ENGLISH

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"Space of knowledge"

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Analysis of the Historical Models of University Architectural Structures

The University is the house in which the lights prevailing over the shadows of ignorance must be lighted. But, who will enlighten the University?

From the days of its establishment as an institution, during the Middle Ages, Universities have played a significant role in the History of Mankind. Along their joint evolution with society itself, they have made a decisive contribution to improve its capacity for renovation and have become the very place for the generation, transmission and adequate use of knowledge.

As a product of their own history, universities have made use of diverse building types for their physical materialization, either in a rural or urban context.

As this is our very issue, we think it would be rather interesting to take a look at the actually existing buildings of the Spanish Universities in order to learn about their roots, their presence and progression. Because, in addition to the evident theoretical interest of this study, it is, in fact, the magnificent heritage of the Institution, that appeals and seduces the scholar.

In order to analyze both the architectural traditional assumptions and the innovations present in a certain university complex, always in relation to its own cultural heritage, it is not enough to make a detailed study of the individual case. One must also analyze nearby cases either in time or space. And also collect and take into account an exhaustive list of historical paradigms which could act as ideal types for imitation. With this procedure, we enrich our case study with the virtues of comparison and, thus, find many immediate responses to our inquiries.

The present study is intended to provide a panoramic view of the Spanish Universities, taking as research lines both the historical and typological characterization of the different cases, of which we will try to establish the following features:

A- City-University Relationship: *Integration vs. Segregation*
- Periphery and Zoning
- Urban Fabric and Superimposition
- Insularity
- Poly-Center Systems and Urban Diffusion

B- Inner Spatial Organization: *Introvert vs Extrovert character*
- Cardiac Space (agora)
- Compositive Patterns
- Linear Developments
- Organic Formalism
- Juxtaposition and Collage

C- Architectural Configuration: *Homogeneity vs. Heterogeneity*
- Cloister type Buildings
- Single Building-University
- Distortions
- Symbolic Elements

This critical scheme will be applied to a certain number of contemporary examples belonging to our country's university system. These have been selected using clearly subjective criteria, but with the intention of recalling some cases rather neglected by current publications which nevertheless, bear interesting lessons for us. The itinerary will reveal us the presence, in our university architectural structures, of identifiable elements, which have been taken from historical models.

The historical-typological panorama

The physical configuration adopted by Universities, that is, the spaces of knowledge, along the centuries has been basically linked to urban structures. They have become part of the urban genesis and transformation, and have incorporated architectural realities which belong to a certain urban conception and correspond to the particular educational ideal of each period.

As wrinkles on the face of an old man, the marks left by the Universities have rested on the territory and the urban fabric. This process was probably initiated in the Greek polis, the cradle of the University pre-history. This embryo "city of knowledge" incorporated within its urban structure some spaces whose future development would become fundamental, as the agora, the Academy, the Gymnasium, in which masters and pupils met and which became the built context for the transmission of knowledge through the use of language and dialogue. Classical Greece offers us the first example of a urban structure dedicated to the communication of an educational discourse and, thus, the first example of the links between Politics and Culture, between City and Knowledge.

If we now take a look at the Spanish case, we will have to perform a historical jump and talk about Muslim Universities, the madrasas, ancestors to the Christian institution which would come later. The puissant Muslim culture was responsible for the creation of the Schools of Translators, whose fundamental role was that of adapting and organizing that part of Muslim knowledge which would be received by Northern Europe. We should also take in account the significance of cathedrals as institutions and, above all, that of the monastery cloisters. Monasteries were the germ of the physical structures adopted by Universities, which were assumed and transported with slight variations up to the present. As they used to be segregated units, they were conceived as ideal cities, the bastions of civilization and collective culture. Their functional autonomy, was expressed by means of the inner arrangement of the buildings, for which we must take, as a paradigmatic case, the project for Saint Gall's Abbey, attributed to Einhard and dated around the year 830.

The etymology of the term University relate us to the gild institutions which emerged within the cities, as it refers to the spontaneous community of masters and pupils (universitas magistrorum discipulorumque) for the defense of their interests. Universities emerged as powerful institutions within the European context from the 12th century, although there were already some important centers established during the previous century as Bologna (1088), Oxford (1167) and Paris (1170). In Spain, Universities were usually royal foundations as it happened with the pioneering and prematurely effaced "Estudio General" in Palencia (1212), the germ of the historical Universities of Salamanca (1215), Valladolid (1260), Alcalá de Henares (1293) or Lérida (1297).

Universities were established as vital institutions when the exodus of knowledge from the cathedral and monastery cloisters towards the civil society ocurred. Knowledge began, therefore, to be transmitted within a cosmopolitan atmosphere rather distant from the self-sufficient and insular monastic communities. But the physical arrangement of these Universities, emerged within a urban environment, continued to be, nevertheless, the outcome of the cloister type heritage. The cloister as the proper space in which Absolute Truth can be delivered, the faithful image of the Theological philosophy of those times. Now, in the case of our country, the first specific document regarding the applicable design criteria for the place in which the activities of the Estudio General should take place, can be found in the second of Alfonso the Tenth's "Seven Partidas", around the mid years of the 13th century. The monarch demanded proper and functional buildings, rather distant from the city, in what is the first theoretical and conceptual characterization of the segregated type University which would become the germ of the North American campus, five centuries later.

The European City of Study, which was created along this particular historical period, could be ascribed to a single model, of which the first and paradigmatic cases could be the Universities of Paris, Bologna, Oxford and Salamanca. Probably the most significant architectural innovation of those days was the single building-University, ancestor of the present macro-structures. Until the 15th century, the different seats of one Institution were arranged in a poly-centric and scattered way within the urban fabric, and consisted of buildings which were not really suitable for educational purposes. So they began to build compact complexes, equipped with the necessary elements (classrooms, chapel, library, auditorium...), all arranged in a square or rectangular plan, around a central court, usually dominated by a tower. We must mention, as belonging to this type, the famous Sapienza and Bologna's Archiginnasio, a magnificent complex with an asymmetric plan, designed by the architect Antonio Terribilia in 1563.

Now, the architectural type which was most widely adopted in Spain was that of the University-College of which a notorious paradigm could be found in Bologna's Saint Clement College, erected around 1367. One of the most significant cases outside our country was the institution founded by Robert de Sorbonne, a Men's College in Paris. This complex was, at the beginning (1257), just a University-College, but began to grow and be transformed up to become, with the years, the great Sorbonne University. Within our Spanish soil, the most widely imitated model along the prolific 16th century was that of the San Antonio Portaceli College in Sigüenza. It was opened towards the end of the previous century and is the acknowledged ancestor of the San Ildefonso College, founded by Cardinal Cisneros in the nearby village of Alcalá de Henares. The extraordinary and abundant construction of magnificent examples, belonging to this particular type, along the whole Spanish territory, became the personal landmark of our Institutions, which had began their upbringing somewhat late in the European context.

The English Model

The English proposal, represented by the paradigmatic cases of Oxford and Cambridge, was the pioneer formalization of the integrated University model, in which University and City are merged by means of the expansion and superimposition of the different colleges along the urban fabric. These later came to be architectural elements of foremost importance in the European Universities, which were subsequently transported to the 18th century North America and thus became the ancestors of the emblematic campus type. Their plan is usually a square or rectangle (the quadrangle), and one can easily perceive the mark of their monastic heritage, as this court or cloister is the formal space in which the authorities can exert their control over the students' life. Moreover, the geometrical character of these structures made it easy to place them within the pre-determined lots of a urban fabric.

The French Model

The French University, which was born around the beginning of the 19th century, carried with it the Napoleonic conception of such an Institution. It was based on the principle of Reason as Reasons of State, and was established as an imperial, centralized, bureaucratic and subordinated Institution. The model selected for its spatial arrangement defined the Capital city, Paris, as the only center and pole of attraction; but locally, the different buildings adopted a poly-centric and nearby disposition, in such a way that the type of settlement adopted was somewhat scattered, within the interior of a huge metropolis. The different clusters of pavilions, the outcome of a process of fragmentation into departments and chairs, became a solidly built reality, the heritage of the utopia of enlightenment.

This process was somehow complicated by the continuous growth and expansion of the magnificent building of the Sorbonne. The old fabric, built in the days of Richelieu, was

completed by an addition designed by Nénot. When Napoleon created the Imperial University, this emblematic building was, to a certain extent, left aside, and this was the source of the transformation from a concentrated and unified structure towards dispersion within the Latin Quarter. The Academic Palace, located in a privileged central position, was built between 1885 and 1887. The intention of this fabric was the revindication of a Republican University, an emblem and banner against religious or ecclesiastic education. The renovated main entrance opened towards the city, as an image or metaphor of an Educational Institution opened towards the "res-publica".

The German Model

In 1810, the Free University of Berlin was founded under the guidance of Wilhelm von Humboldt. The academic endeavour of the institution was the search for Truth, through the joint research work of professors and disciples. As in the case of its British and French predecessors, it was an enterprise that could be ascribed to the social minority and elite of the liberal bourgeoisie. From the point of view of urban planning, this institution decided to adopt the model of the compact single building-University, the outcome of the Renaissance tradition. In this particular case, the rationalist Neo-Classical style and the monumental character were the selected features for a structure in which the influence of the Quattrocento could be perceived in the Romantic ornamentation. This Romantic character was also present in some similar macro-structures erected in Spain, as the building of the Central University of Madrid, which was occupied when the Alcalá de Henares seat was abandoned in 1836. Another larger example was the complex of the University of Barcelona, erected between 1859 and 1885 by the architect Elías Rogent. The site selected within the Catalan capital was located midways between the old and the new city, and so, this Institution can be considered one of the main infra-structures created during the Expansion Plan of the 19th century.

We can conclude with this German model by mentioning the case of Munchen where, leaving aside the architectural formalization, the University became a significant element in the urban plans to enlarge the periphery of the city.

The North-American Model

If we are to analyze the significant North-American campus model, we should begin by making an attempt to determine the scope of that term, so carelessly applied nowadays to any University structure. It seems it was first used, around 1774, in Princeton to designate a vast extension surrounding the "Nasau Hall", and was made up as a Latin expression referring to old Rome's Campus Martius. The aim of this new prototype was to achieve an Ideal City, to materialize the utopia of insularity. This new proposal began to take shape as an alternative "City of Knowledge", in search of self-sufficiency, in an appropriately distant location from the urban turmoil. Thus, it performed a clear return to the insularity inherent to the monastic cloisters of its Medieval origins. Using the formal and functional language of the British college, these structures were, nevertheless, transported into an spacious extension dominating Nature in order to make up an idyllic, segregated and self-sufficient city. The main difference with the European architectural models for the buildings themselves, remained in the fact that the Americans tried to avoid the introvert cloister type in favor of open and scattered structures within a green environment of a clear extrovert vocation. But the American campus was, above all, the urban image of the social, cultural and economic personality of the new nation. The motor of its bet was based on a revolutionary or ideal utopia which would defend the location of the University outside the cities and would lead to the, so called, "Academical Village".

From the point of view of a wider territory, the establishment of many campi throughout the country generated a real "archipelago" of "islets of knowledge", from the beginning of the 19th century up to our days. One of the most relevant projects was, of course, the University of Virginia, in Charlottesville, designed in 1817 by the third president of the U.S.A., Thomas Jefferson. The unity of the global design incorporated Neo-Classical and Palladian influences in the architectural language. The author based his ideas on the Greek (life together of masters and disciples) and Roman (style and arrangement) traditions. It has been suggested, in fact, that one of the drawn plans which most influenced the conception of Jefferson's campus was that of the Villa Trissino.

Along the two last centuries, this trans-oceanic model has experienced many variations in its style and arrangement. To be brief, we can mention in chronological order the repertoire of the diverse types employed, from the first colonial settlements inspired in the colleges; the 19th century complexes dominating a natural environment; the Park-University model of the first Land Grant projects; the Beaux Arts trend, with so emblematic examples as the Stanford campus, designed by Olmsted around 1886; later proposals which aimed at the recovery of the intimate British quadrangle; up to the recent plans, mainly determined by the priority of circulation schemes.

The Contemporary Spanish University

After this brief historical and typological outline of both the academic and architectural aspects of Universities, we find now that we have a series of unsolved questions.

- Is there any specific peculiarity in the recent architecture adopted by the Spanish University?
- Which marks of the historical spatial models are still in use?
- Is it possible to dissolve the practical link between formal and conceptual eclecticism, in order to take a first step towards a logical way of urban configuration for the University space, coherent with its cultural essence?

We should now look back and try to follow the trail of the imprint of the Spanish case throughout History to find out the present state of such heritage.

The urban establishment of one of the basic pieces in the World's history of the Universities, ocurred during the 15th century: the University of Salamanca (plan No. 1). As it happens with Alcalá de Henares, Valladolid and Santiago de Compostela, in this case we can notice the actuality of the integrated model, in which City and University merge in an identifiable unit.

The physical arrangement of this Alma Mater relates it to the type of University which is conceived as a structure superimposed to that of the city fabric, so that, the educational buildings become the main and significant landmarks within the city core. The relations between these two organisms is that of mere continuity, both in an architectural and cultural sense and for social purposes. Thus, the outcome is a continuous renovation and revitalization of the city thanks to the presence of the University. Within it, we may find many noticeable buildings and open spaces. Among the first, the University Colleges which are a living example of their own formal and functional essence, built around imposing courts and cloisters, which disclose the atmosphere of past days. Among the later, we must mention the Patio de Escuelas, which has a certain special symbolic flavour and an unanswerable historical weight. It makes up one of the city's most significant cardiac spaces or agorae, a small piazza or rectangular

court in which the urban fabric is enlarged in order to make visible the splendid Plateresque facade, which is the most divulged image of the institution. In this way, we have achieved an open space with a certain cloister character which favors the view of the emblematic building. It is rather interesting to compare this process with what has happened in Paris' Sorbonne. The church, erected by Richelieu, is opened both towards the inner court and the surrounding area. The facade, placed at the end of its nave, looks towards the city which, on its part, makes place for and dignifies it. This process included the demolition of a series of houses and produced the piazza or open space in front of the University temple and tangent to the Rue Sorbonne. By means of different procedures, in Paris and Salamanca, the City and the University have both contributed to the enrichment of the other.

In Salamanca, the University quarter includes a series of complex and irregular streets, the outcome of the old urban fabric of the historical center. We can mention three elements: the Libreros street, the Plaza de Anaya and the Rúa Mayor in which, everyday, we can witness the extrovert character of such a way of coexistence between the educational and the regular population. The Via Zamboli and the Pizza de Porta Ravegnana, in Bologna, play more or less the same role within the city. On the other hand, we have Oxford's High and Broad Streets which channel the University flux. And, in Cambridge, the axis joining St. John's Street, Trinity Street and King's Parade and going southward to meet Trumpington St., and the oblique one formed by Magdalene and Bridge streets.

Going back to our comparison with the Italian historical example, we must say that Bologna, as Salamanca, has also an expansion area which is conceived as a peripheral complement. Bologna's School of Chemistry and Engineering, to the Southeast of the urban core, could easily be compared to the juxtaposed Miguel de Unamuno complex, leaving aside the chronological and dimensional differences. In this sense, the Via Antonio Aldini plays a similar role to that of the Paseo de San Vicente, connecting the new seat with the old center.

The University of Gerona (Plan No. 2), which became an independent institution in 1991, has two representative seats: Barri Vell and Montilivi. So we find here, again, the combination of an integrated solution within the city fabric together with a peripheral and segregated element. The most significant characteristic of the first seat is the influence of its urban and also natural context. The rough topography of the site, together with the irregular medieval urban fabric surrounding it, justify our classification of this space as a real Acropolis which, approached by means of the ascendent Pujada de Sant Domènec, offers an impressive scenographic view with no rival in the Spanish University.

The spatial arrangement is actually weighing on three pivotal elements, the "Les Aligues" building, the Convent of Sant Domènec and the Seminar, in which we can perceive the marks of the cloister type. Homogeneity is the basic characteristic of its architectural materialization. The mentioned disposition around significant inner courts makes of these spaces the proper place for meeting and protocol, that is, makes of then real inner agorae. In relation to its extrovert side, we must also mention the Sant Domènec Pizza as one of the best designed examples of a University agora located between the city and the institution. The solemn image of the precinct, while ascending the mentioned Pujada, reinforces its exterior projection and gives it a certain formal personality.

Now, during the 19th century, the European University suffered a crisis and, in this preoccupying state, it gained the 20th century. This was also manifest in the Spanish University. The Medieval and Renaissance splendor was followed by a period of decay during the 17th and 18th centuries. The many attempts to renovate it, as those by Charles the Third and Charles the Fourth, or the innovations included in the 1812 Constitution failed, probably because Spain had not a puissant bourgeoisie interested in such a process, as other countries within the Continent did. With a poor and weak University, Spain decided to forget any attempt to restructure it and embraced a superstitious centralism. This policy was sanctioned by the Moyano Law of 1857, which established the Central character of the University of Madrid, while mentioning nine District Universities scattered around so many provinces. The hope for renewal came with the Free Educational Institution, created by Giner de los Ríos in 1876 and lately supported by Manuel Bartolomé Cossío and the intellectual generation of 1898. The creation of the Students' Residence was a new stimulus. In 1915, it was relocated in its present site, which was labeled by Juan Ramón Jiménez as the "Poplars' Hill".

The beginning of the 20th century was a period marked by the rigid administration of the Institution which frustrated any aspiration to autonomy. Regarding the urban establishment of the Universities, the present century brought with it the creation of the, so called, University City, somehow the outcome of the poly-centric and scattered pavilions of the 19th century Paris University, but now with a characteristic urban structure, a peripheral location and the new inspiration of the North American campi. This was the origin of the University Cities of Madrid (1927), Rome (by architect Marcello Piacentini), Montreal (project designed in 1924), Athens (by Em. Kriesis) and, in some indirect way, that of Oslo, by the architects Finn Bryn and Johan Ellefsen who won the second contest organized in 1926.

This was the context in which the new peripheral seat of the University of Santiago de Compostela was erected (plan No. 3).

The project, designed by the architect Jenaro de la Fuente in 1930, tried to materialize the idea of a rational approach to Nature, with an alternative Garden Town opposed to the historical and juxtaposed old center. The following years would transform its segregated character by means of a progressive integration within the urban fabric, embracing it in its growth.

The result is a somewhat Baroque proposal, which includes a linear initial cell with significant perspective views and carefully designed gardens, rather similar in style to the contemporary University City of Rome. The central role of the agora is something that is also present in both cases. In Santiago's South Campus this space is limited by the "San Clemente", "Fonseca" and "Rodríguez Cadarso" Halls of Residence. As it has three sides occupied by buildings, the fourth one is reserved as the symbolic link with the city by means of the ascending steps of the Alameda. This element seems to be an allusion to the historical way in which a lateral aperture implied the intention of integration within a surrounding context. An interesting exemplar of this openness tendency can be found in the Puritan Harvard College as opposed to the Anglican William & Mary, both built at the beginning of the 18th century in North America.

The basic idea behind the design can also be compared to other examples of the fruitful American 19th century, as the Plan for the National University of Washington D.C., designed by Latrobe in 1816, which bears a clear resemblance to our Santiago case. Another significant campus which could be mentioned as a reference is the expansion plan for the University of Virginia (original by Jefferson), after a 1898 project by McKim, Mead & White. Here, the group of three buildings surrounding a central open space to the South happens to be rather similar to our case. The project belongs to a period in which the monumental Beaux Arts design system was at its highest point. Within the Spanish soil, we must also mention, as a model, the University City of Madrid, which diverges for Santiago's South Campus and from the Roman example in the absence of that cardiac space occupied by the agora.

The overall plan has a somewhat anthropomorphic configuration in both a conceptual and a formal sense: the Western head merges with the city by means of the Herradura ball and socket joint; the first nucleus of the Residence is the thorax generating around itself the posterior extensions to the campus; to the South and the North, it extends its extremities towards the limiting roads; finally the precinct's feet reach the river Sarela with a clearly organic formalism.

Three years after the project for Santiago's South Campus was initiated, the project for the University City of the San Francisco Piazza in Saragossa (Plan No. 4) began to be conceived. There are some morphologic analogies between these two projects which we should analyze.

In this case the main feature is the introvert character of the proposal, from both an architectural and a social point of view. Inside it, the elements demanding an external projection and which bear a symbolic character, as pertaining to a University, could be related to three different aspects.

The first one is born out of the isolated character of the complex which is, nevertheless, erected within a city and, therefore, could be seen as an integrated element superimposed over a dense metropolitan fabric; the second is the presence of an agora, which is part of the nucleus of the original central core of the project and which is rather similar to Santiago's one and could also be related to the 1813 Union College of Schenectady, by Joseph-Jacques Ramée, one of the first "cohesive" campi; the third is the outcome of the heterogeneous architectural language employed in the diverse structures, which have their own marks of identity. Within the precinct, we find clusters of organized elements, which make up micro urban structures with their own sense of unity. Thus, it is the autonomous character of each object which is the basic aim of the complex.

Going back to our chronicle, the civil war delayed, until the decade of the sixties, the real re-structuration of the Spanish University. But now, as it happened in the rest of Europe, it was the mass University type that was in vogue as a different model from the precedent English, French, German or North American ones. This new format brought with it an inner contradiction, the opposition between the democratic utopia of equal opportunities and the doubtful educational efficiency of a plural, multi-social and massive University. After the World's conflict, the University renewal carried out during the 60's and 70's offered us two new urban proposals which would be subsequently developed: the English one, based on the results of the Robbins Report of 1963, and the German one, their main difference being the existence of an integral residential programme in the first and the absence of such a thing in the latter. If we should mention some paradigmatic cases, we could not forget the case of the University of Berlin, designed by Josic, Woods and Schiedhelm in 1963, whose two-way grid inaugurated a certain influential tendency in the contemporary European panorama. We should also mention the University of Surrey, in which an orthogonal grid connects the different academic elements while other more symbolic pieces as the Library, the Amphitheater and the Cathedral are left outside it. One of the most expressive examples of a linear development can be found in Vittorio Gregotti's University of Calabria (1973), which is also an interesting exercise of urban planning as applied to a University layout.

In the University of Barcelona (Plan No.5), the clear insufficiency the 19th century Plaza de la Universidad, by Elías Rogent, made it necessary the creation of a new "University City". With this purpose, the new peripheral Pedralbes complex was inaugurated in 1957. The selection of this 28 Ha's site, which

belonged to the Güell family, was the result of a certain political pressure and the election of never clarified criteria, which surly included some speculation: there was an alternative location, near Montjuic, which would have made of the University a much more integrated element.

The complex has a clear extrovert character in its planning, although the presence of the Diagonal Avenue, which divides it in two and determines the position of the buildings' main facades, should lend it a certain introvert connotation. The basic arrangement of the buildings' layout is based on a double linear development against a much more veiled orthogonal grid, within the context of an adjacent city.

A simple view reveals the lack of equilibrium and homogeneity of the complex, mainly due to the powerful attraction of a urban element as the Diagonal Av. The first buildings to be erected there based their design on a certain hierarchic symmetry aiming at representation. But the development of the complex came to dissolve to a certain extent the significance attributed to the mentioned axis and the new structures began to show less regular and symmetric elevations. This emancipation resulted in a clear loss of emphasis on the previously mandatory imposing facades and thus revealed the widespread rejection to the dictates of a great axial composition. So, if we try to analyze the complex by taking the avenue as its generator, what we will find would be a series of distortions and the progressive individualistic and singular character assumed by each architectural piece.

The gaps between the buildings do not compose any cardiac space or agora. This is probably the result of the long censured lack of an overall plan for the whole precinct. There are, nevertheless, some smaller plans related to the presence of singular buildings and their contextual layout. In 1982, the architects Torres, Lapeña and Llinás, elaborated a global plan which was never put into practice and which included, precisely, the creation of a great piazza or meeting point within the South sector.

The development process of the University of Seville (Plan No.6) was rather similar to Barcelona's case. Since 1954, the Institution occupied the magnificent Neo-Classical building of the Tobacco Factory, designed by the Dutch architect Sebastian Van der Borcht, in 1766. But the necessity of an expansion obliged the University to look for other alternative seats. The School of Architecture, for example, was the first one to be relocated in the new precinct of the Reina Mercedes Avenue, in 1967. This new complex implied an innovative model of urban settlement for the University, as it finally was consolidated as a multi-cellular structure, with the addition of two new educational poles in Ramón y Cajal and Macarena.

The life pattern is mostly of a extrovert character, which is the usual thing when a University is integrated within a urban fabric, unless its bearing an introvert connotation should be the result of a real state of isolation within a urban context.

The precinct, which is merged with the urban layout, is a clear example of an interesting category of contemporary proposals. These try to oppose the traditional paradigmatic model of the autonomous campus, of anglo-saxon origin and fully developed in the U.S.A. Our case could be compared with some of the abundant University Cities erected in Germany during the 70's whose main characteristic was the lack of residential facilities. Another good example which could be even closer is that of the Illinois Institute of Technology in Chicago, designed by Mies van der Rohe in 1940. This later is also integrated within the metropolitan fabric and displays its perfect volumes against an orthogonal grid. In relation to the architectural language employed, though, we must say that the homogeneity and constant proportion used in Chicago are something missing in the Spanish case.

The cardiac space or central agora is defined by a group of Faculties in a central position. It is a space of significant size, with three sides clearly delimited by buildings and a fourth side opened towards the tangent Reina Mercedes Avenue. The extrovert character of this aperture to its environment is new example of the usual role of this type of configuration either in an integrated or an isolated position regarding the city.

In Seville, moreover, we find an interesting example of another element which can be present in University precincts, the landmark, the symbolic construction: we are talking about the tower of the Cordoba Pavilion for the 1929 Latin American International Exhibition (an event which took place precisely in this urban location). It is still a recognizable emblem, which can be seen from outside, although its significance has nothing to do with the educational enterprise.

In Spain, after the attempt of the Minister Villar Palasí to obtain autonomy for the University in the 70's, and the subsequent 1983 Reform Law, we can perceive the incorporation of certain rather particular characteristics in the physical layout of our Universities, which are the result of this progressive decentralization. On one hand, we have a powerful growth implying both the establishment of new institutions and the significant expansion of the existing ones. Thus, University seats have come to be real architectural collages placed, in most cases, within new peripheral areas. On the other, we can see the widespread use of macro-structures, compact and immense buildings which are the new and enlarged version of the primitive single-building Universities, the compact Renaissance complexes and even the older Medieval monasteries. A third case is that of the recovery and refurbishment of historical centers for educational purposes, in what can be considered a return to the old Spanish University tradition, which was based on a direct relation with the city, while the incorporation of foreign models had somehow disfigured this particular feature. The adoption of such models was a clearly eclectic process, in most cases without a real functional justification. And finally, we must mention the extensive use of obsolete military facilities, happily recovered and restored for their new educational role.

One of the best examples of this later case is the new peripheral complex belonging to the University of Alcalá de Henares (Plan No. 7). The selected site was originally occupied by an airport, adjacent to the city and located to its North. The first idea was just make use of an old military building, lost in the immensity of 250 Ha's of land, to become part of the new University, which came to relieve the overpopulated Complutense University of the nearby capital city.

The layout system incorporates a geometrical scheme of two alternate grids (one orthogonal and the other oblique), which define a series of large plots with an interesting element of connection. This later is embodied by a central bank which is the linear hinge of the complex. There are also two main cross axis which divide the whole precinct into four large sectors. The East-West axis goes along the bank itself which defines the two geological terraces of the site; the North-South axis connects the Railroad Station with the junction with the Meco Road. Each large plot will incorporate, in a near future, a single building. Each one of these, taking a central position within its respective plot, has a certain similarity with the mentioned single-building University type, using in this case heterogeneous architectural languages.

As it happened in the Pedralbes complex, there is no main cardiac space or agora provided, so that the smaller open spaces act as secondary elements usually linked to an specific building. In any case, the future Botanic Garden could easily assume the role of becoming a pole of attraction to both the internal population and the visitors.

Some of the buildings, as the new Polytechnic, display a renovated version of the old paradigmatic space of the cloister, although with a new conceptual and physical configuration. The historical center of Alcalá de Henares does precisely include some of the most significant examples of this type, which have survive from the Renaissance era, among which we must mention the San Ildefonso College with its emblematic three courts.

The University of Las Palmas (Plan No.8) obtained its legal independence in 1989, but before that, in 1977, it had already planned the erection of the Tafira campus, contemporary to the above mentioned case but completely divergent form it.

We are now dealing with a completely segregated cell, rather distant from the urban center, whose main feature is the coexistence with Nature, which means that it is the geography of the site which has become the determining element in the planning strategy. The physical support is a large sloped extension, descending Westward towards the imposing Gully of Guiniguada, that makes of it a really panoramic site.

Inside it, the project respects the protected

areas which include preserved vegetation of an enormous environmental value. We must mention here, among other species, the Palm tree as an element that has to be protected. There is, in fact, a Natural Park for such purpose located by the School of Architecture. The links between this case and the North American campi are abundant. Its commitment with its own natural environment reminds us of the University of Santa Cruz (California), designed in 1963 by Carl Warnecke and Thomas Church. The precinct includes a series of smaller clusters scattered over a public, virgin green area in which the different buildings try to generate a certain sense of integration, in what has been called an "ecological metaphor". In the conception of this campus, we can find an attempt to recover the paradigm of the collegiate model, by means of clusters of buildings of a moderate size, which try to revive the welcoming character of the cluster college, that is, of the combined structures of colleges and cloisters.

The project has a clear extrovert character within a certain atmosphere of isolation due to the scarcely consolidated nature of the site. It bears a clear allusion to the North American campus, in which buildings open themselves to the surrounding landscape with their formally organic dispersion. The precinct, in fact, combines a symbolic preservation of landscape with its occupation by the erected buildings, and has become one of the most committed University projects in the Spanish contemporary architectural panorama.

The architectural heterogeneity employed is materialized by a varied repertory which shows diverse cluster and individualized types. We must mention here the interesting formal integration achieved by the Classroom Units and other unfinished elements designed by Juan Navarro Baldeweg. These are located over the curved axis and are the Western limit to a subtle radial layout, while reinforcing the configuration of the road as a generator of spaces.

The result is a real collage, rich in styles and interconnections. In opposition to any functionalist proposal which would have defended a more controlled solution, Tafira has embraced a type of composition in which the individual personality of each architectural element is fully preserved. It also incorporates a series of small open or cardiac spaces, as urban self-sufficient micro-structures which can be connected, but which preserve their autonomous configuration.

There is probably no other Spanish contemporary project for a University so opposed to the Canarian case as the new Arrosadía seat for the Public University of Navarra (plan No.9), designed in 1989.

Is consists of a peripheral and segregated complex, adjacent to the existing urban fabric, and is a clear example of what is an intentional architectural homogeneity. This is precisely the main characteristic implied by the very planning which determines a rigid geometrical grid.

The general arrangement displays two basic elements which envelop a significant cardiac space or central agora: the Dean's Seat and the Great Library, around which, in a lateral position, we find the rest of the dependencies, divided according to the departmental structure of the Institution. The embryo character of the complex is a characteristic that can also be traced in the Classicist structural types of the 19th century North American campus of which one of the first references was Jefferson's design for the University of Virginia. The idea is to provide an orientated grid in which two linear groups of buildings envelope a central open area or Lawn, crowned by the circular shaped Library. In Sáenz de Oiza's proposal for Pamplona, this polarity is duplicated so that the linear and pedestrian agora gets even more defined, acting as the thorax of the planned body.

The spatial arrangement adopts a paradigmatic dispersed disposition due to the shallow quality of the architectural pieces involved. We must mention here, for the sake of contrast, the model of the "University-Cathedral of Knowledge", developed by Charles Z. Klauder in 1925 for the University of Pittsburgh (Pennsylvania). It consisted of an educational skyscraper, whose justification was based on the restricted space available and the necessity to provide a pregnant and representative image. The change in denomination, from skyscraper to cathedral, was due to the intention of fostering the spiritual qualities of the Institution over the technological or material, an objective that was also achieved by means of the adoption of the Gothic style. After this analysis we must conclude that there are no distortions incorporated in this particular case of University layout. Our Pamplona example shares this particularity with the University of Jussieu, in Paris: the global unity of the scheme coincides here with an architectural uniformity.

The library appears as an exception to this global treatment. Its volume and position reveal the intention to provide it with a chief role. With a sincere energy, it vindicates the significant position occupied by these storehouses for books, for Theoretical knowledge, throughout the History of Universities.

Taking a look at the recent University projects developed in Spain, we must conclude that there is a widespread adoption of the macro-structure architectural type, the late offspring of the traditional single-building Universities. A rather noticeable example of this tendency is the Nou Campus of the University of Valencia-Estudi General (Plan No. 10), whose planning project was designed by the architect Carlos Salvadores Navarro. The basic idea behind the project is the development of a linear structure, parallel to the important Naranjos Avenue, a urban axis which has been the germ of its tangent layout.

Unlike the previously analyzed case of Tafira, this project incorporates its own complexity in the inner arrangement of the containers and not in the general planning. There is, thus a change in the formal personality of both stages of design. The first planning process has become a passive assumption of an inert orthogonal grid of large macro-plots. These act as completely regular containers which are conceived to incorporate heterogeneous architectural pieces. We can think of an allusion to the essence of the very term "University". A superimposition of differentiated bodies over a common base can be described as the "unification of diversity".

The highly symbolic appearance of these buildings is an attempt to assure another role pertaining to such an Institution: they must become the showcase and laboratory of the contemporary Architecture. That is why a series of diverse architects have been summoned, in order to show a variety of contemporary approaches to University projects. The Classroom Units are two strongly linear compositions embracing a significant cardiac space or agora. This strong and neat symmetry is somehow dissolved by the complex arrangement of the lateral pieces. Although Grassi's and Estellés' Library is a rather controlled element, the East Classroom Unit, by Manuel Portaceli, reveals some formal eccentricities, well mastered by the adoption of the traditional cloister-college type. Siza Vieira's Government Building incorporates a rotation towards the South, in its Northwestern extreme, probably with the intention of establishing a connection with the adjacent urban fabric and the already erected Services Building. The Western Classroom Unit is the culmination of this process of dissolution of the initial orthogonal grid. It displays a complex plan, with an expressive combination of articulated volumes, with a clearly sculptural meaning. Finally, the Departments make up the precinct's facade over the tangent Avenue.

This type of architectural structures are usually based on the concentration of functions and specialized spaces, and finally tend to give place to enormous complexes. They tend to be significant and weighty projects within their context, both in relation to the University itself and to its surrounding society. This particular quality is even reinforced by the peripheral and, so far, segregated character shared by this new campus and the adjacent annex to the Polytechnic University of Valencia, which is also located along the Naranjos Avenue.

After this obviously restricted and partial review of the architectural offer revealed by the Spanish University projects, we must say that, nowadays, the Institution seems to be flourishing within the context of an "advanced or decisional Tertiary sector", as it happens to be much more linked to the elitist economic realm of decision than to an ideal "City of Knowledge". In any case, the process which is still leading our society to a mass high education, does not want to keep it away from the scientific and technological advancement of our times. Thus, one of the most innovative proposals, in this context of the University physical layout, is precisely based on the rejection of the term physical by the replacement of the material and architectural bodies with modern telecommunications' channels. This would be the beginning of a hypothetical fourth "City of Knowledge" based on the, so called, Data Highways, which could be denominated with the an expression that was recently made up by the Boston M.I.T. Publication: the virtual campus.

In Spain, the Universitat Oberta de Catalunya created, in 1994, a communications system based on an "Intranet" program connected to "Internet", in such a way that the first net is only available to authorized users within the University. We can mention other similar experiments as the North American Athena University, the English Open University or the Dutch University which is the seat of the European Association of Remote Universities.

A look into the Future

The main challenge of the University is still the establishment of a proper relationship with a changing society in which a continuous structural development induces repeated crisis of ideology, institutions and values.

Its own history has revealed, both in the its academic and formal means expressions, a continuous and exciting confrontation between dream and reality, convergence and deviation, illusion and disenchantment. The potential power of the transcendental role played by this Institution, has allowed it to undertake a never ending and continuous process of renovation after each decay period, in which it has always find a way to recover its ideals and also its material structures. After examining the changing trail of the "marks of Knowledge" left by the Spanish University on the cities and territories which it has occupied along history, we must still take a look at a series of questions which should be answered by the present essay by means of flexible and coherent proposals.

First.- No unique model can be traced after analyzing the present physical layout of the Spanish Universities. The diverse types adopted cannot be comprised within a closed definition: we just find flexible or open archetypes which incorporate some local particularities, that are not always justifiable from the point of view of an optimum approach.

As a built reality which is nevertheless inspired by the transmuting energy of utopia, our University should try to incorporate planning and architectural criteria in the arrangement of its physical space, avoiding political or economic impositions.

Second.- It is not easy to find large-scale complexes sustained by a globally designed layout, which would take in account the total area affected and would provide the means for its development.

The University should carry out its transcendental mission of providing an integral education for the human being. That is why it

should make an emphasis on the proper arrangement of the spaces in which this process must take place. The organization of the University seats has to excel a mere provision of available areas. The clear intention of the complexes must be a mandatory requisite and it would be advisable that open spaces would be as essentially taken in account as the building structures.

Third.- The Spanish Institution has progressed along history from the assumption of its medieval architectural types to an increasing eclecticism, due to the incorporation of foreign models, frequently those developed in North America. But, in recent projects, we find a renewed interest in the recovery of past models which results in the adoption and adaptation of historical spatial paradigms.

The conception of an educational space must bear an special commitment to its own social, natural and urban environment, trying to avoid the incorporation of foreign proposals and styles whose origin, whose essence or formal arrangement would be completely strange to our local culture. The optimization of the built space must be deeply rooted in an vocational symbiosis between University and City.

Fourth.- Our University has never renounced to its own continuity. Regardless the particular evaluation of its planning and architectural results, we must admit that we always find a determined will of commitment with its own evolution, which has permitted its survival after innumerable occurrences and obstacles along the past centuries.

As a living organism, both in essence and in its material configuration, the basic need of our University is the adoption of built structures with an interior and exterior flexibility, which would allow evolution and progress in an uncomplicated way. That is way any design of its material layout must bear in mind this basic premise: we are not conceiving a urban or architectural object but a whole process.

Fifth.- Our University has not yet employed all its human and architectural potentialities in order to offer a response to a society which is demanding projects coherent with its significance and essence.

Although making use of the transmuting power acquired by the Utopian impulse behind its progress, the architectural projects for Universities should, nevertheless, avoid the unattainable quality of any Utopia.

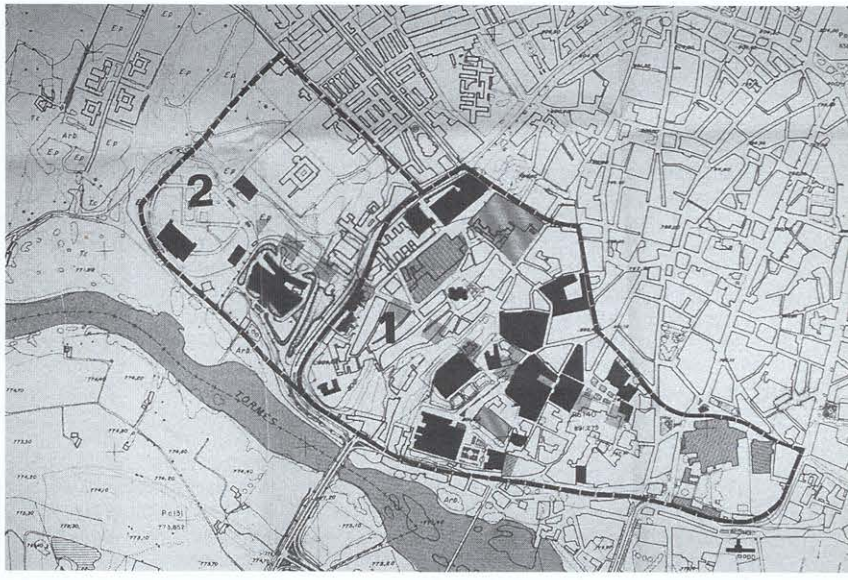
Finally, the main aspiration of the responsible professionals in charge of the design of these Spaces of Knowledge, should be to offer the best possible response of qualified architecture appropriate to the transcendental mission attributed to the Institution.

With this brief essay, we have tried to make a contribution aiming at the improvement of the analysis of the physical marks of the Spanish University, from a rather varied approach. Moreover, the recent proliferation of architectural projects for new University seats and for the renovation of the old structures, should make us insist on the necessity to provide intelligent and courageous planning schemes with the adequate architectural inspiration.■

The task of shedding some light over the future of our University will be long and complex. We hope these lines would have lighted a probably tenuous but firm candle...

Design criteria for a new university on the threshold of the 21st century. The Saint Amaro Campus in Burgos

Luis Moya



In a cultivated and developed society, the university, the means to organize knowledge in order to improve transmission and research, can be located in any place within the city. That was the case in the old Greek cities where the learning space was the street, the stoa, the gymnasium, the garden. When knowledge began to be the privileged heritage of a few, in the Middle Ages, it was caged within the cloisters of monasteries. And when this knowledge was again extended, specially from the 19th century, it was the American campus model that was adopted, a model that includes a certain amount of social isolation as it usually chooses the outskirts of the cities for its location1 (Fig. 1).

A careful look at several modern and newly created universities will reveal that there is no definite and extensively used model but many different cases in which the main factor is the particular configuration of the estate selected for its erection. So models have become extremely determined by the characteristics of the site.

In any case, it seems as though new universities tried to make their presence apparent within cities that are already saturated by singular buildings. The usual procedure is to reproduce the campus model outside the city but really near to it as in Salamanca (Fig. 2); or create a big building which is the sum of the many buildings in a campus, and which becomes an imposing elements by its magnitude as in Cosenza (Fig.3) or Palermo, both by Gregotti; or finally chose to refurbish the historical city core or part of it to accommodate the university buildings as in the paradigmatic case of Alcalá de Henares (Fig. 4).

Universities are not anymore prominent institutions in the social hierarchy and that is the reason why, in many cases, they loose their battles for the recognition of their own territory, as in Madrid's case. But sometimes things come out right as in the mentioned cases and these encourage new attempts. The only way is to count on the adequate assistance of public institutions as Town Halls and Autonomous Communities or private ones as Foundations or Banks. This type of collaboration has as a result the spatial integration of activities and buildings. The key is therefore integration within the city activity but without loosing for good the old elements of self identity and isolation which facilitate meeting of people and ideas.

Moreover, a University seat should incorporate innovations and become an avant-garde champion in all its activities. In new knowledge and research techniques of course, that could be of any help to the institutions with which it collaborates, but also in the way it is built and created. It should incorporate low-energy construction techniques, for example, and in any case, new architecture, exemplary architecture for the rest of society. We should not forget that Universities try to transmit the notions of order and aesthetics to their alumni.

These are the ideas behind the project for a new university in Burgos. Now, we will revise some of its main characteristics2.

The University of Burgos

We all know Burgos as a remarkable city, not only because of its magnificent cathedral but also because of its linear structure along Saint Jacques Pilgrim's Road which links a series of foremost religious and civil monuments. It also counts on a rather interesting historical center with nice squares, walks and original and noticeable streets. But there is another interesting feature of this city which is not so widely acknowledged. The real axis of the city is the river, a river of crystalline waters and magnificent old woods, with bridges of every age and, besides, a river which is faced by the main facades of the most representative buildings in the city and which accompanies the city's main walks. This characteristic, which is not frequent in Spain where the city rivers have just been convenient sewers and never conceived as real ornaments, is the result of years of conscientious care and attention to their River Arlanzón.

Burgos had a University which was just a delegation from Valladolid's and was scattered among a series of historic buildings within the city. But now, it has become an autonomous institution and tries to acquire an structural

role, integrating itself within the city and taking advantage of the new Masterplan (which is being elaborated by a team coordinated by a University teacher of Urban Planning).

The real change occurred when the university chose the King's Hospital for seat, a building founded by Alfonso the Seventh to the end of the 12th century in order to assist the pilgrims of Saint Jacques Road. This building was refurbished to accommodate the Dean's seat and the Law Faculty. Around it, other new buildings have been erected which form the initial embryo of the S. Amaro campus. Now, the idea is to enlarge it and create a university which will assume the short, middle and long term aspirations of the city.

The S. Amaro area is located to the West of the city, way down the Arlanzón River. The landscape, there, is the same as it used to be, a small valley with hills to the North and plains to the South watered by the river going West among lines of trees. 20th century men, erecting factories and basic equipments there and transforming the area into a city outskirts, have not succeeded in depriving it of its natural beauty (Fig. 5). So now we can easily recover it for its new use without a great expense. In fact, the already present university buildings, the closing of some factories and the development of high quality residential quarters in this area, have marked a certain line which is what the new plan wants to promote.

The project for the new S. Amaro Campus

Among the mentioned models, this project has chosen the perfect integration with its neighbor city, becoming a peripheral development which is continuous with the city grid but which has its own and unmistakable identity, aiming at a certain isolation, encouraging the meting of people and ideas (Fig. 6)

So, we have tried to recover some historic buildings which lead, from the center of Burgos, to the selected area. This itinerary goes along the river valley and the Pilgrim's Road, which will traverse the University Campus in its way West.

In the subzone close to Burgos, where we find the preexisting university buildings, there will be a large open space, the entry, surrounded by those buildings and other which complete the spatial composition. The entrance to this open space, located between the magnificent Park of El Parral and the Municipal Sports Center, by the river, will be a sort of Gate Building, the university and pilgrims' restaurant (Fig.7).

For the second subzone, the campus extension, we have chosen a natural meander which will offer a certain particular character to the new university campus. The arc's chord is, in fact, a channel, 1,2 Km long and 60 m wide, which takes its waters from the river's highest level (where there is a dam) and delivers them in a lower point, with a 6 m jump, at the end of the meander with the intention of producing electricity (Fig. 8).

The educational buildings are intended to adapt themselves to the river curve in modules which will leave 30 m separation gaps in order to link the beautiful river banks with the central prairie, which goes up to the channel with its old and large trees. To the South of the channel, we find the residential buildings for teachers and students and the administration buildings. All of them form a comb with a link building aligned with the channel and with the boulevard which is the prolongation of the axis leading towards the city center.

The educational modules are also linked by means of a glazed, south orientated gallery, 15 m wide and 13 m high, which is intended to produce a greenhouse effect providing an additional heating system in the hard winters of Burgos. In the center of the arch, we find the Paraninfo, a building which will house important university and municipal acts which is, on its part, linked to a building dedicated to fairs and exhibitions looking towards the river, while the Paraninfo dominates the prairie and the channel with its important height.

At the beginning of the channel, we find a cylinder-shaped building traversed by a small channel supplying the larger one, which will be used for academic exhibits and reunions. At the end of the channel, we find a similarly shaped building which is dedicated to the production of electricity. In this area, we also find the botanic garden with the agriculture laboratories.

On the other side of the river, we locate the sports' facilities with a large building, which is a multi-gymnasium, a multi-sports' center, a pelota court and playing fields around. This area is connected with the Nautical Club, located at the end of the buildings' arch where the river and the channel finally meet.

The Jail Building, which will probably become a pilgrim's center in the future, is also located on the outer side of the river, by the sports' facilities.

The idea has been to avoid traffic roads traversing the most representative area of the campus, that is, the area between the channel and the river. But, for the rest, the campus is inserted within the actual and new plans for the city's access roads and is assumed as part of it. The road to Valladolid, for example, which is the axis of the S. Amaro Campus, will become a wide urban boulevard leading to the already existing residential quarters and the new university accommodation complexes, administration centers and laboratories and other equipment, so important for the city development.

The Saint Jacques Pilgrim's Road is the star of the campus planning: after a bifurcation, it traverses the campus with two branches, one passing by the Monastery of Las Huelgas and the King's Hospital, the other, by the Valladolid's Road. Both meet at the center of the new campus and continue, as a unique way, in the large boulevard, parallel to Valladolid's Road.

And, in relation to the architecture of all this elements, the idea is to provide high quality and very varied buildings which will comply with the urban planning criteria. We will have a different architect for each building and the selecting procedure will be an open contest. If this procedure would reveal itself inapplicable for non university buildings in the surrounding area (housing units, service and equipment buildings), we suggest that at least the quality of the proposals, their morphology and selected types, would be controlled by a committee formed by the town hall and the University's Technical Unit for Architecture (Fig.9).

On the other hand, we must think about the future development and renovation of the University itself. That is why the plan includes a long term project with flexible effective building stages, but has already secured the property of the future sites in order to take advantage of the expected appreciation.

So we talk about a large extension and an important investment project. If the coordination of the different institutions involved should work out well enough and achieve the development of a good project, with good architecture, we will have, along with an important university for many years and a scientific and technological research center for the development of the region, a substantially improved city of Burgos.■

N O T E S

1. See the article by P.Navascués: "El saber ocupa lugar", "Urbanismo" magazine No.21,Published by COAM 1993.
2.The project has been elaborated by a multi-disciplinary team from the university, with the sociologist Mario Gaviria and the engineers Ramón Parra and Agustín Soro with L.Moya for all the urban planning and architectural parts. The criteria have been determined by the architect Pedro Silleras, from the University's Technical Unit for Architecture.

F I G U R E S

1. University of Virginia by T.Jefferson
2. The new University Campus in Salamanca, frame No. 2.
3. University of Cosenza by Gregotti.
4. Historic Center of Alcalá de Henares with various university buildings, specially to the west. Drawing from the Special Masterplan by C. Ferrán.
5. Present state of the site for the future university campus in Burgos.
6. Scheme of the structural relationship between the university and the city in the project elaborated by the university team.
7. General Plan of the proposal.
8. Detail of the new University Campus.
9. Photographic Montage with a perspective of the proposal.

A without and within Campus in Alcala de Henares: the problem of residential space

Maryan Álvarez-Builla Gómez y Joaquín Ibañez Montoya

One of the most characteristic manifestations of the architecture of the 90's is the recovery of history. In our case, the recovery of historical sites and fabrics to give them the same function they had in former days, the function of transmitting and interchanging knowledge as corresponds to a University.

Almost twenty years ago, the University of Alcalá de Henares was re-founded in its foundational seat. In this recovery effort the challenge was a double one: acquire, rebuild and occupy those old buildings which belonged to it and in which it gained universal renown, with their adjacent urban context and, at the same time, incorporate these new elements to the homogeneous post-industrial society of the city, the support of all activities.

We could talk about reconversion or even recovery but also about transformation, imitation, about integrating within the life of the city those old buildings, to become a source of contradiction. There was just one possible project in the best tradition of Cisneros, recover the empty space.

Alcalá de Henares was conceived as a valid and renewable space, containing original and irreplaceable objects, but also as a "no services, no facilities" piece belonging to that congested metropolis of uncontrolled territory to the East of Madrid.

This completely built complex was very difficult to know and to control in the process of recovering the University, its streets and cloisters. But this process of renewed incorporation of the University has resulted in a new structuration for the whole city, up to and even beyond its limits with the construction of a second campus to the Northwest of the city's periphery.

This "terra ignota" in our end of a century has been rediscovered thanks to projects like this one, possibly strange to but fundamental for the very population. This new colonization of a "second nature" is one of the basic characteristics of our days, but just possible when there is enough material to work on, what is really the case with an interesting city as Alcalá de Henares.

The idea behind the University project is not only the physical recovery of the buildings,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that is obviously assumed, but also of their old functions and of the cultural context and framework which sustained them and which was disintegrated in the last century.

The city development ocurred during the late Franco era, had surrounded this historical city with an impersonal and miserable belt, and had left the patrimony in a petrified state dedicated to extinct functions: convents, military quarters, jails... The accelerated increment of the urban population and the extensive use of the car had met, as an obstacle, this marginal land, secluded from contemporary relations of production.

The University of Alcalá has perceived the necessity to interpret the city, its old precincts, by overcoming the functional fallacies which extract the exact form from the function, but trying not to fall into a new historical fallacy and resolving, from the first moment, to combine political decision with the necessary time for reflection and planning. As a result of this, we have now a Interdepartmental Covenant, a Masterplan and a Special Protection and Reform Plan.

At this point, we found that, after creating the occupation strategy for the periphery and recovering the most representative old buildings and urban spaces, the process of revitalization will not be complete until something is done about accommodation, about its location and its structure. In both senses, the University of Alcalá de Henares has promoted some innovative experiences which we will subsequently describe. One of the most interesting aspects of the changes endured by the Spanish society in the last decade, is the renovation of the residential space. This, as the University, is an indicator of cultural development.

The demand of suitable accommodation has become as complex as the society itself: this fact has required a varied and sensible response which has been incorporated to the process of building a "modern" city.

The University of Alcalá had to solve the problem of finding suitable accommodation for its employees and for a certain amount of alumni. The idea was also to offer an integral academic project including university residency. Besides, the problem was not only to find room enough for everybody but that of creating a higher quality environment.

We will not insist on the singular historical and geographical context of a city like Alcalá de Henares. The Covenant which was the first document of the renewed incorporation of the University in Alcalá, the mentioned Interdepartmental Covenant, says in its Clause 5, Point h, "...the Autonomous Community of Madrid will acquire and refurbish housing facilities within the city's old center...".

In this way, and after a detailed study of the historical complex realized by the Ministry of Public Works and Urban Planning, the new residential policy began with a careful examination of the possibilities of the so called "South Area". This decision of concentrating on one area and not disseminate the operations, bears a certain resemblance with the public initiative which created the very University of Alcalá, in the Renaissance Era: as in those days, the idea is an strategy to revitalize the whole city.

The selected south sector is a completely derelict and deserted area in a state of perfect degradation, its built network has really no compositive relevance. The first sketch of the strategic policy, which was elaborated in order to be presented in Europe's Council to apply to funding programmes, revealed the way in which the whole operation should be carried out. The proposal included, in its first stage, 384 housing units which amounted to 4900 million pesetas.

But this public funds, which had been so much employed, even in an overacted way, in theatrical terms, in other sectors, proved to be insufficient for the materialization of the residential possibilities of the historical center. The complex character of the operation and its management was surely beyond the reach of the political and legal instruments available.

In any case, the problem of the University subsisted and was logically aggravated. In this context of inefficiency, the only possible way out was the use of the less problematic and obviously less attractive space of the Second Campus, in order to solve the second aspect of the question, leaving now aside that of the location, which was the structure and types selected for the accommodation facilities.

The morphological features of the residential project for the Exterior Campus define it as a Modern space. The University has decided to analyze the virtues of the concept of "existenzminimum", in order to extract its basic elements. The concept of a student's life, without a profound memory, a transitional stay... all this requires a critical revision of a certain architectural trend which has been developed by the Modern Movement and its late followers.

The Residential City of the University of Alcalá is one of the most significant experiences within the policy encouraged by the Community of Madrid regarding its "Housing Programme for Young people". This programme tries to find a new qualification of the housing, studying and entertainment spaces rooted in today's cultural patterns but also linked to the social context of peripheral developments.

Just by the, so to be, 250 Ha's Botanical Garden of the University, the residential project includes three hundred units which will be managed as public housing and whose function is also that of occupying the deserted area between the Exterior Campus of the University and the city outskirts, secluded from the city itself by the terrible barrier of the Madrid-Saragossa highway. The housing types are rather varied and combine the materialization of the space of a mythical students' republic with traditional housing. Moreover, the housing units are interlocked by a series of buildings containing collective services as the University Club, Retail Center and Baby Care, which fashion a low impact architectural operation whose volumetry and texture belongs to the same language as the university complex.

The basic bet is on the autonomy of the user with a completely open system which differs from the old tutelage forms. A bet which does not imply the disappearance of communal services, which include from optic fibre ducts from the University to heating services, water mains and other completely centralized facilities.

In spite of the evident importance of this operation, nowadays with the first stage of two hundred units completed and occupied, we still think that the really transcendent project will be the future campaigns involving the historic center. These will prove the real scope of the intentions, with proposals which will combine the design of the contemporary housing space with an efficient renovation of the present city.■

S L I D E S

1 Historic Center of the city of Alcalá de Henares with the University Buildings and other equipment colored (Source: Technical Office of the University of Alcalá).
2 South Area of the Historic Center. Voids.
3 Residential City of the University of Alcalá. University Club in foreground.
4 University Club.
5 Covered Pathway. Central Square and Retail Center.
6 Housing Unit Type A. Common rooms.

Palermo. Acampus between the imagined city and the possible city

Graziella Trovato

Location: Orleans Park by the Kemonia River, going towards the Papireto and the Sea, in Panhormus, the Port City.

In the fifties, the University acquired this space. It was designed as a linear city connected with the historical center, the faculties of Law and Political Sciences belong to it.

In the late fifties, the rationalistic architects Edoardo Caracciolo, Antonio Bonafede, Caronia Roberti and Vittorio Ziino designed the Faculties of Agriculture, Economy and Commerce, Engineering and Humanities.

Leonardo Urbani, in his "Verso un disegno per Palermo", notices that this architecture was not easily accepted by the aristocracy ruled city. It was a time of transition, and some architects from Palermo, as Alberto Samoná, or working in the city, as Carlo Scarpa (restoration of the Chiaramonte-Steri Palace, Dean's Seat (1977), in collaboration with Roberto Calandra), Vittorio Gregotti and Gino Pollini (Science Department (1969)) tried to promote renovation.

Scarpa did also accomplish the restoration of the nearby Palazzo Abatellis, today Museum of the City.

Gregotti talks about the importance of the site. In fact, the Chemistry, Physics and Biology Departments are very respectful with it so that it becomes a "park limited by privileged materials for the specific project" (Gregotti).

The architecture is modern, of an international character. Three squares located in ascendent levels create the space for the three departments along an axis which continues that of the Viale delle Scienze. The volumes, as boxes o containers have been abandoned and neglected for ten years.

But the campus progresses and there are two projects on site, Schools of Architecture and Education, by the teams of Pasquale Culotta and Giuseppe Leone, professors at the University of Palermo and students in the times of Gregotti and others, who tried to promote projects centered on two themes "the Sicilian Territory and Universal Architecture". In the same line as Alvaro Siza's.

The insular tradition, then, and its social context become the peculiar features of the architecture and architectural criticism of the School of Palermo.

Now, the two new projects instead of respecting the site try to become landmarks of a city in search of references. The campus becomes part of the city and not an isolated enclosure.

The Faculty of architecture began as a contest in 1983. The committee formed by Giancarlo de Carlo and Gino Pollini (the author of the 1972 Development Plan) selected Culotta and Leone to coordinate the working groups. Ten years later, the project was built in a rather different position as the one firstly proposed, just by the Science departments.

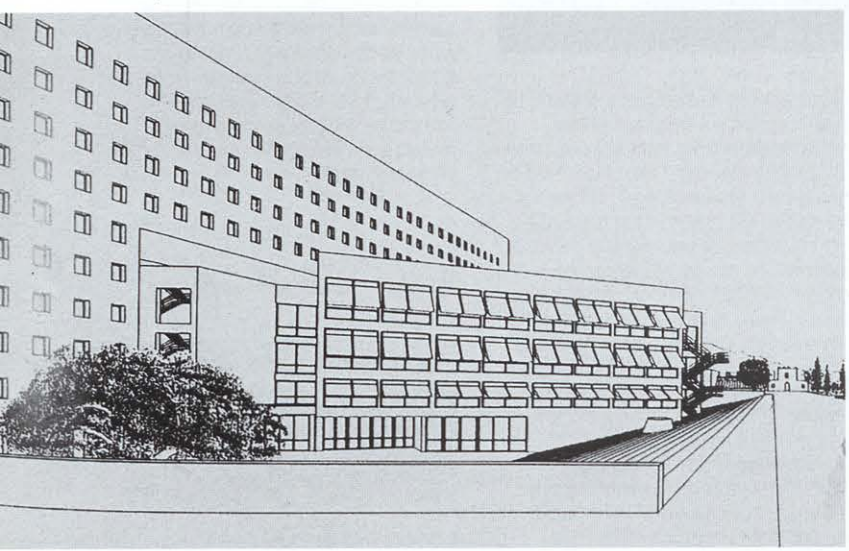
The project combines two functional and material parts which are interrelated but never physically connected: the didactic areas (Faculty) and the research areas (Departments). The longest volume, the Faculty, is a five storey intersection of prisms which defines the Via Basile as the limit of the University Campus. The Department Building is like a Grand'Arche over the Faculty. The building is related to Gregotti's own project in a spatial and ideal way.

On the other extreme, we find the Faculty of Education, with two bodies of different size and different function. There is a five storey linear volume with the classrooms and departments and an octagonal lower volume with the building's general service areas. The building defines a series of itineraries from the squares by Gregotti ad Pollini towards the city in which interchange and meeting become possible.

"Il giornale dell'Architettura" has published both projects in order to make them known to those who will have to finish and complete these spaces along the following years.

The important thing is to promote the renovation and reconstruction of Palermo's identity.

The fifty years old campus continues its growth and ageing always connected with the city itself. With the same rhythm and the same spirit... between the imagined city and the possible city.■



"In the center of Turin´s new masterplan, the Polytechnic gets duplicated"

Agata Spaziante

The New Masterplan for Turin redefines a central derelict industrial area as the new expansion for the University.

It is the result of ten years of design and discussion between the economic, political and academic power groups.

It is a strategic decision for Turin, although it could seem that an industrial city should not rely on a University plan for its growth.

But the authors of the Masterplan have decided to foster the importance of the Polytechnic.

The question is, weather the promotion of technical education will have an important role in the development of the economic and social structure of the city, or it is the current economic growth which determines the proved interest in education.

The Polytechnic, the plan and the city

In Turin, the prestigious, 1859 founded, Polytechnic is considered a fundamental element of the city.

In fact, the technicians and researchers educated in it have contributed to the development of this mix of Tertiary and Industrial city.

There have always been links between the industry, the public administration and the research programs carried out in it.

But its potentialities have not been fully exploited.

Cooperation could be even greater and this is the idea fostered by the New Masterplan.

The duplication project for the Polytechnic has appealed the academic authorities, interested in solving the problems of their actual location, but also the economic and political powers interested in such an important estate development. But the occasion of cultivating a deeper collaboration has been somewhat lost.

Because only when Academic Institutions are really integrated within the local social structure, and the importance of their primary role in the education of the city population is really acknowledged, becomes possible to assume them as signs of identity.

In Turin's case, in spite of the relations established, the society has not assumed the importance and potentiality of its own Polytechnic.

But in the latter four years, the joint efforts of the Academic circles and the City Hall Administration have fostered the proposed role of the institution.

The interest of the new mayor and urban counsellor, both teachers at the Polytechnic, has been decisive.

So, there have been several moves, as the obtention of funding, the agreement with the Rail Company, the owner of the estate, and thus, the enlargement project for the Polytechnic has been made possible.

The Town Hall, the regional and provincial authorities, together with other public and private institutions, have invested in this project.

Today, the conflictive part of the operation is over, the site has been finally selected and the design projects are concluded. The first group of buildings is to be finished in 2008, and the rest in 2010.

Now we can comment what has happened.

In 1987, the academic authorities began to complain about problems with their lack of space: 118000 m2 for 12800 students (that is 9.21 m2/student).

That same year, two circumstances helped the conception of a second campus.

- The existence of a convenient and abandoned area, separated from the Faculty of Engineering just by the railroad.
- The beginning of the process to renovate the City Planning replacing the old 1959 Plan.
- Gregotti and Associates was commissioned to elaborate it, and during four years the idea of duplicating the Polytechnic began to take form and became central to the Masterplan.
- The plan included a series of great operations with two basic points:

a) The reorganization of the railroad system with the addition of three new stations. The covering of the railroad trench by a new great surface boulevard (the central "Spina") along which we find the actual seat of the Polytechnic and other refurbishment operations.

b) The recovery of large industrial and derelict areas along the central Spina of which 33% would be public services (including green areas) and, of the rest, 62% tertiary and 38% residential.

The Polytechnic project was always among the most prestigious operations contemplated. It would occupy one of these industrial areas along the Spina: the "Spina 2", 132800 m2 belonging to the National Railroad and located just by the Ateneo (seat of the Dean, Central Administration and Faculty of Engineering) and near the city center.

The City Hall, very interested in the project, commissioned the same practice with the specific plan for the campus in 1990 and, then, in 1992, tried to put it into practice before the official approval of the City Masterplan.

In 1994, the building projects for the campus began to be designed by the same Gregotti and Associates.

Before the end of the year, the Polytechnic must decide who will undertake and supervise the construction process.

There will be an International contest to define the tender projects

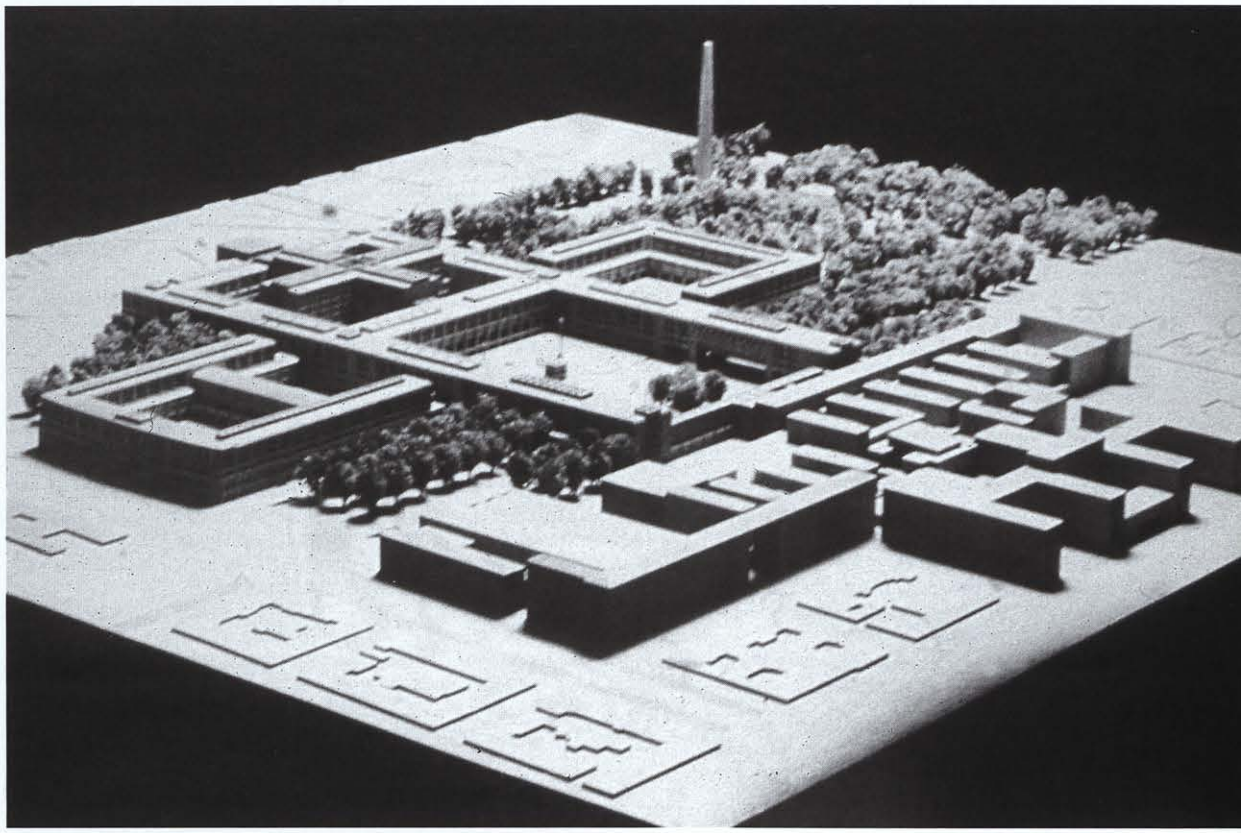
So now is the time to revise the ideas behind the basic design projects and their interpretation of the planning.

The project for the Polytechnic Citadel

Vittorio Gregotti and Augusto Gagnardi, the authors of both the planning and the projects, have seen the Polytechnic as a means to develop the city's future.

In 2010, we will have, along the Spina, two blocks of a continuous university campus, in both of which the architectural spaces and types will be of a traditional kind. There are no really substantial innovations assumed.

The plan is based on the city's existing morphology, and just tries to replace an industrial estate with a tertiary area. The campus, between the historic city and the new expansion, becomes a symbol of a renovation of the city based on the validation of its most brilliant past.



Although the projects are delineated, there will be many changes and adjustments.

- The increasing number of applications to the Architecture and Engineering Faculties should make their dimension increase too.
- After the Specific Plan of the area was completed, it was decided that some 19th century buildings would be reused. This will diminish the provision of green areas.
- This newly incorporated buildings will have to be contemplated as part of the campus and thus assigned some function in it.
- There will be changes in the organization of the pedestrian, and public and private vehicles movement.

What will remain is the idea behind the plan, almost a specular image of the actual seat, designed by Muzio, Bairati and Pochettino in the late fifties. The new plan is based on that institutional type of architecture and on the character of Turin's traditional squares, as the baroque "Vittorio Emmanuele" rectangle.

The style is that of other projects by Gregotti, clear and rational.

There are several traditional types easily recognizable: the university Quadrangle, the Interior Street for social purposes, the different squares which draw a traditional Italian urban grid.

The university campus, in this central position within the city, assumes its high density. In order to compensate this fact, the Specific Plan contemplated the creation of a Urban Park but the decision to preserve some 19th century buildings has fragmented it.

There is no real intention of breaking with this traditional way of integration, so necessary when there is no university accommodation nor complementary services, as it happens in Italian and other South Europe Universities.

The project is inserted within the urban renovation, mainly based on the creation of the great boulevard. The two parts of the city, traditionally separated by the railroad, will unite there and so, the old and new Polytechnic campuses.

And about the sketched building projects, we must mention some fix elements:

- The wings connecting the new and old parts and flying over the boulevard which define the inner public square (the connection with the city).
- The commercial and services buildings around this square.
- The inner structure of open and closed courts surrounded by wings of classrooms and research areas and connected to the open functions (restaurants, library).
- The glazed gallery of the ground floor which is the link between the different functions.

It is a certainly open project which will be subsequently defined.

Contrary to what was made in 1985, when the refurbishment projects for the old faculties were elaborated by working groups within them, in this case there has been no contact with the future users. Conflictive discussion has been avoided and the faculties involved, which are both dedicated to the building world, have not participated in the project.

Their possible contribution has been delayed to the final definition.

In spite of the many problems, it seems we will have the complete structure erected in the following years, by means of a four stages building process.

The final projects will have to solve the many questions yet posed.

It will be an opportunity to make of the Polytechnic the motor of innovation within the city, not just in industrial matters, but also in other questions as the city's building and planning processes and the education and training of its population. That is the challenge for both the political and social powers and the academic instances. The most difficult and also the most important.■

* Agata Spaziante teaches "Analysis of the city and its territory" in the Faculty of Architecture within Turin's Polytechnic.

Félix Candela 1910-1997 Obituary

By Alfonso Basterra*

Félix Candela was born in Madrid on the 27th of January 1910. He studied Exact Sciences and Architecture and was brilliant in Descriptive Geometry and specially in Material's Resistance, that is, Theory of Elasticity. He was assistant to Professor D. Luis Vegas an became renowned among his companions.

In 1935, he won a grant to study in Berlin with reinforced concrete specialists Franz Dischinger ad Ulrich Finsterwalder, but Civil War prevented his travel. He fought on the Republican Side and became an exile arriving in Mexico on the 13th of June 1939.

Mexico was then a developing country with many prospects in the building sector.

He worked first with other exiles and collaborated with the Republican Exiled Government. He could not validate his degree but he continued his studies on structural design.

In 1951 he created his own contractor company "Cubiertas Ala S.A." to commercialize reinforced concrete shells and erected the roof of the Cosmic Rays Pavilion in the University City with a just 1.5 cm thick hyperbolic paraboloid. He became worldwide famous.

He published his own and very simplified theories on elasticity, criticizing the usual ones and confronting the engineering establishment.

His achievement was economy, both in calculations and in building costs.

He progressed in his investigation, designing more and more sophisticated shell structures. He became a complete "magister operi": a builder, engineer and architect as Pier Luigi Nervi in Italy. He followed the steps of a Freyssinet or a Maillart, pioneers of reinforced concrete construction.

Thus, he built both churches, as the Virgen Milagrosa (1955), and many warehouses and industrial buildings with his "umbrella" roofs made out of four fragments of hyperbolic paraboloid with a central support.

In 1955, he built the roof of Mexico's Stock Market with a "free edge" (unreinforced edge) hyperbolic paraboloid.

He collaborated with local architects Fernando López Carmona and Enrique de la Mora and made several churches between 1955 and 1963. With José Ramón Azpiazu and engineer José Antonio Torroja, he made his so far only work in Spain Our Lady of Guadalupe (1963).

Other interesting works: open chapel in Lomas de Cuernavaca (1958-59), restaurant Los Manatiales in Xochimilco (1958) and Bacardi's Distillery in Cuautitlán (1960). Won international renown and honors.

In 1968 he designed as an architect, in collaboration with Enrique Castañeda and Antonio Peirí, the Sports Pavilion for the XIX Olympic Games in Mexico with a recognizable copper roof. He managed to built it in just 18 months. He also became a teacher in Mexico's University UNAM but work became scarce around the mid sixties.

In 1971 he joined the University of Illinois as full professor and so went to Chicago where he remained until his retirement. There, he continued his collaborations with current practices and made two important and never built projects, a sports center for Brown University (1970) and a new Santiago Bernabeu Stadium for Madrid (1973).

In 1980, he bought a flat in Madrid and then began to live both in the U.S.A. and in Spain. He was lately working with his acknowledged admirer Santiago Calatrava in the Universal Oceanographic Park to be built in Valencia.

Along his fruitful life he won many important architectural awards as the Auguste Perret, the I.U.A.'s, the London Institute of Structural Engineers Golden Medal, and the Alfred E.Lindau from the American Concrete Institute. In Spain, the Golden Medal of the Superior Council of Spanish Colleges of Architects, the award from the Antonio Camuñas Foundation and was twice a candidate for the Prince of Asturias Arts Award.

He finally went to live in Raleigh, North Carolina, where he died on the 7th of december 1997 from a cardiac disease. R.I.P.■

* Alfonso Basterra Otero is an architect and teacher of Construction in Valladolid's School of Architecture. Currently writing his Doctorate Thesis on Félix Candela's work.

Impressions of an Asturian Architect on Félix Candela's decease

Miguel Díaz y Negrete

The recent publication by "El Comercio", a Gijón newspaper, of the Rationalist project my father, José Avelino Díaz y Fernández Omaña, did and never could build for a High School in 1935 has brought to my mind that summer of 1935 in which I met Félix Candela.

I was fifteen then and my father asked Julio Galán Gómez for two young graduates to collaborate in the High School project.

Félix Candela and Fernando Ramírez de Dampierre came to our house and studio, located in a villa called "La Terraza". They worked with my father during july and august on the High School project to be built in San Lorenzo's beach, in front of the Cantabrian Sea.

I remember this summer as the time in which I decided to become an architect. I became a friend to Félix Candela who developed a brilliant work with my father and also proved a skillful sportsman, swimmer and mountaineer. He even climbed the mythical "Naranjo de Bulmes". Photographs of these days were lost in the Civil War but remain impressed on my mind.

In october 1935 I came to Madrid to study architecture and joined, as Félix Candela, who was my mentor, the Real Madrid Football Club.

I remember Félix' flat, a humble and dark room, where I went with my father to hand him the plans of another rationalist and magnificent project for Gijón's Savings Bank. He draw a perspective which always remained among the original plans.

Then, silence. My father died in 1964 and I learned about Félix Candela's success in Mexico, about his 1968 Sports Pavilion. I visited Mexico in 1970 but could not see him though I visited his works.

In 1975, I met him again in Madrid's I.U.A. Congress and in Santiago de Compostela's Reunion (Candela, Bonet and Sert were the stars then). He also came to Granada's 1981 Congress but he continued living ad working abroad, in Mexico till 1978 and then in Illinois where he retired.

In 1995 he was accorded an Award by the Colleges of Engineers and Architects in Madrid. In his discourse he resumed his natural philosophy: "... I am not an engineer nor an architect, I like to be known as a contractor, and this is something rather amazing in the U.S.A., specially in the Academic world..." ■

Gijón, December 1997.

Manuel Manzano-Monis (1913-1997)

Alberto Humanes

Manuel Manzano-Monis died last october, 26th in Madrid. He had basically worked on the reconstruction of historical cities both in the General Bureau of Beaux Arts and the National Urbanism Office and in his own practice. He made projects for Avilés, Fuenterrabía, Irún, Guetaria, Hernani, San Sebastián, Baza, etc.

The most important was Fuenterrabía's which included restoration of monuments and the wall, renovation of existing urban spaces and creation of a new urban grid with more than thirty new, but traditionally designed, buildings.

His interest in historical buildings made him an expert in traditional and artisan building methods which he employed with sensibility.

He also used this knowledge in his single family house projects, with traditional bearing walls, oak framing, large eaves, shutters etc, in harmony with surrounding landscape.

He was not admired nor understood by his companions who criticized his Folklorism. In 1978, Maurice Culot and Leon Krier, who admired his works in Fuenterrabía, asked about him in a conference in Madrid's School of Architecture and nobody seemed to know him. Krier was annoyed and criticized the audience for knowing such distant architects as Eisenmann or Ando and ignoring whom he acknowledged as one of Europe's leading architects.

He had the international respect, was profusely published abroad and received the 1982 European Prize on City Reconstruction.

We should remember this interesting figure. We have his works, drawings and poems and the assured continuity in the person of his son Manolo, his close collaborator and critical admirer.■