

## **Science Park and Universities: conditions for their contribution to economic growth**

MICHEL LACAVE\*

An outstanding idea today is that grey matter-intelligence-is the real basis, the main resource for economic development, somehow the main "raw material" of the future.

Consequently, we have to encourage, as far as possible, CROSS-PERTILIZATIOIN between academia and industry, in order to shorten and facilitate technology transfer from universities and research centres towards business.

Exploiting the scientific and technological resources existing in universities and higher education institutions is widely viewed as a preferential path to a larger added value and a better competitiveness.

The ways which can be used to achieve this scope are diverse, but not exclusive. Let us cite three of them, with a growing level of complexity:

1. the appointment of a Professor in charge of T.T. by the authorities of a university or of a higher education institution, and possibly the creation of a small task force dedicated to t.t. inside the university.
2. the creation of centres of innovation and T.T., specialized in such or such a field (e.g.: biotechnologies, CAD-CAM, etc) ensuring a legal partnership between academics and companies and offering at least consultancy services.
3. the creation of a science park, that is to say: a real estate development operation, accompanied by t.t. services and a partnership between academia and business.

The first high tech spots appeared almost spontaneously in the U.S. at the end of the 50's and at the beginning of the 60's with Silicon Valley in California and Road 128 in Massachusetts in the neighbouring of powerful universities and higher education institutions.

---

\* Michel Lacave, Professeur, Faculte de Droit et des Sciences Economic de Montpellier

They served as a **model** and they widely continue to serve as a model for today Science Parks (S.Ps.).

The first S.P. appeared in Europe at the end of the 60's with Cambridge S.P. and Heriot-Watt in the U.K., Grenoble and Sophia Antipolis in France.

At that time, the phenomenon came to a stanstill, but **with the 80's, there was an extraordinary multiplication of S.Ps.**, since they are today **about 400 S.Ps.** throughout the world.

What are the reasons of this trend?

1. **the first post oil-crisis period** (though I don't like the term crisis for this period): in a large number of countries, governments started policies dedicated to the modernization of industry through incentives to innovation and T.T., end of the 70's-beginning of the 80's.
2. **the growing dependency of goods-and services-producing activities upon R&D**: that is to say, with or without the oil crisis, it was essential to foster linkages between research and industry.
3. **the growing contradiction between more and more transnationalized economies and keynesian - style macro-economic policy**, the latter becoming less and less relevant: this phenomenon paved the way for the enlargement of the role of local authorities, confronted to industrial restructurations and unemployment caused by the new conditions of production at world level. As the national governments appeared relatively helpless, particularly in Western Europe, local authorities tried to find their own solutions to their problems, one of them being the creation of S.Ps.

I must stress that **until a very recent time the multiplication of S.Ps. was essentially a North American, West European and Japanese phenomenon.** But, New Industrialized Countries, countries of Central and Eastern Europe in transition to the market, and past developing countries, begin to be interested in S.Ps. because of the second reason above mentioned and because people in these countries become aware of the absolute necessity of using at the best their own scientific resources.

It is clear that the creation and development of S.Ps. in such countries has to **take into account their specific problems**:

- lack or deficiency of entrepreneurship
- prevalence of small or micro-business

- heavily centralized national governments, that is to say deficiency of local authorities,
- a tendency of universities and higher education institutions to abstraction and "intellectualism", accompanied by a lack of involvement in day-to-day economic matters.

According to my opinion, such a context brings with it **two major practical consequences**:

**1. The role of the national government remains essential:** generally speaking, local authorities lack experience, competence, money to create S.Ps. But I must emphasize that some universities can do it, the national government supporting the projects, acting as a coordinator at the national level and developing policies encouraging and funding T.T., which is necessary to the success of S.Ps.

Incidentally, it would be dangerous to disregard the role of the government because of a somewhat naive rediscovery of the market, as it may happen in the former communist countries.

**2. Anyway and in every country, according to our opinion, S.Ps. have to be devised as integrated instruments for regional, and possibly national, economic development.**

We will stress this last point, dealing with what we consider as the five main elements:

- strengthening international scientific cooperation
- encouraging T.T.
- developing a pedagogy of entrepreneurship
- creating and maintaining networks
- offering high quality office and industrial spaces

### **1. Strengthening international scientific cooperation**

In the countries that we could qualify as being "middle of the path"- in transition to the market, newly industrialized or fastly developing - universities and research institutions may considerably vary in quality either by lack of financements, or by lack of highly qualified people, or by lack of links tight enough with the best academic centers of North America, Western Europe or Japan.

Considering the prevailing context of global competition, a S.P. of which scope is to help high tech companies to develop, has few chances to be successful if the universities which support it are not **centers of excellence**.

Consequently, it will be helpful, when and where a S.P. is planned

or contemplated, to identify fields of excellence and to strengthen them financially and intellectually by accelerating and deepening international scientific cooperation at the doctoral and post-doc levels.

Four years ago, the E.C. decided to finance a student exchange programme, called **ERASMUS**, which proved to be very successful. About 20 months ago, the **ERASMUS** programme was extended to countries of Central Europe (Poland, Hungary, Czechoslovakia) and more recently to EFTA countries, under the appellation **TEMPUS**. Very usefully, exchanges of professors and researchers were provided for, besides exchanges of students.

We hope that the **TEMPUS** programme will raise the level of Central Europe university and research institutions, when and where it happens to be necessary. So, it will be a very useful instrument for strengthening international cooperation.

## 2. Encouraging technology transfer

Basically, what are the differences between a **S.P.** and an ordinary business or industrial park?

First of all, a rather strict selection of the companies or institutions accepted as tenants. Criteria may be substantial and /or formal:

- **Substantial:** the company or the institution has to be "innovative" which is not always easy to determine.
- **Formal:** the company or the institution has to be linked by a research or technology transfer contract to the university supporting the **S.P.**

According to our opinion, the formal criterion is much better, for it does not raise subtleties of interpretation.

**Second point:** the managers of a **S.P.** are able to offer varied services to their tenants. Among them and at the foreground: **technological consultancy and assistance** with the cooperation and help of research and professors of the university supporting the **S.P.**

Thus, there has to be, among the managers and the staff of the **S.P.** somebody whose job is either direct technological consultancy or helping people demanding technological consultancy to find the right professors or researchers. This role is essential.

If, inside the university supporting the **S.P.**, a special task force dedicated to **T.T.** does exist, it will carry out this job by itself, being the natural link between the **S.P.** and the university.

And if centres of innovation or **T.T.**, grouping academics and

industry, already exist or are being created, it is highly desirable that they settle on the S.P. in order to reinforce synergy.

Anyway we must emphasize that a fundamental pre-requisite is to clarify the problems of intellectual property in order to establish the relationship between academia and business on a sound basis.

In some countries, this point raises some real difficulties.

All these actions have to be supported, as far as possible, by **financements from business from the national government and as far as possible, from local authorities** (few chances, let us remind of it, in the so-called "middle of the path" countries), and from the Foundations.

For instance, in France, besides the specific fundings coming from ANVAR, the policies directed to help T.T. are partly based on mixed financements 50% national government 50% regional authorities. In Germany, particularly in Baden -Württemberg, Foundations such as the Steinbeis Foundation play a major role.

Finally, let us say again that the example of E.C. programmes is very interesting:

- **SPRINT** for innovation and T.T.
- **COMETT** Community in Education and Training for Technology.

These programmes systematically **associate higher education institutions** and industry on a transnational basis, compelling them or at least inducing them to cooperate if they want to get money from the E.C..

**France** as well, some years ago, had the initiative of the **EUREKA programmes**. The EUREKA programmes affect a larger number of European Countries than the 12 members of the E.C. They finance applied research and T.T. in some sectors considered as key sectors in today's global competition, associating again academia and industry.

Of course, E.C. and EUREKA programmes are not reserved to companies and institutions settled on S.Ps. But one of the major task that the managers of a S.P. have to achieve is to **inform as precisely as possible their tenants of the opportunities offered by these programmes and to help them to apply**, for instance in searching for the necessary foreign partners.

Public or parapublic financement of T.T. is an absolute necessity in "middle of the path" countries but it is rarely sufficient when a small high tech company plans to develop an innovative product or an innovative process: it needs seed-capital or venture-capital. With seed

or venture-capital, we are now in the world of entrepreneurship.

### 3. Developing a pedagogy of entrepreneurship

On West Europe an S.P, the problem of the **entrepreneurial spirit** and, more technically, of **know - how** regarding **business incubators** was not raised until the end of the 80's, for it seemed obvious that anybody who wanted to start a business had automatically the required capacities and profited by an old entrepreneurial culture.

This seems less obvious today:

1. in regions of old and declining industries
2. and in some backward regions, especially in Southern Europe, where the traditional economic culture is not predominantly directed toward entrepreneurship.

In such contexts, were created **the first incubators** and, under the sponsorship and with the help of the E.C., **the first Business Innovation Centers (B.I.C.)**.

**B.I.Cs** constitute sophisticated instruments dedicated to help and support new and innovative business:

- office and industrial spaces often rented cheaper than the market price
- a wide range of services with the general scope of reducing significantly the rate of failure among new business: training in management, conception of the business plan, technological consultancy, research of partners, marketing consultancy, access to seed and venture capital. The E.C. supports, by a system of matching fund, **specific seed - capital funds** initiated by B.I.Cs

The couple **S.P. - B.I.C.** is undoubtedly very attractive as an instrument for economic development, especially for post doc students or young researchers wanting to create their own business.

We think that such an instrument could be a very useful one for the so-called "middle of the path" countries.

### 4. Creating and maintaining networks

Strengthening international scientific cooperation, encouraging T.T.: that means necessarily creating and maintaining networks between universities or between universities and industry.

Yes, it is not enough. Everybody knows today, that high tech

companies selling on the world markets do research, produce and sell more and more **through partnership agreements**, industrial, technological, commercial ones:

**paradoxical as it may appear, competition and partnership are two faces of a same phenomenon.**

A big business has no problem in dealing with it. It is quite different for the small high tech companies which are the ordinary tenants of S.Ps. **So the managers of the S.Ps., the universities supporting them, have to help the tenants to find the partners they need throughout the world.**

**I shall give one more time the example of some E.C. programmes:**

- **BC Network:** computerized on line network of business opportunities in the 12 countries of the E.C.
- **Europartenariat:** annual meeting organized in peripheral regions of the E.C. in order to help companies of these regions to meet potential partners in more developed regions.
- **Interprise:** programme financing specific actions regarding search of business, for the universities are, as well as business, leading actors of the development process, and they are important and more in building international networks.

## **5. Offering high quality office and industrial spaces**

**We must not forget that a S.P. is a property development operation:** land, water and power supply, sewage, roads and so on.

If the university supporting the S.P. has convenient land, everything is easier.

**The neighbouring, the proximity between university and companies tenants of the S.P. and the prestige of the address are rightly considered as very important.**

In the fast developing countries and in countries in transition to the market, the so - called "middle of the path" countries, I must add that such a proximity has to be accompanied by **two other types of proximity:**

**1. between local and foreign companies** for T.T. and the modernization process take place not only through exchanges between universities and companies, but as well between companies themselves.

Let us add that, in such a situation, a feed - back on the university supporting the S.P. must be favoured by the government through

incentives to the foreign company to contract with the university.

**2. between small companies and national big business**, private or public, through Foundations or research centers favouring spin-offs as do big business in Europe and North America.

**To be succesful in collecting the profits of these proximities**, the creators and sponsors of a S.P. have to **offer high quality standards**, almost similar to those that a tenant ordinarily finds in North America, Western Europe or Japan. This is particularly important with **telecommunication equipments and services**. International network-ing bears no sense without a high quality in telecommunications.

A S.P. devised as a major instrument for economic development has to:

1. **facilitate t.t.** to the benefit primarily of the **tenants**, but as well of small and medium size businesses for its region in order to raise the technological level of local business;
2. **help to create new innovative businesses on the park itself** and as well, as far as possible, outside the park;
3. **attract foreign companies** able to contribute to national economic development and to the modernization of national industry with the prospect of a better competitiveness in the world markets.

\*\*\*

## **Επιστημονικά Πάρκα και Πανεπιστήμια: οι όροι για την συνεισφορά τους στην Οικονομική ανάπτυξη**

MICHEL LACAVE

Στη σημερινή εποχή προβάλλει η άποψη ότι η διανοητική δύναμη είναι η κύρια πηγή της οικονομικής ανάπτυξης. Η θέση αυτή δρίσκει την έκφράσή της στη διασύνδεση της βιομηχανίας και του Πανεπιστημίου, που υλοποιείται με τον καλύτερο τρόπο μέσα από το θεσμό των Επιστημονικών Πάρκων. Η τάση για τη δημιουργία των επιστημονικών πάρκων εμφανίστηκε ιδιαίτερα μετά τη δεκαετία του 1980. Στην κατεύθυνση αυτή έπαιξαν ρόλο: α) η εκβιομηχάνιση μετά την πετρελαϊκή κρίση του 1974, β) η αυξανόμενη εξάρτηση του παραγωγικού τομέα της οικονομίας από την Ερευνα και Ανάπτυξη, και γ) η αντίθεση ανάμεσα



στις σύγχρονες διεθνικές οικονομίες και στα Κεϋνσιανά μακροοικονομικά μοντέλα. Η τάση αυτή δεν εμφανίζεται μόνο στις προηγμένες χώρες της Β.Αμερικής, Δ.Ευρώπης, και Ιαπωνία, αλλά και σε μια σειρά άλλες νέες βιομηχανικές χώρες, οι οποίες όμως αντιμετωπίζουν δομικά προβλήματα στις οικονομίες τους. Η πολιτική της ίδρυσης των Επιστημονικών Πάρκων έχει δύο πρακτικές επιπτώσεις: α) την ανάδειξη του ουσιαστικού ρόλου των εθνικών κυβερνήσεων, και β) την ανάδειξη των ίδιων των Επιστημονικών Πάρκων ως συστατικών στοιχείων μιας νέας περιφερειακής και εθνικής πολιτικής. Στην τελευταία κατεύθυνση παίζουν ρόλο, πέντε στοιχεία:

α) η ισχυροποίηση της διεθνούς επιστημονικής συνεργασίας βοηθά ιδιαίτερα τις χώρες που βρίσκονται “στη μέση του δρόμου” διότι τα ΑΕΙ τους προκειμένου να επιτελέσουν τη λειτουργία τους ως κέντρα γύρω από τα οποία αναπτύσσονται Επιστημονικά Πάρκα, πρέπει να καταστούν άριστα επιστημονικά κέντρα. Η συνθήκη αυτή μπορεί να επιτελεστεί μέσω της διεθνούς συνεργασίας. Μια μορφή τέτοιας συνεργασίας είναι τα Ευρωπαϊκά προγράμματα όπως το ERASMUS και το TEMPUS.

β) η ενθάρρυνση της μεταφοράς τεχνολογίας, πράγμα που αποτελεί και ειδοποιό διαφορά ανάμεσα στα Επιστημονικά Πάρκα και στα συνηθισμένα βιομηχανικά πάρκα. Τα Επιστημονικά Πάρκα διακρίνονται για την αυστηρή επιλογή των εγκατεστημένων επιχειρήσεων, για την πρόσδασή τους σε φορείς παροχής τεχνολογικών συμβουλών και βοήθειας (πράγμα που διευκολύνεται από τη σχέση τους με τα ΑΕΙ). Αυτά διευκολύνονται και με την οικονομική ενίσχυση από τις κεντρικές και τοπικές κυβερνήσεις, και από τα διάφορα Ινστιτούτα. Στην κατεύθυνση της διασύνδεσης των Επιστημονικών Πάρκων και των ΑΕΙ συνεισφέρει επίσης και η Ευρωπαϊκή Κοινότητα με διάφορα προγράμματα όπως το SPRINT, COMMET, και το παλαιότερο Γαλλικής έμπνευσης EUREKA.

γ) η ανάπτυξη μιας “παιδαγωγικής της επιχειρηματικότητας”, που σήμερα είναι πιο απαραίτητη, καθώς υπάρχουν πια περιοχές με παλαιές και παρακμάζουσες βιομηχανίες, και λιγώτερο ευνοημένες περιοχές με μικρή παράδοση επιχειρηματικότητας. Στην κατεύθυνση αυτή συνεισφέρει η δημιουργία των εκκολαπτηρίων επιχειρήσεων (στα πλαίσια των Επιστημονικών Πάρκων) που προσφέρουν την κατάλληλη υποδομή και υπηρεσίες, καθώς και διευκολύνσεις για μείωση του επιχειρηματικού κινδύνου.

δ) η δημιουργία και η διατήρηση δικτύων στην κατεύθυνση της συνεργασίας των επιχειρήσεων, καθώς ο ανταγωνισμός και η συνεργασία είναι δύο όψεις του ίδιου νομίσματος. Αυτή τάση μπορεί να υλοποιηθεί

με τη βοήθεια των διαχειριστών των Επιστημονικών Πάρκων ή και με τα διασυνδεδεμένα με αυτά ΑΕΙ, αλλά επίσης υλοποιείται και με τη βοήθεια της Ευρωπαϊκής Κοινότητας με προγράμματα όπως το BC Network, το EUROPARTENARIAT, και το INTERPRISE.

ε) η προσφορά υψηλής ποιότητας χώρων γραφείων και βιομηχανίας είναι επίσης απαραίτητη για λόγους ανταγωνιστικότητας της χωροθέτησης των επιχειρήσεων. Η υψηλή ποιότητα δεν ορίζεται μόνο ως η πρόσβαση σε ΑΕΙ και η ύπαρξη συμβατικής υποδομής, αλλά επίσης ως δυνατότητα αλληλοπρόσβασης μεταξύ των τοπικών και ξένων εταιρειών (για μεταφορά τεχνολογίας), και μεταξύ μικρών και μεγάλων εθνικών επιχειρήσεων. Απαραίτητοι όροι για την διεθνή δικτύωση είναι η υψηλή ποιότητα της υποδομής και των υπηρεσιών των τηλεπικοινωνιών.

Ετσι, η διευκόλυνση της μεταφοράς τεχνολογίας, η βοήθεια για την ίδρυση νέων καινοτόμων επιχειρήσεων μέσα στα πάρκα και η προσέλκυση ξένων επενδύσεων, αποτελούν ουσιαστικές λειτουργίες των Επιστημονικών Πάρκων στο βαθμό που αυτά φιλοδοξούν να λειτουργήσουν ως σημαντικά εργαλεία οικονομικής ανάπτυξης.