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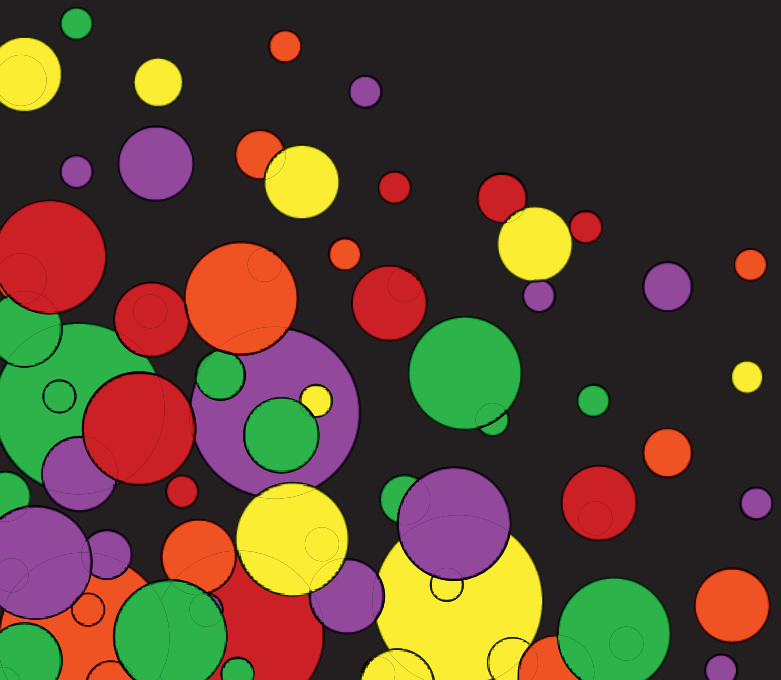

DOCUMENT

DESIGN REPORT

russell harding
diploma two

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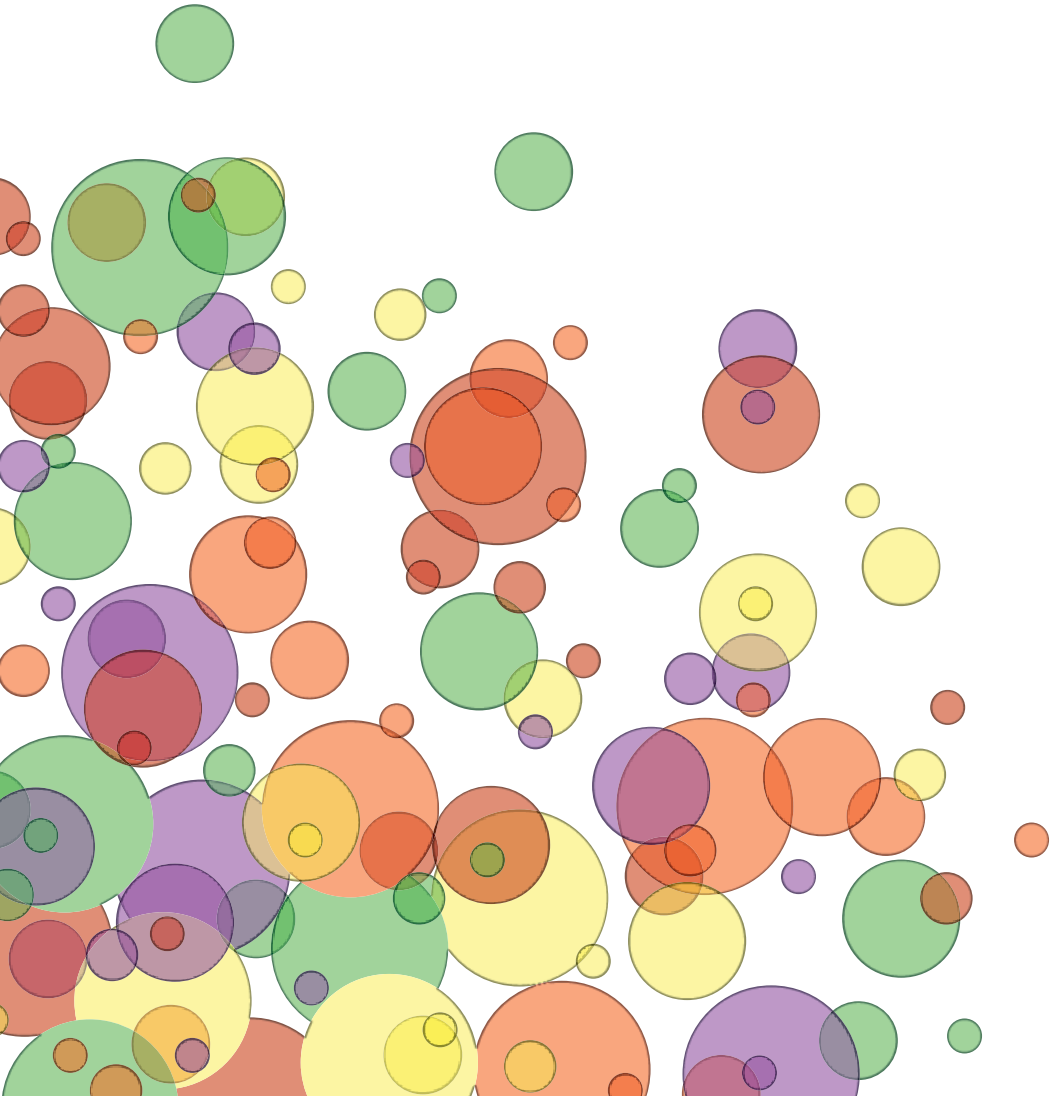

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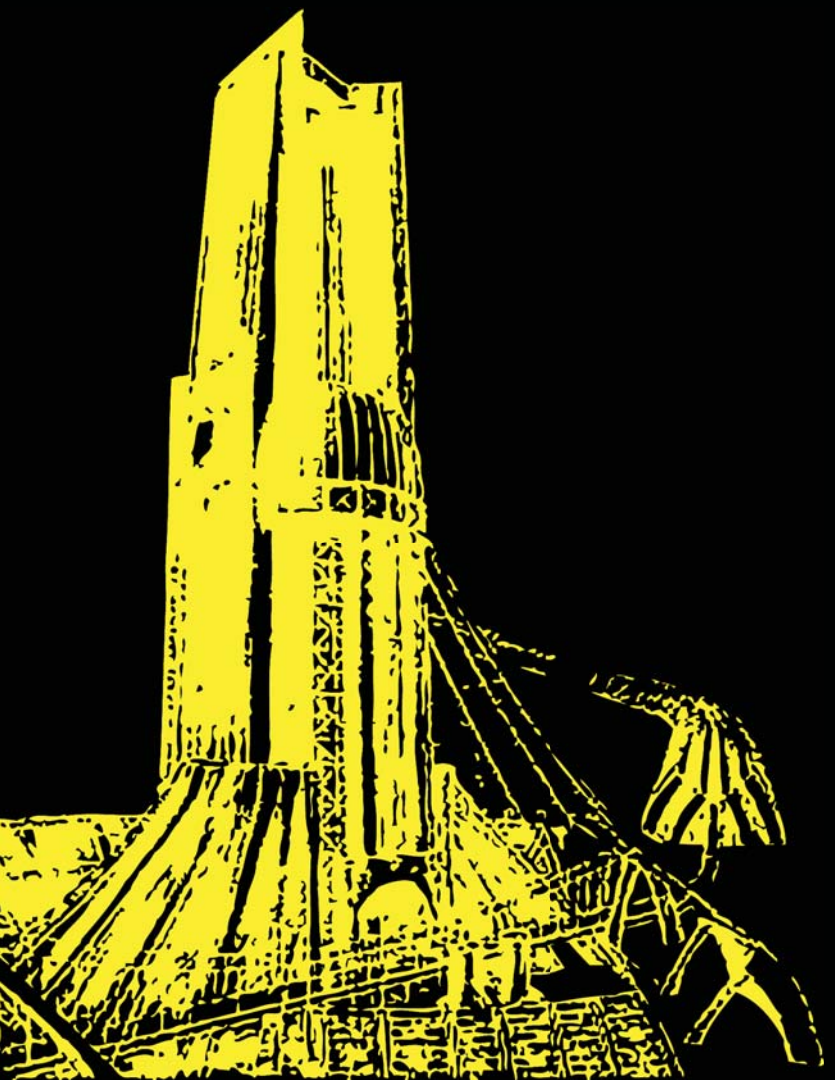

DISSERTATION SYNOPSIS

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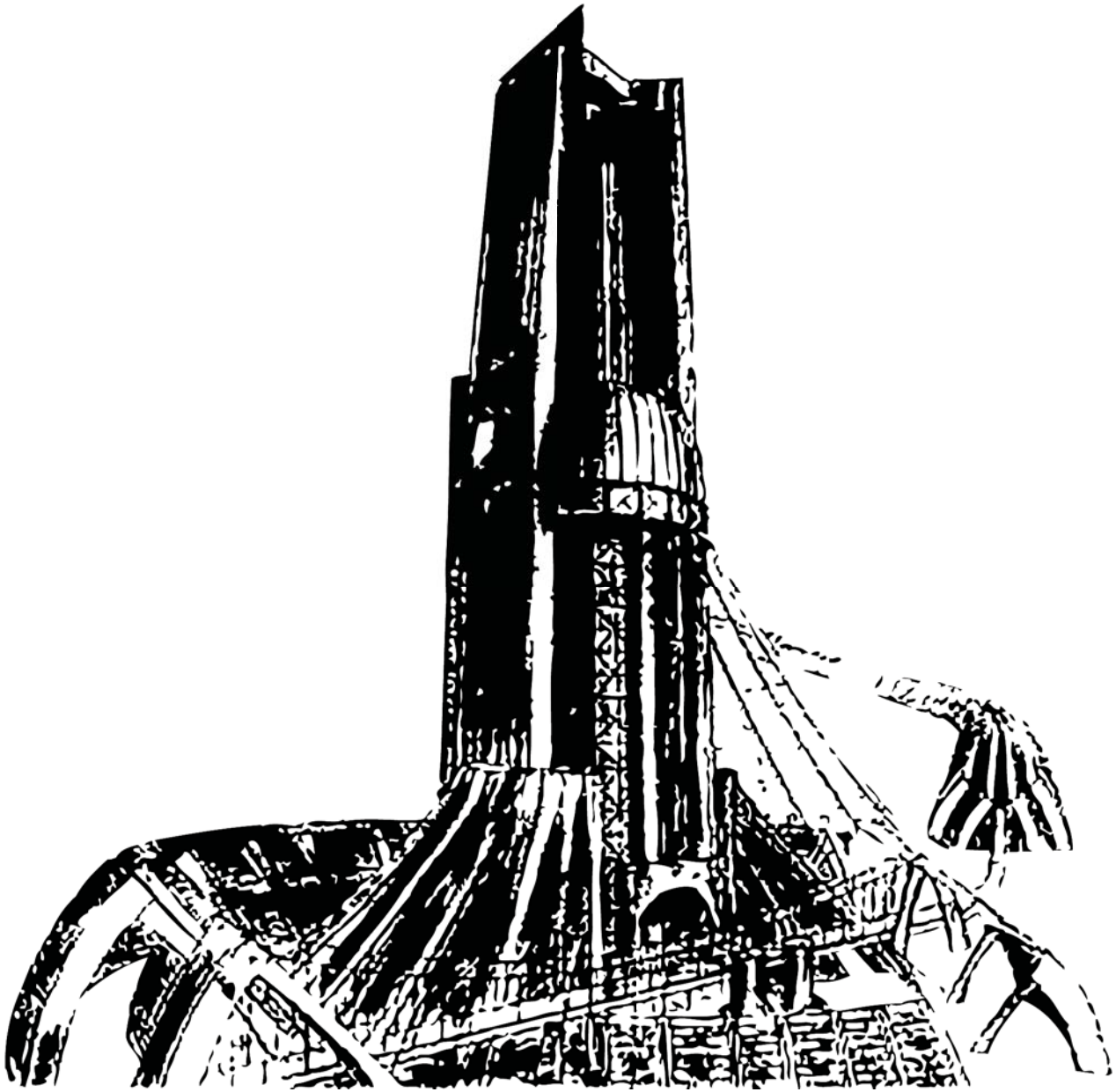
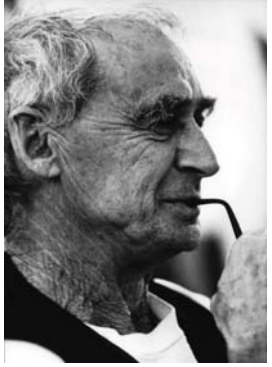


HYPER | a city in the image of man

Soleri's award winning vision of the modern city



Paolo Soleri

Russ Harding

Synopsis

In the dissertation that follows I discuss the ideas and inspiration behind the work of Paolo Soleri and an in depth study into the function of his most recent piece of work on a concept he calls Arcology.

Soleri has dedicated his life in architecture to finding the answers to a multitude of problems we as the human race face in our evolutionary path. Problems such as global warming, climate change, urban sprawl, consumerism and waste production.

With Soleri's latest project, Hyper Building, he proposes to construct a one kilometer high structure that contains within it all that a city needs to function for approximately one thousand years. The design of this city targets complete sustainability, a vast reduction of urban sprawl, a denser form of living with an enhanced sense of community within it.

The project which is located in the Mojave desert is designed to thrive in the hot, arid and inhospitable local environment and to create a largely self-sustaining community that will remain as a precedent for future city and urban planning.

*A full copy of my dissertation is provided as a seperate document, the following is only the text

Introduction

> "If a street rises in height and detaches itself from the ground, it is because the street must overcome and obstacle. Rarely does it climb because it wants to reach a building or a space on the other side. And this changes everything. Normally streets and homes or buildings are two separate things. To understand today's city, one need only look at the blueprints for the buildings. That's not the case with arcology…
>
> …Since the surface of the earth is a two-dimensional configuration, the natural landscape is not the appropriate frame for the complex life of society. As a result, man must create a metropolitan landscape In his own image. It should not be a tenuous film of organic material, but an energetic lump that is physically compact, dense, and multilevel; it should be a solid of three compatible dimensions."

This quote by Paolo Soleri is an abstraction of a presentation made to the Hyper Building Research Committee in 1996; in this speech Soleri is attempting to explain some of his observations of the evolution of human society up until that point. He comments on the problems of designing in a two-dimensional fashion and notes that because this from of mono-planar design is so regular and recurring we need to justify rises in levels and elevations of elements of the city that are normally flat. Soleri also observes that the design itself is two-dimensional with little depth to the creation of structures and each evoking only a shallow emotion. He goes on to explain that the path forward in this evolution is a change in direction; to design in the image of man is the most logical and a more efficient way to cope with the problems we as a race must overcome. Soleri suggests that his concept of Arcology can provide the change in direction that architectural planning and construction should take; he presented his Hyper Building design as a solution to the problems caused my two-dimensional design and suburban sprawl. The design is the most recent development in Soleri's work on Arcology and it holds many answers to how the human race can make such a radical leap in a social, economic and structural existence and adapt to the changes that will come from it.

The term Arcology derives from the fusion - literally as well as grammatically - of Architecture and Ecology.[1]
He believes that the only way to create for - and in the image of - humankind is primarily to discover a way to blend these two terms together. In his opinion, to understand both is the only true way a structure such as an Arcology will thrive. Soleri believes that the cities of today such as New York, London, Tokyo and even Dubai - a relatively new development - will not support the evolution of mankind in the future. The structures of these cities are haphazardly achieved while the individual facilities are the fruits of a rigid set of economic, technical, racial, religious, and status standards. Soleri states that:

> "If one adds the incoherence of the logistical organization (communication, transportation, facilities) the picture is as gloomy or gloomier than the skies of our cities. There is no need here to demonstrate the necessity of bringing man into a far greater interplay with society than any of our cities can afford their stifled functionality"[2]

Soleri's philosophy of Arcology is one that has developed and evolved over decades, most likely starting when he parted company with Frank Lloyd Wright in 1949. It appears to have progressed whilst trying to comprehend the physicality of the schemes that he undertakes; he can then gain a greater understanding of how he should proceed. To identify with his ideas it will be necessary to look at some of his earlier works, to see each stage of progression. To better understand Soleri's schemes, this study will take a brief look at the projects that were designed pre-Hyper Building such as Mesa City, Hexahedron, Asteromo and also the work he has done to construct Arcosanti. Through analysis of the projects it is possible to understand the particular aesthetic that has evolved.

The design of each of these structures comes from a revised understanding of the contemporary city, the interactions we as human beings have with the city and also a much deeper evaluation of the evolution of man. Soleri states that it is only through re-assessing the evolution of man and discovering the path we have taken that we can make true progress in the future.[3]

The main body of this work is to understand Hyper Building itself. What made it Soleri's most promising project? Why was it designed the way it was? How was it to function on a grand scale, interacting with other cities or developing a new 'stand alone' city?

The philosophy - in Soleri's vision - is not a strict guideline that he must follow but a set of boundaries to be experimented with. The projects he undertakes are tests, attempts to develop and secure the theory of Arcology so that it can be used in the adapting climate of human evolution. Much like Ebenezer Howard's designs for 'Garden Cities' Arcology proposes an escape from overcrowding and poverty in industrial cities. Soleri perceives a solution to urban sprawl and the pollution of the atmosphere created by large and often over-expanded cities of the modern era.

1 Stephen Sennott, *Encyclopedia of 20th Century Architecture* (Taylor & Francis, 2004),p.61.

2 Paolo Soleri, *A Bridge Between Matter and Spirit is Matter Becoming Spirit* (New York: Anchor Press/Doubleday, 1973), p.39.

3 Paolo Soleri, *The Omega Seed: An Eschatological Hypothesis* (New York: Anchor Press/Doubleday, 1981), p.15.

Soleri's cities are designed with a greater sense of community in mind than that of the contemporary city, the life led by its inhabitants would be different from the interactions we have today. The cities are divided up into Sectors and within those would be groups such as Residential, Industrial, Commercial, and Leisure. Soleri admits this kind of architecture and inhabitation would ask for a new a sort of tolerance and perception by the residents. Each inhabitant of the city would need to support each other.[4]

People would have to work together to provide for each other. In theory this would provide for a perfect city, people would live amicably within their needs and no one would be impoverished.

Due to the sheer scale of the structures Soleri envisages, it would take a different approach to architecture to make them feasible; understanding the human psyche to make these structures desirable for human habitation is the prime goal of Arcology. Without this the schemes themselves could never function.

Although Soleri did not get a great deal of acknowledgement for the years of development in the field of Arcology his work did not go unnoticed. In 1996 Soleri was invited to take part in a competition held in Japan. This competition to create a structure that would be known as the Hyper Building was a chance for three architects to propose a city for the future; the city must be revolutionary in its function.[5] Unlike the contemporary cities of today it would need to function as one unit, to be seen as a whole and work in the most efficient manner.

> "The Hyper Building would be a project that could not exist in any form except as a culturally, historically and perhaps an evolutionarily important urban laboratory, otherwise the whole scheme would be open to debate and disillusionment. Furthermore, private ownership should not be a measure of its success, at least in the early stages of construction.[6]

The same is true of Arcosanti, the development Soleri has been working on as an experiment and investigation into the true nature of Arcology and the principles behind all the other Arcologies that he has designed prior to Hyper Building.

4 Paolo Soleri, *Arcosanti: An Urban Laboratory?* (Cosanti Press, 1983), p.80.
5 Paolo Soleri, *Harry Rand & Ron Anastasia, What If?* Collected Writings 1986-2000 (Berkeley Hills Books, 2002)p.234.
6 Paolo Soleri, *The Hyper Building Interim Synopsis* (Paper, June 1996.)

Arcology

Contrary to the rudimentary understanding of the term Arcology – wherein it is percieved as a city within a megastructure – describing it as such would be doing the term a great injustice; the theory of Arcology runs much deeper than that. Soleri believes that discovering the harmony between architecture and ecology can bear the fruits of a type of structure that will truly connect with humankind. It is his belief that to gain a connection between man and building, we need to remove certain objects that we have become complacent with. We must look at areas of urban and city planning that have become mandatory and rethink them.[1]

The Problems with the City

Firstly, vehicular transportation - although good when travelling over large distances such as city to city, within the city it causes separation and a broken sense of community. To think of a city in the third dimension brings with it the abolition of vehicular transportation that we have become so dependent on in the last century and brings back the traditional method of transportation: walking. No longer would people see traversing distances in miles and kilometres but in strides.

Secondly, Urban Sprawl - part of the western dream, a desire to own a piece of land is something that is considered a luxury and ultimately the dream of most people. However this only contributes to the consumption of land needed to help support the economies we as a race need so that we are able to sustain life. This is contrary to the ethos of Arcology. To spread flat across the land is wasteful and destructive because the process cannot evolve to protect land and stop the consumption of it. Soleri believes this process will only bring about an Eschatological state of human civilisation (the ultimate destiny of humanity). The three-dimensional city proposes a new way to resolve this issue and bring about a new solution to the growth of the human race.

Thirdly, the consumption of natural resources is the next area, a problem that is currently the largest concern facing the world. The theory of Arcology and the designs proposed by Soleri address this issue as a whole. It looks at the ways a city can produce its own sources of energy and reduce the need to consume the Earth's non-renewable resources by utilising the surrounding environment in the most efficient way possible. In practice this would involve harnessing the energy of the sun, wind, and water that is available and more importantly, recycling all forms of waste produced by the city.

1 Timothy W. Luke, *Ecocritique: Contesting the Politics of Nature, Economy, and Culture* (University of Minnesota Press, 1997)p.154

A Deeper Insight

To look into Arcology as a concept more deeply we need to analyse this vision Soleri has. When we view architects like Soleri, Wright, Corbusier, and many others like them we see a consistency within their work. These architects each believe in a certain design philosophy, ideal or theory and by allowing flexibility within those concepts they can strengthen and build upon the design principle. Soleri designs projects using a set of guidelines he feels best achieves the targets set for each individual project. Ideals and understanding of the original concept are not static, they change and evolve as the architect experiments and develops new ways to achieve their goals. Soleri's vision of what a city should be is one that has taken decades of experimentation and evaluation. It is also a journey that will have no end; with the development of new technology there are always new ways to achieve the goals that previously were unobtainable. Some of these developments would be necessary to achieve success in what he sees as the ultimate Arcology: a city completely self-sustainable and providing its own energy and resources from its immediate surroundings whilst recycling and reusing its waste.

Soleri's theories of new urban planning began shortly after completing an apprenticeship under Frank Lloyd Wright in 1949. Soleri moved to Vietri sul Mare on the Amalfi coast of Italy to learn the craft of ceramics. It was there that he was commissioned to design and build a large ceramics factory, 'Artistica Ceramica Solimene'.

However, in 1956 Soleri moved back to America and purchased land in Scottsdale, Arizona. This would later become the site of his most famous and lifelong project, Arcosanti. It could be said that this was the seed by which Arcology would grow; this was the pivotal point at which the design process spawned. Soleri's schemes up until this point had been small-scale environmental designs but from 1956 onwards Soleri's projects were predominantly in revolutionary urban planning.

The Mesa City Project

One of the first schemes that Soleri used as an expression of Arcology was also located in Arizona. The project was designed as part of the excavation of a quarry. The excavation would generate the city's structural and expressive axis: an expanse of approximately nine to twelve miles long of quarry/park/museum. During the process of excavation the void left would become transfigured. Soleri views the park as:

> "the final result of a process that goes through extraction, research, organisation and formation. The engineer, the geologist, the naturalist and the ecologist would all work together with the architect, the sculptor, the artist, the musician and the scholar to unite natural geology and manmade geology."[2]

Soleri gave the scheme its apt title 'Project Mesa: Quest for an environment in harmony with man'. Over a period of five years Soleri developed over a thousand feet of scrolls, each detailing various parts of the structures and landscape of this hypothetical city. The city was mapped out on an imaginary landscape approximately the size of Manhattan.

This settlement, which consists of two separate entities, is designed to be entirely dependent on the produce of traditional agricultural practices. In the Mesa City, food and radiant energy are produced within a south-facing greenhouse designed to support the city's population at a minimum level. Other products and services such as electricity from the main grid are imported from external resources to supplement those provided in this self-reliant base,[3]

Mesa City aims for a degree of independence and sustainability rather than being wholly self-sufficient. Self-sustainable communities, which aim at total self-provision of food and energy and the complete recycling of wastes, are according to Soleri, extravagant and devoid of sense. There is no way anything on Earth can be perfect because it is a small part of a much larger system.[4]

In the North End of Mesa City the 'Theological Complex' is designed to foster a multi-religious dialogue; temples and monasteries to various religions are housed in six vast bowl-shaped structures that meet at a towering library/ museum complex. At the edge of the mesa there is a series of market villages and on the opposite side of the complex the landscape descends into the canyon of the Axial Parks.

The second mass of structures is the 'High Learning Complex'. This is one of the most 'abstract' conceptions of the whole project. Many ideas used in other projects are incorporated here and are done so to the limit:

- The multiplication of grounds – Soleri provided substantially larger areas of agricultural ground in comparison to an equivalent urban metropolis.

- Addressing environmental issues of 'the city' – addressing the problem areas in modern society and providing economical solutions for them. One such answer was the recycling of waste produced by a city of this population efficiently. A solution such as this can have a profound environmental impact.

- The study of 'the city' – understanding the needs an urban development must fulfil by looking at previous examples and creating a structure of interaction that creates an efficiency and aesthetic quality that provides a desirable habitat.

In 2007 Manhattan was calculated to have a population of 1,620,867.[5] This shows that with Mesa city Soleri was trying to achieve an environment of high-density habitation over 40 years ago that were advanced even by today's standards of green living. Mesa was the first step on Soleri's journey of experimentation and, as you will see in the following projects, of furthering his understanding of a new type of urban planning, constantly bring him closer to succeeding his vision of an idealistic Arcology.

The Mesa City was a result of a decade of study and experimentation on multiple interconnected concepts, including primarily the concerns of the Earth's ecology - the constant curiosity about human beings - and the idea that the city is the most aesthetic of all phenomena and can therefore only be generated through an act of creativity. Soleri accepted that the journey of discovery he was taking would have no end and allowed himself time to come up with both a concrete image and the best means to express it.

The innovative ideas at the centre of the design for Mesa City included the choice of the site – the arid highland – that would be crucial to the generation of a respect for the nature that the hard work needed to create the city would accomplish. This type of site would also dictate the autonomous nature of the city: near complete self-sustainability was paramount in this climate. The main source of energy would need to come from the environment - sun, wind, water and dams - but also the proper recycling of refuse and other waste products created. Other key factors of the Mesa City project included a ban on cars in the city and the surrounding towns and villages as well as automated services, thus enabling people to dedicate their free time to the arts. The city was conceived as a superior organism in which various organs would handle specific and complex functions: as a result it would have its own precise personality at the morphological and dimensional levels to fight the threat of atrophy and gigantism.

2 Paolo Soleri, *Visionary Cities* (New York: Praegar Publishers, 1971) p.47-48* double page spread

3 K. R. Gupta, Prasenjit Maiti & Maria Anna Jankowska, *Global Environment: Problems and Policies* (Atlantic Publishers & Distributors, 2008)p.208

4 ibid

5 United States Census Bureau, 2007

Cosanti and Arcosanti

In the spring of 1958 – around the same time as Mesa City was being designed - Soleri was also establishing the Cosanti Foundation; the word Cosanti supports Soleri's beliefs and attitude (Cosanti meaning anti-materialistic, originating from the Italian word 'cosa' meaning 'thing' with the suffix 'anti'),[6] an operation that he still heads. He sought a way to claim autonomy whilst still expressing his inventive impulses. Using the large amounts of soil available on his land and concrete - materials that are both versatile and easily usable - he began to create. Soleri realised that learning by doing was something of a constant in his life as he investigated, tested, designed and built ceramic and bronze objects, including the wind bells that had earned him acknowledgement perhaps even before architecture had. It was on this exploratory basis that the Earth Houses that the Cosanti Foundation is now known for were developed.

Soleri refers to the transition from the small-scale (wind bells) to the larger scale (earth houses) as "simply a form of extrapolation, changing from fractions of square feet to many square feet and from liquid clay to concrete. That which had been a pot became a house."[7]

These words and the understanding of creativity that Soleri is trying to achieve express an implementation of a concept also believed by William Morris who states that architecture draws from a conscious exploration of materials and a dialect with craft and that by working on something with mind and body you use the energies that will it into existence.[8] Soleri's constant awareness of spatial design from the beginning of the project meant he often created the spaces with his own hands, step by step and in dialogue with nature itself. He created forms, cavities, grain, texture, colour, motor and tactile sensations for structural membranes. Like Gaudi, many of the structures created by Soleri can be represented in two-dimensional design that tackles expenses, suitability of the site and the relationship between the habitat and the earth used to create it.

The Earth Houses that he designed are not like underground homes but rather homes placed inside the ground, they still have light, air, atmosphere and sound. There is a synergy between nature and neo-nature. The few two-dimensional ideas that helped form the structures are only sketches in Soleri's sketchbooks, from there the designs were developed. The reasons for this are that it would be pointless to create a formal building plan as the spaces are carved from within and their foundations vary according to their function, making them works of architecture that depend not only on their materials but also on their form, shape and gesture. They combine expressionism and informality.

Soleri's techniques were free of any rationalist formula. For example, surfaces were treated coarsely and some items were left undefined, seemingly unfinished. He sees this as a way of showing that the earth has its own needs and must always be tamed from within, through actions that remain flexible and able to adapt to happy accidents.

Cosanti displays the kind of art that Soleri believes is the reason for the existence of the human race, as well as the starting point for man's transformation of the environment. This was clear in an essay he published in 1963, in which he discussed two related concepts: the need for prolonged and coherent thought in order to find ecological equilibrium for the environment and technology in the service of art.[9] Machines could free man from his need and leave him time to focus on creative work.

This kind of work is made tangible in Cosanti's following architectural spaces:

- Earth House – spacially distributed around the plastic mass of a chimney, it receives natural light from the oblique cut of the skylight and by the glazed walls of the entryway divided by cartilage-like limbs that become movable shelves; an aesthetic quality that offers an adaptability in special comfort.
- Cat Cast – a multileveled architectural promenade in the excavated space of the night area, a dormitory for Cosanti staff artisans. Open to the entire space, it subverts a sort of planning code based on the usual living plan for a house.
- North Studio – An exhibition space for finished materials, excavated and cast by ossified structures that convey a sense of destabilisation (as in Gaudi's Colonia Güell). Here a skylight, broken up by ribs, brings daylight to the vibrant, plastic surfaces.
- North Apse – this space gathers the walkways from the entrance and opens onto the Cosanti structure. Without breaking continuity, it passes from the enclosed spaces of the apse to the informal Ceramics Studio, covered by an unbalanced bonelike structure that connects to the office and branches out on the many-sided irregular South Courtyard Apse.

The Hexahedron City

The next major city design Soleri created was during the mid-1960s and he called it the Hexahedron City. The Hexahedron City is one of the prime examples of Arcology. It is designed to hold 100,000 residents and standing

6 Paolo Soleri, Scott M. Davis, *Paolo Soleri's Earth Casting: For Sculpture, Models, and Construction* (Peregrine Smith Books, 1984),p.107
7 J. Cook, *Paolo Soleri* (Architectural Association Quarterly, 1969), p.20
8 Holbrook Jackson, *William Morris: craftsman-socialist* (F.C. Fifield, 1908),p.31
9 Paolo Soleri, *How Things Look To Me* (Paper Review, Spring, 1963), p.37

at 3,000 feet this city becomes more of a mountain than a metropolis. The building is designed as two offset inverted pyramids. The pyramids, each being approximately one Empire State Building in height, would be encrusted with landscaping inside and out with allotments and within the skeletal structure would be buildings for various uses.

This city provides something no mono-planar city ever could in terms of the cohesion of the city in its functionality.

As with the majority of Soleri's urban designs, accepting that no one city can be completely self-sustainable, he breaks down the elements for which a city can provide for itself. He looks at providing zones and habitats for agriculture and development. He also finds uses for the land that surrounds the structure. Hexahedron City has room to grow a large percentage of its own food on the building while the rest would be grown in fields surrounding the site; this space being the same space that would be taken up by buildings and residential estates – suburbia - in a contemporary mono-planar metropolis.[10]

Residents gaining access to the natural landscape surrounding the building is another issue confronted by Soleri and here each citizen is no more than a short walk and a vertical drop to the base.

Asteromo and the Space Program

Venturing into space was a bold challenge Soleri had set himself, possibly the ultimate challenge he has faced. In 1966, NASA successfully made an unmanned soft landing on the Moon and following the hype many scientists began divulging into the possibility of space travel and people living in space. That same year Soleri began work on the Asteromo project. After deciding 8 years earlier that it would be extravagant and devoid of sense to create a self-sustaining community, he embarked on a project designed to sustain itself in space - a vacuum atmosphere incapable of sustaining life. He wanted to display the development and progression of the newest age of technology and the adaptations that he had implemented in his designs for an Arcology. The concept of Arcology is adaptable and as 'homo-carbonis' (man) develops the evolution of the 'homo-siliconis' (machine) more of the targets set by Soleri become achievable.[11]

Asteromo was an adventurous experimental design that Soleri wanted to create as a test of his theories. A variation on his idea of Arcology, Soleri designed a structure that would have no external assistance; it would provide for itself and its inhabitants in every way. This unique design is an Asteroid for a population of about 70,000 people in an 'artificial ecology'. To briefly describe the design - it is a double-skinned cylinder kept inflated by pressurisation and rotation of the main axis. The weight of a person will vary from zero at the axis to a fraction of his earthly weight on the ground: he will be able to fly without the need of any power devices. There will be Dantesque promenades at different levels of physical prowess -- from weak (centre) to strong (periphery). Man, standing head toward the axis of rotation, will be enveloped in a solid ecology. Specifically designed as a research station that would remain in space, it would provide laboratories, residential living, recreational centres, etc.

Soleri was once again creating a city within one structure. This revolutionary design could only be described as the epitome of Arcology: a building that would be completely self-sustaining. 'Space Arcology', as Soleri describes it is, the design of a structure that can hold life in the voids of space.

In 1994 Soleri was commissioned to produce a model of Asteromo for the Mei Center for the Arts in Japan. This was the first time that Asteromo had come to life in the form of a 3D-model showing once again that the schemes that seem so out of reach are still possible to create in some form.

It may seem in some instances that Soleri diverts from the progress that he makes in previous works, an example being the leap from Mesa City (a structure for 2,000,000 inhabitants) to Asteromo (an asteroid structure designed to orbit the earth from space). These are not leaps made from the failings of previous projects but a test of experimentation, with new advancements in the technological world fresh perspectives are gained. It is at these key points in the progression of mankind that Soleri tests and extends his theory of Arcology, attempting to perfect it and with each project try and accomplish something that the last project did not succeed in overcoming. He is consistently trying to discover the adaptability of his theory in correlation with current affairs.

10 Charles Knevitt, *Space on Earth: Architecture, People and Buildings* (Thames Methuen, 1985),p.151

11 P. Soleri, H. Rand & R. Anastasia, op cit ,p.104

The JMCC Project

In 1996, four years before the new millennium, we – as a race – were reaching a pinnacle in the awareness of ecological and planetary problems, globalisation, large-scale events significantly affecting human life, increasing cultural diversity, an uncertain future for nature and democracy, reactionary and xenophobic tendencies, new horizons in scientific research, technological acceleration and evolution of the media. At the time the planet's population was close to six billion.[1]

The Global Environment

In the 1960s and 70s words like overpopulation, pollution and depletion of resources were discussed at great length and whilst a greener way of living was demanded, very few solutions were provided:

- Recycling was sluggish and inefficient; the implementation was costly and so became undesirable.

- Solar power was also slow in developing; this was costly to the consumer – again in the short term – and was also an option, there was no governmental stipulations that stated that the population must provide a percentage of its own power via natural resources and so in-turn very few people chose to provide for themselves.

- Pollution reduction – a large amount of information was gathered to help predict the current situation of the earth's environment and how we as a species could remedy some of the issues discovered.

- Finite resources – new ways to generate power were put in place, with smog appearing over some of the larger cities in the western world the restrictions on coal burning were put in place.

However during the 1970s a scientist by the name of Charles Keeling used the most modern technologies available to produce concentration curves for atmospheric CO2 in Antarctica and Mauna Loa. These curves were to become one of the major icons of global warming. Using his technology he depicted a downward trend of global annual temperature from the 1940s to the 1970s. At around the same time, scientists analysing ocean sediment had shown that there had been no less than 32 cold/warm cycles in the last 2.5 million years, rather than previous beliefs that there had only been 4. With these results people believed that the earth's climate was beginning to cool and would continue doing so. The media and many scientists ignored scientific data of the 1950s and 1960s in favour of global cooling and so in architecture we began to see fewer radical designs for urban planning. In the 1970s economists such as Schumacher proposed ideas of sustainable development on top of our already existing settlements as the solution to the global problems rather than building new developments. In his book 'Small is Beautiful' he concludes that government effort must be concentrated on sustainable development, because relatively minor improvements, such as, technology transfer to Third World countries, will not solve the underlying problem of an unsustainable economy.

It was only in the late 1980s that the global temperature trend began to change and the Earth moved into a warming cycle once again. By the 1990s the trend was rising so exponentially that the idea of global warming began to play a larger part in the environmental actions humankind should take. It was around this time that the greenhouse effect theory prompted the founding of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations Environmental Programme and the World Meteorological Organization.

The Global Population

The other larger problem – specifically to the human race – is one of overpopulation. At the rate our species is growing it is estimated that by 2050 the world population will reach approximately 9.1 billion people, 2.6 billion more than the current population.[2] That is to say that with the current lifestyle that we – as humans – have the room for expansion will cease to exist, land for the growth of food will be taken for habitation and cities will expand to colossal sizes.

With the new revelations about climate change, depletion of finite resources and overpopulation, it is once again that the designs for a new urban existence have come back into favour. If we are to solve the problems stated above – problems that our over development has been partly responsible for – we must look at revolutionising the way we live as a collective. The only way to do so is to live in a more efficient manner, we should only take from the earth what we need for survival and utilise other methods to harness the power of the natural environment that is around us.

Taking Action

One of the first countries to put these ideas into motion was Japan, in 1996 Japan's government set a challenge to the world: planning the city of the

1 Antonietta Iolanda Lima, *Soleri: Architecture as Human Ecology* (New York: The Monacelli Press, 2003), p.353

2 U.S. Bureau of the Census, Current Population Projections

new millennium. The Japanese Ministry of Construction and Culture (JMCC) sponsored a scheme for a revolutionary city, a project named Hyper Building. An invitation competition was launched in which they commissioned work from three architects, each known for their innovative designs, their unique outlook on architecture and urban planning in regards to future habitats. Those architects were Rem Koolhaas, Nobuaki Furuya & Paolo Soleri. Each of the three would work with the same parameters - a human scale infrastructure, 1 cubic kilometre volume of space that will house 100,000 inhabitants for 1,000 years. The design had to highlight the notable difference between American and European cultures to that of Japan – suburbia must be halted. A new urban plan had to succeed its former disorganised structure, one of high-density living on a colossal scale. The idea was to provide a sustainable environment for the people to live in that was to recreate the idea of 'the city'.

Clearly the design would have to meet complex and multifaceted goals: an extrapolation of the Eco-style buildings of the modern era. In the brief the only variable given was the location of each of the projects. Rem Koolhaas was asked to imagine a project for the outskirts of a city, while Furuya's building was to be built within the city of Tokyo, and Soleri's was not in an urban environment at all.[3]

As well as the revolutionary ideals of Hyper Building Project there would be two commissions and a team of more than thirty experts in various sectors, this group were known as the Hyper Building Research Committee. Within this there were five basic concepts:

- To seek agreement in order to obtain strong public support for the scheme;

- To structure the idea; to study feasibility for a national project; to review rules created to encourage production;

- To search for innovative super-technology.

The intentions of this commission were to build an image for the city of the future, to inform people's desire for such a city as well as to accustom them to the idea of living within it. Without public support and awareness, a project like the Hyper Building would not be worth constructing.

The Designs

The design proposal by Nobuaki Furuya was to be a functioning part of an already completed urban environment. He chose to place the scheme in Chuo-ku, Tokyo, Japan.

Its Japanese name – Chūō - literally means "Central Ward," and it is historically the main commercial centre of Tokyo. He gave his design the name 'Hyper Spiral', because of its unique design. The structure took the form of three interconnected rings that were designed to be the main connection routes through the city. The unique shape of this structure came from the idea that a city of this magnitude should not be one constructed in one process as one element but instead develop over a longer period of time so that the city can function almost immediately.

> "Taking high complexities in Asian cities into consideration, we should propose an alternative 3-dimentional city instead of tower shape high-rise buildings. Flexibility and porousness of buildings are more important rather than height and bigness. The Hyper Spiral Project has a flexible self-organizing structure and infrastructure system. It is to be constructed not immediately but very slowly, century by century"

Nobuaki Furuya, 1996

The strength of Furuya's project was its alternative approach to the design of a monolithic structure. To construct the building over a longer time frame was a method that came from rational thinking and an understanding of the sheer scale of a project such as this.

The scheme submitted by OMA (Office for Metropolitan Architecture) - the company that Rem Koolhaas is a head partner in – was located on the outskirts of Bangkok. It was on a green reserve called Phra Pradaeng on the west bank of the Chao Phraya River. They chose this site because it was close to the new business developments and could work in conjunction with Bangkok's import urban infrastructures. The hypothesis of the scheme was thus, the Hyper Building – if placed in the a well developed urban condition – may be less credible, for instance placing it on the outskirts of Tokyo or New York. If you were to look at the unique qualities the project could add, the contribution made would be of little significance. However, if you were to locate the scheme in a developing condition, the virtues of the Hyper Building – the provision of enormous controllable critical mass – could have an positive influence upon the economy of the surrounding urban mass.

Koolhaas comments that, if a hypothesis such as this is true, the scenario that would follow should be one that plays down the technical aspects of the Hyper Building. Although a scheme of this nature would – logically – be the next movement in the chain of our evolution, its technological development should not be its ultimate achievement. The goals of this structure should be defined

3 A. Iolanda Lima, op cit p.353

around the scale of the project and its potential to craft future urban design rather than its more obvious advancements in technology.

To test the hypothesis, OMA analysed the city of Bangkok and noted that from a lack of control over its overall construction to its radical overpopulation, it is what they describe as "…a city of crisis. It is therefore by definition a city that would be ripe for this kind of socio-cultural experimentation".[4]

A scheme of this nature – although more viable in a completed upon fabric – would be better suited to an environment like that of Bangkok, a city of critical mass bordering the point of modernisation.

The design for Koolhaas' Hyper Building scheme was one that would:

- Preserve the quality of the environment
- Plan to provide a necessary proximity between home and work space
- Provide for 200,000 people commuting every day.
- Become a self-contained city without being disconnected from the surrounding urban dynamic.

Using the existing build-up of a city as the base layout Koolhaas wanted to achieve an urban variety and complexity, he disassembled the building as a whole and used it as a metaphor for the contemporary city: the towers in his design constituted streets, horizontal elements were to be parks and open areas of public space, volumes became districts, and the diagonal became the boulevards.

The scheme was to have a multitude of transportation systems, each one designed for use in separate sections of the structure. The four boulevards reaching down to the city below would be mounted with cable cars, gondolas and train elevators, six streets would be equipped with high and low speed elevators to connect between the plateaus whilst a pedestrian promenade of 12km would stretch from ground level to the top of the structure. The structure is one designed as the implementation and integration of several smaller buildings into the larger whole. Each element supports its neighbouring elements in every sense: technically, the issues of stability, of access, circulation and servicing are organised collectively; as a whole, the entire building becomes an urban quarter of a new kind; architecturally, they form an integrated complex.

Unfortunately, following the completion of the designs and the presentation of the projects the Asian economic crisis in late 1997 that overwhelmed Japan forced the project to a halt. Of the ninety companies originally interested in taking on the Hyper Building Project only a handful are still left.

4 OMA Amo REM Koolhaas, *El Croquis*, Issue 131/132 (2006), p.62

Soleri's Hyper Building

Looking at Soleri's proposal for the Hyper Building in more detail it is clear why the project was a promising proposal for the future of urban planning.

It was situated in the Mojave Desert between Los Angeles and Las Vegas. Soleri chose his site largely for its resemblance to his ideals of Arcology; the necessity for sustainability and also the ability to manipulate the surrounding environment to provide natural sources of energy. His long cultivated knowledge of the desert helped him understand how to plan a city that could withstand the harsh, marginal and arid environment. The Mojave Desert draws many tourists due to its location between Los Angeles and Las Vegas, two urban communities that exemplify contemporary society's serious illnesses.

The Building has been designed on a predominantly vertical axis. This is to lessen the impact the building has on the natural landscape, and also, in doing so, makes the landscape more accessible to the inhabitants of the structure. This building would rein-in urban sprawl, be capable of generating and recycling its resources and reduce environmental damage.

Thinking Green

The Hyper Building also combats further environmental issues.

One of the key environmental design aspects would be the use of solar energy. The building and its surrounding environment absorb vast quantities of solar energy:

- Using 78,000 square meters of solar panels with photovoltaic cells will produce 10 megawatts of low voltage electricity per hour primarily for low voltage lighting;

- Windmills at the top of the structure produce 10 megawatts from strong desert winds;

- 5,000 Genset hydrogen conversion units, solar power generators, at the top of the parking garage produce 175 megawatts of electricity per hour from the many hours of desert sunlight providing for the bulk of household needs.

The whole building is virtually self-sustaining in terms of food, power and heating. In general, this building displays strong elements of Arcology within the whole design.

To judge the success of the building we must look at the origins of its design in more detail. Soleri examines the planning of evolutionary coherence (meaning that humankind takes responsibility for life's development as its fundamental motive and at the same time its ultimate goal); the convergence of the concern for the environment and the use of high technology.

Evolving Through Design

Soleri manages to achieve a fertile blend of experience and innovation without abandoning modernity, rationally evaluating the new rather than simply turning his back on it. This can be seen in his essays on future cities and urban planning where he measures the risks and dangers in what has been done before and states that man, as a species, must proceed along the road to self-awareness because this is the only way a discovery can honestly be considered a form of progress. He acknowledges that such progress can be difficult and it cannot be successfully achieved in a short time (in terms of evolutionary scale.)[1]

Furthermore, in his book, 'A Bridge Between Matter and Spirit' published in 1973, he explores anew the intrinsic potential of nature and geology and uses this to enhance his designs for the Hyper Building. Likewise, he absorbs and incorporates the best results of the computer age. Thus virtual reality, which is a dangerous field because it offers constant simulation, can instead become a tool for enrichment. He states that

> "For the first time in history, man's thinking and tinkering is going on between the brain mind and a non-organic device, the computer. Internal; the mind, and external; the computer, is in discourse. A miniaturized-complex domain, the brain mind, interacting with a complicated miniaturized domain, the computer. The carbon cycle and silicon cycle, are coming together in a first encounter. We are on the line between organic (carbon-based) intelligence and mineral (silicon-based) intelligence. This is a position of extreme promise but also a dangerous one. The mineral intelligence can open the cosmos to the mind and to its transcendent faculties."[2]

Soleri continues to prophesise about the future and suggests that perhaps the carbon cycle, which has performed remarkably over its 3.5-eon history, will be challenged by a silicon cycle. However, Soleri states

> "for at least another millennium I believe that the former will play the main role in humanity's evolutionary development. Full biological reality (in free-

1 P. Soleri, *A Bridge Between Matter and Spirit is Matter Becoming Spirit*, op. cit, p.56
2 Ibid p.68

oxygen environment) is inconceivable without light, without the infrared ultraviolet spectrum."[3]

Although water and light have always been the two elements of life, Soleri believes technological advances and future society to battle against this dependence.

"The death of light is rationalized by silicon because the entire biosphere that depends on it is made superfluous …
…The youth of cyberspace are already running to the new superhighway. The dark underground prison of video games and computer laboratories rejects the luminosity of the planet as an unbearable intruder and the presence of moisture introduces jungle and fungus scenarios. So, when we are able to witness the birth of silicon conscience, we will simply be in an era that the subversion of much "data" [sic] will affirm itself as real …
…The powerful presence of light with its unique and profound impact on Homo sapiens, both body and psyche, could lose all meaning. Light and silicon have no common synergy. Darkness goes well with the second; carbon-based intelligence and silicon-based intelligence will never be able to find common ground."[4]

One may ask, is this premise relevant to discussion of the new city and its architecture? Soleri says it depends on the needs of those commissioning a project. The Hyper Building is to have a life span of one thousand years and so these questions are undeniably relevant. They provide a solution to the question of how to conceive of a structure over this long time period. It suggests and says no to the indiscriminate use of silicon and yes to light and carbon. This is the only possible hypothesis that would guarantee the health of a species that may have already seen, as he puts it "the best of its journey and finds itself in a kind of melancholy, inner conflict when looking to the very essence of its own progeny".[5] He believes that "the Hyper Building would then be a mineral tool placed between the biosphere and Homo sapiens. It would be an active, participatory tool, appropriate and necessary, sensitive to light and the sun's trajectory".[6]

The Hyper Building becomes a connective element between man and environment, a bridge enabling contact and organic exchange. It announces that it is outside of nature whilst also collaborating with nature at the same time.

In addition to the idea of the carbon-silicon cycle, there are six more concepts that stand as an antidote to the suburban growth and provide for a new urban ideal:

- Urbanisation of marginal land (to be occupied by about one-third of the worlds population - three to four billion people).
- Implosion of habitat (a three-dimensional, high density city).
- The desire to link habitat, ecology and energy so that the habitat is responsive to the sun, climate and landscape thus returning land to agricultural use and nature.
- Frugality-internalisation (uncompromising self-sustainability) as a life system, accompanied by energy and water conservation.
- The urban effect as a human-cultural imperative; when the two agents required for it to occur, complexity and miniaturisation, interact they generate the mnemonic capacity of all living systems that make such systems capable of building a life story (duration).
- Maglev (Magnetic Levitation) transportation – the modern, faster, quieter mode of transportation - for connection to and benefit of the biosphere.

In our current position, which is a situation that is extremely dangerous, only exponential growth in MCD (An acronym invented by Soleri meaning Miniturisation-Complexity-Duration) micro technology can cause a "new reality" to emerge. In this context, the Hyper Building is an indispensable proposal that is potentially valuable for the ontological dynamic of life.[7]

"In the present metropolitan fabric, the absence of the implosion of miniaturisation makes the social organism ill-fitted for survival, let alone development. The environment of contemporary man is a statistical utopia taken in by the game of laissez-faire. Such as it tends to make man abstract."[8]

The Physical Aesthetic

The physical structure is a system of steel cages and interconnected components. With a series of strategically placed focal points and 'terras' (artificial grounds and parkways) giving a human scale to the central tower that emerges from the 'exedras' (a semicircular recess, crowned with a half-

3 Paolo Soleri, *The Urban Ideal conversations with Paolo Soleri* (California: Berkeley Hills Books, 2001), p.69
4 Paolo Soleri, *The Hyper Building Interim Synopsis* (Paper, June 1996.)
5 ibid
6 ibid
7 P. Soleri, *The Hyper Building Interim Synopsis* (Paper, June 1996.)
8 P. Soleri, *A Bridge Between Matter and Spirit is Matter Becoming Spirit*, op. cit, p.43.

dome) at its base to soar above the landscape reaching the full height of one kilometre. The base and the tower are two entities that are joined by a group of divided structures. Large public spaces appear on many levels with natural light penetration. They were designed to house cultural, arts and educational centres as well as large multilevel parks with their own microclimates that would provide alternative environments to that of the arid climate of the desert.
The building itself makes more use of the human scale. Soleri measures distances between places within the building in walks or minutes, vehicles become nonsensical.

Several means, including local elevators and high-speed connections, reach the various sectors of the city. With Soleri's ideas of miniaturisation the structure is free from any kind of schematic grid and thus strongly stimulates the Urban Effect, as would the intensity and quality of the atmosphere. At the base, bicycles and mini-taxis connect to the many parks and urban spaces whilst at the top an airport and helipad would be used for travel or emergency evacuation. The complex plan of the design arrangement fulfils the many functional requirements whilst offering an ever-changing landscape where life in urban spaces, freed from the automobile, can thrive in a pioneering and experimental habitat.

In the lower portion of the building, centred around a geometric base above and below ground level, there is an area of controlled environment. Here temperature, wind, rain and light will all be modifiable. Taut membranes that are stretched between the exedras, which Soleri refers to as 'Garment Architecture' change from opaque to transparent at the spring and autumn equinox respectively, highlighting the seasonal changes. At the same time, on the outer facades of the exedras, tree-lined terraces with lawns help control temperature, thus providing shade and cooling from the external climate.

The plan for the Hyper Building, the two exedras facing each other and surrounding the large tower rising out of their core, could be considered geometrically symmetrical, but as always with the architecture of Soleri, the building was not generated by a predetermined idea. It came instead, from Soleri's attempt to develop a specific way to interpret reality. Using the concept of MCD, Soleri's Hyper Building strengthens the vitality and transcendence without which life and self-awareness cannot exist, this paradigm validates frugality and symmetry is the natural result.

Though the Hyper Building is connected to the traditional energy grid, it relies only modestly on traditional energy sources. The dependence on this energy source is minimised through means of various other resources. Those resources are both passive and active alternative energy systems that work with the efficiency of the three-dimensional system, which decreases the consumption of non-renewable energy sources. By constructing photovoltaic solar cells on the outer skin of the exedras, windmills to capture the energy from the desert winds and solar generators with connections to hydrogen conversion equipment, the Hyper Building can guarantee a significant energy resource from its surrounding environment. The 'Garment Architecture', constructed of opaque and transparent membranes implemented on the interior of the building and pulled taut between the exedras to cover the space below the tower, would form greenhouses that can capture the warm air channelled during the winter whilst during the summer months provide shade from the intense sunlight. Interior ventilation systems control the airflow and control the temperature by using a 'Chimney Effect' (where by warm air rises and cold air sinks).[9]

9 P. Soleri, *The Hyper Building Interim Synopsis*, op cit

Conclusion

Soleri's adaptability of his own theories is what makes his ideas strong. Constantly reassessing possibilities allowing current developments and discoveries in technology and science to enable him to more effectively realise his designs, there by expanding more of the ideals that Arcology provides. A recurring debate in the development of sustainable cities is whether existing cities can be modified or adapted to provide a greener style of living. During the 1960's and 1970's architects began designing new cities that would take an alternative direction like Archigram with their Walking-City and Plug-In City, Le Corbusier's plan for a utopia, Kisho Kurokawa's Helicoids and NER Group's Urban Project.

However, there is still a drive for a new urban form and arcology is the theory by which . In Japan, plans for a new Arcology are being developed in the form of the X-Seed 4000, this is a modern adaptation of Arcology that, whilst it may not entirely maintain Soleri's principles, has the desire to revolutionise the city plan.

It is impractical to think that we as a race can keep spreading ourselves like a thin membrane across the surface of the earth consuming all available land. Where would we grow the things we depend on to survive? Soleri speaks strongly and at length about this problem.

Our urban planning is not dissimilar to the growth of a coral reef: a spontaneous nodal expansion, spreading from its origin, consuming all that is below it. However, coral reefs do this as a function of a larger life cycle. Covering the surface of the earth in concrete and tarmac will not return anything to the land when we are finished. Soleri often talks about the direction we should take, that the life forms we should be mimicking are those such as the bee: where the construction of the hive is the epitome of ideal functionality and completeness; it is a structure that is efficient, a non-sporadic development that is copied time and time again.

Having an overwhelming population has never been the subject of dispute in other species on the Earth. The ant, the termite, the wasp all set an example of efficient and massively high-density communities through necessity. It is perhaps unrealistic to assume that our (human) problems of overpopulation will cause our downfall and, subsequently, the demise of the earth itself. As Soleri proposes, the human species needs to look at a different, more efficient, more cohesive method of living that is not so wasteful of the finite resources we take from nature.

So, what does the Hyper Building represent? What would it achieve in the context of man's accomplishments?

Taken as a whole, the Hyper Building's magnetic semantic autonomy makes it a unique and extraordinarily memorable monument. With its walkways, residential

zones, terras, parkways, meeting places and work places it is a blank canvas for the display of human desires. In all of Soleri's Arcologies, especially those highlighted in this essay, city planning must becomes the structure. With the Hyper Building this expressed desire is heightened, ascending to levels beyond the others due to its strong symbolic value as a new city. Were the Hyper Building constructed, it would be a structure seeping into the collective imagination and gradually further into humanity's consciousness. Such absorption would ultimately be sourced from the inhabitants' feeling of belonging to their city, thus the city can live symbolically through those that live, work and view it. The spaces within the building would teem and thrive with the life of its residents offering it in return this symbolic life and energy. These residents would be the unpredictable forces imbuing its very tissue and provoking an emotional response that is both spiritual and sensory.

Soleri's design for the Hyper Building is his most recent development in Arcology. The architecture and ecology cooperate with each other as symbiotic elements that create a city based on a one structure system that is not secondary but central to the organisation of the urban habitat itself. The Arcology is a dense urban environment that provides interaction vertically while expressing the flow of humankind's life in a complex organism that can offer its residents open, uncontaminated land. The compactness of an Arcology, when looking back at a project such as Mesa City, is designed to provide a much larger amount of land for agricultural use, roughly 90% more in fact than that of a contemporary city.

Arcology is different to the structure of contemporary cities in other significant ways also. It deals with pollution in a collective manner because the structures are founded on the principles of increased efficiency and decreased waste. The fundamental principle of Arcology is to prevent urban sprawl (the suburbia development) and the effects that ensue. Therefore, should the Hyper Building be constructed and the territory surrounding it follow in the same direction, the developments must be founded on a similar basis of Arcological Complex.

With the developments Soleri has made to date through his ideal of an Arcology, one of the most fundamental aims that has remained is the fusion between building and environment. The structure's design acts as a conduit for power, harnessing the maximum amount of energy available using technology that

our species has developed over its life cycle. The structure enters into a fertile dialogue with its environment and is a frugal structure sensitive to the sun and the climate it is situated in.

When Soleri designed the Hyper Building he deconstructed the contemporary city, established what was needed, removed the least efficient elements and created a city that would increase the longevity of the human race. Thinking of the future of society and the knowledge we have access to,

Soleri designed a model that can be progressive and evolutionarily parallel with technological and scientific advancements. It is reasonable for him to assume that Hyper Building would become an urban laboratory bearing the fruits of the potential for urban planning in the future. Soleri's ideas of what Hyper Building should represent run much deeper than one hyper structure. They provide an example of what can be achieved by the human race at our current level, that is not to say that new options will not be available, quite the contrary, Soleri wants governments, architects, planners and ecologists to begin looking in new directions for the solutions to problems that will progressively deteriorate if left unchecked. The JMCC saw this in his designs, from the paper Soleri wrote and the seminars he held with them. The legacy of Soleri's Hyper Building is the hope that the potential for a new, greener urban fabric is one that is not out of reach – a valuable inheritance as an ecologically sound way of living will almost certainly become essential in the future of our race.

CHAPTER 02

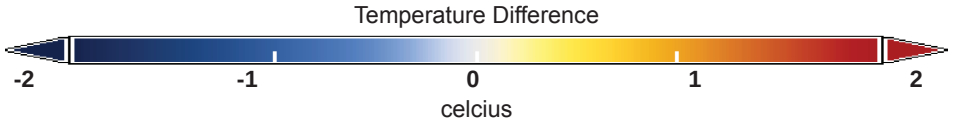
ENVIRONMENTAL ANALYSIS

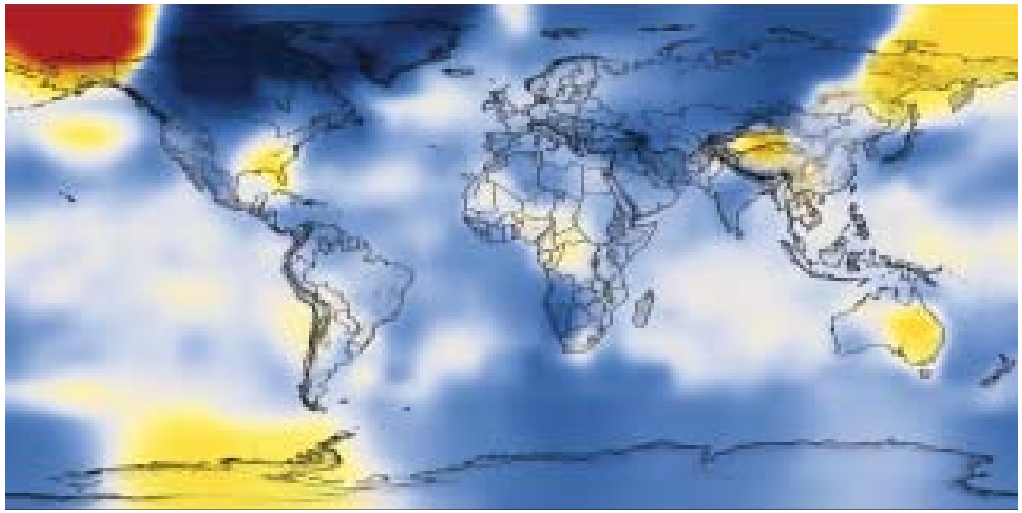
russell harding
diploma two

Global Warming is still a large issue when we look at the future development of humankind, temperatures are carefully monitored and regular predictions are made about the future of our environment. The following images show the state of the Earths temperature over the past 129 years.

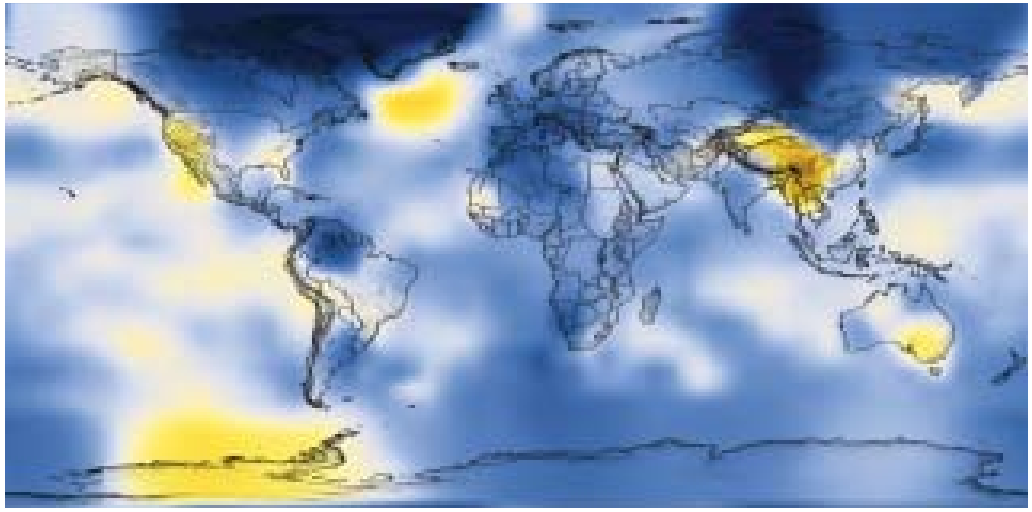
Because of a rapid warming trend over the past 30 years, the Earth is now reaching and passing through the warmest levels seen in the last 12,000 years. These color-coded maps show a progression of changing global surface temperatures from 1880 to 2008, with 2006 being the warmest ranked year on record and the years to follow being in the top 10.

*Images retrieved from NASA SVS Image Server.

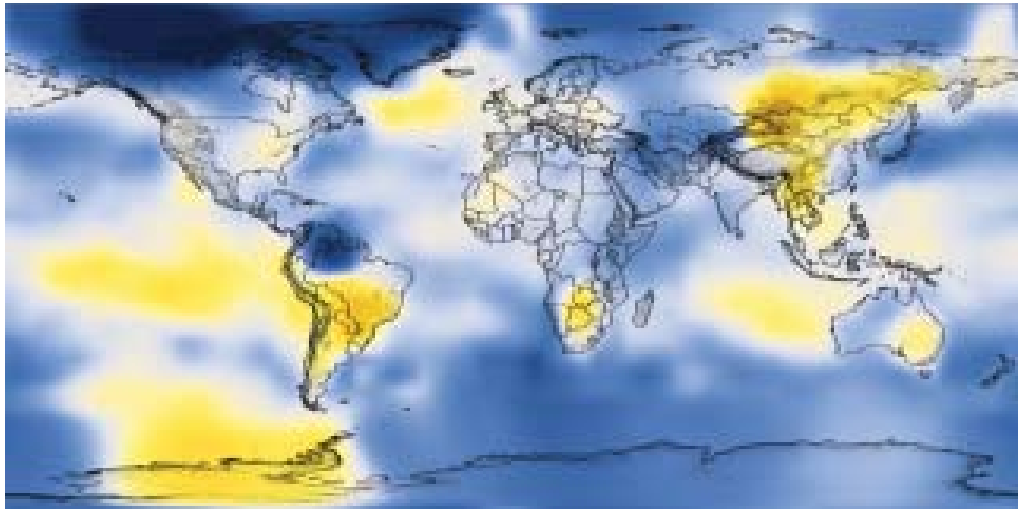




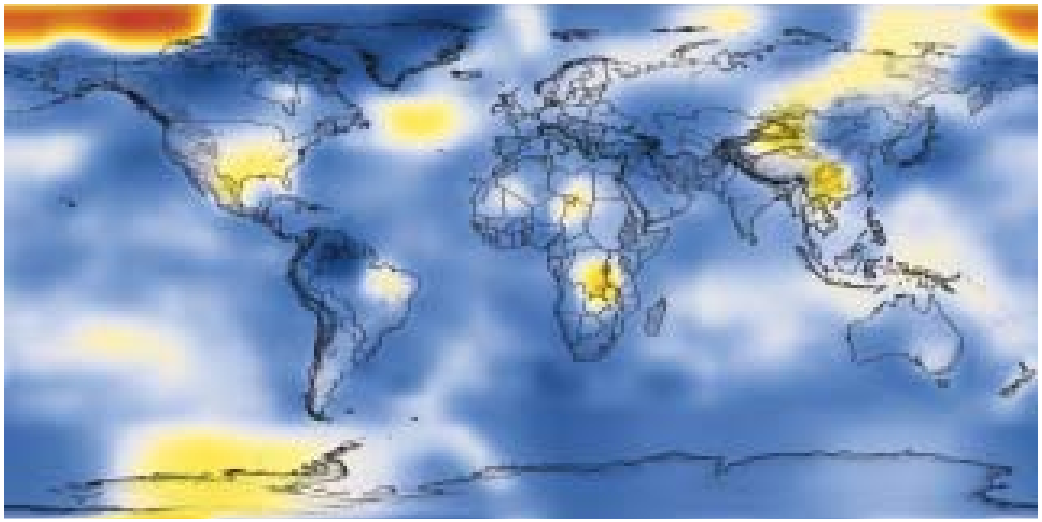
1880-1884



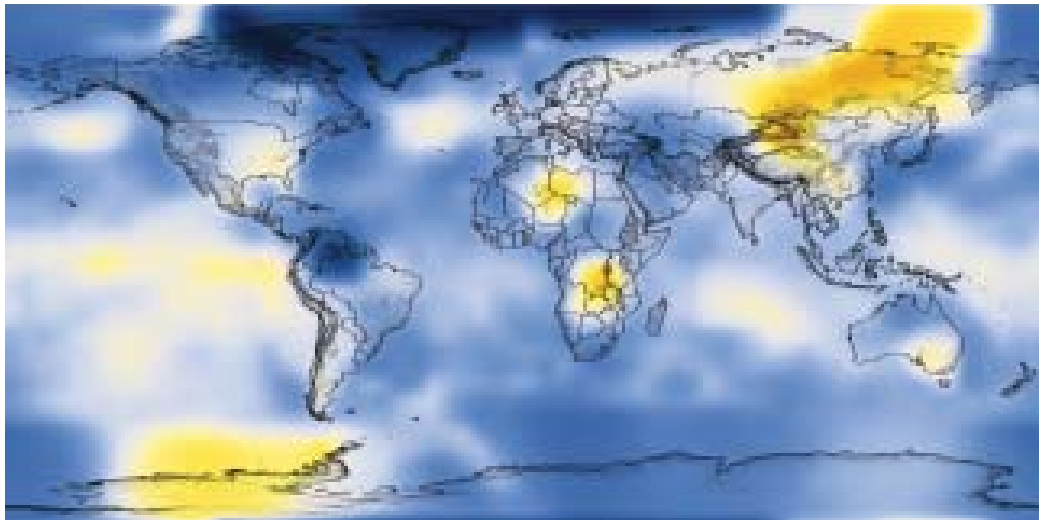
1886-1890



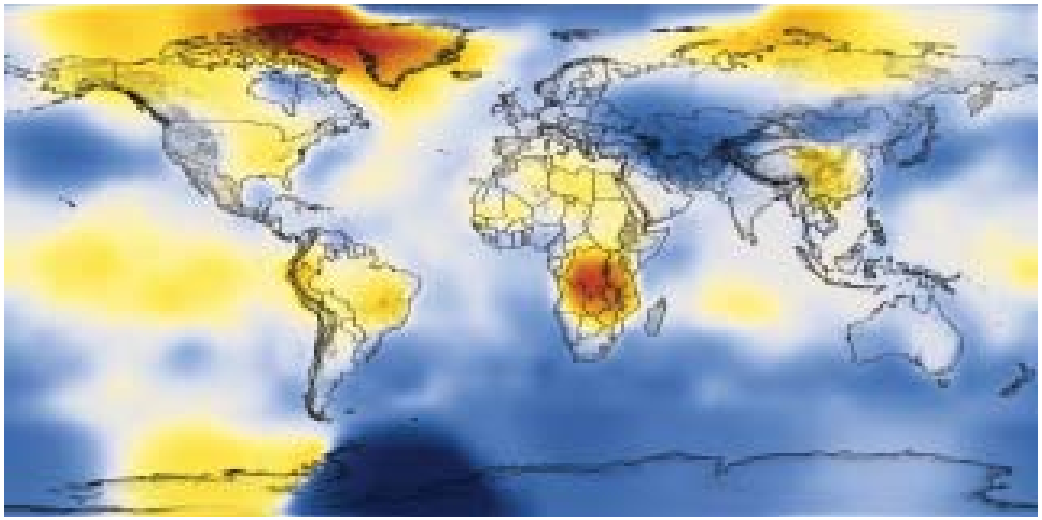
1896-1900



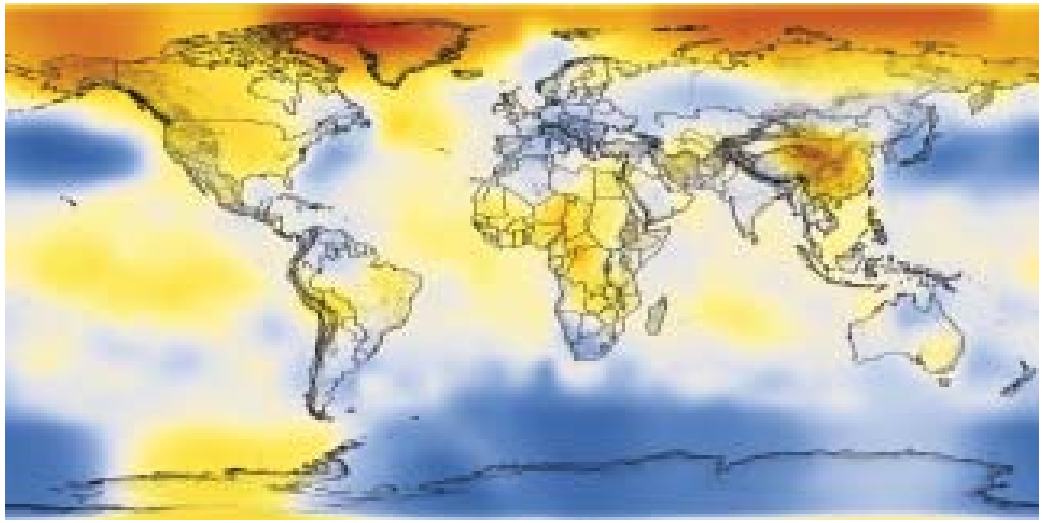
1906-1910



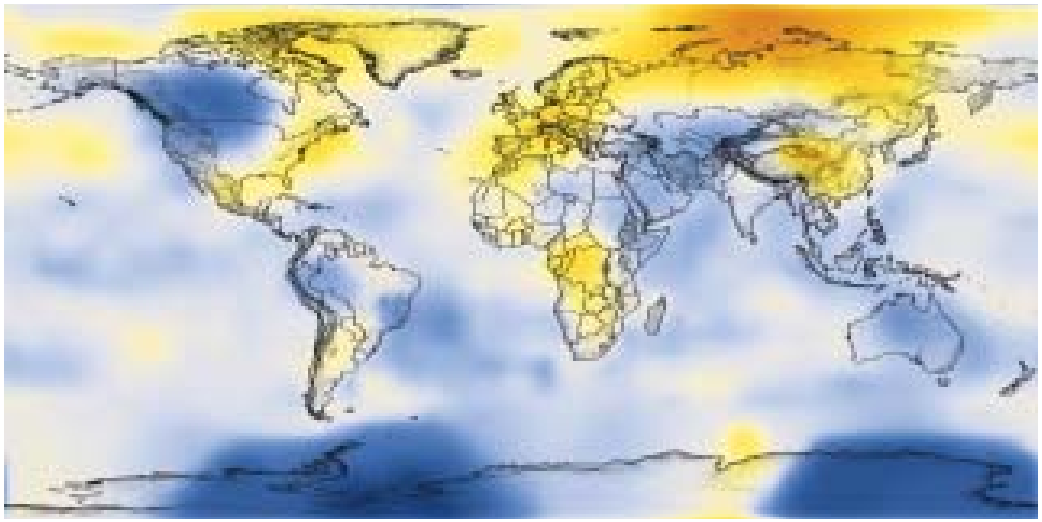
1916-1920



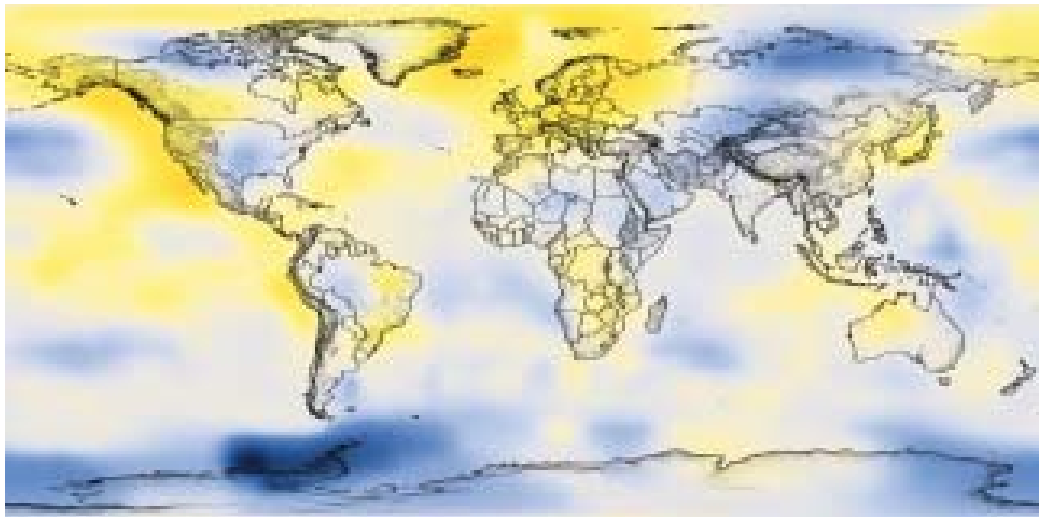
1926-1930



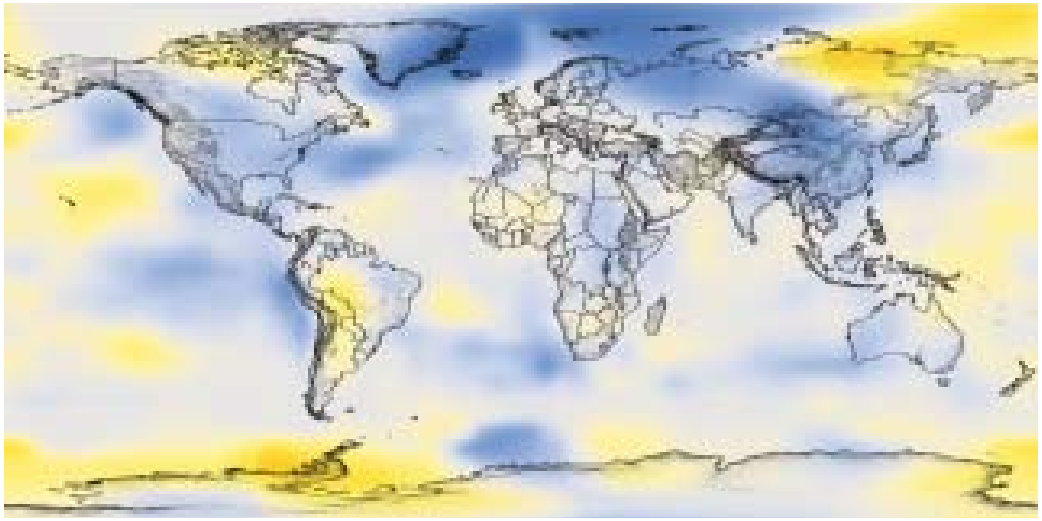
1936-1940



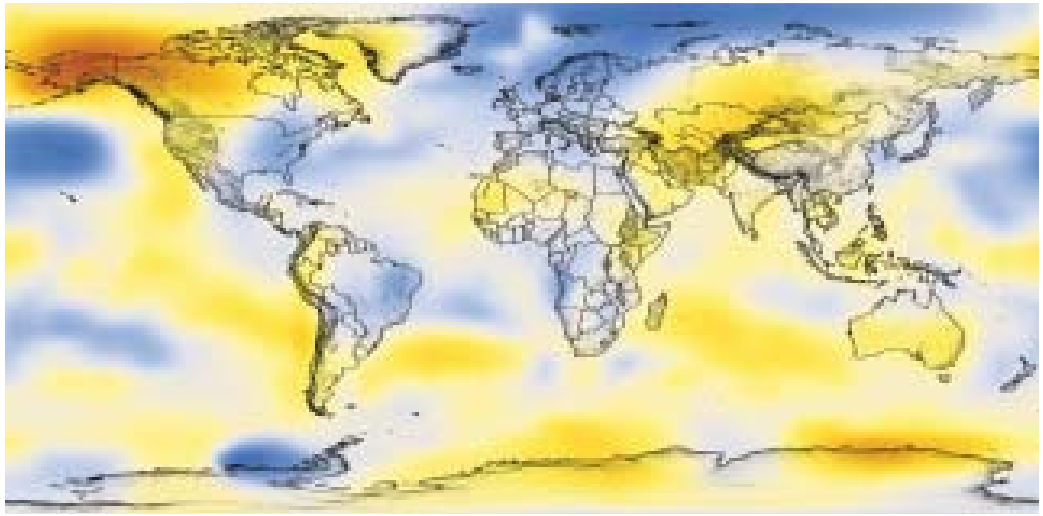
1946-1950



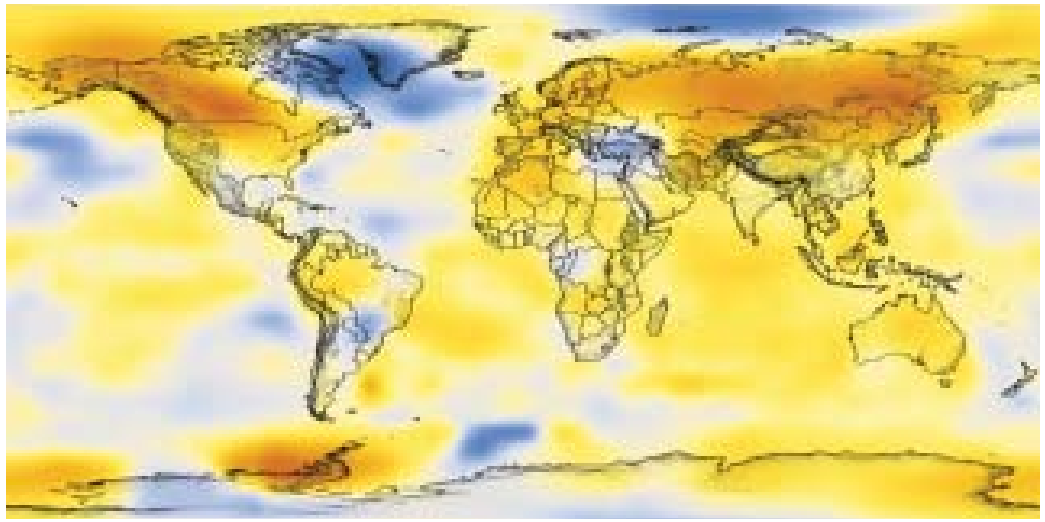
1956-1960



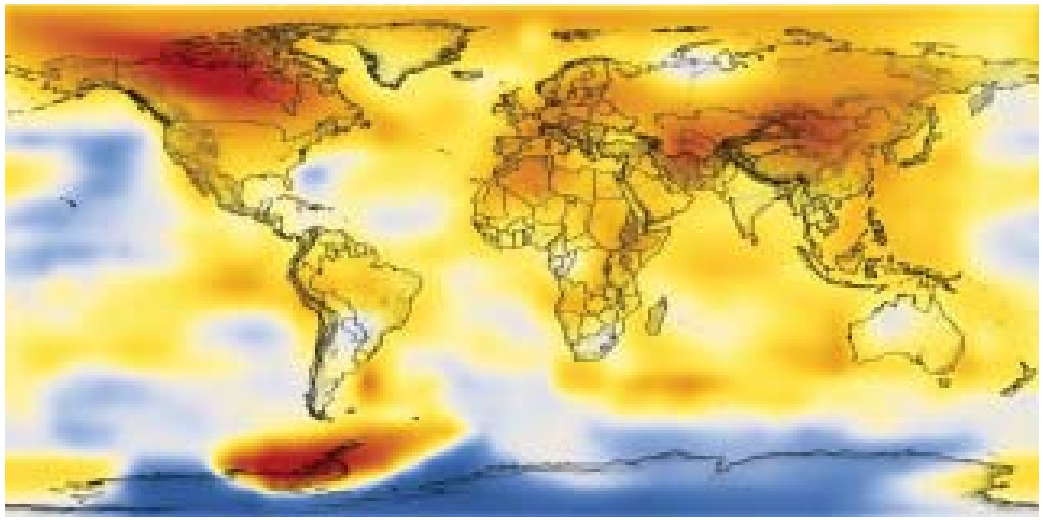
1966-1970



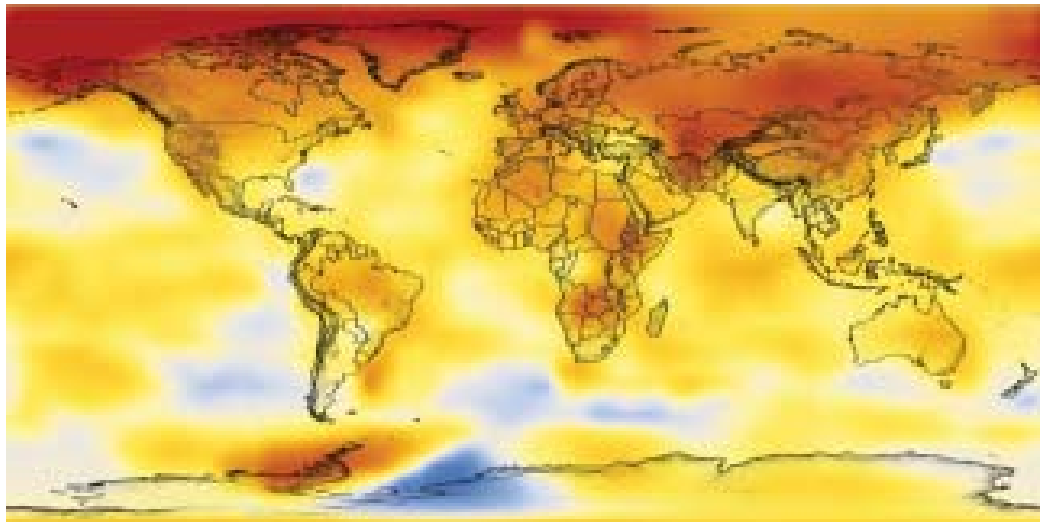
1976-1980



1986-1990



1996-2000

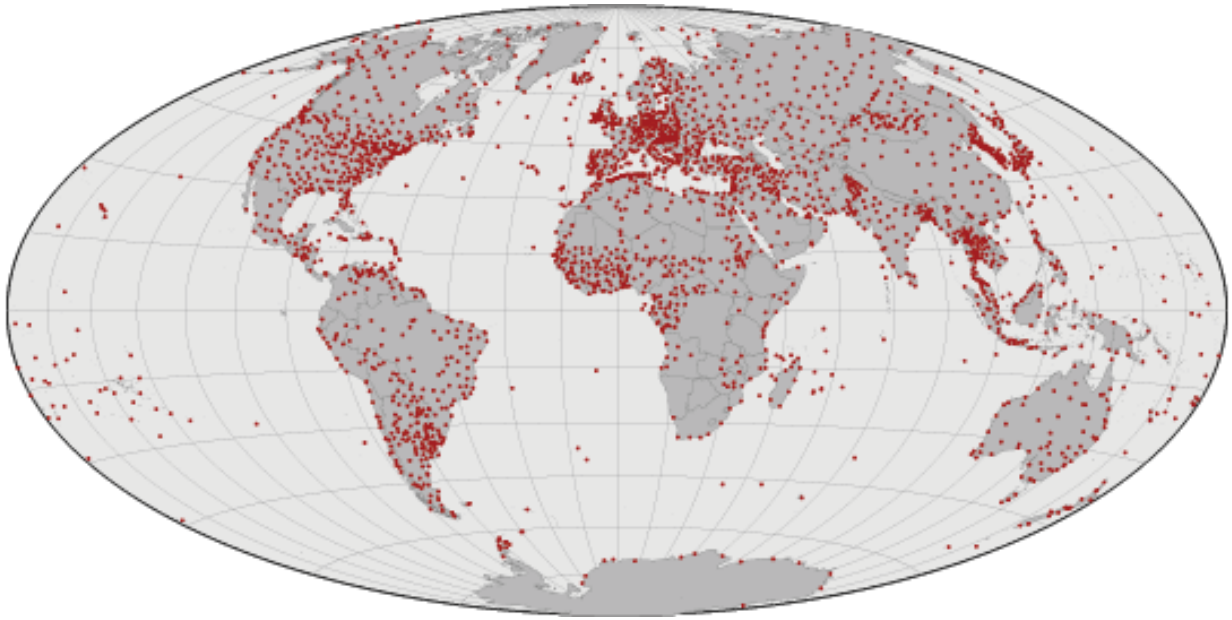


2006-2008

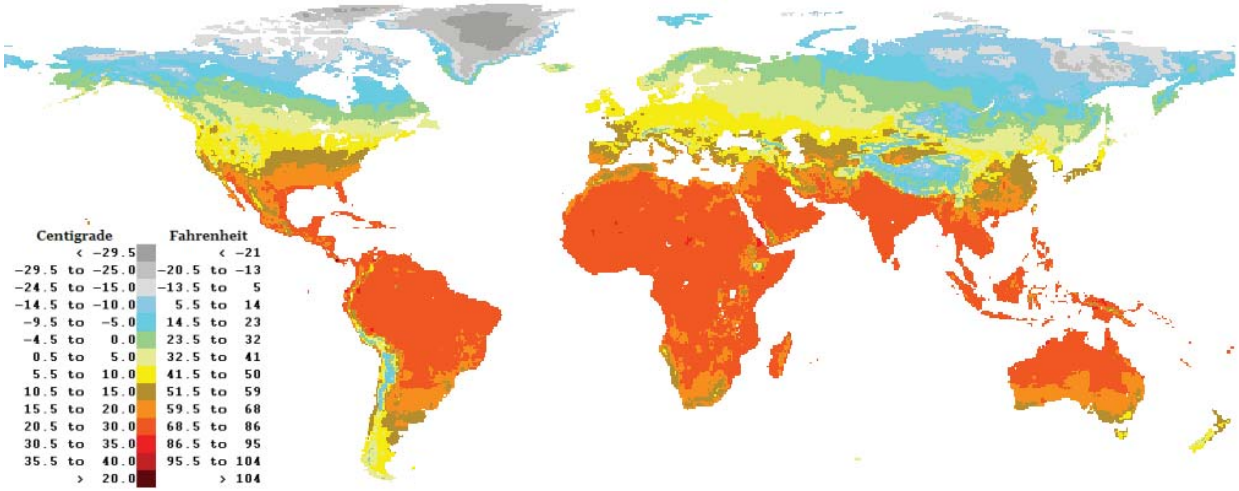
These images show that although the Earth has a natural warming and cooling cycle the temperature averages are increasing rapidly. This can have a dramatic effect on the development of humankind.

With the average global temperature increasing areas that depend on agriculture for sustainability will be greatly effected. Crops are highly sensitive to climate change and places that are well known for growing certain crops may need to look at alternative crops to grow in the area.

The growth of crops will migrate further from the equator producing a dangerous economic loss for countries that rely on such exports to sustain their development.



Location of the worlds meteorological stations



Annual average temperature

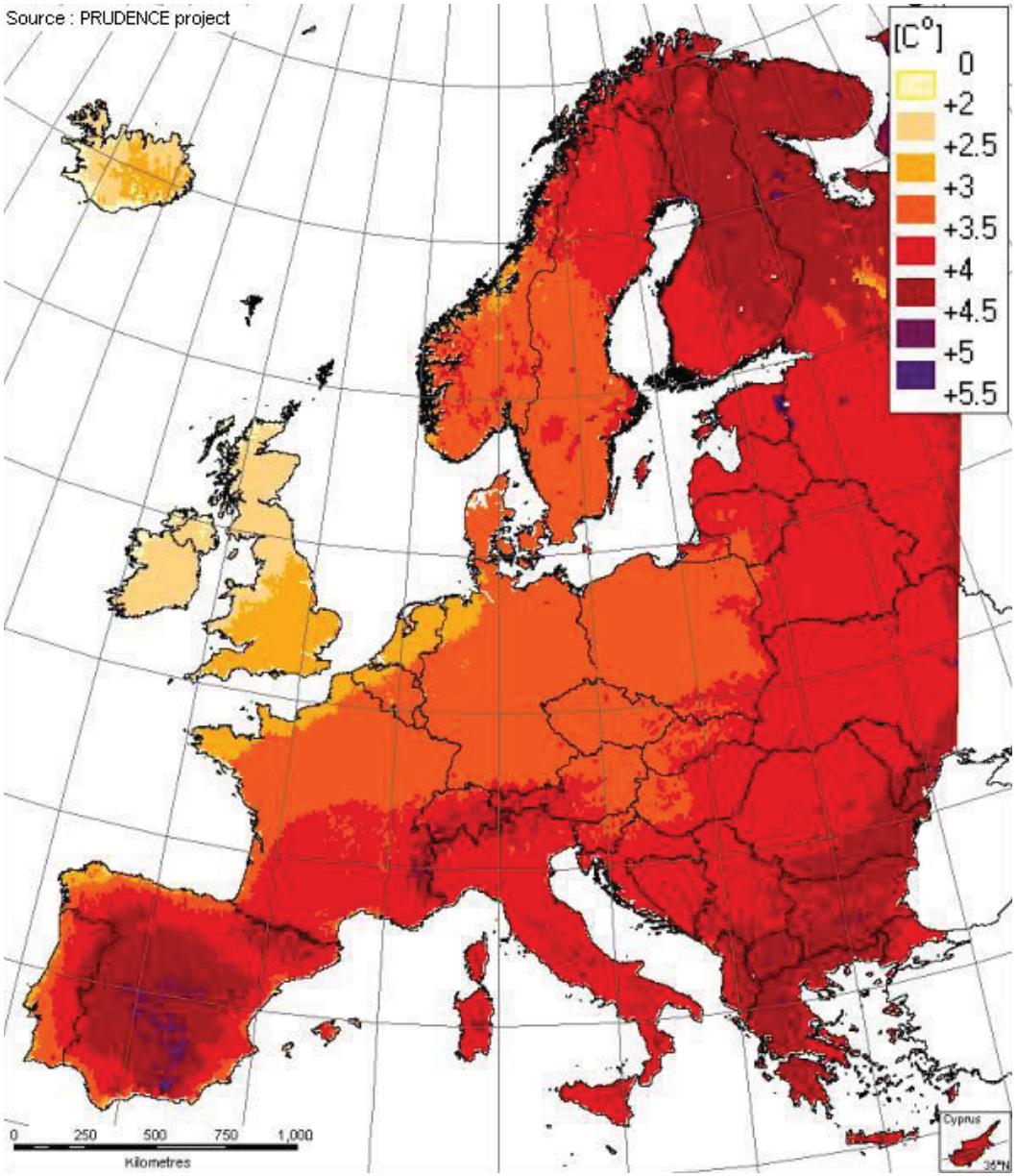
Global warming is the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century and its projected continuation.

Global surface temperature increased 0.74 ± 0.18°C (1.33 ± 0.32°F) during the 100 years ending in 2005. The Intergovernmental Panel on Climate Change (IPCC) concludes that most of the temperature increase since the mid-twentieth century is "very likely" due to the increase in anthropogenic greenhouse gas concentrations.

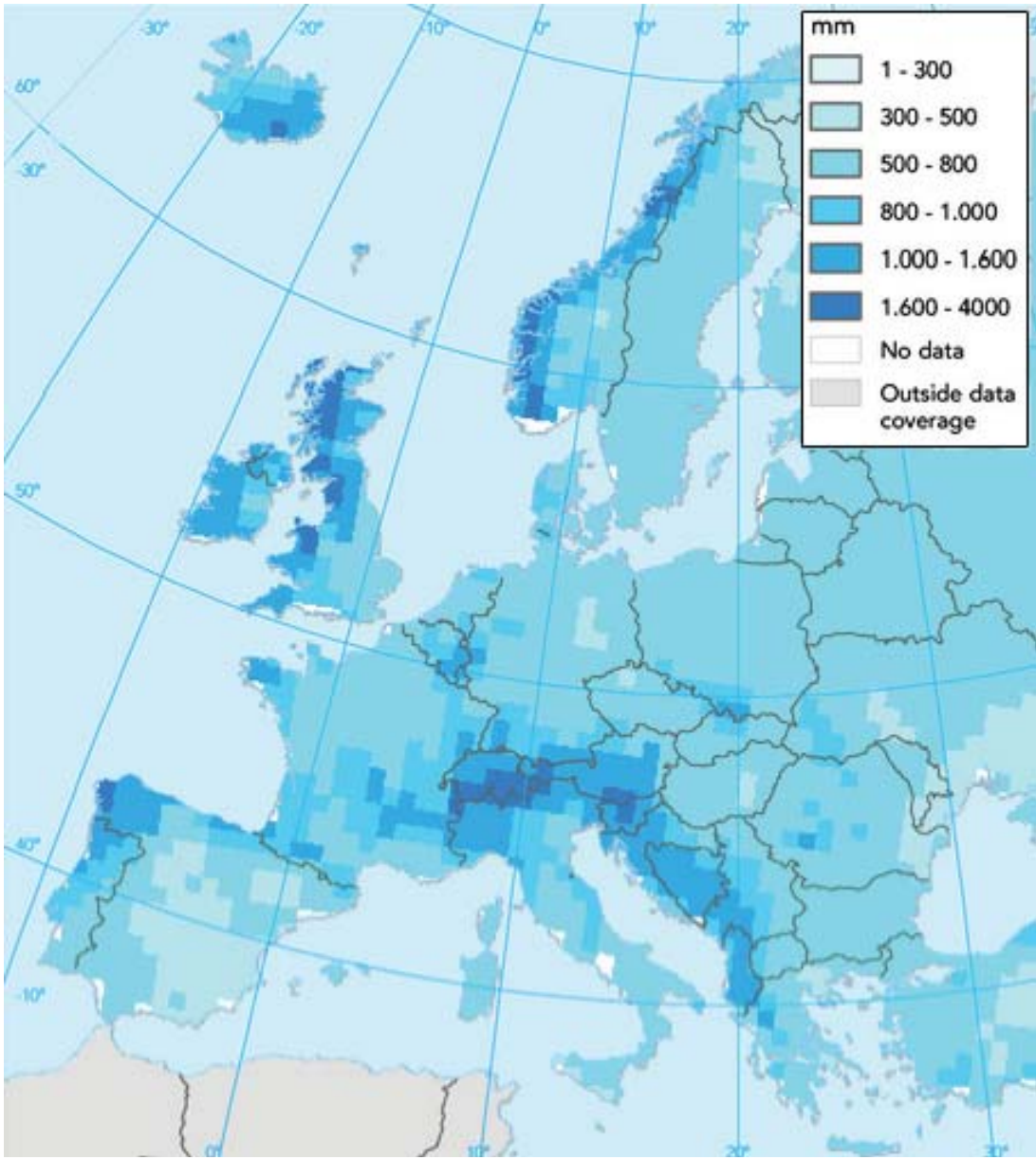
Natural phenomena such as solar variation and volcanoes probably had a small warming effect from pre-industrial times to 1950 and a small cooling effect from 1950 onward. These basic conclusions have been endorsed by at least 30 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. While a small minority have voiced disagreement with these findings, the overwhelming majority of scientists working on climate change agree with the IPCC's main conclusions.

Increasing global temperature will cause sea levels to rise and will change the amount and pattern of precipitation, likely including an expanse of the subtropical desert regions. Other likely effects include Arctic shrinkage and resulting Arctic methane release, increases in the intensity of extreme weather events, changes in agricultural yields, modifications of trade routes, glacier retreat, species extinctions and changes in the ranges of disease vectors.

Climate model projections indicate that global surface temperature will likely rise a further 1.1 to 6.4 °C (2.0 to 11.5 °F) during the twenty-first century.

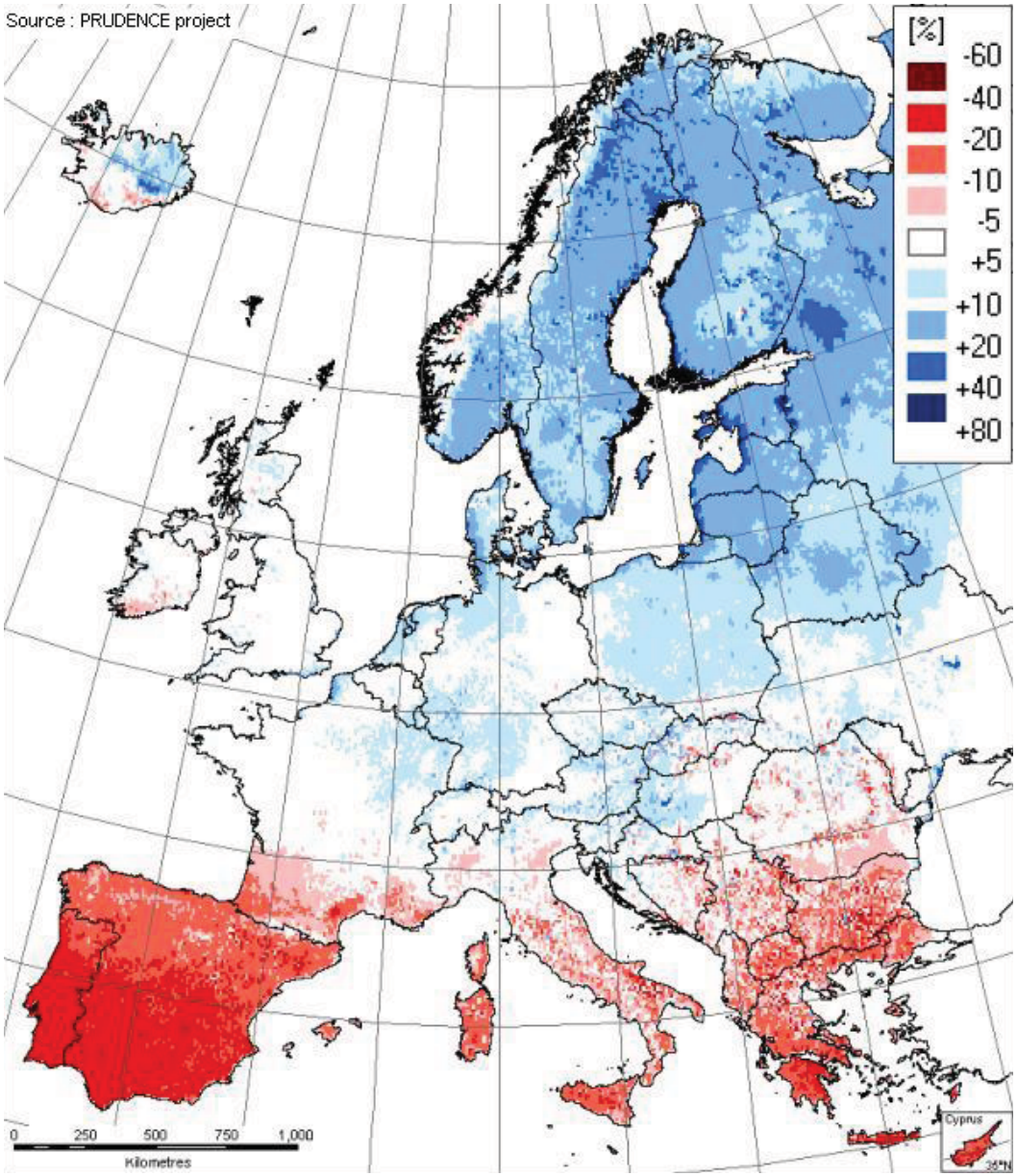


Europe: Change in mean annual temperature



Europe: Average annual precipitation

EUROPEAN PRECIPITATION



Europe: Change in mean annual precipitation

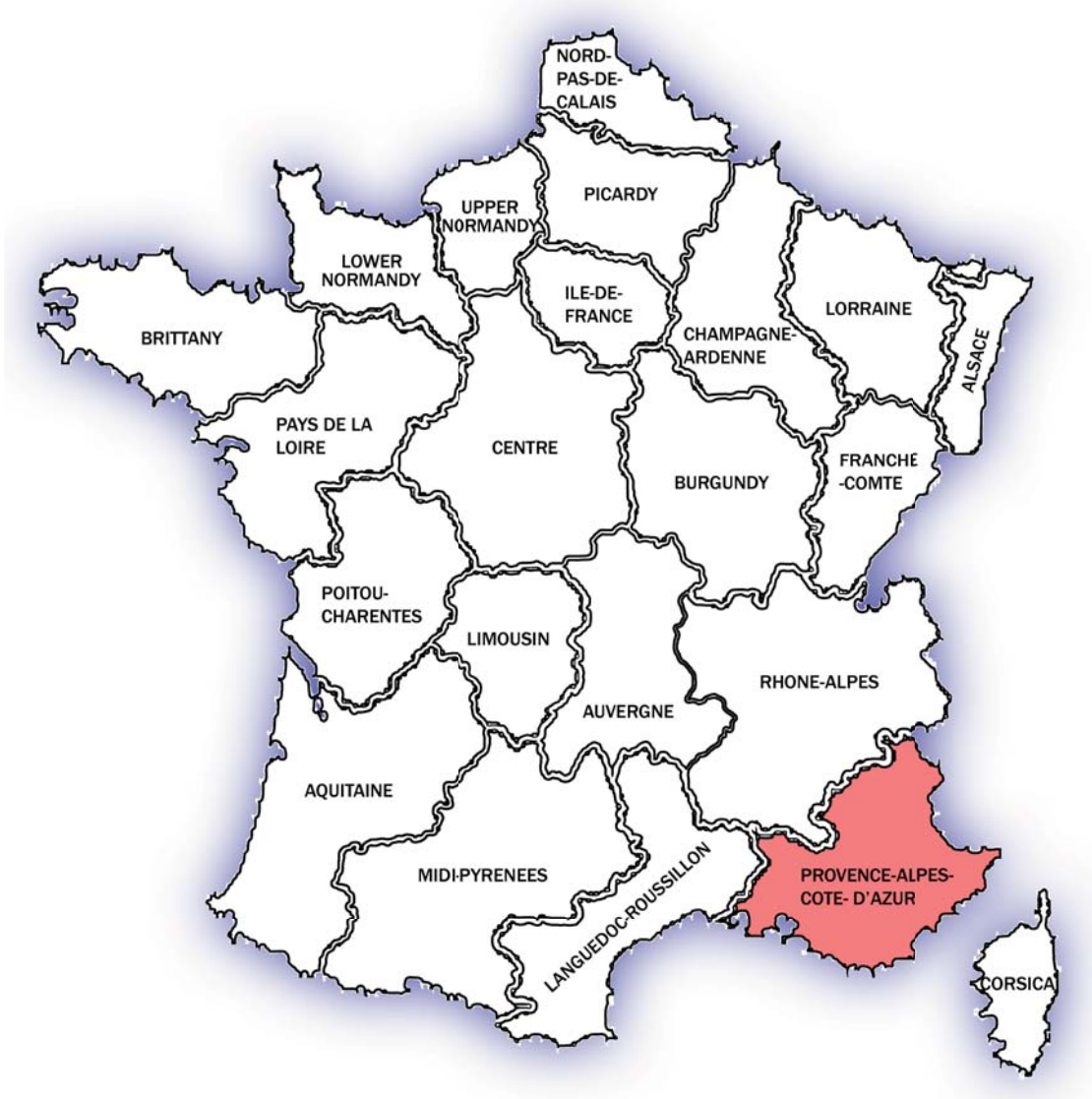
In the diagrams on the left you can see the predictions for temperature and precipitation change in Europe by 2070. This projection has been calculated by the IPCC (Intergovernmental Panel on Climate Change) relative to the calculations made between 1961-1990.

These diagrams show an increase in the temperatures around the Mediterranean by over 4°C and a reduction in surface water by 15-20%. This will have a dramatic impact on the agriculture in these areas. In Italy and areas of South France where the annual rainfall reaches approximately 2,000mm and is relied upon for the main agricultural exports a loss of 400mm would greatly reduce the crop yeild. In these cases a change in agriculture may be essential to the sustainability of entire regions.

CHAPTER 03

PROVENCE ANALYSIS

russell harding
diploma two



The original Roman province was called Gallia Transalpina, then Gallia Narbonensis, or simply Provincia Nostra ('Our Province') or Provincia. It extended from the Alps to the Pyrenees and north to the Vaucluse, with its capital in Narbo Martius (present-day Narbonne.)

In the 15th century the Conté of Provence was bounded by the Var River on the east, the Rhône River to the west, with the Mediterranean to the south, and a northern border that roughly followed the Durance River.

Rivers of Provence

The Rhône River, on the western border of Provence, is one of the major rivers of France, and has been a highway of commerce and communications between inland France and the Mediterranean for centuries. It rises as the effluent of the Rhône Glacier in Valais, Switzerland, in the Saint-Gotthard massif, at an altitude of 1753 m. It is joined by the river Saône at Lyon. Along the Rhône Valley, it is joined on the right bank by Cévennes rivers Eyrieux, Ardèche, Cèze and Gardon or Gard, on the left Alps bank by rivers Isère, Drôme, Ouvèze and Durance.

At Arles, the Rhône divides itself in two arms, forming the Camargue delta, with all branches flowing into the Mediterranean Sea. One arm is called the "Grand Rhône", the other one is the "Petit Rhône".

The Durance River, a tributary of the Rhône, has its source in the Alps near Briançon. It flows south-west through Embrun, Sisteron, Manosque, Cavaillon, and Avignon, where it meets the Rhône.

The Verdon River is a tributary of the Durance, rising at an altitude of 2400 meters in the soutwestern Alps near Barcelonette, and flowing southwest for 175 kilometers through the Alpes-de-Haute-Provence and Var (départements before it reaches the Durance at near Vinon-sur-Verdon, south of Manosque. The Verdon is best known for its impressive canyon: the Verdon Gorge. This limestone canyon, also called the 'Grand Canyon of Verdon', 20 kilometres in length and more than 300 metres deep, is a popular climbing and sight-seeing area.

The Var River rises near the Col de la Cayolle (2,326 m/7,631 ft) in the Maritime Alps and flows generally southeast for 120 kilometers (75 mi) into the Mediterranean between Nice and Saint-Laurent-du-Var. Before Nice was returned to France in 1860, the Var marked the eastern border of France along the Mediterranean. The Var is the unique case in France of a river giving a name to a department, but not flowing through that department.

Language and literature of Provence

Historically the language spoken in Provence was Provençal, a dialect of the Occitan language, also known as langue d'oc, and closely related to Catalan. There are several regional variations: vivaro-alpin, spoken in the Alps; and the provençal variations of south, including the maritime, the rhoadanien (in the Rhone Valley) and the niçois (in Nice). Niçois is the archaic form of provençal closest to the original language of the troubadors, and is sometimes to said to be literary language of its own.

Provençal was widely spoken in Provence until the beginning of the 20th century, when the French government launched an intensive and largely successful effort to replace regional languages with French. Today Provençal is taught in schools and universities in the region, but is spoken regularly by a small number of people, probably less than five hundred thousand, mostly elderly.

Wines of Provence

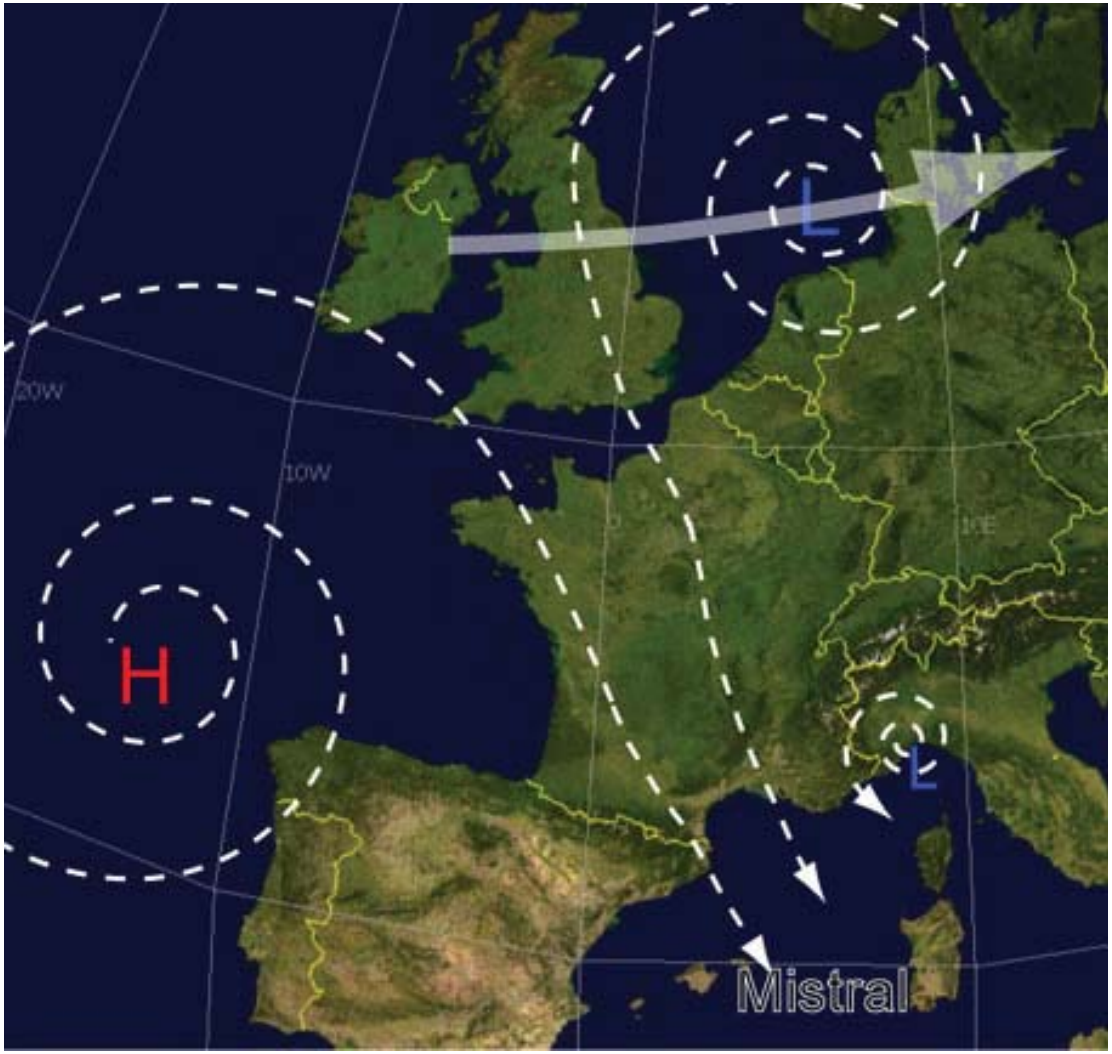
The wines of Provence were probably introduced into Provence around 600 B.C. by the Greek Phoceans who founded Marseille and Nice. After the Roman occupation, in 120 B.C. the Roman Senate forbid the growing of vines and olives in Provence, in order to protect the profitable trade in exporting Italian wines, but in the late Roman empire retired soldiers from Roman Legions settled in Province and were allowed to grow grapes.

The wines of Provence are grown under demanding conditions; hot weather and abundant sunshine which ripens the grapes quickly; little rain, and the Mistral Wind.

The great majority of the wines produced in Provence are rosés. The most characteristic grape is mourvèdre, used most famously in the red wines of Bandol. Cassis is the only area in Provence known for its white wines.

Pastis

Pastis is the traditional liqueur of Provence, flavored with anise and typically containing 40–45% alcohol by volume. When absinthe was banned in France in 1915, the major absinthe producers (then Pernod Fils and Ricard, who have since merged as Pernod Ricard) reformulated their drink without the banned wormwood and with more aniseed flavor, coming from star anise, sugar and a lower alcohol content, creating pastis. It is usually drunk diluted with water, which it turns a cloudy color. It is especially popular in and around Marseille.



Climate

Most of Provence has a Mediterranean climate, characterized by hot, dry summers, mild winters, little snow, and abundant sunshine. Within Provence there are micro-climates and local variations, ranging from the Alpine climate inland from Nice to the continental climate in the northern Vaucluse. The winds of Provence are an important feature of the climate, particularly the mistral, a cold, dry wind which, especially in the winter, blows down the Rhone Valley to the Bouches-du-Rhône and the Var Departments, and often reaches over one hundred kilometers an hour.

Mistral

The mistral in France is a fresh or cold, often violent, and usually dry wind, blowing throughout the year but is most frequent in winter and spring. It blows from the northwest or north of Europe through the valley of the Rhône River to the Mediterranean. It also affects the whole of Sardinia in Italy.

In the south of France the name comes from the Languedoc dialect of the provençal language and means “masterly”. The same wind is called mistrau in the Occitan language, mestral in Catalan and maestrale in Italian and Corsican.

The mistral is usually accompanied by clear and sunny weather, and it plays an important role in creating the climate of Provence. It can reach speeds of more than ninety kilometers an hour, particularly in the Rhone Valley.

The cause of the mistral

The mistral is an example of a katabatic wind, which is created by the difference in pressure between the cold air of a high pressure system over the Atlantic or northwest Europe and a low pressure system over the Gulf of Lion or the Gulf of Genoa in the Mediterranean. The high-pressure air flows south through the Rhone Valley, gathering speed as it is funneled between the Alps and the Massif Central.

In France, the mistral particularly affects Provence, Languedoc east of Montpellier, and the department of the Var to the west of Frejus, as well as all of the Rhone Valley from Lyon to Marseille as far as Corsica and Sardinia. The mistral usually blows from northwest or north, but in certain pre-alpine valleys and along the Cote d’Azur, the wind is channelled by the mountains so that it blows from east to west. Sometimes it also blows from the north-north-east toward the east of Languedoc as far as Cap Béar. Frequently the mistral will affect only one part of the region, particularly when it is not caused by a flow of air from the northwest.

The mistral from the northwest

The mistral and the similar north wind in France, the tramontane, usually originate with a flow of air from the northwest. A cold front associated with a low pressure area over northern Europe moves toward the east. The flow shifts to the northwest, bringing with it cold maritime air. The cool wind from the northeast dries the air and rapidly disperses the clouds. The acceleration of the wind is caused by the creation of a depression, or low-pressure area, in the Gulf of Genoa under the wind from the Alps. In this case the mistral affects the entire Rhone Valley, the inland territory of Provence and the Cote d'Azur, where the wind comes from the east.

In the Languedoc area, where the tramontane is the strongest wind, the mistral and the tramontane blow together onto the Gulf of Lion and the northwest of the western Mediterranean, and can be felt to the east of the Balearic Islands, in Sardinia, and sometimes as far as the coast of Africa.

The mistral from the west

When the mistral originates from the west, the mass of air is not so cold and the wind only affects the plain of the Rhone delta and the Cote d'Azur. The good weather is confined to the coast of the Mediterranean, while it can rain in the interior. The Cote d'Azur generally has a clear sky and warmer temperatures, the classic effect of this type of foehn wind. This type of mistral usually blows for no more than one to three days.

The mistral from the northeast

The mistral originating from the northeast has a very different character; it is felt only in the west of Provence and as far as Montpellier, with the wind coming from either a northerly or north-northeasterly direction. In the winter this is by far the coldest form of the mistral, when it carries chill air from Central Europe and from Russia. It is caused by the presence of a high pressure area over northern Europe. The wind can blow for more than a week, until the high pressure area has moved east and the wind changes direction. This kind of mistral is often connected with a low pressure area in the Gulf of Genoa, and it can bring unstable weather to the Cote d'Azur and the east of Provence, sometimes bringing heavy snow to low altitudes in winter.

When the flow of air comes from the northeast due to a widespread low pressure area over the Atlantic and atmospheric disturbances over France, the air is even colder at both high altitudes and ground level, and the mistral is even stronger, and the weather worse, with the creation of cumulus clouds bringing weak storms. This kind of mistral is weaker in the east of Provence and the Cote d'Azur.

The mistral from the east

The mistral is not always synonymous with clear skies. When a low pressure front over the Mediterranean approaches the coast from the southeast, the weather can change quickly for the worse, and the mistral and its clear sky changes rapidly to an east wind bringing humid air and threatening clouds. The position of the low-pressure front creates a flow of air from the northwest or the northeast, channeled through the Rhone Valley. If this low-pressure area moves back toward the southeast, the mistral will quickly clear the air and the good weather will return; but if the cold-weather front continues to approach the land, bad weather will continue for several days in the entire Mediterranean basin, sometimes transforming into what French meteorologists call an épisode cévenol, a succession of torrential rains and floods, particularly in the areas west of the Rhone Valley: the Ardèche, the Gard, Herault and Lozère.

The summer mistral

The summer mistral, unlike the others, is created by purely local conditions. It usually happens in July, and only in the valley of the Rhone and on the coast of Provence. It is caused by a thermal depression over the interior of Provence (The Var and Alpes de Haute-Provence), created when the land is overheated. This creates a flow of air from the north toward the east of Provence. This wind is frequently cancelled out close to the coast by the breezes from the sea. It does not blow for more than a single day, but it is feared in Provence, because it dries the vegetation and it can spread forest fires.

Sunshine, clarity, and a dry climate

The mistral is a dry wind, and its arrival almost always clears the skies and dries the air. The Mistral helps explain the unusually sunny climate (2700 to 2900 hours of sunshine a year) and clarity of the air of Provence. When other parts of France have clouds and storms, Provence is rarely affected for long, since the mistral quickly clears the sky. In less than two hours, the sky can change from completely covered to completely clear. The mistral also blows away the dust, and makes the air particularly clear, so that during the mistral it is possible to see mountains 150 kilometers and farther away.

The mistral and health

The mistral has the reputation of bringing good health, since the dry air dries stagnant water and the mud, giving the mistral the local name mange-fange (Eng. “mud-eater”). It also blows away pollution from the skies over the large cities and industrial areas.

The mistral and forest fires

The sunshine and dryness brought by the mistral have an important effect on the local vegetation. The vegetation in Provence, which is already dry because of the small amount of rainfall, is made even drier by the wind, which makes it particularly susceptible to fires, which the wind spreads very rapidly, sometimes devastating vast expanses of mountainside before being extinguished. During the summer, thousands of hectares can burn when the mistral is blowing.

The mistral and the growth of vegetation

In the Rhone Valley and on the plain of la Crau, the regularity and force of the mistral causes the trees to grow leaning to the south. Once the forest has been razed by fire, the strong wind makes it difficult for new trees to grow. The farmers of the Rhone Valley have long planted rows of cypress trees to shelter their crops from the dry force of the mistral. The mistral can also have beneficial effects—the moving air can save crops from the spring frost, which can last until the end of April.

Cooling of the sea water

As summer visitors to the beach in Provence learn, the summer mistral can quickly lower the temperature of the sea, as the wind pushes the warm water near the surface out to sea and it is replaced by colder water from greater depths.

The effects of the mistral beyond France

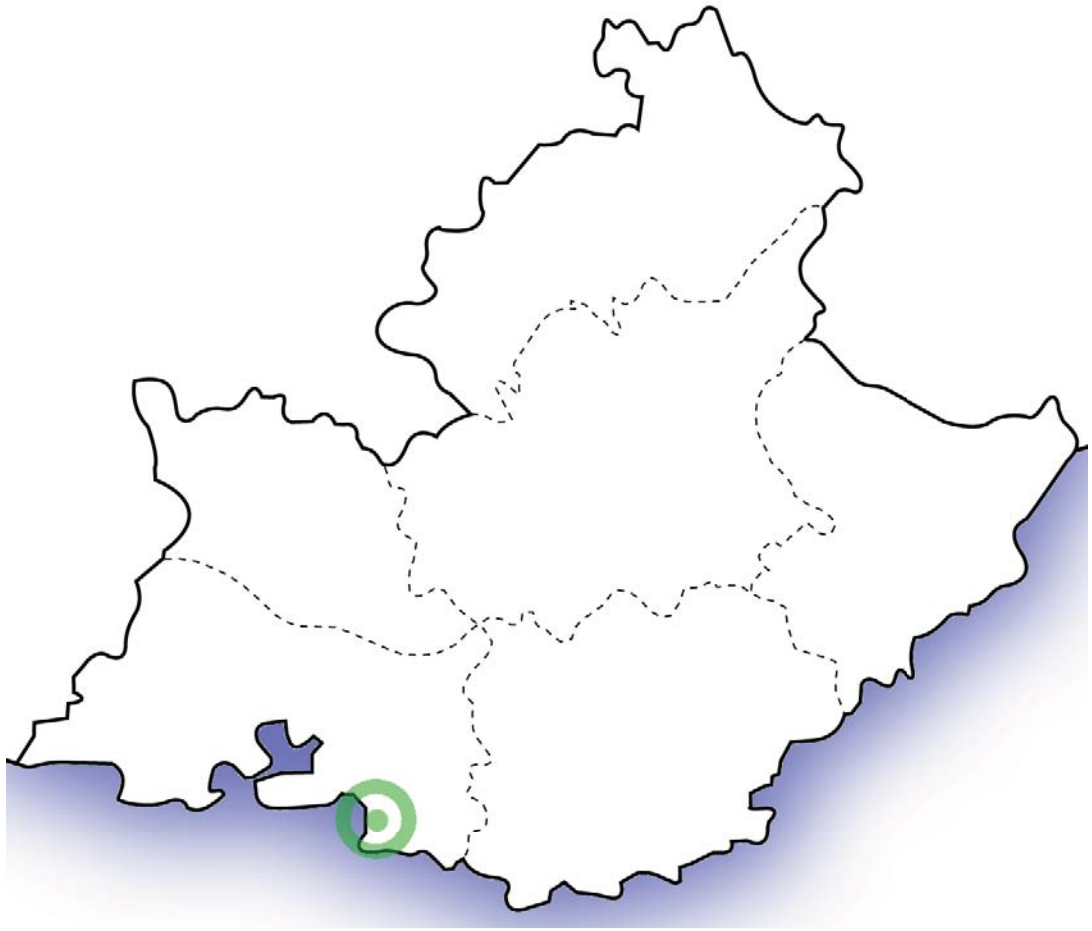
The mistral can affect the weather in North Africa, Sicily and Malta or throughout the Mediterranean, particularly when low pressure areas form in the Gulf of Genoa.

Similar names—maestral or maestro—are used for (although also mostly northwestern) a quite different wind in the Adriatic Sea. It is an anabatic sea-breeze wind which blows in the summer when the east Adriatic coast gets warmer than the sea. It is thus a mild sea-to-coast wind, unlike the mistral. The strong katabatic wind there is the northeastern bora.

In south-western Crete it is also known as maestro and it is considered the most beneficial wind, which is said to blow only during the daytime.

The mistral in Provençal culture

The mistral plays an important part in the life and culture of Provence, The mas (farmhouse) traditionally faces south, with its back to the mistral. The bell towers of villages in Provence are often open iron frameworks, which allow the wind to pass through. The traditional Provençal Christmas crib often has a figure of a shepherd holding his hat, with his cloak blowing in the mistral.



Marseille - Provençal Occitan: Marselhas - is the second-largest city of France and forms the third-largest metropolitan area, after those of Paris and Lyon, with a population recorded to be 1,516,340 at the 1999 census and estimated to be 1,605,000 in 2007. Located on the south east coast of France on the Mediterranean, Marseille is France's largest commercial port. Marseille is the administrative capital (préfecture de région) of the Provence-Alpes-Côte d'Azur region, as well as the administrative capital (préfecture départementale) of the Bouches-du-Rhône department. Its inhabitants are called Marseillais.

Marseille is the most populous commune in France after Paris and is the centre of the third largest metropolitan area in France. To the east, starting in the small fishing village of Callelongue on the outskirts of Marseille and stretching as far as Cassis, are the Calanques, a rugged coastal area interspersed with small fjords. Further east still are the Sainte-Baume, a 1,147 m (3,763 ft) mountain ridge rising from a forest of deciduous trees, the town of Toulon and the French Riviera. To the north of Marseille, beyond the low Garlaban and Etoile mountain ranges, is the 1,011 m (3,317 ft) Mont Sainte Victoire. To the west of Marseille is the former artists' colony of l'Estaque; further west are the Côte Bleue, the Gulf of Lion and the Camargue region in the Rhône delta. The airport lies to the north west of the city at Marignane on the Etang de Berre.

The city's main thoroughfare, the wide boulevard called the Canebière, stretches eastward from the Old Port (Vieux Port) to the Réformés quarter. Two large forts flank the entrance to the Old Port - Fort St Nicholas on the south side and Fort St Jean on the north. Further out in the Bay of Marseille is the Frioul archipelago which comprises four islands, one of which, If, is the location of Chateau d'If, made famous by the Dumas novel The Count of Monte Cristo. The main commercial centre of the city intersects with the Canebière at rue St Ferreol and the Centre Bourse (the main shopping mall). The centre of Marseille has several pedestrianized zones, most notably rue St Ferreol, Cours Julien near the Music Conservatory, the Cours Honoré-d'Estienne-d'Orves off the Old Port and the area around the Hotel de Ville. To the south east of central Marseille in the 6th arrondissement are the Prefecture and the monumental fountain of Place Castellane, an important bus and metro interchange. To the south west are the hills of the 7th arrondissement, dominated by the basilica of Notre-Dame-de-la-Garde. The railway station - Gare de Marseille Saint-Charles - is north of the Centre Bourse in the 1st arrondissement; it is linked by the Boulevard d'Athènes to the Canebière.

Economy

Historically, the economy of Marseille was dominated by its role as a port of the French Empire, linking the North African colonies of Algeria, Morocco and Tunisia with metropolitan France. The majority of the old port and docks, which experienced decline in the 1970s after the oil crisis, have been recently redeveloped with funds from the European Union. The old port now contains restaurants, offices, bars and hotels and functions mostly as a private marina. Fishing, however, remains important in Marseille and the food economy of Marseille is still dominated by the local catch and a daily fish market is still held at the Belgian Quay at the Old Port.

Today, the economy of Marseille is dominated by the New Port, which lies north of the Old Port, a commercial container port and a transport port for the Mediterranean sea. 100 million tons of freight pass annually through the port, 60% of which is petroleum, making it number one in France and the Mediterranean and number three in Europe. However, its recent growth in container traffic is being stifled by the constant strikes and social upheaval. Petroleum refining and shipbuilding are the principal industries, but chemicals, soap, glass, sugar, building materials, plastics, textiles, olive oil, and processed foods are also important products. Marseille is connected with the Rhône via a canal and thus has access to the extensive waterway network of France. Petroleum is shipped northward to the Paris basin by pipeline. The city also serves as France's leading centre of oil refinement.

Marseille is a major French centre for trade and industry,with excellent transportation infrastructure (roads, sea port and airport). Marseille Provence Airport, is the fourth largest in France. It is the main arrival base for millions of tourists each year as well as serving a growing business community. All three branches of the University of Aix-Marseille - the University of Provence, the University of the Mediterranean and Paul Cézanne University - are represented to varying degrees in both Marseille and Aix-en-Provence. The economy is closely associated with the Marseille Provence Metropolis, France's second largest research centre with 3000 research scientists.

Marseille Metropole Provence is home to thousands of companies, 90% of which are small businesses. Among the most famous ones are CMA CGM, container-shipping giant; Comex, world leader in sub-sea engineering and hydraulic systems; Eurocopter Group, an EADS company; Azur Promotel, an active real estate development company; La Provence, the local daily newspaper; L'Olympique de Marseille, the famous soccer club; RTM, Marseille's public transport company; and Société Nationale Maritime Corse Méditerranée (SNCM), a major operator in passenger, vehicle and freight transportation in the Western Mediterranean.

In recent years, the city has also experienced a large growth in service sector employment and a switch from light manufacturing to a cultural, high-tech economy. Marseille acts as a regional nexus for entertainment in the south of France and has a high concentration of museums, cinemas, theaters, clubs, bars, restaurants, fashion shops, hotels, and art galleries, all geared towards a tourist economy.

In May 2005, the French financial magazine L'Expansion named Marseille the most dynamic of France's large cities, citing figures showing that 7,200 companies had been created in the city since 2000.

Employment

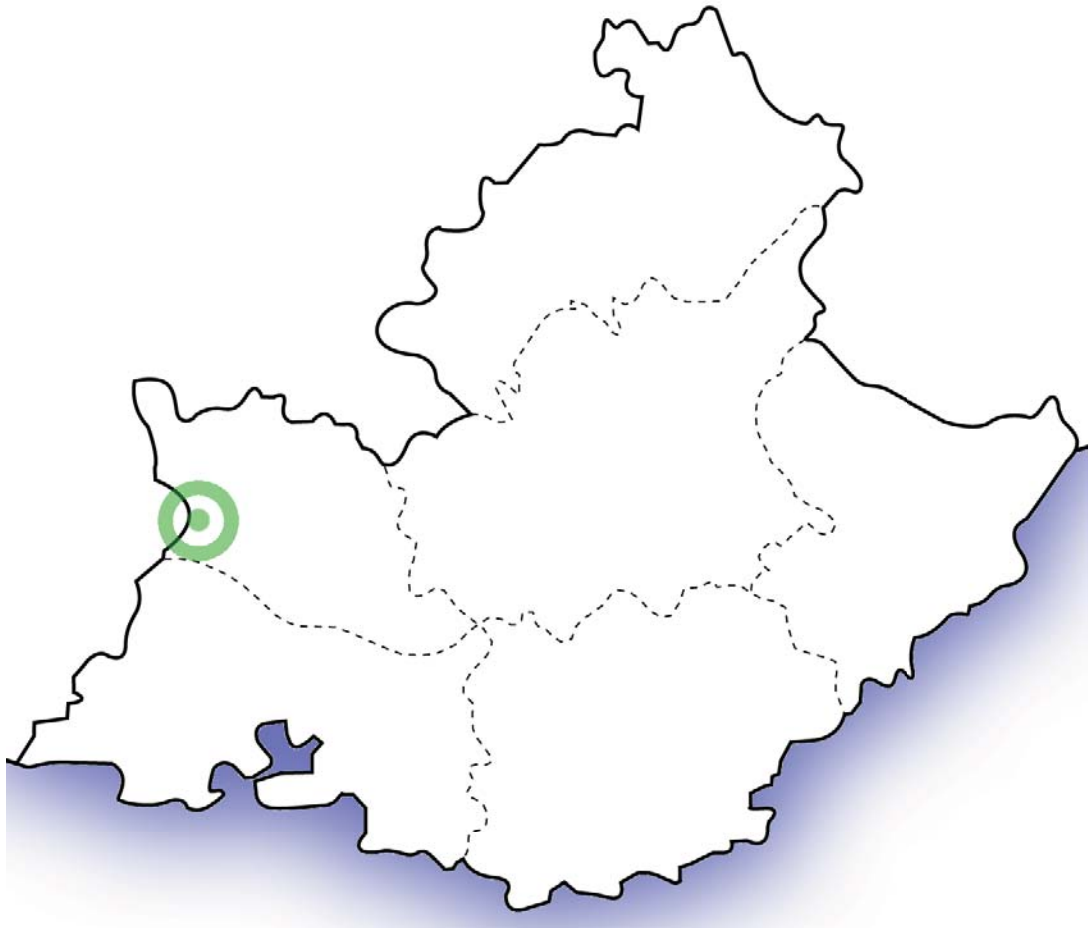
Unemployment in the economy fell from 20% in 1995 to 14% in 2004.However, Marseille remains a city with high unemployment against the national average and suffers a lack of jobs for its large immigrant population. For example, in some parts of Marseille, youth unemployment is reported as high as 40%.

Immigration

Because of its pre-eminence as a Mediterranean port, Marseille has always been one of the main points of entry into France. This has attracted many immigrants and made Marseille into a cosmopolitan melting pot. By the end of the 18th century about half the population originated from elsewhere.
The main group of immigrants came from Italy (mainly from Genoa and Piedmont) as well as from Spain, Greece and the Levant.

Economic conditions and political unrest in Europe and the rest of the world brought several further waves of immigrants in the 20th century: Greeks and Italians started arriving at the end of the 19th century and in the first half of the 20th century, up to 40% of the city's population was of Italian origin; Russians in 1917; Armenians in 1915 and 1923; the Spanish after 1936; North Africans in the inter-war period; Sub-saharan Africans after 1945; the pieds-noirs from the former French Algeria in 1962; and then from Comoros. In 2006, it was reported that 70,000 city residents were considered to be of Maghrebian origin, mostly from Algeria. The second largest group in Marseille in terms of single nationalities were from the Comoros, amounting to some 45,000 people.

Currently over one third of the population of Marseille can trace their roots back to Italy. Marseille also has the largest Corsican and second-largest Armenian population in France. Other significant communities include North African Arabs and Berbers (25% of the total population), Turks, Comorians, Chinese, and Vietnamese. The main religions practised in Marseille are Catholicism (600,000), Islam (between 150,000 and 200,000), Armenian Apostolic Church (80,000), Judaism (80,000, making Marseille the third largest urban Jewish community in Europe), Protestantism (20,000), Eastern Orthodoxy (10,000) and Buddhism (3,000).



Avignon - Provençal Occitan: Avinhon - is a commune in the Vaucluse department in southeastern France with an estimated mid-2004 population of 89,300 in the city itself and a population of 290,466 in the metropolitan area at the 1999 census.

The city is well known for its Palais des Papes (Palace of the Popes), where several popes and antipopes lived from the early 14th to early 15th centuries.

Avignon is situated on the left bank of the Rhône, a few miles above its confluence with the Durance, about 580 km (360.4 mi) south-south-east of Paris, 229 km (142.3 mi) south of Lyon and 85 km (52.8 mi) north-north-west of Marseille.

Avignon occupies a large oval-shaped area, not fully populated and covered in great part by parks and gardens.

Avignon is often subject to windy weather, the strongest wind is the mistral. The popular proverb is, however, somewhat exaggerated, Avenie ventosa, sine vento venenosa, cum vento fastidiosa (windy Avignon, pest-ridden when there is no wind, wind-pestered when there is).

History

The site of Avignon was settled very early on; the rocky outcrop (le Rocher les Doms) at the north end of the town, overlooking the Rhône River, may have been the site of a Celtic oppidum or hill fort.

Avignon, written as Avennio or Avenio in the ancient texts and inscriptions, takes its name from the Avennius clan. Founded by the Gallic tribe of the Cavares or Cavari, it became the centre of an important Phocaean colony from Massilia (present Marseilles).

Under the Romans, Avenio was a flourishing city of Gallia Narbonensis, the first Transalpine province of the Roman Empire, but very little from this period remains (a few fragments of the forum near Rue Molière).

During the inroads of the barbarians, it was badly damaged in the 5th century and belonged in turn to the Goths, the kingdoms of Burgundy and of Arles, the Ostrogoths and the Frankish-Merovingian kings of Austrasia. In 736 it fell into the hands of the Saracens and was destroyed in 737 by the Franks under Charles Martel for having sided with the Arabs against him. Boso having been proclaimed Burgundian King of Provence, or of Arelat (after its capital Arles), by the Synod of

Mantaille, at the death of Louis the Stammerer (879), Avignon ceased to belong to the Frankish kings.

At the end of the 12th century, Avignon declared itself an independent republic, but independence was crushed in 1226 during the crusade against the Albigenses (the dualist Cathar heresy centered in neighboring Albi). After the citizens refused to open the gates of Avignon to King Louis VIII of France and the papal Legate, a three month siege ensued starting on June 10th, 1226, and ending in capitulation by Avignon on September 13th, 1226. Following the defeat, they were forced to pull down the ramparts and fill up the moat of the city.

On 7 May 1251 Avignon was made a common possession of counts Charles of Anjou and Alphonse de Poitiers, brothers of French king Saint Louis IX. On 25 August 1271, at the death of Alphonse de Poitiers, Avignon and the surrounding countship Comtat-Venaissin (which was governed by rectors since 1274) were united with the French crown.

In 1309 the city was chosen by Pope Clement V as his residence, and from 9 March 1309 until 13 January 1377 was the seat of the Papacy instead of Rome. This caused a schism in the Catholic church. At the time, the city and the surrounding Comtat Venaissin were ruled by the kings of Sicily from the house of Anjou. French King Philip the Fair, who had inherited from his father all the rights of Alphonse de Poitiers (the last Count of Toulouse), made them over to Charles II, King of Naples and Count of Provence (1290). Nonetheless, Phillip was a shrewd ruler. Inasmuch as the eastern banks of the Rhone marked the edge of his kingdom, when the river flooded up into the city of Avignon, Phillip taxed the city since during periods of flood, the city technically lay within his domain. Regardless, on the strength of the donation of Avignon, Queen Joanna I of Sicily, as countess of Provence, sold the city to Clement VI for 80,000 florins on 9 June, 1348 and, though it was later the seat of more than one antipope, Avignon belonged to the Papacy until 1791, when, during the disorder of the French Revolution, it was reincorporated with France.

Culture

Avignon Festival - A famous theater festival is held annually in Avignon. Founded in 1947, the Avignon Festival comprises traditional theatrical events as well as other art forms such as dance, music, and cinema, making good use of the town's historical monuments. Every summer approximately 100,000 people attend the festival. There are really two festivals that take place: the more formal "Festival In", which presents plays inside the Palace of the Popes and the more bohemian "Festival Off", which is known for its presentation of largely undiscovered plays and street performances.

The International Congress Center - It was created in 1976 within the outstanding premises of the Palace of the Popes and hosts many events throughout the entire year. The Congress Center, designed for conventions, seminars, and meetings for 10 to 550 persons, now occupies two wings of the Popes' Palace.

Transport

Avignon has an SNCF railway station, situated just outside the ramparts of the old town, and a TGV station outside the town, served by the LGV Méditerranée, a high-speed rail system. Provision for transport within the city includes 110 km of bike paths, and 23 bus lines. The Avignon - Caumont Airport is situated about 8 km southeast of Avignon. Avignon is situated on the banks of the river Rhone, one of the main water thoroughfares in France.

CHAPTER 04

BOULBON ANAYLSIS

Boulbon is a charming village in the north of the department of Bouches du Rhône, between Avignon and Tarascon. Nestled in a fold of La Montagnette, the land around Boulbon is divided between the fertile plain used for farming and La Montagnette, a paradise for walkers, mushroom gatherers and hunters (except for July to mid September when access is prohibited because of the fire risk). Visitors to Boulbon will discover a typical mediaeval Provençal village.

It has a fortified château which dominates the village and fortifications which protected it from attack. An attractive brochure produced by the mairie forms a useful guide, with lots of information about the history concealed in the old stones of the village.

As you leave the Place de la Mairie at the entrance to the village you will pass through the fortified gate, the Porte Loriol. On the left is the “Gardette” (the building which formerly housed the guards who controlled people entering and leaving the village). You will then find yourself in Boulbon’s longest street, la Grand’rue, which boasts old houses with lovely façades, some with Renaissance windows. You will also pass the large 14th-century statue of St Christopher. Look out for the old doors with sculpted pediments and little lanes which open out into charming little squares with flower-bedecked windows.

Going along the ramparts from the rue du Barri, you come to the foot of what remains of Boulbon’s splendid feudal fortress. Its keep (11th century) can still be seen but the defence towers, the machicolations, the living quarters and the terraces sadly did not survive the many turbulent periods in the village’s history.

Not far from the château is the church of St Anne, built in 1626, after which you will come to the chapel of St Marcellin, a little gem of Romanesque architecture, that you will reach via the street with the town hall on it. The way into the chapel is through a wonderful semicircular portal. The building is not only of interest for its architecture but also because it is the scene every year of the rather unusual Bottle Procession, which is without doubt the most picturesque of Boulbon’s festivals. It takes place every year on the evening of June 1st.

At around 7 pm the bells ring out and all the men and boys of the village (the women and girls are excluded) hurry along behind the priest to process to the Chapel of St Marcellin. Each man or boy carries one of his best bottles of wine. At the end of the mass the bottles are uncorked and the priest sings prayers and solemnly blesses the wine. Then everyone clinks glasses and drinks religiously. Generally they all then very carefully recork their bottles - thus enriched by reverent prayer the wine will serve to soothe fevers, stomach aches and other illnesses until the following June… Then the procession returns to the village, uplifted and joyful.

CHAPTER 05

DESIGN BRIEF

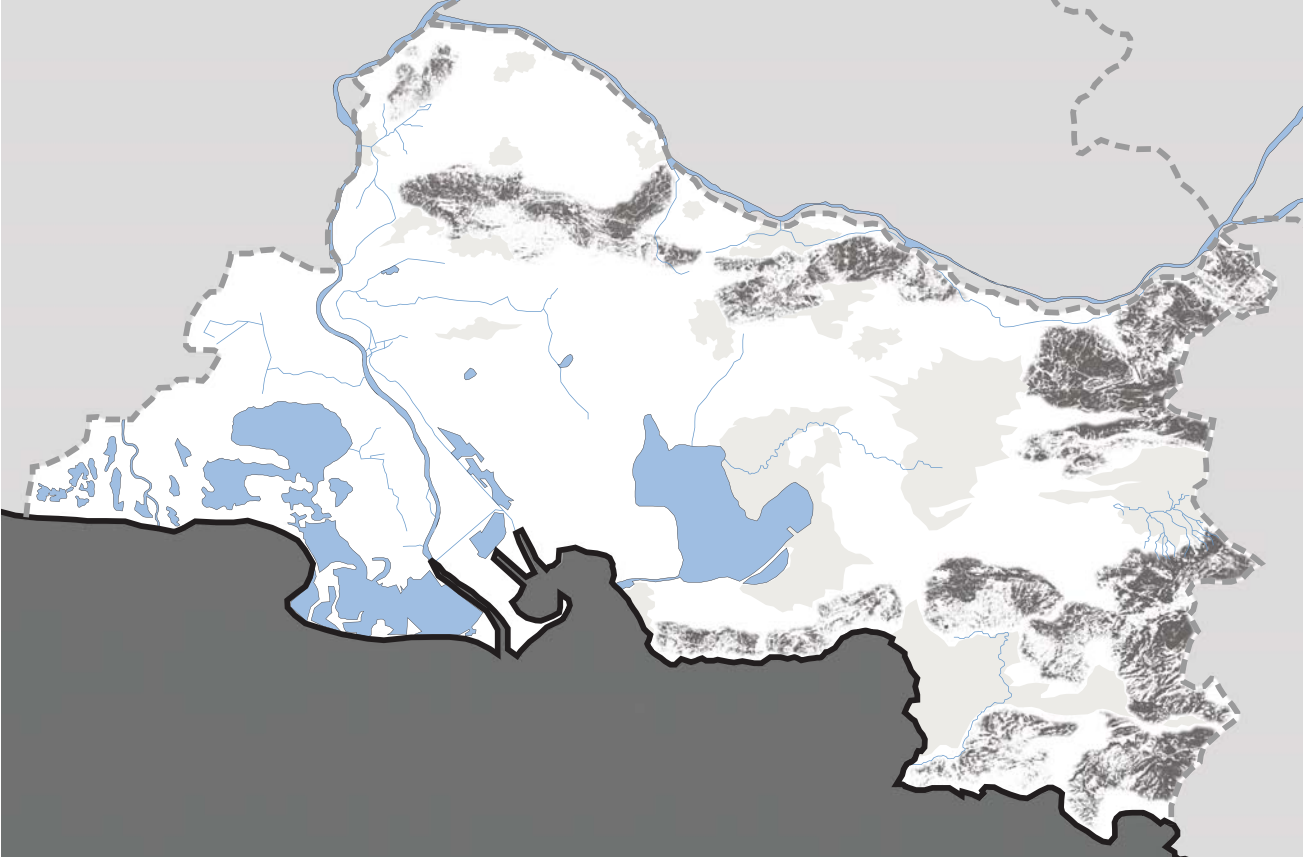
russell harding
diploma two

WORLD > EUROPE > FRANCE > PROVENCE

Design Report

Russ Harding

Diploma Two

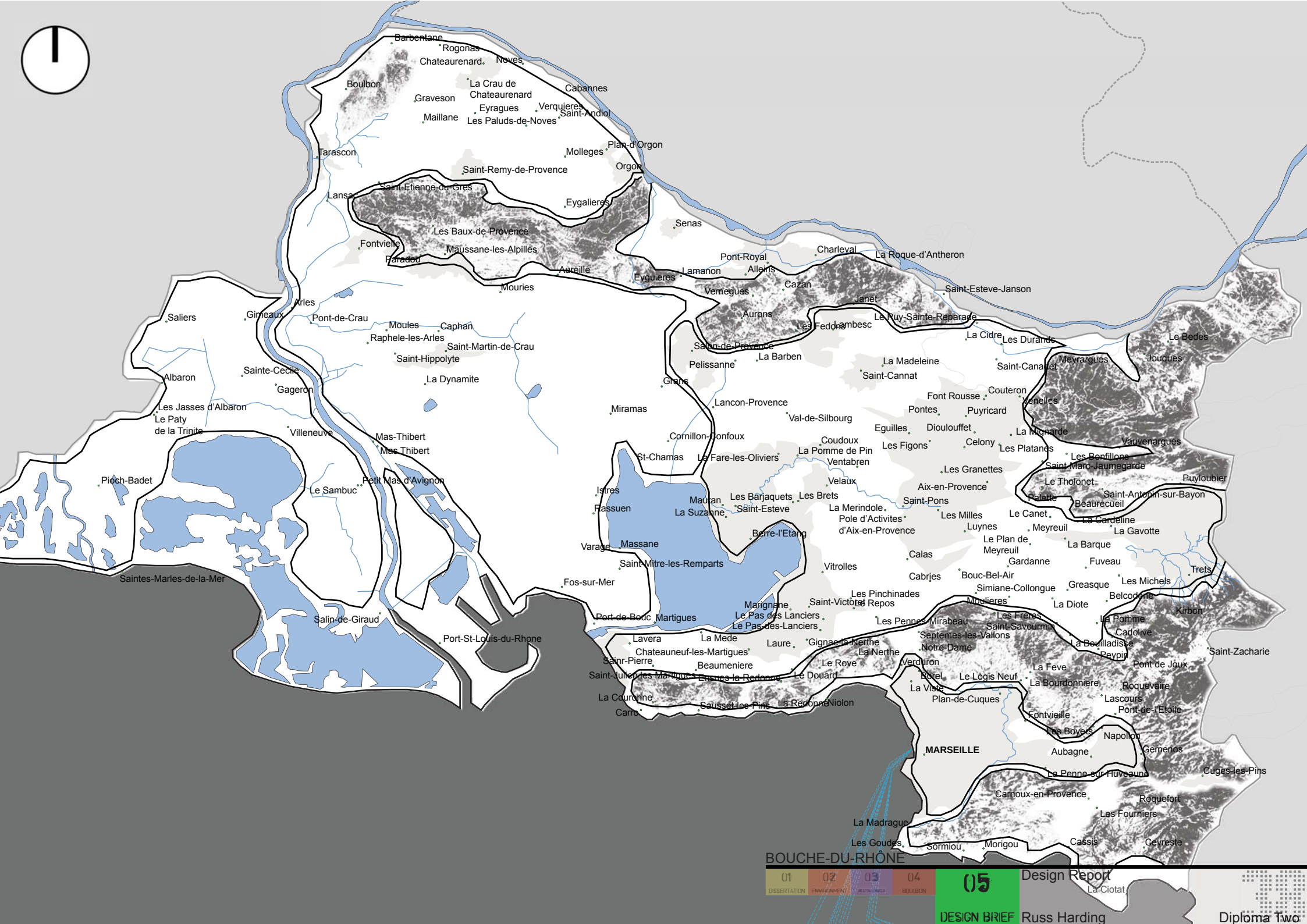


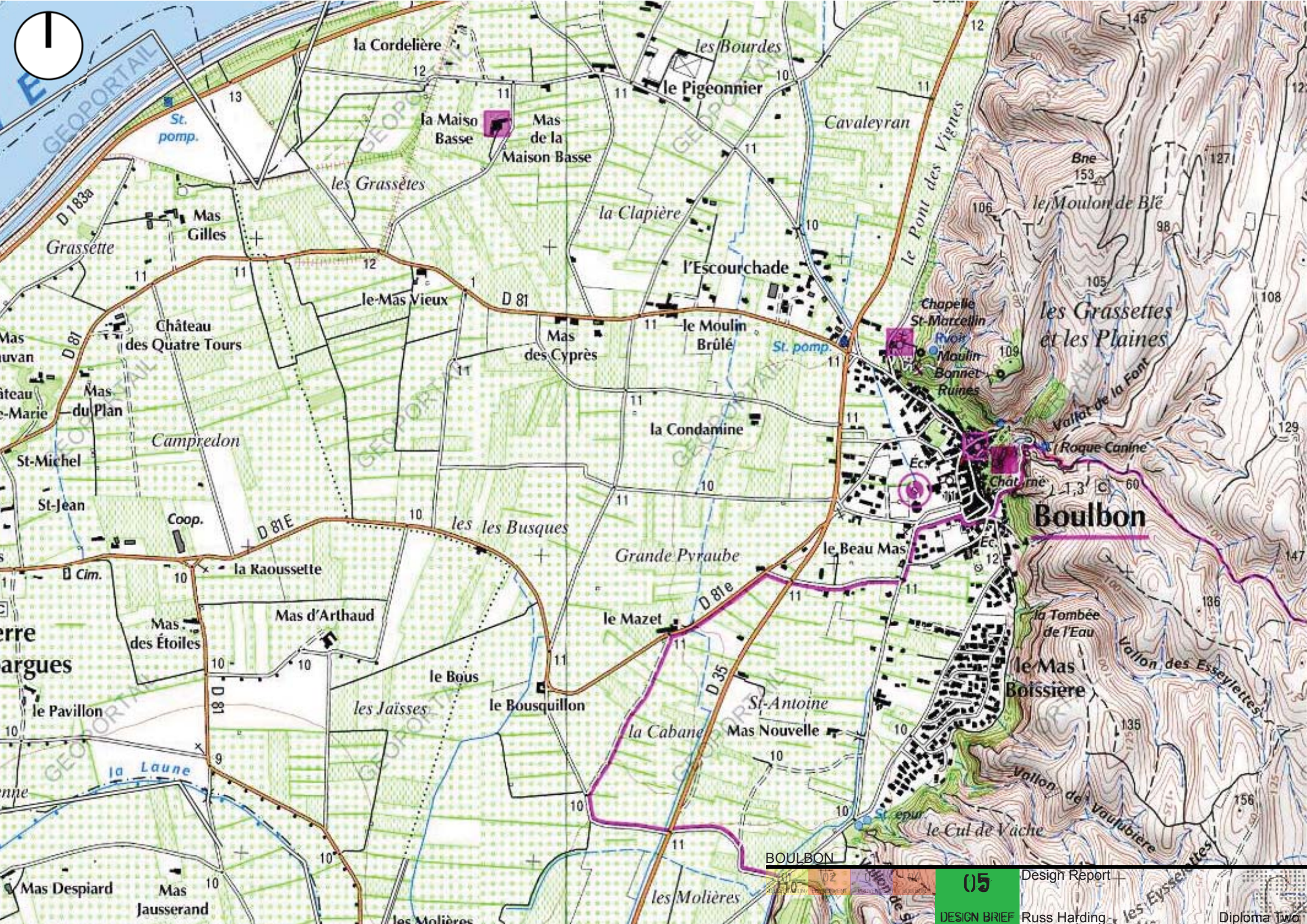
Provence is the South Eastern most region in France bordering the Alps to the North, Italy to the East and the Mediterranean Sea to the South. Provence is so named because it was the first Roman province outside of Italy.

The traditional region of Provence comprises the départements of Var, Vaucluse, and Bouches-du-Rhône and parts of Alpes-de-Haute-Provence and Alpes-Maritimes. The original Roman province was called Gallia Transalpina, then Gallia Narbonensis, or simply Provincia Nostra ('Our Province') or Provincia. It extended from the Alps to the Pyrenees and north to the Vaucluse, with its capital in Narbo Martius (present-day Narbonne.) In the 15th century the Conté of Provence was bounded by the Var River on the east, the Rhône River to the west, with the Mediterranean to the south, and a northern border that roughly followed the Durance River.

Most of Provence has a Mediterranean climate, characterized by hot, dry summers, mild winters, little snow, and abundant sunshine. Within Provence there are micro-climates and local variations, ranging from the Alpine climate inland from Nice to the continental climate in the northern Vaucluse. The winds of Provence are an important feature of the climate, particularly the mistral, a cold, dry wind which, especially in the winter, blows down the Rhone Valley to the Bouches-du-Rhône and the Var Departments, and often reaches over one hundred kilometers an hour.

The department of Bouches-du-Rhône is located in the South West of Provence, it comprises 119 communes including Aix-en-Provence and Marseille. Marseille, in the Bouches-du-Rhône, has an average of 59 days of rain a year, though when it does rain the rain is often torrential; the average annual rainfall is 544.4 centimeters. It snows an average of 2.3 days a year, and the snow rarely remains long. Marseille has an average of 2835.5 hours of sunshine a year. The average minimum temperature in January is 2.3 °C., and the average maximum temperature in July is 29.3 °C. The mistral blows an average of one hundred days a year.


Barbentane
Rogonas
Chateaurenard
Noves
Boulbon
La Crau de Chateaurenard
Cabannes
Graveson
Eyragues
Verquieres
Maillane
Saint-Andiol
Les Paluds-de-Noves
Plan-d'Orgon
Tarascon
Molleges
Orgon
Saint-Remy-de-Provence
Saint-Etienne-du-Gres
Lansac
Eygalieres
Senas
Les Baux-de-Provence
Fontvielle
Maussane-les-Alpilles
Paradou
Aureille
Pont-Royal
Charleval
La Roque-d'Antheron
Lamanon
Alleins
Eyguieres
Cazan
Mouries
Vernegues
Saint-Esteve-Janson
Janet
Arles
Aurons
Le Puy-Sainte-Reparade
Saliers
Gimeaux
Pont-de-Crau
Les Fedons
Lambesc
La Cidre
Les Durands
Le Bedes
Moules
Caphan
Raphele-les-Arles
Saint-Martin-de-Crau
Saint-Hippolyte
Salon-de-Provence
La Barben
Pelissanne
La Madeleine
Meyrargues
Jouques
Saint-Canadet
Albaron
Sainte-Cecile
Gageron
La Dynamite
Grans
Saint-Cannat
Couteron
Font Rousse
Venelles
Les Jasses d'Albaron
Le Paty de la Trinite
Miramas
Lancon-Provence
Pontes
Puyricard
Val-de-Silbourg
Eguilles
Dioulouffet
La Mignarde
Villeneuve
Mas-Thibert
Mas Thibert
Cornillon-Confoux
Coudoux
Les Figons
Celony
Les Platanes
Vauvenargues
La Pomme de Pin
Ventabren
St-Chamas
Le Fare-les-Oliviers
Les Bonfillons
Saint-Marc-Jaumegarde
Les Granettes
Pioch-Badet
Petit Mas d'Avignon
Le Sambuc
Velaux
Le Tholonet
Puyloubier
Aix-en-Provence
Palette
Saint-Antonin-sur-Bayon
Istres
Mauran
Les Barjaquets
Les Brets
Saint-Pons
Beaurecueil
Rassuen
La Suzanne
Saint-Esteve
La Merindole
Les Milles
Le Canet
La Cardeline
Pole d'Activites d'Aix-en-Provence
Luynes
Meyreuil
La Gavotte
Berre-l'Etang
Le Plan de Meyreuil
Varage
Massane
La Barque
Calas
Gardanne
Fuveau
Saint-Mitre-les-Remparts
Vitrolles
Trets
Saintes-Marles-de-la-Mer
Cabries
Bouc-Bel-Air
Fos-sur-Mer
Simiane-Collongue
Greasque
Les Michels
Les Pinchinades
Belcodene
Moulieres
La Diote
Marignane
Saint-Victoret
Le Repos
Kirbon
Salin-de-Giraud
Port-de-Bouc
Martigues
Le Pas des Lanciers
Les Pennes-Mirabeau
Les Freres
La Pomme
Le Pas-des-Lanciers
Saint-Savournin
Cadolive
Port-St-Louis-du-Rhone
Lavera
La Mede
Septemes-les-Vallons
Laure
Gignac-la-Nerthe
La Bouilladisse
Notre-Dame
Chateauneuf-les-Martigues
La Nerthe
Peypin
Saint-Zacharie
Sainr-Pierre
Le Rove
Verduron
Pont de Joux
Beaumeniere
Saint-Julien-les-Martigues
Ensues-la-Redonne
Le Douard
Borel
Le Logis Neuf
La Feve
La Bourdonniere
Roquevaire
La Vistre
Plan-de-Cuques
Lascours
La Couronne
Carro
Sausset-les-Pins
La Redonne
Niolon
Pont-de-l'Etoile
Fontvieille
Les Boyers
Napollon
MARSEILLE
Aubagne
Gemenos
La Penne-sur-Huveaune
Cuges-les-Pins
Carnoux-en-Provence
Roquefort
Les Fourniers
La Madrague
Les Goudes
Sormiou
Morigou
Cassis
Ceyreste
La Ciotat
BOUCHE-DU-RHÔNE
01 DISSERTATION
02 ENVIRONMENT
03
04 BOULBON
05 DESIGN BRIEF
Design Report
Russ Harding
Diploma Two


la Cordelière
les Bourdes
le Pigeonnier
la Maison Basse
Mas de la Maison Basse
St. pomp.
les Grassètes
Cavaleyran
le Pont des Vignes
Bne 153
le Moulon de Blé
D 183a
Mas Gilles
Grassette
la Clapière
l'Escourchade
le-Mas Vieux
D 81
Château des Quatre Tours
Mas des Cyprès
le Moulin Brûlé
St. pomp.
Chapelle St-Marcellin
Rvoir
Moulin Bonnet Ruines
les Grassettes et les Plaines
Vallat de la Font
Roque Canine
Mas du Plan
Campredon
la Condamine
St-Michel
St-Jean
Coop.
D 81E
les Busques
Grande Pyraube
le Beau Mas
Boulbon
la Raoussette
D Cim.
Mas d'Arthaud
le Mazet
D 81e
la Tombée de l'Eau
Mas des Étoiles
le Bous
le Bousquillon
D 35
St-Antoine
le Mas Boissière
Vallon des Esseylettes
le Pavillon
les Jaïsses
la Cabane
Mas Nouvelle
la Laune
Vallon de Vaulubière
le Cul de Vâche
Mas Despiard
Mas Jausserand
les Molières

Boulbon is a small commune in the Bouches-du-Rhône department in southern France and has a current population of approximately 1,555.

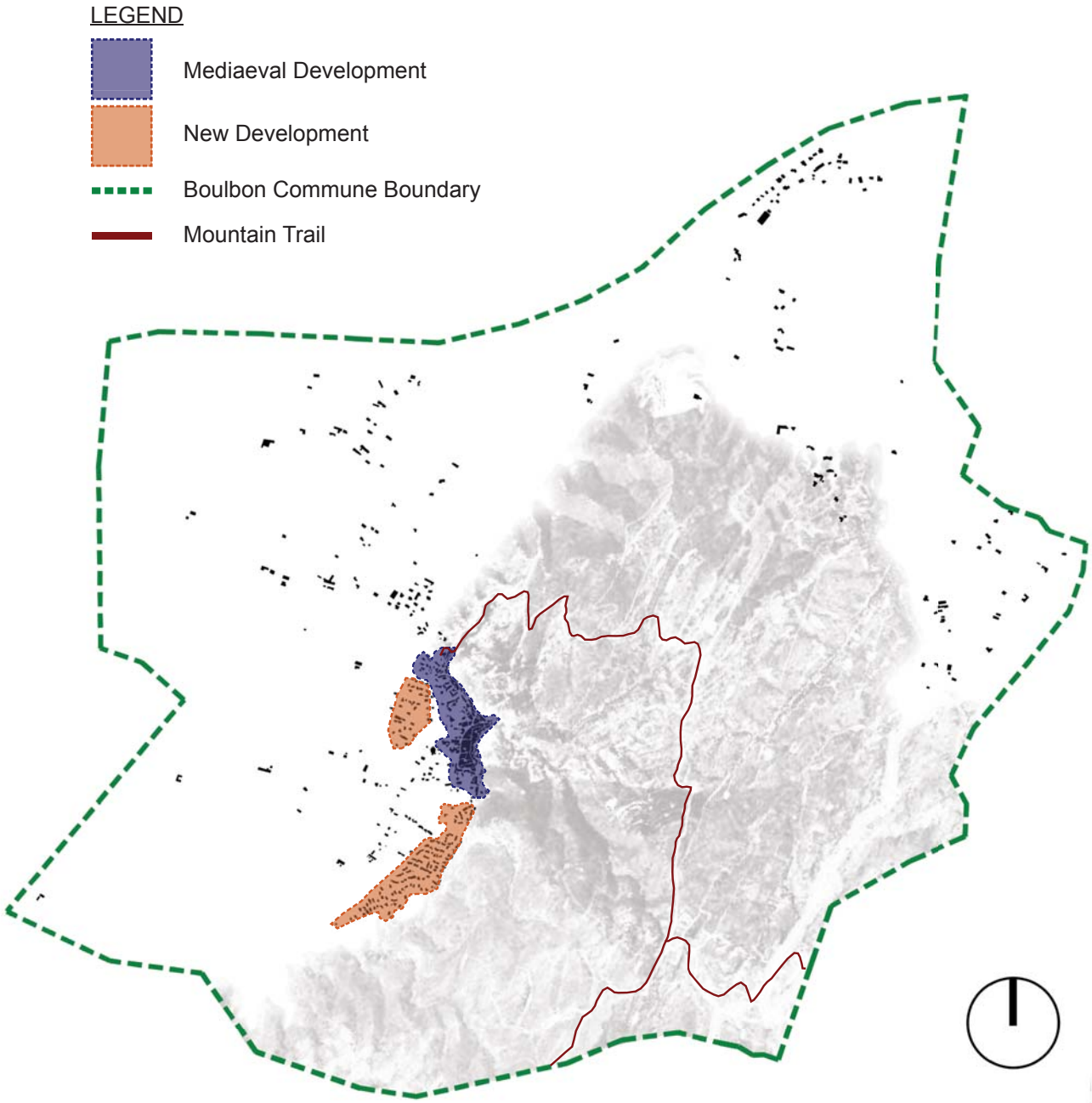
Located between Avignon (15km North) and Tarascon (8km South,) it is nestled in a fold of La Montagnette, the land around Boulbon is divided between the fertile plain used for farming and La Montagnette, a paradise for walkers, mushroom gatherers and hunters.

Boulbon is a mediaeval Provençal village. It has a fortified château which dominates the village and fortifications which protected it from attack. The town has two main access roads - one from the north that leads around the north side of La Montagnette and then over to the East to the Abbaye Saint-Michel de Frigolet and one from the south that leads past the Southern edge of La Montagnette towards Tarascon.

The town has two main sources of economy. The first and longest standing is agriculture, located close to the Rhône river the land to the West of Boulbon is very fertile. The second is tourism, with 3 annual events, a weekly market and walking, horse riding and mountain biking activities on the trails of La Montagnette the town appeals to a wide range of people.

However, due to the demands of tourism and also its location between Avignon and Tarascon the development of holiday homes, second homes and the ability to commute to the larger towns and cities is beginning to divide the town literally. The new development of these homes to the South of the original mediaeval development is isolated and has little interaction with the existing environment. During the winter months the development becomes a ghost town with a vastly reduced winter population.

Little is being tdone to improve the situation in Boulbon and there is evidence of new developments being constructed further West over existing agricultural land.

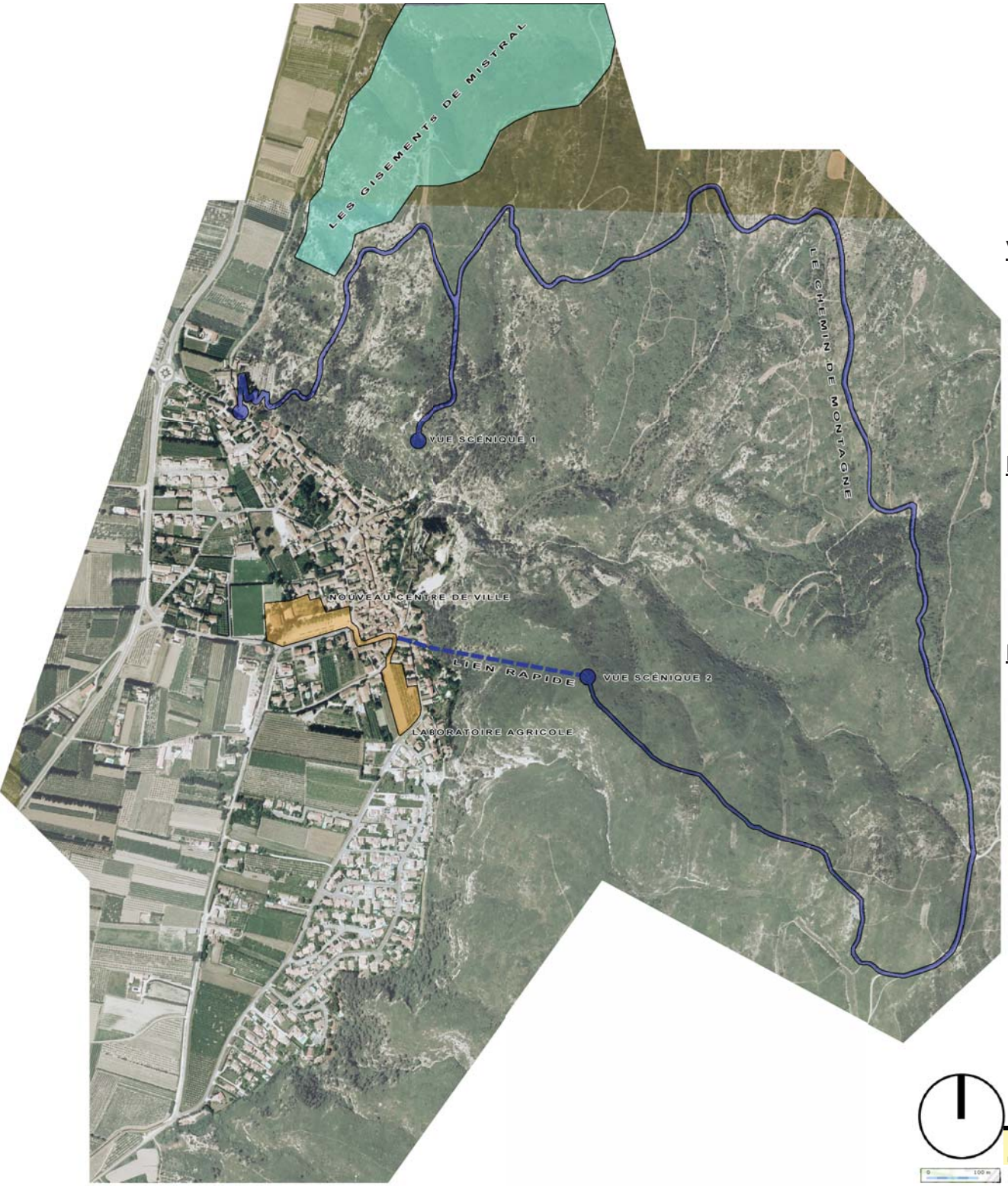


Boulbon is a small settlement on the West side of La Montagnette, it's location uses the mountains Northern face as a shelter from the strong katabatic winds that travel down from the Rhône valley known as La Mistral. La Mistral passes over Provence 100 days of the year on average and can last for up to 3 weeks at a time. This has a large effect on the development of Boulbon creating a limited urban footprint for comfortable living.

The mediaeval development of Boulbon is extremely high in density with narrow streets with juxtaposed structures creating winding routes through the town. The new development to the South consist of large plots of land with single and double storey villas and wide roads and open spaces highly contrasting with the traditional provencal developments. This development is sparsly populated during the winter months and deteriorates the provencal village aesthetic.

The land to the West of the development is extremely fertile in comparison to a large amount of the land in Bouches-du-Rhône because it is bordered on two sides by the Rhône river. However, the agriculture - like the residential- is effected by the strong Mistral winds and the growth of many of the crops and plantations are dictated by the Mistral's unpredictable cycle causing problems for the agricultural economy of the town.

To the East is the steep incline of La Montagnette that provides terraform border to the town. To the North of the town is a mountain trail that leads up and into La Montagnette creating a tourist draw to the area and provides a scenic view out across the border of Provence and onto the plains of Languedoc-Roussillon.



Vue Scénique

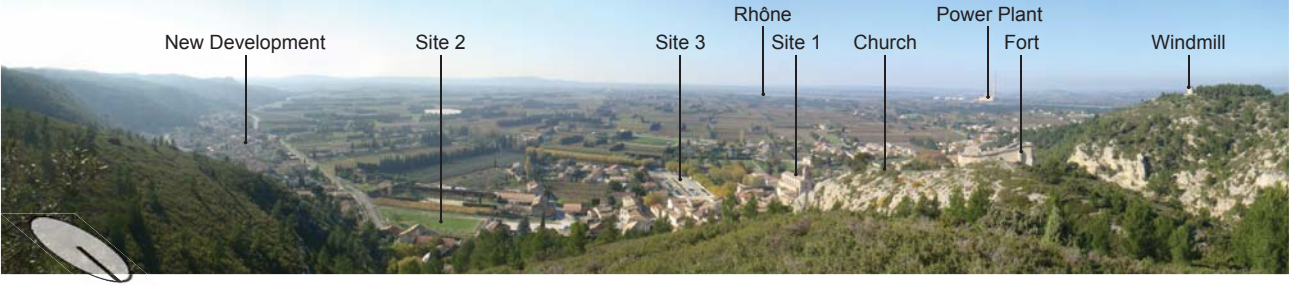
The mountain trail in La Montagnette is a large draw for tourism in Boulbon with several activities such as mountain biking, hiking and horse riding. I plan to boost this by providing destinations that have a particular scenic interest. The sites will house an installation or structure that touches the ground lightly and provides shelter to travellers.

Laboratoire Agricole

This will be a structure that houses agricultural scientist that can test the surrounding land and climate to experiment with new crops and the potential for growing crops more efficiently to increase the yield of the fertile land around Boulbon. It will also contribute to the weekly market held in the town square.

Nouveau Centre de Ville

This will be the site of the new town centre, will it's location central to the whole of Boulbon, new and old, it will increase the intergration between the two and boost the sense of community. It will also be the central node for annual events and gatherings such as the weekly market. It will also have a series of public building such as a new large library and town hall. This site is ideal due to its close proximity to the existing 11th Century church and the Recreation Centre/Sports Facilities.



Vue Scénique

This is the proposed site for the viewing shelter and the destination for hikers and tourists. It will provide a shelter from La Mistral and a view over Boulbon, the Rhône river and out beyond into Languedoc-Roussillon.

The shelter will contain:

- A viewing room of approximately 4m in diameter
- A fresh water source
- A unisex w/c
- An external viewing platform on the South side sheltering it from the strong gusts of La Mistral.

The shelter will have electricity and heating provided by the energy produced by wind turbines located on the North face of La Montagnette that will harness the energy of La Mistral.

The path leading to the shelter will have to be widened marginally to 1m wide and resurfaced with shallow steps with balustrading leading down the steep inclines allong the ridge line.

The fresh water will be sourced and pumped from the valleys beside the ridge and an reservoir will be stored on the North side of the shelter. In addition a grey water storage will be stored in the same area for the lavatory.

There will also be a quick access cable car leading directly from Boulbon up the South valley to the shelter for disabled and ambulant disabled persons providing access to the shelter for all persons.

Laboratoire Agricole

This is the location for the proposed Agricultural Laboratory.

The laboratory will consist of:

- Offices totalling a floor area of 27m²
- Meeting room with a floor area of 10m²
- A unisex w/c
- An indoor facility for close monitoring of crops
- An outdoor facility sheltered from La Mistral
- A series of exposed allotments for trial crops

The laboratory will experiment with the soil types in the surrounding areas and test various crop types in the local climate to discover ways of improving the crop yield. It will have close interaction with the local farmers that wish to involve themselves with the resources that will be available.

All documentation published by the laboratory will be stored in the Boulbon Library for public access.

Further development of the projects may envolve redeveloping unused or uncultivated plots of land local to Boulbon. Once established the crops cultivated by the Agricultural Laboratory will be available for purchase in the weekly markets that will be held in the town square.

The aims of the laboratory are to boost the agricultural economy and in addition the community of Boulbon and it's neighbouring towns and villages.

Boulbon will become a hub for the agricultural adaptation with climate change and will form a precedent for other such developments in France and other countries suffering from similar situations.

Nouveau Centre de Ville

Currently this site used used for car parking and the weekly market that is held every Monday. To the North is the mediaeval development and to the South is the new development of villas. It is an ideal location for the new town centre.

The site is linear spanning East to West lined with Plane Trees and central planters. To the East is a fountain, to the North is a bouls area and a walled in park with a small library to the East of that. To the South are a collection of buildings including a doctors surgery, an office and a villa and to the West is a Recreation Centre and sports facilities. The square has an approximate area of 9,400m²

The new town centre will contain:

- Town hall (approx. 325m²)
- Library (approx. 1,810m²)
- Tourism Office (approx. 165m²)
- Bouls area (approx. 320m²)
- Open square (approx. 600m²)
-

Approximate Total = 3,220m²

The town hall, library and tourism office will be broken down as thus:

Town Hall

- Offices (125m² in total)
- Lobby and Reception (40m² in total)
- Lavatory facilities (40m² in total)
- Atrium for exhibitions and displays (60m²)
- Storage facilities (20m²)
- Circulation space (40m²)

Tourism Office

- Lobby and Reception (40m²)
- Offices (50m²)
- Lavatory facilities (40m²)
- Storage facilities (10m²)
- Circulation space (25m²)

Library

- Offices (200m² in total)
- Lobby and Reception (50m² in total)
- Resource spaces (450m²)
- Silent reading spaces (150m²)
- Open reading spaces (80m²)
- Preserved documents room (200m²)
- Meeting rooms (100m²)
- Copying rooms (60m²)
- Lavatory facilities (120m²)
- Storage space (150m²)
- Circulation space (250m²)


0
50m

Foster + Partners
Carré d'Art
Nimes, France, 1984-1993

Client: Ville de Nimes
Consultants: Ove Arup and Partners /
OTH Mediterranee,
Thorne Wheatley Associates,
OTH Mechanical,
Claude R Engle,
Daniel Commins,
Jolyon Drury Consultancy

The Carré d'Art shows how a building project, backed by an enlightened political initiative, can not only encourage a dialogue between ancient and modern architectures but can also provide a powerful catalyst for reinvigorating the social and physical fabric of a city. The challenge was to relate the new to the old, but at the same time to create a building that represented its own age with integrity.

The urban context of Nîmes also acted as a powerful influence. The site faces the Maison Carre, a perfectly preserved Roman temple. The challenge was to relate new to the old, but at the same time to create a building that represented its own age with integrity.

The creation of this urban space was an integral part of the project. Railings, advertising boards and parking spaces were removed and the square in front of the building was extended as a pedestrianised realm. The geometry of this piazza follows Nmes Roman grid in recreating tree-lined streets alongside the building and providing a new setting for the Maison Carre. Lined with caf tables and thronged with people, the new square has reinvigorated the social and cultural life of Nîmes. Together with these urban interventions, the Carr d'Art shows how a building project, backed by an enlightened political initiative, can not only encourage a dialogue between ancient and modern architectures but can also provide a powerful catalyst for reinvigorating the social and physical fabric of a city.

LAN Architecture
The Children Toy Library
Bonneuil-sur-Marne, France 2005

Client: Ville de Bonneuil-sur-Marne

The Children Toy Library of Bonneuil-sur-Marne is a public building as well as a playing space for children: the project represents the opposition between monumentality and conviviality, a dialogue in the same construction.
It is located in an area where social housing from the 60's have a strong physical and social impact. We designed exterior and interior spaces respecting both strategies. The building façade, as a shell, is linked with its urban context, translated into its shape, monolithism and strictness. We wanted to create a strong urban symbol, disconnected from its environment and whose shell could protect its core and participate to the regeneration of Bonneuil-sur-Marne social structures.

Rehabilitate - Renovate
Architecture alteration: towards the shell
The Children Toy library of Bonneuil-sur-Marne was created in a crossed reflection on several axes:

- Changing destination and utilisation of an existing building
- Conception of a playing area for children
- Creation of a public equipment in an unstable area through a small scale project compared to the surrounding buildings
- Confrontation with a very restricted budget (originally planned for internal arrangements)

We decided to set up an unscaled and timeless design, a solid mass object, an urban symbol able
to separate itself from its environment, that is able, like a shell, to protect its contents.

The new facades juxtaposed to the existing building, create the alteration, adding a monumental entrance, a new open courtyard on the first floor, and supplementary surface for administrative spaces, saving the original concrete structure. The shell is a green-tinted raw concrete cast into coffering simulating wood slats.

The opposition between the hermetic and closed outside and the coloured internal spaces represents another interest of the project. Children play in a sort of cocoon, rich in light variations, rising up over the two levels, in a simple, functional and intimate scale volume.