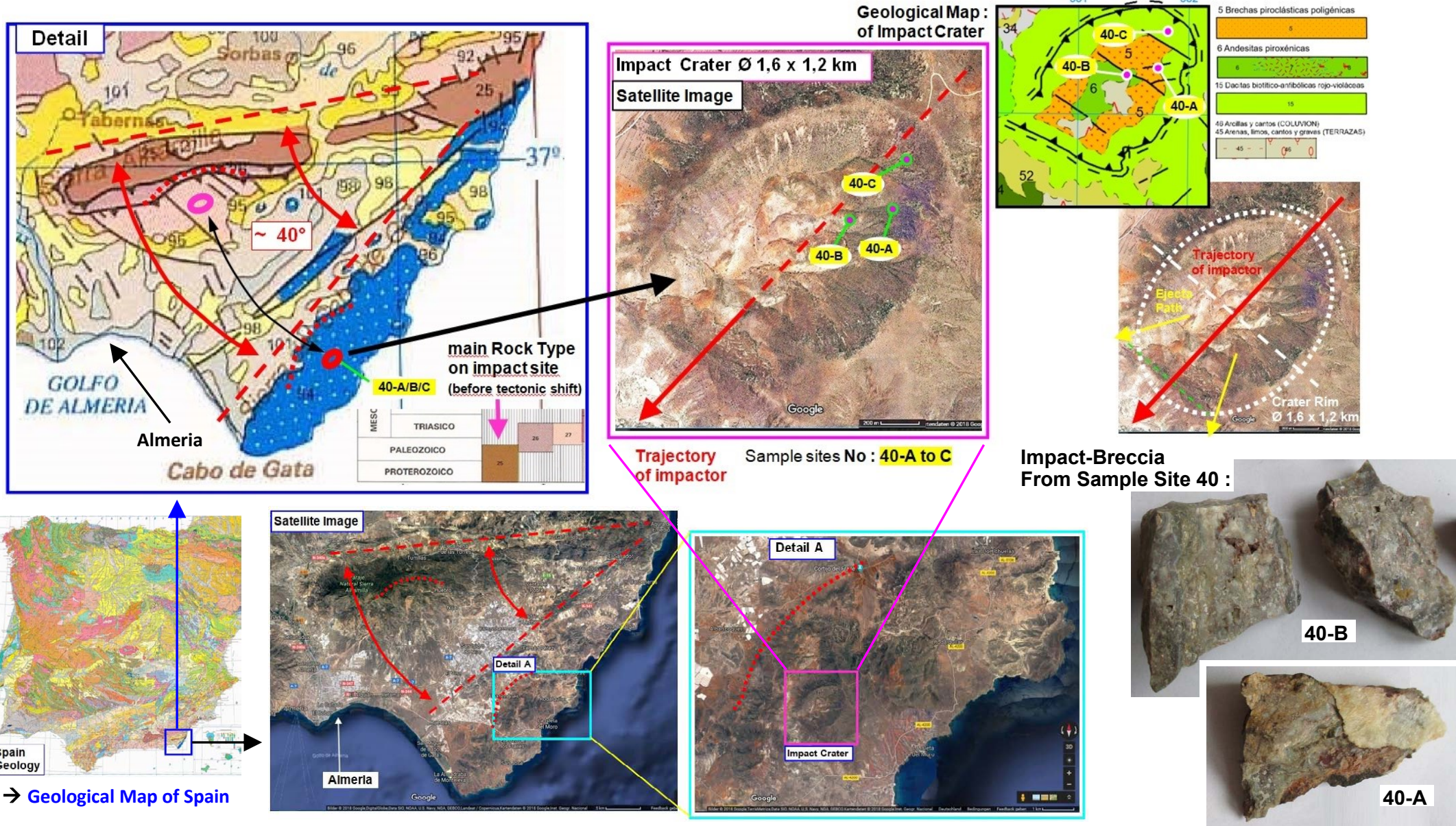


Fig. 5: Sketch-map of the Rubielos de la Cérda structure. 1 drainage pattern, 2 Paleozoic, Mesozoic and Lower Tertiary rocks, 3 Upper Tertiary and Quaternary rocks, 4 Pelarda Fm. ejecta, 5-10 Muschelkalk, Keuper, Jurassic, Cretaceous in the central uplift. About 50 km south of the Azuara impact structure (35 - 40 km diameter; Fig. 1) [1, 2], the Rubielos de la Cérda structure is defined by a circular to elliptical basin with a diameter of roughly 40 km, a circular central uplift with a diameter of about 15 km and a 500 m stratigraphic uplift, and a geometrically associated drainage pattern (Fig. 5). The most significant feature is the enormous compressive signature in the rocks including gries brecciation [3] (Fig. 9) and continuous megabrecciation up to chaotic criss-cross layering nearly everywhere (Fig. 10, 11). Apart from the general megabrecciation, all kinds of monomict and polymict breccias (Fig. 8) and breccia dikes (Fig. 6) occur. - Strong evidence for an impact origin of the Rubielos de la Cérda structure is given by the find of compact melt rocks within the structure between the central uplift and the northern rim. The melt rocks (silicate, carbonate, and phosphate melt) occur as blocks of variable size intermixed in a polymict megabreccia (Fig. 2, 3). A petrographic description of these melts is given in [4]. - More evidence of impact signature in rocks from the Rubielos de la Cérda structure is given by the occurrence of shock metamorphism. We observe heavily disintegrated feldspars with strong mechanical twinning and multiple sets of PDFs, crossing sets of isotropic lamellae in twinned feldspars, diaplectic quartz and feldspar together with multiple sets of PDFs (Fig. 4). Kinkbanding in mica from silicate Cretaceous rocks and strong microtwinning in calcite are frequently observed. As a macroscopic shock feature,

A small elliptical Impact Crater Ø 1.6 x 1.2 km in Southern-Spain in all probability is a Secondary Impact Crater of the PT- Impact Event

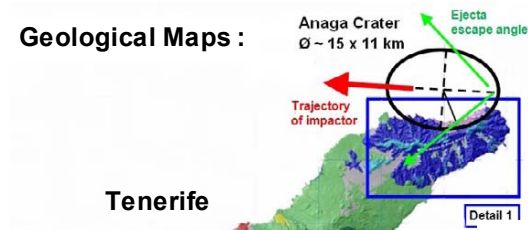
The yet unknown impact crater could provide evidence for secondary impacts in Europe, caused by the Permian-Triassic Impact. This crater surely isn't a volcanic structure ! I could find impact breccia on the Sample Sites 40-A / B (see images below). The crater structure seems to consist of Proterozoic rock. After the impact the surrounding proterozoic rock however was shifted away in a 40° angle as indicated , by tectonic forces which probably were caused by the ≈ 40° rotation of Africa, as a result of the ejecta impulse from the PT-Impact Event.



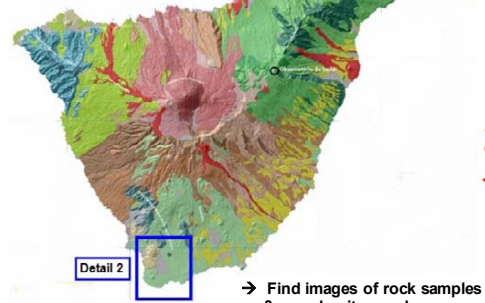
Two oblique impact craters Ø 20x15 km & Ø 15x11 km on the Canary Islands (Spain)

The **Canary Islands Tenerife & Gran Canaria** show evidence for two oblique impact craters (Ø 20x15 km & Ø 15x11 km) which were caused by impactors (ejecta) ejected from a much larger crater. This larger crater was a secondary crater which was produced by the **Permian Triassic (PT)-Impact Event**. The **“bases”** of the **Canary Islands Tenerife & Gran Canaria** (& all other islands of this island-chain) were part of the crater-wall of this ~Ø 280 x 200 km secondary crater ~ 253 Ma ago, before they slowly drifted away in a SW-direction from the location of the initial ~Ø 280 x 200 km crater. **Gravity Anomaly- & Magnetic Anomaly** Maps provide the evidence

Geological Maps :

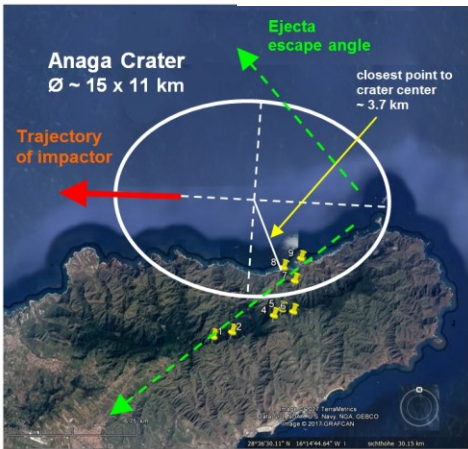


Tenerife

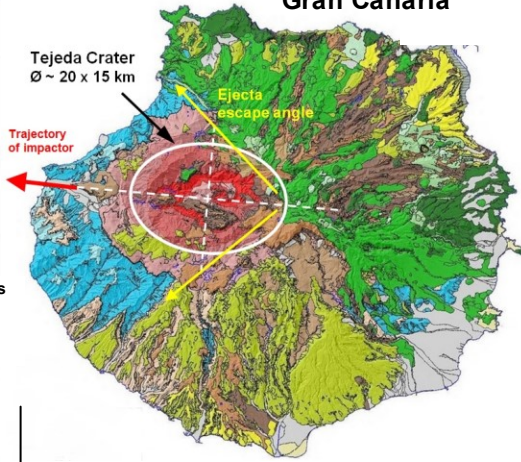


→ Find images of rock samples & sample sites under :
www.permiantriassic.at or
www.permiantriassic.de

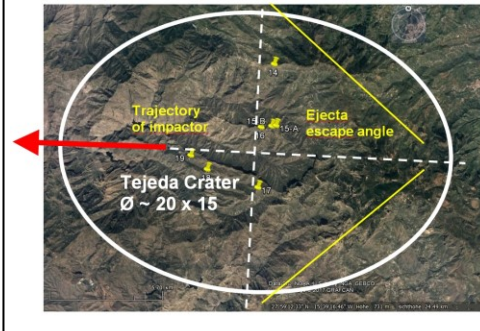
Satellite Image :



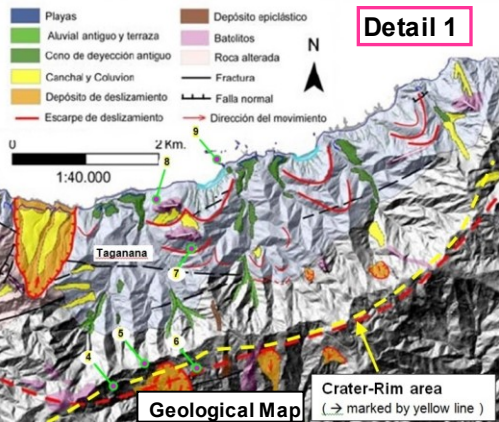
Gran Canaria



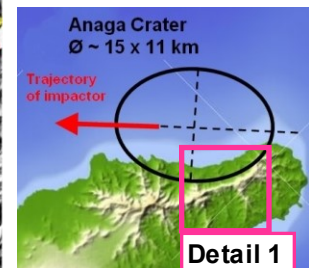
Satellite Image :



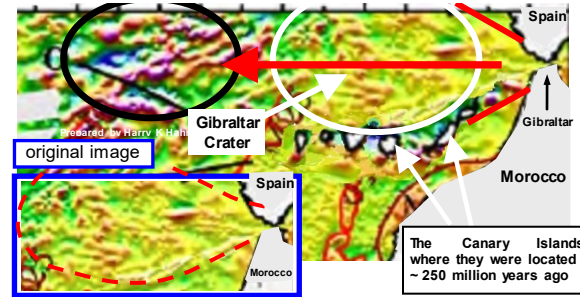
Detail 1



The two impact craters **Anaga Crater** ~15 x 11 km & **Tejada Crater** ~20 x 15km have the **same orientation** ! Sample sites **No. 7 & 9** may provide proof for the described Ø 15x11 km Anaga Crater.

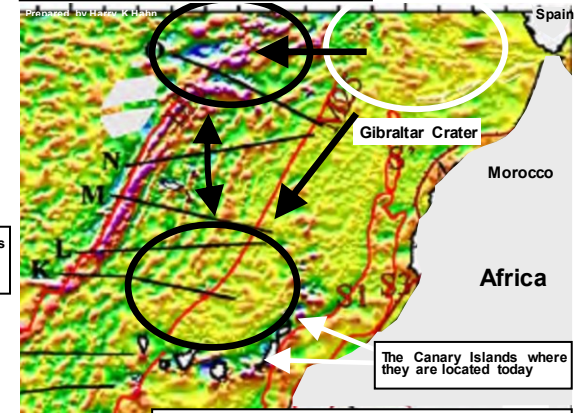


manipulated Magnetic Anomaly Map



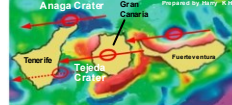
The **Magnetic Anomaly** Map of the ocean floor west & south-west of **Gibraltar** shows the clearest traces of the impact event which happend ~253 Ma ago. → see original map on right side (original image)

original Magnetic Anomaly Map

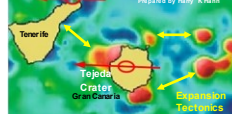


The area marked by a white ellipse, size: ~Ø 430 x 290 km is the remaining **magnetic signature** of the original crater (→ **Gibraltar Crater**). The black ellipses mark two **“drift-off copies”** of this signature in different crust-layers, caused by ocean floor spreading. The **manipulated Map** (left) shows the Canary-Islands on their original position ~ 250 Ma ago.

manipulated G-A-map :



original map :



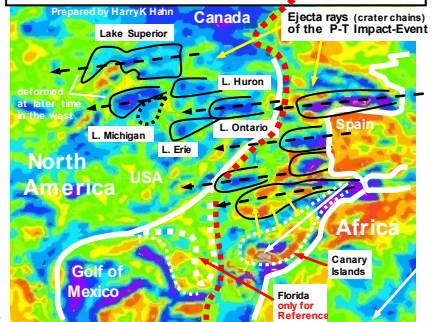
Analysis of Gravity Anomaly (G-A) Maps :

Magnetic anomaly maps, topographic maps and **Gravity Anomaly** maps show that the Canary Islands were part of the **southern crater-wall** of a **crater at the end of the R1-crust-chain** caused by the **PTI-event**. The gravity anomaly map on the left indicates that the Canary Island-Bases were initially close together & that they were hit by ejecta (impactors) coming from the same direction

The Great Lakes (USA) were formed by ejecta :

The map on the right side shows a Gravity Anomaly Map of Europe, Africa & North-America (without the Appalachians), ~200 Ma ago. The Great Lakes were caused by ejecta from the PTI-event (→R1)

Gravity Anomaly Map showing Europe & North-America (Great Lakes) ~200 Ma ago

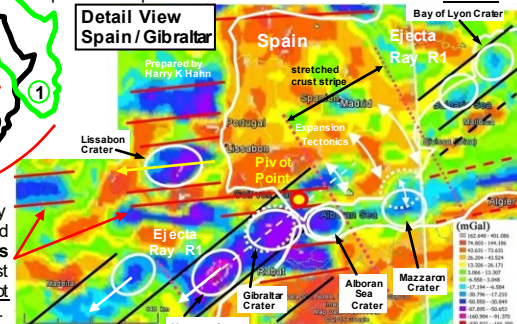


The rotation of Africa caused a 30° rotation of Spain in relation to Africa : The **Ejecta Rays R1 to R4**, caused by the **PTI-event** accelerated the African Plate towards the SW. From its original **position 1** (green), the African Plate rotated clockwise essentially around a pivot point close to Gibraltar to the later **position 2** (red), from which it then rotated back to the current **position 3** (black). However

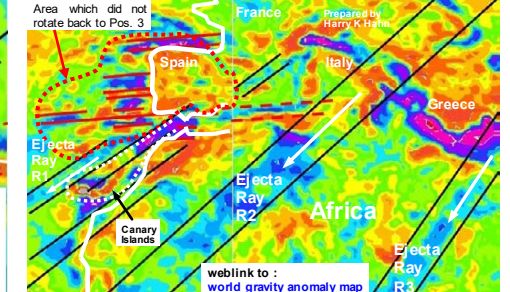
Spain and a part of the new Atlantic Ocean Floor did not rotate back from **Pos. 2 to 3**. This is indicated by the G-A map



The set of gravity anomalies marked by the **red lines** indicates the crust area which did not rotate back to 3.



Gravity Anomaly Map of Europe & Africa



weblink to : world gravity anomaly map

Canary Islands (Spain) – Fuerteventura / Lanzarote with Secondary Impact Craters from the PT- Impact Event

Overview of areas where samples were collected :

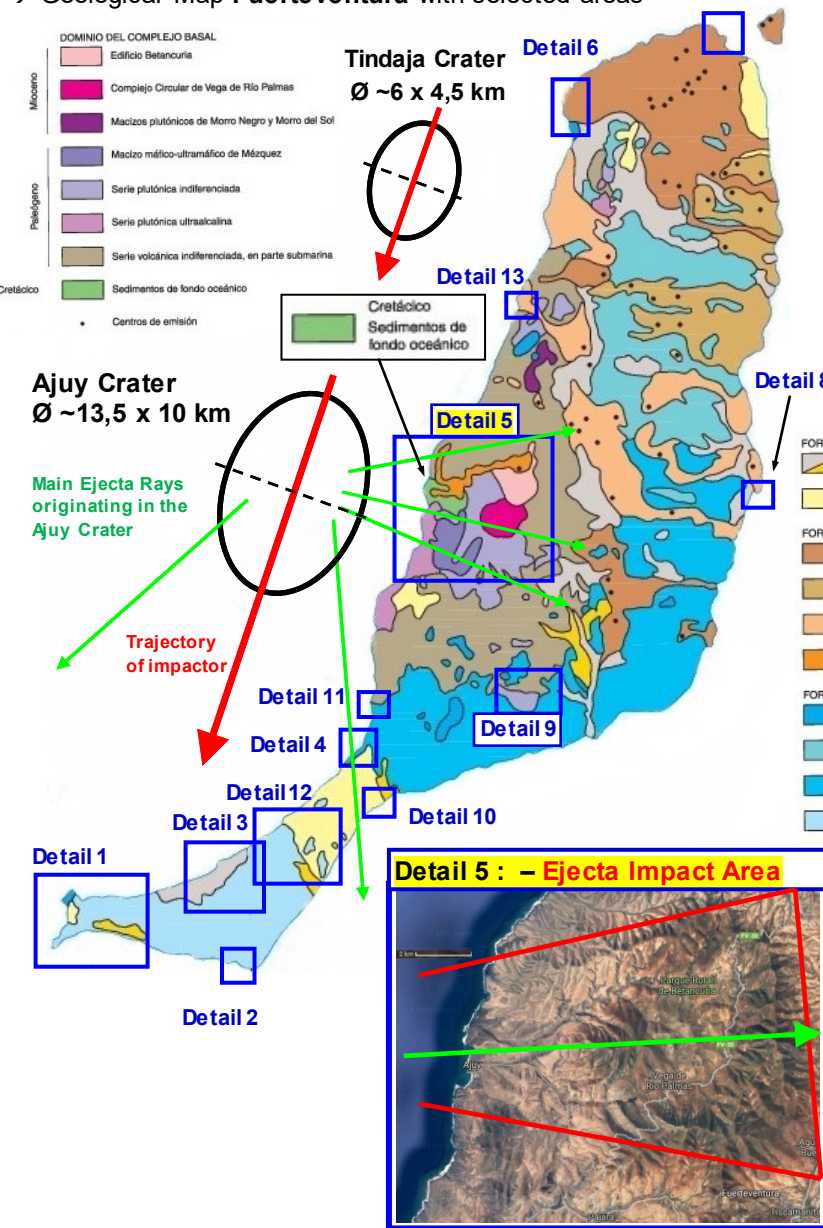
→ Geological Maps of Fuerteventura & Lanzarote with marked areas where rock samples were collected :

Fuerteventura

Lanzarote

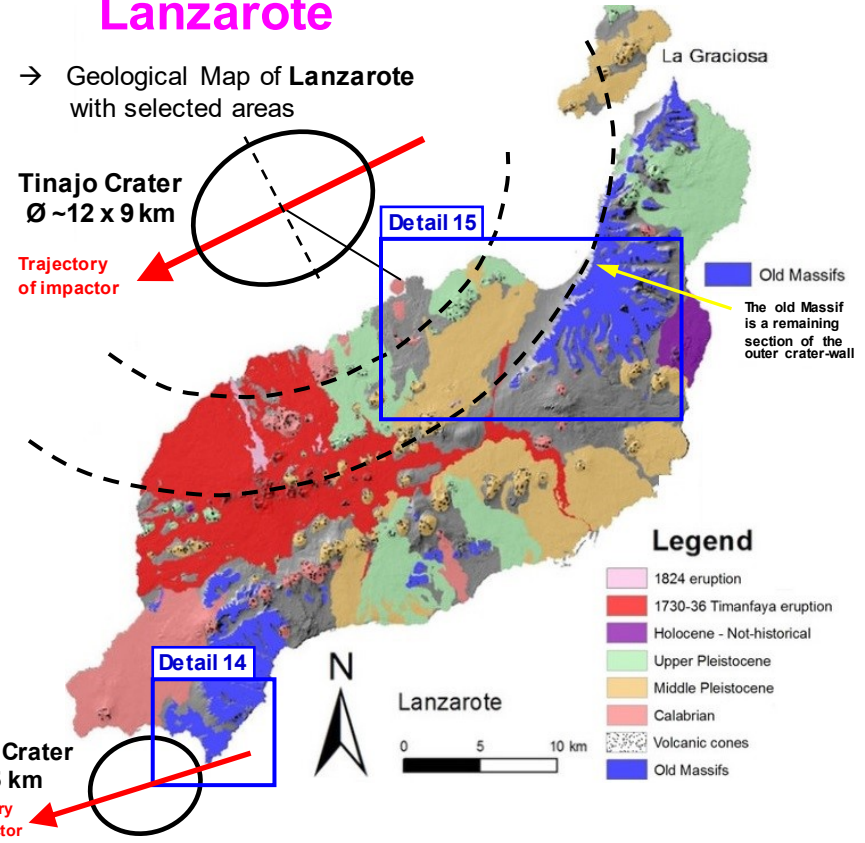
→ Geological Map Fuerteventura with selected areas

→ Geological Map of Lanzarote with selected areas



The two Canary Islands Fuerteventura and Lanzarote show evidence of a large scale Impact Event. This impact event probably was the result of ejecta from the PTI (Permian Triassic Impact) which impacted in this area and caused the Ø 430x290 km Gibraltar Crater (GIC). The shown smaller oblique impact craters belong to this impact event and are located along the original crater-wall (-rim) of the GIC.

The gravity anomaly map of Fuerteventura shows a larger 13,5x19 km and a smaller 6x4,5 km elliptical crater offshore of the west-coast of Fuerteventura on the ocean floor. The gravity anomaly map also indicates a 12x9 km crater offshore of the north-west coast of Lanzarote and a smaller 7x5 km crater offshore of Lanzarote's southern end.

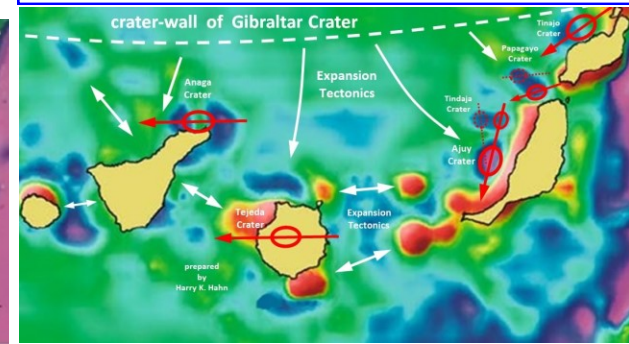
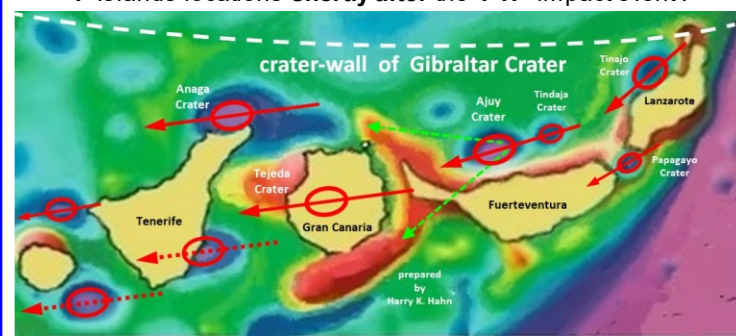


manipulated Gravity Anomaly Map :

→ original Gravity Anomaly Map :

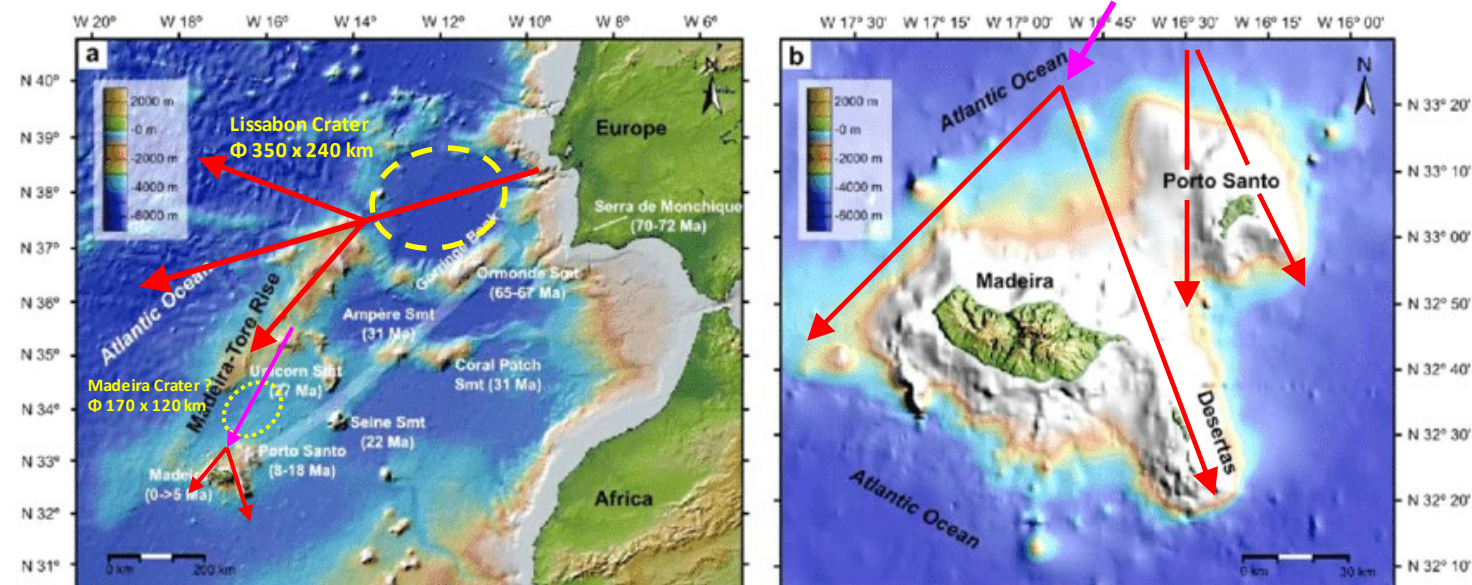
→ Islands locations shortly after the PTI - impact event :

Gravity Anomaly Map – Canary Islands (today) :

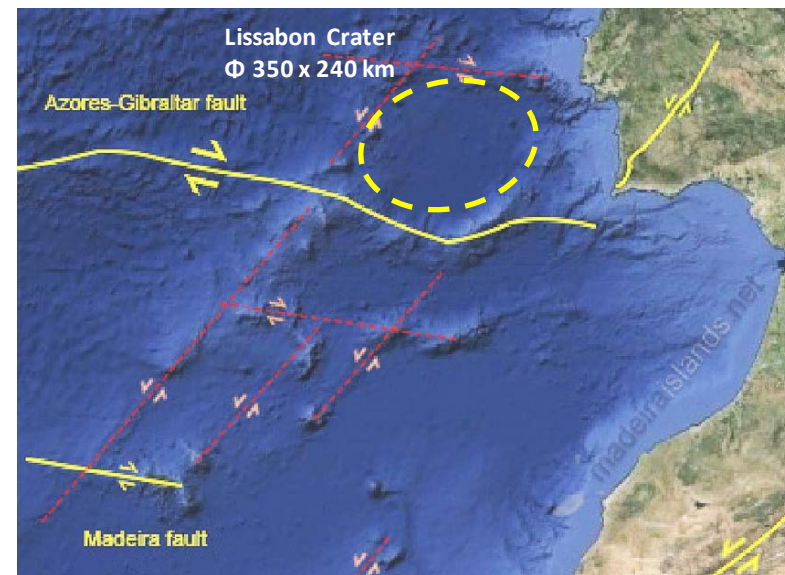
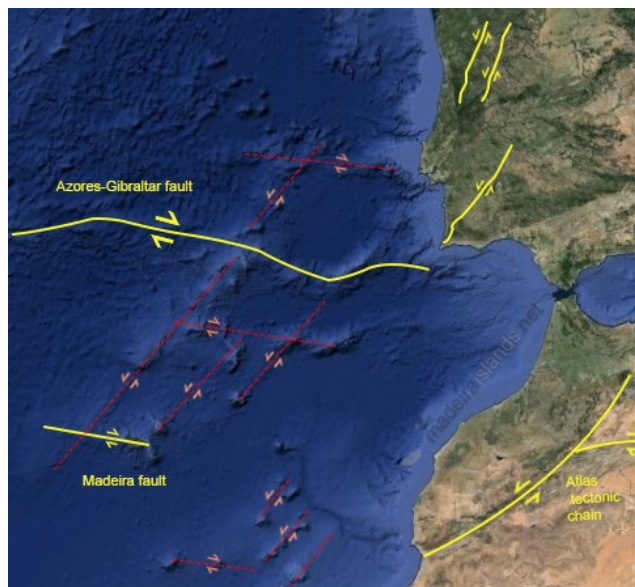
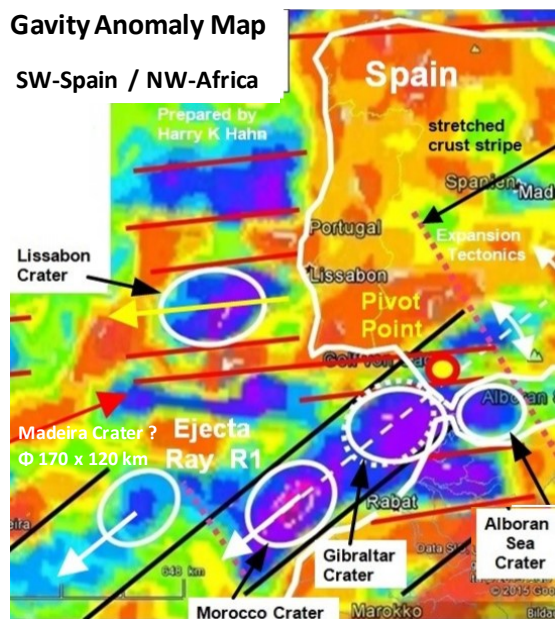


The islands Madeira & Porto Santo were formed by ejecta from the Φ 350 x 240 km Lissabon Crater a secondary crater of the PT-Impact Event

Originally the islands Madeira & Porto Santo were the result of impacting ejecta material (either) from the elliptical Φ 350 x 240 km Lissabon Crater or they are the result of impacting ejecta that came from a smaller secondary crater $\approx \Phi$ 170 x 120 km (Madeira Crater ?) south-west of the Lissabon Crater. The assumed trajectory of the impactor which formed the Lissabon Crater, \rightarrow ejecta from the PT-Impact Crater, indicates that the Lissabon Crater and the base-structures of the islands Madeira & Porto Santo were caused by the PT-Impact Event. The topography of the base structure of Madeira and the topography of the other ejecta material (submarine mountains) clearly indicates a large scale secondary impact scenario. (see maps below) caused by the Permian Triassic Impact Event.

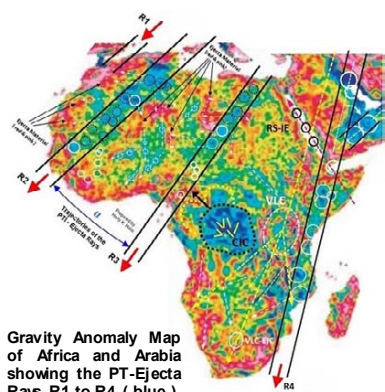


Topographic Maps showing the topography of the ocean floor and the fault systems around the Lissabon Crater & Madeira
(Note : The base structures of the Canary Islands in all probability are the result of impacting ejecta from the Gibraltar Crater)



Epilogue

All the new impact craters discovered during my study (see **Parts 1 - 6**) should lead to new oil- & gas-fields with more than 600 billion barrels of oil-reserves, and with more than 300 trillion cubic feet of gas-reserves ! (→ at a ~50 % success rate)

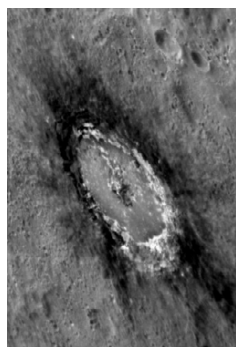


Especially the crater chains R1 to R4 and the CIC which are located on or near the African Continent, will contain a large share of these impact related oil- & gas-reserves. Because at least 50 ≥ Ø150km craters are located within the crater-chains R1-4 & the CIC

The expected reserves in this areas alone should exceed 400 billion barrel oil & 200 trillion ft³ of gas. Additionally large reserves of metal-ores should be located in the ejecta areas of these impact craters.

I now want to mention an interesting discovery on

Mercury. The image on the right shows the Ø 80 km Basho Crater on Mercury. The low-reflectance material (black) which is surrounding the crater is a form of carbon called graphite.



The scientists believe it was excavated by the impact from the planet's original, ancient crust which lies deeper.

It is thought that Mercury was once covered by a crust composed of graphite, when much of the planet Mercury was still molten.

An alternative explanation would be that the carbon was brought-in by the impactor itself, for example if the impactor was a carbon-rich comet. This would be my first guess when I look at this image. However an origin from within Mercury (from Mercury's mantle) is also possible.

I mention this discovery for the following reasons :

- 1.) In all probability the PT-impactor was a carbon-rich comet with a diameter of ≥ 50km.
- 2.) Lengai Volcano located in Tanzania within the strong ejecta ray R4 is erupting Carbonatite Lava, Carbonatites are formed essentially of carbonate. Because the distribution of carbonate rocks in Europe seems to be closely related to the impact event in Europe, caused by PTI-ejecta, it must be considered that the carbonate which formed the carbonatite lava originates from the PT-impact.
- 3.) The 12 km "Kola super-deep borehole" showed that at a depth > 7 km the rock in Earth's crust is saturated with Hydrogen (H₂) and H₂O which originates from deeper sources in the mantle ! Therefore we must take into consideration the possibility that certain amounts of the hydrocarbon reserves found close to impact structures could be the result of thermochemical processes which are going on during and after an impact event !

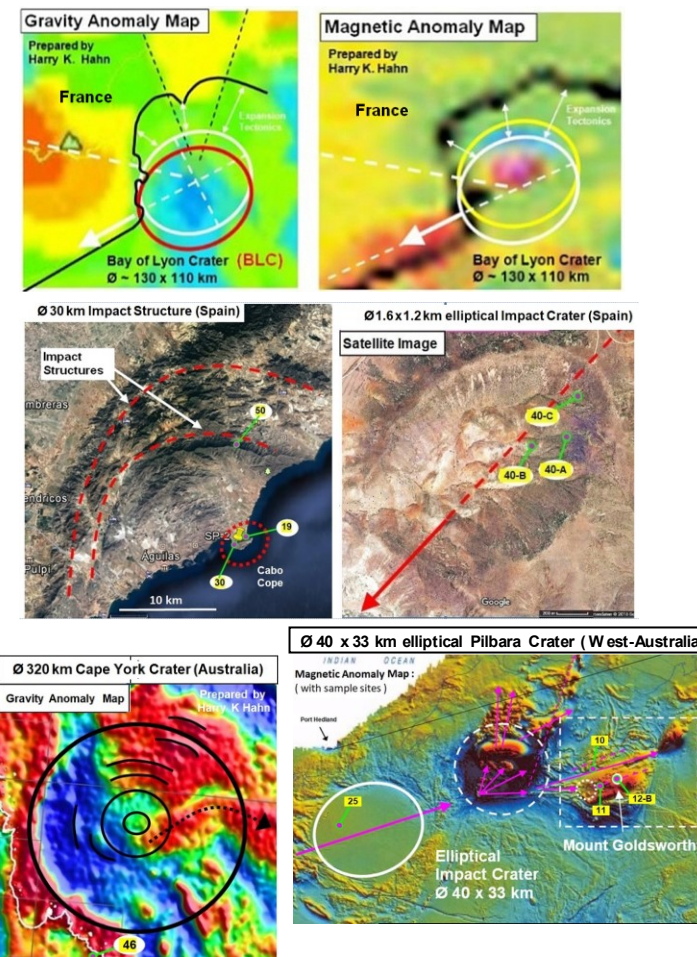
First indication for six PT- Secondary Craters :

I have found indication for shock-metamorphic effects in the rock-samples of **six possible Secondary Craters** of the PT-Impact Event.

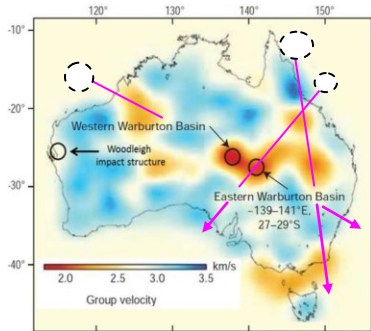
This provides the first scientific evidence for real impact structures caused by the PTI-event !

I used **Micro-Raman Spectroscopy on quartz-grains** to provide the evidence for a shock event, that in all propability was caused by the PT-Impact Shifts of the Raman peaks in quartz-samples of these six possible PT-secondary-craters indicate that the quartz-grains were shocked with a shock-pressure in the range of 20-22 GPa in some cases

This is clear indication for an impact shock event ! The most interesting PT-Secondary-Craters for further scientific research in Europe, to proof the PT-Impact Event, are the Ø 130 x 110 km „**Bay of Lyon Crater**“ and the Ø 30 km **Impact Structure** near Puerto de Mazarron and the Ø 1.6 x 1.2 km **elliptical Impact Crater** near Rodalquilar, both in southern Spain. In Australia the most interesting PT-Secondary Craters are the Ø320 km **Cape York Crater**, the Ø 40 x 33 km **elliptical Pilbara Crater** and the Ø 8 x 7 km **elliptical Warwick Crater**, as well as the possible Ø 30 km Mt Warning Crater. All these PT-Secondary Craters are unknown yet ! **A detailed analysis in Part 6 (P6)** of my hypothesis



There are still many other large-scale impact structures on Earth which need to be properly analysed, in order to figure out the correct tectonic model for Earth before & after the PT-Impact Event → e.g. the East- & West-Warburton Impact Basins.



→ see image on the left !
 There are two craters which formed the East- & West Warburton Basins approx. 300-360 Ma ago (estimated diameter Ø 100-200km each)
Weblinks :
[New s Article 1](#) , [New s Article 2](#)
[East-Warburton Basin](#)
[Eromanga Basin](#)
[\(Woodleigh Crater\)](#)

However this work must be carried out by experienced planetary scientists & geologists now, together with the analysis of all planets and moons

Because we need to know the root causes of all global impact events which took place in our Solar System and we need to find all impact structures !!

After reading this study about global impact events
What practical measures should be taken ??

1.) The first and most important measure must be the continuation of the research work, regarding global impact events and their causes & effects, which was started with this study here !

Scientists from many different disciplines must take on the challenge to find further evidence for the global impact structures described in this study

2.) Rock samples from all new impact craters and impact structures described in this study (Part 1-4) should be collected and analyzed.

3.) After the confirmation of the P/T-impact crater and related secondary impact structures a new

analysis & simulation of the tectonic processes in Earth's past, in the last 253 Ma, must be done !

4.) Then the cause of the expansion tectonic process, which obviously was triggered by the P/T-impact, must be found. And because there are other planets & moons in our solar system where expansion tectonic processes were triggered by a global impact event, a teamwork of scientists from different disciplines is required.

To find the driving physical / chemical process for the mantle expansion visible on different planets and moons, a close collaboration of planetary scientists, geophysicists, geologists, chemists and physicists (especially with expertise in fission research and high-pressure / high-temperature material research) is required.

5.) A more precise and more detailed computer analysis of the collisions (pericenter events) of the Sagittarius Dwarf Galaxy with our galaxy must be done. In all probability debris- (mass) streams resulting from these collisions are the cause of periods of violent global impact events in our solar system ! That's why it is important to find out the exact composition, extension & the effects of the debris streams, caused by these collisions, on our solar system !!! The starting point of this analysis should be the study from Mr Chris Purcell

Important ! : Especially the effects and the position of the leading tidal tail of the **Sgr-DG** in the past (-300Ma) & in the future must be studied !!

6.) Because the distribution of metal-ores and energy resources, like crude oil or natural gas in Earth's crust, is mainly caused and defined by large (global) impact events, knowledge of the precise location and size of all impact craters on Earth is crucial for future explorations of ore deposits, and especially for the exploration and discovery of new large oil- and gas-deposits !!

Good knowledge of all large impact structures on Earth will make a big difference in future

explorations, in order to find these important energy- and ore- deposits for mankind !!

Especially the correlation of big impact craters with the formation and the development of large oil-fields & gas-fields must be precisely analysed !! It seems that in particular the impact-related tectonic motion of crust fragments and magma streams, which were created during large impact events, are an important condition for the development of large oil- and gas deposits !!

This correlation must be studied & analysed !

Having seen and analyzed the Permian-Triassic Impact and the global destruction which it caused :

THE FOLLOWING WARNING MUST BE GIVEN :

We must consider different worst case scenarios in regards to one or more impactors (asteroids or comets) which are on a collision course with our planet Earth !!! And we must find solutions, and build and install suitable defence technology in space, in order to deflect the impactors of all assumed worst case scenarios away from Earth !!!

Possible Worst Case Scenarios to consider !! :

1.) Accumulations of **Asteroids** and/or **Comets** with a density like in the **Asteroid Belt** are approaching from deep space and they are on a collision course with Earth, having velocities up to 100 km/s !!

2.) Up to 10 Asteroids in the diameter range of Ø 10-40 km with velocities of 20-100 km/s are on a collision course with Earth and all are arriving at the same time !! Pre-Warning Time < 18 months !!

3.) A large **Asteroid** with Ø 200 km and a velocity of 100 km/s is approaching from deep space (from outside the solar system !!) and is on a collision course with Earth. Pre-Warning Time < 2 years !!!

As long as we don't exactly know what astro-physical processes have caused the global impact events within the last 300 million years, described in this study, we must take sufficient precautions !! in this violent and merciless universe !!

Because if we don't do so !!, Mankind and most other species on Earth could go extinct within a very short time !!, just like the Dinosaurs !!!

There are already some ideas and plans for the realization of technology to deflect small asteroids.

But every idea or plan which I have seen so far regarding the deflection of an asteroid or comet is far away from being able to cope with one of the described worst case scenarios !!!

If we are very lucky we could survive Worst Case Scenario 1.) But only if all asteroids or comets > Ø 10 – 20 km would miss our planet Earth !!!

Because we are not able to deflect such large impactors yet !!! We just don't have the required defense capability and technology to do that !!!

I have made an own assessment, and I found a few suitable defense strategies which are able to cope with large impactors, up to Ø 200 km !!

However these strategies only work if the required technology is installed in space (in defined locations in our solar system !) and if we are ready (well trained !!) to use this technology. And it would only be possible to cope with high-velocity [Asteroids](#) or [Comets](#) (with velocities >30-40 km/s) if the technology is installed with maximum rocket performance which is possible and if it would be installed on many locations in our solar system !!!

It would probably take at least 20 years to design, build and install such a defense system and it would probably cost ≥ US\$ 100 billion !

However if all members of the UNO cooperate in the effort to build such a defense system for our planet Earth, then it shouldn't be a problem to finance it !!! And it also shouldn't be a problem to

convince the UNO members to invest in such a defense system for our planet Earth !!

Because this is really the only possible insurance against a global impact event and the extinction of mankind and the total destruction of our world !!

And we shouldn't wait until the devil comes around the corner! Fast and smart action is required !

How such a defense system for our planet Earth could look like is described in my following study :

→ see Weblink : **[“To the deflection of asteroids in the diameter range of 5 to 200 Km”](#)**

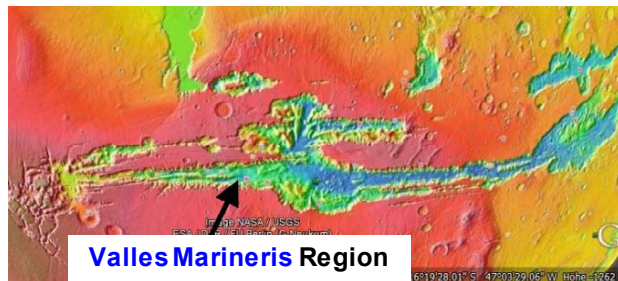
(This study will also be available at www.vixra.org soon. Just type-in my author-name in the search field and press enter. Then you will find the study.)

The interested readers should also have a look at the following Wikipedia page :

→ [Asteroid Impact Avoidance Strategies](#)

The strategies and the technology described in my above mentioned study : **“To the deflection of asteroids in the diameter range of 5 to 200 Km”** can also be used for doing [Terra-Forming](#) on Mars and on other planets & moons

With the described asteroid deflection strategies it would be possible to carry out controlled impacts of asteroids in the 10-20 km diameter range on Mars and on other planets & moons !!



The Valles Marineris is a deep 2400 km long Canyon on Mars probably caused by a crack in the crust of Mars.

Note : Mars' ocean water came out of the mantle here !

An action plan for Terra-Forming on Mars :

In order to create an additional “Second Earth” for Mankind we should perform Terraforming on Mars as quick as possible before the settlement starts !! With a controlled impact series of probably 3 to 4 asteroids in the Ø 10-20 km range a large crack in the crust of Mars could easily be produced.

Alternatively a few 50 MT Fusion-Bombs located in 10km deep drill-holes can be used to achieve this.

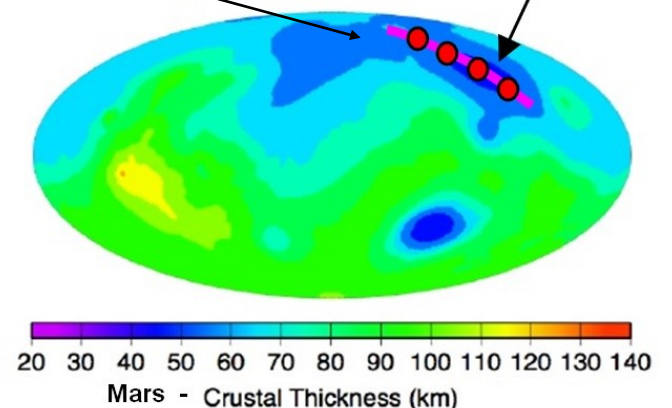
In order to achieve the crack with the smallest possible impactor diameter & energy expense, the optimum area for the intended crack would be the thinnest crust area of Mars. This is in the center area of the northern lowland (→ the former ocean floor on Mars) Here the crust is only 40 km thick!

A large crack in this area should cause large amounts of volatiles (e.g. H_2O) to rise up to the surface, similar as it happened in [Valles Marineris](#).

This would quickly produce a small ocean near the crack and a thicker atmosphere, which would improve the living-conditions on Mars considerably!

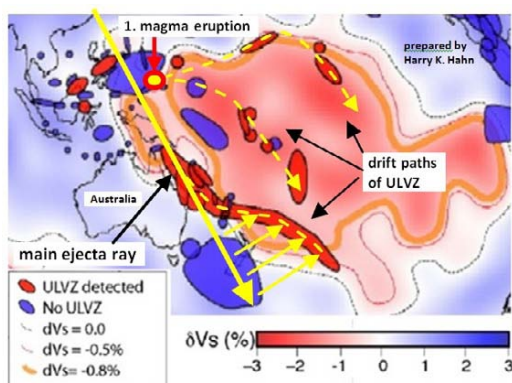
Such a [Terra-Forming](#) project should first be tested on another planet or moon which is located further away from Earth, and which is not a primary target for human settlements. It could be tested for example on Jupiter's moon [Ganymede](#)..

From this crack large amounts of salt-water Ø 10-20 km impactors produce a crater chain which causes a crack from Mars' mantle can fill up the old ocean basin !



A few words to the dangerous Pacific-LLSVP :

An essential new discovery in comparison to the first edition of my study is the fact that the Pacific Plate and the expansion tectonics process which has formed it, is the result of ≥ 8 gigantic magma eruptions in the west pacific region over the last 200 Ma. These magma eruptions were caused by the Pacific-LLSVP-(ULVZ), which in all probability is a direct result of impacting ejecta of the PTI !



Further new discoveries were the Victoria Lake Impact event, the Canary Islands Impact event, the localization of the “Bay of Lyon” Crater, the correct position & orientation of the Indian Plate, Madagascar and South-America at the time of the PTI-event and some other new interdependencies.

Regarding the described magma eruptions in the West Pacific the following **Warning** must be given :

With high probability another magma eruption will take place in the west pacific region ! In all probability it will occur in proximity to the Fiji Islands. When it will happen is difficult to say !

Therefore the mantle area below the Fiji region must be examined with seismic tomography in more detail, e.g. the vertical velocity of the magma flow under the Fiji region must be measured ! **see Part 1**

Note that a new mass extinction, caused by another gigantic magma eruption of the Pacific-LLSVP, can begin at any time ! Within a short time period such a largescale magma eruption could kill up to 60% of all

species on Earth ! Like the other eruptions in the past it will cause an oceanic anoxic event (like the OAE-1a & OAE-2 and PETM (Paleocene-Eocene Thermal Maximum.), which will release vast amounts of CO_2 , H_2S etc. into the oceans and will kill up to 60% of all marine species. Largescale explosive volcanism with vast amounts of CO_2 released will be a result too (e.g. see Ajupa Island)

It could begin in a few years, or it may not happen in the next million years. But in all probability it will happen sometime within the next ~ 5 million years ! A solid column at the top end of the Pacific LLSVP near Fiji, which is located close to the surface, may be an indication of the next due magma eruption !

And there seems to be a connection between these magma eruption events in the west pacific region and the **62 Ma bio-diversity cycle** on Earth (\rightarrow Extinction-cycle with two half periods of ≈ 31 Ma)

In all probability some of these violent magma eruptions were triggered by extreme earthquakes, e.g. caused by impact events, like the Chicxulub-Impact in Mexico. Like a punch which triggers an eruption of the contents of a heated Coke-bottle, the shock waves of an extreme earthquake may finally trigger a magma eruption from the Pacific-LLSVP (\rightarrow caused by a sudden pressure spike) !

But to make it clear : We are looking at two different periodic cycles here !

The periodic magma eruptions of the Pacific-LLSVP are caused by thermochemical processes which are going on inside the LLSVP & ULVZ. There seem to be longterm thermochemical processes at work with cycle lengths of 10 - 30 Ma (million years).

(\rightarrow the cycle length seems to decrease over time)

Please note : It may also be the case that a large amount of superheated mantle-water streams out of the Mid-Ocean-Range-crevices before a magma eruption starts, causing in this way climate change and sea-level rise !! see weblink to : [News Article](#)

And the final stage of this cycle, the magma eruption, can be triggered by an outer shock event The 62 Myr Bio-Diversity Cycle (or 62 Ma Extinction-cycle !) is caused by a precise periodic astronomical event going on for at least 500 Ma !

In all probability it is caused by the periodic crossing of the galactic plane by our solar system every 31 Ma. Every second crossing of the galactic plane seems to be particularly dangerous, because it has produced a worldwide mass extinction every time for the last 8 (62 Ma)-cycles !

6 of this 8 crossings caused a mass extinction each time, killing ≥ 70 % of all marine species on Earth ! Because our solar system moves along a spiral path around the galactic center, at every second crossing our solar system crosses the same ring area of the galactic plane, which in all probability is densely packed with debris resulting from collisions of our Galaxy with the Sagittarius Dwarf Galaxy (Sgr-DG).

And to point this out : Our solar-system is currently crossing the galactic plane in this obviously dangerous ring-area ! We know that the last worldwide extinction took place 65 Ma ago !

Therefore the next worldwide extinction event seems to be overdue and can happen at any time ! Maybe we just haven't passed the dense debris-layer yet !

By the way : This assumed debris-ring (or debris accumulation) may be the cause of the Oort Cloud (\rightarrow the source area of comets !) around our solar system, and the densely packed debris ring(s) in the galactic plane (similar to Saturns ring) may offer an alternative to explain the Dark Matter problem !!

Looking at the other global impact events which I have discovered on the planets Venus, Mars & Pluto, and on the moons Ganymede & Charon, which all indicate orbit inclinations $\geq 40^\circ$ for the original orbit of the impactors (comets or asteroids), then it certainly must be taken into consideration that the impactors came from outside our solar system !!

\rightarrow either from the Oort Cloud, or from the assumed debris ring (layer) in the galactic plane !

Because these global impact events probably all occurred within the last ~250 Ma, we must expect large impactors which are coming with high velocity from deep space !

As long as we don't exactly know the physical process which has caused the global impact events within the last 300 million years, described in this study, we must take sufficient precautions !!

Because we are not able to deflect such large impactors yet ! We just don't have the required defence capability and technology to do that !

Therefore an asteroid- & comet deflection system must be built which protects our planet!

I have made an own assessment, and I found a few suitable defence strategies which are able to cope with large impactors, up to Ø 200 km !!

How such a defence system for our planet Earth could look like is described in my following study :

See : → "[To the deflection of asteroids in the diameter range of 5 to 200 Km](#)"

It will probably take at least 20 years to design, build and install such a defence system and it would probably cost ≥ US\$ 100 billion ! But it is our responsibility to build such a system !

It is also our task & responsibility to settle on our neighbour planet Mars as soon as possible, and to establish an independent civilisation on Mars, which doesn't need support from Earth to survive !

This is the only way to make sure that our advanced technological civilisation will survive in the case of a global impact event on Earth, caused by a large impactor coming from deep space, or in the case of another gigantic magma eruption caused by the Pacific LLSVP !

We may be able to build a defence system against a large impact on Earth. However it's not possible to build a defence system against a gigantic magma eruption coming from Earth's mantle !!

That's why the development of nuclear drives for spaceships must be accelerated. We need much more payload capacity ! Instead of just being able to lift 10 tons into orbit, we need payload capacities of thousands of tons to really make progress in establishing settlements on Mars and on other planets and moons. If we shift our focus to the development of nuclear driven spacecraft we can achieve this within a few decades !

Please note that 10 kg enriched Uranium contain as much energy as thousands of tons of rocket fuel ! We already have enough fuel (enriched uranium) to build hundreds of spaceships with payload capacities ≥ 1000 tons ! The weapons industry worldwide must be redirected to build such large spaceships, and the space-technology which we need for the colonization of Mars, instead of ever-increasing the weapons-piles on Earth ! We must shift our focus !

At last a few words to our political leaders :
The G20 & UNO must set a new framework, so that "Resource Wars" can't happen anymore !

Therefore I suggest an **Action Plan** and a **number of Global Regulations** with the following goals :

1.) **Secure & explore the required resources for mankind far in advance before they are needed!**

2.) **To define which resources should be extracted first and which ones should be put on hold**, in order to minimize the environmental impact of the mining industry, in particular regarding very sensitive natural environments.

3.) Altogether there should be a **better longterm planning for a safe and environmental friendly resource exploitation worldwide.**

Speculation on commodity markets must be restricted by setting bandwidths for trading !

Commodity prices must be forced into defined bandwidths to provide stability for world's economy.

A worldwide analysis of all available mineral- and energy- resources and -reserves must be carried out under control of the UNO and G20.

A precise projection of the resource needs for the next 30 years must be done, and a 30 Year plan for food-, water-, energy- and mineral resources supply for mankind must be set up.

Because the next 30 years will be the most challenging time in human history, with maximum resource consumption !

→ see Part 4 of my study for further information

4.) **Mining industries** which are critical for the resource supply for mankind **should be under observation and protection of the UNO & UNSC.** (for example the crude oil exploration industry)

5.) **More food and energy reserves (oil & gas) must be kept in stock** (e.g. during the coming very low sun-spot-cycle minima, in which cold Winters and shortened harvest seasons must be expected !) (see following links : [link_1](#) , [link_2](#) , [link_3](#) , [link_4](#))

6.) The **population growth** in the fastest growing countries **must be reduced as quickly as possible** with the financial help from the G20 & UNO.

And much more irrigated farmland is required !!

A Top-Down Approach is required to reduce resource consumption ! First it must be defined how much resources can be used over the next 30 years. Then all key-industries must get limits for the use of resources, which they shouldn't exceed !

We need to refocus !!! We must start many international projects where all members of the UNO & G20 work together to achieve a better and saver life for all people, a healthy environment and in general good & positive visions for mankind !

One of these positive visions must be the Realization of a constant Settlement of Mankind on Mars → realized by the G8, G20, EU and the UNO !

Other important visions for mankind must be : (→ also realized by the G8, G20, EU and the UNO !)

That we really must get serious Now about the Protection of the remaining Rainforests on Earth, otherwise they will be gone in 10 years !! and with it millions of rare species !! The rich countries must pay compensation to the Rainforest-Countries in order to achieve this goal !

The rainforests are the lungs and filters of our atmosphere, and they reduce climate change !!!

And the species which live in the rainforests (plants & animals) contain billions of highly interesting organic substances for mankind, which all have the potential to create great progress for mankind and big profits for the Pharmaceutical- and the Chemical-Industry for hundreds of years into the future !

That's why it should be a high priority for the big Investment Banks and the world's Pharmaceutical- and Chemical-Industry to protect the Rainforests !!

The Pharmaceutical- and Chemical-Industry together with Investment Banks and governments should work out contracts in which they agree to pay money to the Rainforest-Countries for the longterm protection of the Rainforests. For this they would get e.g. exclusive rights for the copying & using of interesting organic-substances & molecules found in the Rainforest Species. This will be a Win-Win situation for both parties and for the rainforests !

And we must get serious about removing the plastic waste from the rivers and oceans !!!

The source of plastic waste which ends up in the world's oceans is plastic-waste which gets dumped in rivers and flood-areas !

This happens especially in highly populated mostly asian countries and in India. The ten biggest rivers in these countries transport ≈ 70-80% of the plastic waste into the world's oceans !

Especially the monsoon-rain and the following floods transport all plastic waste from the once- a-year flooded areas into the worlds oceans !

To prevent this pollution the authorities in these countries must define dumping-sites for waste on higher flood-safe areas, and there must be high penalties for dumping waste elsewhere !! Penalties for poor people who pollute the environment could be that they must help for a week to collect waste.

Cleaning up the oceans with specialized machines won't work. The task is just to big !!

The root-cause must be eliminated, which is the dumping of waste in rivers and flood-areas !!

It's high time to get serious on all this tasks !!!

The Author : Harry K. Hahn - 8.7.2017

(update 18.1.2021)

Here the weblinks to the Parts 1 to 6 of my study : → They are available on vixra.org and on archive.org

Weblinks to my studies on → vixra.org :

Part 1 : <https://vixra.org/abs/2012.0210>

Part 2 : <https://vixra.org/abs/2101.0052>

Part 3 : <https://vixra.org/abs/2101.0096>

Part 4 : <https://vixra.org/abs/2101.0067>

Part 5 : <https://vixra.org/abs/2101.0127>

Part 6 : <https://vixra.org/abs/2104.0099> → see also : Part 6b

Weblinks to my studies on → archive.org

[Study-Part 1](https://archive.org)

[Study-Part 2](https://archive.org)

[Study-Part 3](https://archive.org)

[Study-Part 4](https://archive.org)

[Study-Part 5](https://archive.org)

[Study-Part 6](https://archive.org) and : [Study-Part 6b](https://archive.org)

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2.) **An alternative Venus** ; Warren B. Hamilton. 3.) **The OIB paradox** ; J. Godfrey
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8. **The African-Superplume (LLSVP) a whole mantle structure**, Start at **33** minutes by Andy Nyblade, from the University of the Witwatersrand (South-Africa)
9. Two studies about Carbonatite Lava : [Study 1](#), [Study 2](#) see also: [Movie 1](#), [Movie 2](#)
10. **Permian-Triassic Extinction Event** : → Two informative studies about the P/T-event
Study 1 : [Study_1](#) ; Study 2 : [Study_2](#)

Impact Cratering :

8. C. Koeberl, F. Martinez-Ruiz : **Impact Markers in the Stratigraphic Record** 2003 ; Springer Verlag ; ISBN : 3-540-00630-3
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→ companion website of book : www.wiley.com/go/osinski/impactcratering
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Interesting Online Documents & Websites :

Note : If weblinks don't work, then type-in or copy the shown web-address directly in your internet browser, or search with titel & author !

Images of **Rock-samples & Sample sites** of some of the described impact structures can be found on these websites : www.permiantriassic.at or www.permiantriassic.de

- 1.) Introduction : **Impact Metamorphism** , by Dr. Ludovic Ferriere
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→ <http://www.lpi.usra.edu/lpi/potter/publications/RossThesis.pdf>, see also: **Oriental impact**
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- 4.) **The Sagittarius impact as an architect of spirality and outer rings in the Milky Way**, C.W. Purcell & others, → see also : **Computer Simulation**
→ <http://arxiv.org/ftp/arxiv/papers/1109/1109.2918.pdf> - (www.youtube.com → type in titel !)
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- 5.) **Asteroid/Comet Impact Craters and Mass Extinctions** , Michael Paine
→ <http://users.tpg.com.au/users/tps-seti/crater.html>
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→ <http://pages.geo.wvu.edu/~jtoro/Research/shrimp/shrimp.htm> → Chapter 2 in my study

- 7.) **A Breakup of Pangaea and plate kinematics of the central Atlantic and Atlas regions**, A.Schettino, E.Turco → <http://gji.oxfordjournals.org/content/178/2/1078.full>
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- 11) **Triassic-Jurassic Rifting : Continental Breakup and the Origin of the...**
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www.books.google.de → Search : → type in : **Ti quartz tholeiite**
- 12) **To the deflection of Asteroids in the diameter range 5 to 200km**; Harry K. Hahn → <https://archive.org/details/ToTheDeflectionOfAsteroidsInTheDiameterRangeOf5To200Km>
- 13) **Ghawar / Saudi Arabia - The world's largest oil-field**, Energy Consulting Group → http://energy-cg.com/OPEC/SaudiArabia/OPEC_SaudiArabia_Ghawar.html
- 14) Publications of **Dr Andrew Glikson**: → <http://archanth.anu.edu.au/staff/dr-andrew-glikson>
→ Studies about large-scale impact events in Australia
- 15) **Info to the Sagittarius Dwarf (Elliptical) Galaxy (SagDEG)** :
<http://www.solstation.com/x-objects/sag-deg.htm>
- 16) **A 2MASS ALL-SKY VIEW OF THE SAGITTARIUS DWARF GALAXY. V. VARIATION OF THE METALLICITY DISTRIBUTION FUNCTION ALONG THE SAGITTARIUS STREAM**
→ <http://authors.library.caltech.edu/16714/1/CHOapj07.pdf>
- 17) **Galaxy: VI. s-Process and Titanium Abundance Variations Along the Sagittarius Stream**
→ <http://arxiv.org/pdf/0911.4364v1.pdf>

Animations, Simulations & Movies in the Web :

- 1.) **3D-Impact Crater Simulation**, Museum für Naturkunde / Berlin
→ **Clic on the images to run the animation !!** :
→ <http://www.isale-code.de/redmine/projects/isale/wiki/Media>
(Especially watch the 3. animation !! clic on the third image !)
- 2.) **The Sagittarius Impact as an Architect of Spirality and Outer Rings in the Milky Way**
→ <https://www.youtube.com/watch?v=pig-uqRehNM&feature=youtu.be>
- 3.) **Two more animations which show the current collision situation with the Sgr-DG !**
Sagittarius Dwarf Galaxy flyaround : → <https://www.youtube.com/watch?v=qfuj5DMI0JU>
The Sagittarius Dwarf galaxy and the Milky Way → <https://www.youtube.com/watch?v=SxJkTDCG5w>
- 4.) **Ganymede - Rotating Globe Geology**, NASA Jet Propulsion Laboratory
→ <https://www.youtube.com/watch?v=Jkerr60mhf8>

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→ Geology : <https://www.youtube.com/watch?v=quZMhSohIEU>
→ Topography : <https://www.youtube.com/watch?v=TFmWl5O9My4>
→ Topography & Gravity Map : <https://www.youtube.com/watch?v=BIPKqLwmxK0>
- 6.) **Permian-Triassic Extinction Event** : → Three informative movies about the P/T-event
[PT_Movie 1](#) ; [PT_Movie 2](#) ; [PT_Movie 3](#)
- 7.) **Global 3D-tomographic model of Earth's mantle**, by David Pugmire & others
→ Joint Tomography was used. Simulation made with ORNL Supercomputer
- 8.) **The Ring of Fire from below (Earth's mantle)**, by Scott Burdick
- 7.) **At last : Titanic Impact Energy unleashed !! Andromeda/Milky Way Collision**
→ **A must-seen for Impact-Researchers !!**: <https://www.youtube.com/watch?v=Prlk6dKcd0U>
From Prof. **Jeffrey Kenney** from Yale University
→ See also the following animation : <https://www.youtube.com/watch?v=1keSq3Wg024>

References regarding the Global Expansion Tectonics Theory :

- 1.) **Global Expansion Tectonics - A more rational explanation** - by James Maxlow
→ http://tmgnow.com/repository/global/expanding_earth.html → see Introduction in my study
- 2.) **Website of Dr. James Maxlow** : <http://www.jamesmaxlow.com/>
- 3.) **The expanding Earth: a sound idea for the new millennium**, Giancarlo Scalera
→ <http://www.earth-prints.org/bitstream/2122/1152/1/A%20SOUND%20IDEA%20....pdf>
- 4.) **Expansion Tectonics** ; → <http://db.naturalphilosophy.org/topic/?topicid=1>
- 5.) **Expanding Earth vs. Plate Tectonics**, Geologist 2010, Timothy Casey B.Sc.
→ <http://expansion.geologist-1011.net/>
- 6.) **Microscopic structure of water at elevated pressures and temperatures**
C.J.Sahle & others → <http://www.pnas.org/content/110/16/6301.full.pdf>
- 7.) **Factors Influencing the Eruption of Water-Based Magmas through Europa's Ice Crust.** L. Wilson, J.W. Head; → <http://www.lpi.usra.edu/meetings/lpsc97/pdf/1139.PDF>
- 8.) **Water content in arc basaltic magma in the Northeast Japan and Izu arcs**
M.Ushioda ...; → <http://www.earth-planets-space.com/content/pdf/1880-5981-66-127.pdf>
- 9.) **Role of Water in Magma Generation and Initiation of Diapiric Uprise in the Mantle**, P.J.Wyllie, → <http://authors.library.caltech.edu/51417/1/jgr12274.pdf>
- 10) **Volatiles in subduction zone magmas**, USA 2003, P.J.Wallace
→ http://www.geo.mtu.edu/EHaz/ConvergentPlatesClass/wallace/Wallace_2005_SOTA.pdf
- 11) **Composition of Earth's mantle → new research results**, Li Zhang, Yue Meng
<http://www.anl.gov/articles/composition-earth-s-mantle-revisited-thanks-research-argonne-s-advanced-photon-source>

Appendix : The Evolution of Europe : It started with the impact of Ejecta from the **PT**-Impact around 253 Ma ago

The following drawing shows what happened around 253 Ma ago when the ejecta from the **PT₂**-Impact near the north-pole impacted in the European Region. At that time whole Europe was an impact area which was hit by at least a dozen large impactors with diameters in the range of 5 to 20 km, which produced a series of craters which fractured Earth's crust and formed several crust fragments. Because of an opening-up of the mediterranean area, caused by the **PT₃**-Impact itself and the impact of the ejecta, a large vortex was triggered (marked with purple lines) which probably reach down > 100 km to the **Asthenosphere**. This vortex then caused the further evolution of Europe. → **see next pages !**



→ Note : Scroll up & down the next three pages quickly to see an animation of the tectonic evolution of Europe !!!

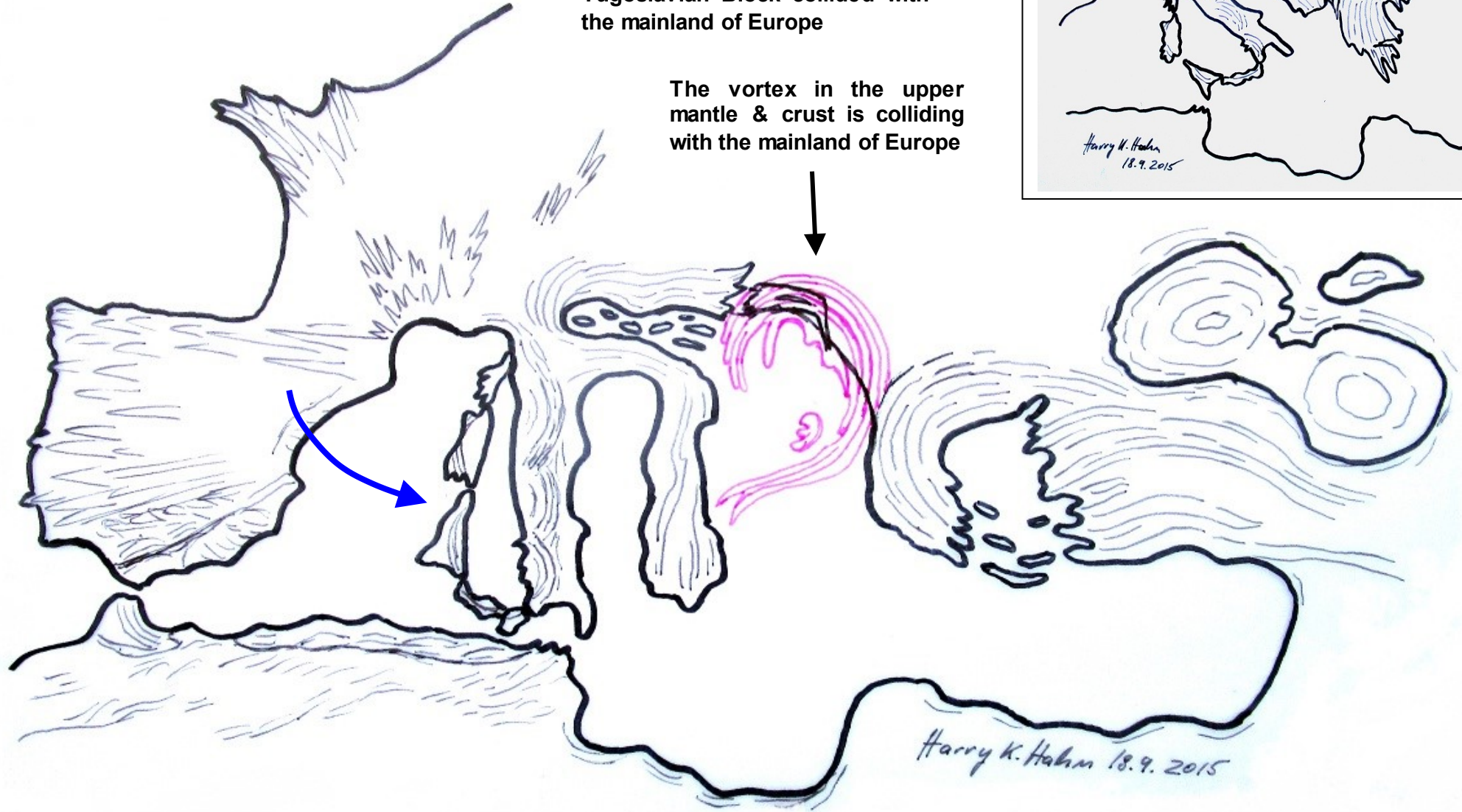
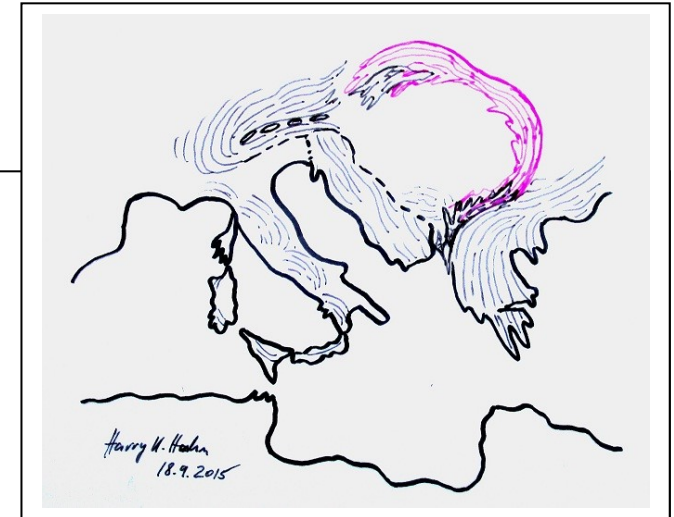
The flow of mantle material in the vortex then moved Italy slowly towards East

The resulting rotary movement of Italy around its last fixing point with the main land Europe, caused by the vortex in the upper mantle & crust, started to form the Alps :

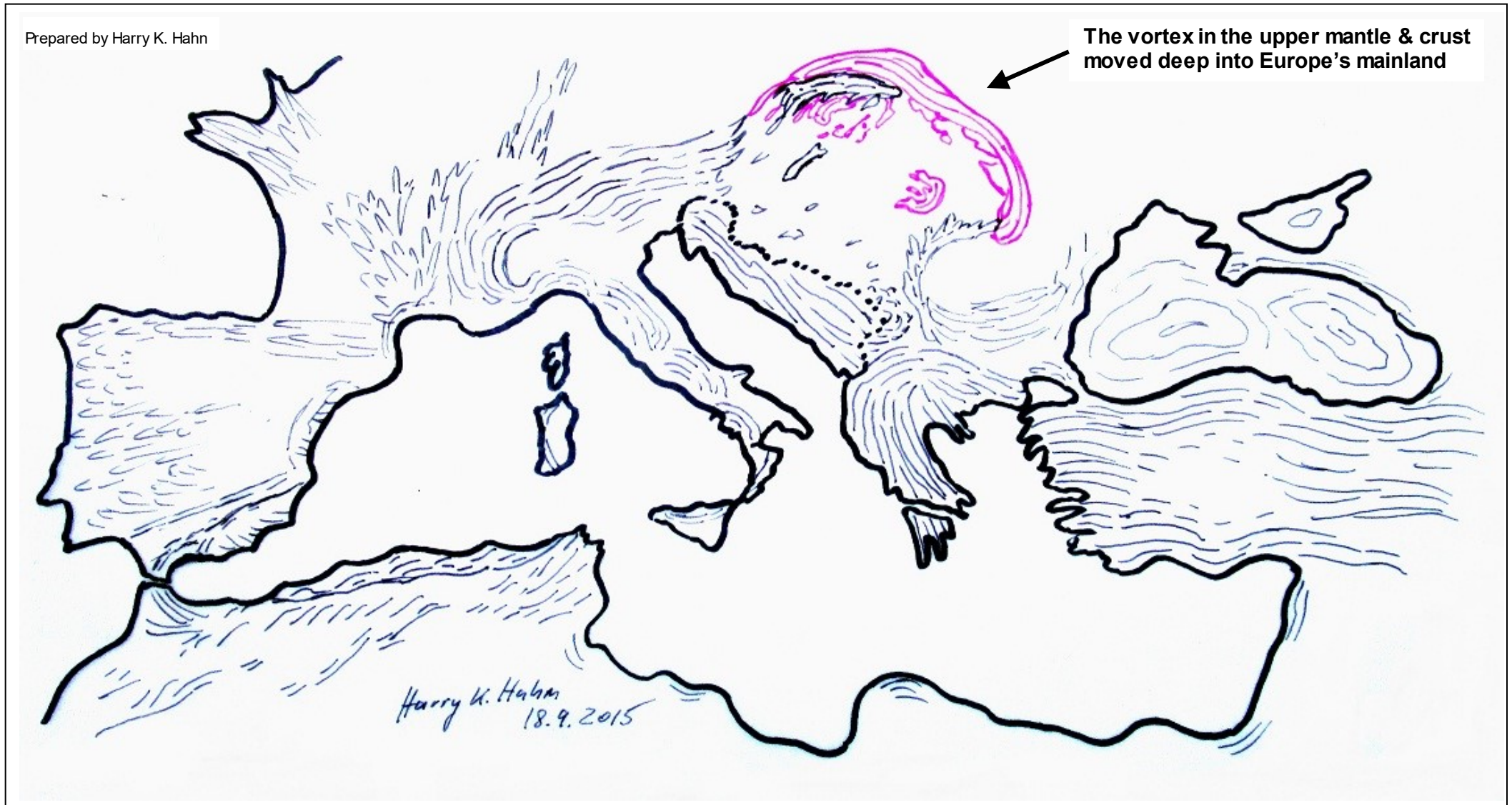
Prepared by Harry K. Hahn

The tectonic situation when the Yugoslavian Block collided with the mainland of Europe →

↓
The vortex in the upper mantle & crust is colliding with the mainland of Europe



Here now the present appearance of Europe today, 253 Ma years after the impact of the ejecta from the **PT**-Impact
The continuous rotatory movement of Italy around its fixing point has produced the Alps and other mountain ranges in Europe.



→ **Note** : Scroll up & down the last three pages quickly to see an animation of the tectonic evolution of Europe !!!