CONFERENCE REPORTS

*Innovation and Technology in the Mediterranean Countries (XVIth-XXth Centuries)**

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The annual conferences organised by the CMMC of Nice University under the energetic direction of Professor André Nouschi continue to provide a unique forum for the exchange of ideas and approaches between Mediterranean specialists from a wide range of disciplines and countries. The emphasis placed on genuine inter-disciplinary exchanges, together with the rejection of any exclusively European-centred approach to the study of the region, is particularly striking and valuable features of these intensive and tightly packed meetings.

The relationship between technology and innovation is of course a topic that lends itself particularly well to a broad comparative approach of this sort, while the Mediterranean region alone provides a sufficiently wide range of cultural, geographical, sociological and economic variants and contrasts to permit a very exhaustive exploration of the questions posed in the relationship. If at times it seemed that the outward-looking focus of the discussion offered temptations to evade rather than confront the specific problems raised by technological innovation, the breadth of the debates also served in the long run to clarify the nature and terms of the fundamental questions that had to be asked and answered.

At the start of the conference, attention tended to be focussed primarily

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on the circumstances (economic, social, political etc.) that might seem to be conducive to the uptake and diffusion of new technologies. But as it became clear that there was widespread evidence not only of technological progress but also of a readiness to innovate in a number of societies that did not subsequently experience processes of sustained economic growth, so attention tended to shift towards on one hand the cultural and political restraints on innovation, and on the other towards a more precise definition of the nature and meaning of technological progress - of the nature and implications of different levels of technology, their capacity for triggering off technological developments in other sectors, and the varying social and economic implications of such innovations. In fact, as the analysis of the relationship between the two concepts developed it became clear that it was no less important to establish a more precise understanding of what was meant by, and what might be subsumed under, the two terms ' technology ' and ' innovation '.

The general comparative under-pinning of the discussions was well set in the opening papers by Mme Clapier and M. Vexliard (Nice University) which posed in general terms the question of the sociological and psychological roots of innovation in society. M. Chastagnaret (University of Aix en Provence) then turned the discussion towards a more empirical and historical terrain with a paper on technological innovation in the XIXth century Spanish mining industry. Asking how it was that a society noted mainly for its economic backwardness and archaism could achieve significant technological progress in a single sector such as mining, he argued that the answer was not to be found in the import of technologies from abroad since Spanish mining engineers had little to learn from foreign entrepreneurs in this respect. The experience of the Rio Tinto mines, for example, illustrated that what foreign management brought was not technical skills but rather the means to apply innovations, the need for which had long been generally recognised. He went on to describe the improvements in working conditions that accompanied technological development in the mines, and to examine the ways that such improvements influenced the political behaviour of the mining communities, but the majority of the questions raised by the paper centred on the issue of technology transfers and the relationship between indigenous and imported technologies.

This same problem featured prominently throughout the second session devoted to the countries of the Maghreb. M. Baduel (University of Nice) described projects designed to improve the utilization of grazing lands in arid zones of Algeria and the relationships between the technical planning agencies, the government and the local shepherd communities. The project described clearly illustrated the ways in which the ' rationality ' that informed the technical criteria on which the programme was based clashed with the internal ' rationalities ' of the systems of communal ortanization and collective property rights around which the rural grazing economy was based.

M. Sanson (University of Nice) discussed the nature of the ' technological

challenge' facing contemporary Algerian society. Pointing out that although technological innovation was not, and had never been, foreign to Algerian society, the scale and tempo of the contemporary technological challenge was unprecedented and hence posed major problems of assimilation and adaptation. In order to achieve such assimilation, he suggested that just as the best ways of overcoming problems of health would be by creating a 'society of doctors', so the answer to the technological challenge lay in creating a widespread awareness and understanding of technology — and this placed crucial importance on education and schooling, necessitating the careful selection of subjects and appraoches best suited to arousing technological curiosity and understanding. M. Smati (University of Algiers) also discussed the problems of technological assimilation in contemporary Algerian society, analysing the ways in which everyday technology — the telephone, for example — served to bring about major but generally unnoticed changes in attitudes and consumer patterns, thereby creating the medium for the assimilation of technological cultures. Mme Chantal Bernard (CREM, Aix en Provence) drew attention to the key role that was played in certain circumstances by the artisan and apprentice groups in the Maghreb countries in the process of the assimilation and dissemination of new technologies, and provided an extremely interesting and detailed analysis of the social and economic roles of these groups. Finally M. Tourati (University of Algiers) provided a vivid illustration of the cultural obstacles that had accompanied technological development in the past, drawting on the diaries of a XIXth century Algerian merchant who had struggled to resolve the conflict between his commercial activities and the Koranic inhibitions on the pursuit of material wealth — a conflict which he attempted to overcome mainly by means of charitable bequests before his death.

The debate on these papers centred around the distinctions that could or should be drawn between technological development and the colonial structure and subordination of the countries in question for much of the period under discussion. The same problem was reiterated forcibly in the paper by M. El Kareh (University of Beirut) that opened the third session of the conference. The author stressed the need to set the problem of technological innovation within the overall structure and situation of a given economy. Taking the Lebanon as an example, he argued that the possibilites for technological development were severely circumscribed by the ways in which the country's commercial and financial systems had developed as functions of an international capitalist economy. To analyse the roots and nature of technological development, he argued, it was essential to ask the question: whom does the new technology serve and why? This in turn could only be answered with reference to the nature of the prevailing social forces.

M. Gast (University of Nice) argued on the other hand that the Yemen revealed many parallels with the situation in the Lebanon, yet the problems of assimilating Western technology to local needs had proved to be relatively

straightforward. In order to explain why technologies could be difficult to apply in one context but not in another, he suggested that there was need for a more precise methodological approach and to this end proposed a model that could be used to explain how technology transfers might be successful. The model consisted of comparing cultural systems to radio wave-lengths, and he argued that in certain circumstances these systems could intersect and even overlap without obliterating one another — but for this to happen successfully, clear objectives and motives had to be established, which meant that political intervention and leadership took on a crucially important role in the process of technological assimilation.

In the following session the focus of attention shifted back towards the European Mediterranean, and in the opening paper M. Georgelin (University of Marseille) both widened the definition of technology and added a new variable to the debate — the effects of climate on production. Arguing that while the correlation between climate and harvests was, as far as the *longue durée* is concerned, now well established and recognised, the are still a number of major methodological problems to be overcome when studying the historical impact of weather on economic activity and agricultural production. He threw doubt on the existence of a correlation between solar activities and weather patterns, although he defended the validity of the term 'little ice age' for the years 1550/60 and the 1850s. He also drew attention to the need to take account of both regional and sub-continental variations in prevailing patterns, and the particular ecology and weather requirements of individual plants and crops. Here he stressed the need for the historian to collaborate closely with the 'geo-botanist', and while acknowledging the complexity of the problems posed by such research he claimed that the Mediterranean region possessed particularly rich and promising sources.

M. Raybout (University of Nice) then examined the technical aspects of olive cultivation in southern France, arguing that a variety of techniques was evolved to overcome the widely recognised links between heavy and poor olive harvests — which included techniques for promoting early flowering, for improving methods of collecting the olives without damaging the trees etc. However, although widely known these techniques were frequently not applied either because they significantly increased production costs or because they increased demands for labour in a region subject to heavy rural depopulation.

The fifth session was devoted to the Italian peninsula and all the papers were concerned with aspects of early industrial development in the XVIIIth and XIXth centuries. J. Davis (Warwick University) described the ways in which the state-sponsored industrial initiatives of the early XIXth century in southern Italy undermined both earlier systems of domestic production and also the fragile bases of the domestic markets. A more detailed description of one of the most extraordinary examples of these Bourbon industrial ventures, the

royal silk factory at S. Leucio near Caserta, was given by R. Rainero (University of Milan). Describing the remarkable statutes and privileges accorded to the S. Leucio artisans when the factory was founded in the last decades of the XVIIIth century, he demostrated the ways in which production was organized and emphasised the high quality of the S. Leucio products (examples of which were also exhibited). However, the S. Leucio factory should be seen, he claimed, more in the light of a royal whim than as part of any coherent strategy for the economic development of the Mezzogiorno.

The current debates on the subject of 'proto-industrialization' were taken up more directly in an extremely clear and well informed paper by S. Ciriacono (University of Padua), in which he analysed the factors that lay behind the spread of a domestic-based textile industry in the Upper Veneto in the XVIIth and XVIIIth centuries. In particular, he explored the factors that contributed to the successful transformation of certain sectors (notably the woollen industries around Schio, Valdagno, and Follina) from domestic out-putting to centralized, factory-based and mechanized production and at the same time to the decline of others (above all the domestic silk industry), which not only failed to make the same transition but also began to lose the high quality attributes that had previously characterised domestic production. The comparison was well selected and raised a wide range of important questions, and in concluding Ciriacono suggested that the Venetian example provided some support for current models of 'proto-industrialization', while also showing the need for major modification of certain aspects of those models.

R. Davico (University of Turin) presented a paper which was also largely concerned with the technological changes occuring in early Italian domestic industries, but which focussed primarily on the ways in which these changes affected the economic and social roles of women. Examining and contrasting the changes that occurred in the XVIIIth and XIXth centuries in the textile industries of Naples and Piedmont, on one hand, and in the rice paddies of the upper Po Valley on the other, she argued that in both cases women had traditionally provided an important reservoir of technical skills, of a collective work-ethic and technical training — but over the period in question these collective skills and solidarities were undermined, with the transformation in one case from skilled worker to '*femme-utensile*' and in the other the creation of a new dependent category of '*femmes-peons*'.

The final session was devoted ro technological innovation in our host country, Mediterranean France, and the papers were focussed principally on the contrasts evident in the region from the mid-XIXth century onwards. Mme Maurin (University of Toulouse) described the impact of the phylloxera crisis in south western France, with reference both to the radical changes in viticulture that resulted from it and also the new scientific orientation which agricultural training subsequently took on. M. Schor also discussed the development of agricultural training programmes in the neighbouring province

of the Alpes Maritimes in the same period, and stressed that in the absence of a comparable technical crisis the objectives which lay behind the renewed interest in improved agricultural training in this region were more closely geared to the desire to stem the rural exodus that was beginning to attain alarming proportions. Since the causes of this exodus were as much social and economic as technical, the agricultural training programmes gave correspondingly little place to technogical issues. M. Derlange (University of Nice) described the factors that had led to the construction of a port at Cannes at the end of the XVIIIth century to protect shipping from the strong tides, and showed how the initiative came mainly from the commercial groups in the town who were linked with the expanding manufacturing town of Grasse, for which Cannes came to act as sea-port. The session closed with a resumé of an important collective research project on the utilization of water supplies in Provence and the Cote d'Azur region, which raised a wide range of technical problems (use of water for irrigation, animal husbandry, drainage, transport etc) which merited wider discussion, and also served to highlight again the fundamental importance of the changes associated with the transition from collective to private forms of ownership and utilization.

To summarize and draw together the main themes of the different sessions was no easier task than usual, and much of the success of the meeting was due to the skill with which the final commentators accomplished their assignments. Addressing the papers on southern France, Marcel Courdurier (Archivist in chief, Marseille Chamber of Commerce) drew attention to the contrast between the Languedoc region in the west and the Alpes Maritimes in the east which was epitomised by the way in which the former had responded to the crisis initiated by the phylloxera blight in correspondingly radical terms: the new methods of viticulture had marked not a only a break with the past, but ushered in widespread economic and social change and also laid the basis for the evolution of a new 'scientific culture'. The economic ills of the Alpes Maritimes had been of a different nature, however, and had not produced any comparable transformations or any attempt to apply new technologies intensively.

Reviewing the contributions on Italy, Maurice Aymard (Maison des Sciences de l'Homme, Paris) argued that the peninsula provided an excellent field for studying the problems of technology and innovation, by virtue both of the variety and complexity of the economic experiences it embraced — and above all because of its uneven and contradictory pattern of economic development. Although the papers had all discussed innovation in terms of manufacturing and industry, he argued that innovation in agriculture was something that should not be overlooked. There was widespread evidence of various major innovations in the agricultural economy, which perhaps contrasted with an apparent reluctance to innovate in the manufacturing sectors. But as in the case of industry, the central problem was lack of correlation between a willingness to innovate and economic development. In other words, the problem was

less one of innovation than of the reasons why innovations were not, or could not be, followed up in a consistent and sustained manner. To identify the causes of this failure, he suggested, it would be necessary to take into account the influence of predominant town-countryside relations, market structures, the nature of state intervention and the consequences of internal and external colonization.

M. Sainte Marie (CMMC, Nice University) argued that the papers on the Lebanon and the Yemen demonstrated that in discussing technology transfers the key problem lay in the fact that they had the result of encumbering strategies aimed at achieving economic independence with new ties of dependence — ties which were frequently open to exploitation by local comprador aristocracies. This in turn created the risk of cultural dualisms, with the inherent danger that indigenous cultures were eroded without there being any satisfactory replacement available.

André Nouschi (CMMC, Nice University) finally attempted to set some of the questions raised in the papers on the Maghreb against the broader issues discussed throughout the conference. The problem of technological innovation could not, he argued, be completely subsumed under the rubric of development and under-development since this left many major questions unanswered and side-stepped others. Defining the situation of the pre-colonial Maghreb countries as one of 'stifled technological development', he argued that this alone was sufficient to make the question of the relationship between Islam and innovation one that could not be avoided. And to answer this question, he suggested that it would be necessary to pay greater attention to the relationship between internally generated technology and technologies imported from elsewhere, as well as to the relationships between culture, interest groups, profit and technology.

When the conference ended the debate was far from over. There was still at the end a clear divergence between a sociological approach that continued to stress the need to identify the aspects of social organisation and structure that favoured the emergence of an innovating dynamic, whereas others saw the way ahead to lie more in the direction of further empirical and historical analysis of the concepts and terms themselves. At the same time, the nature of the problems posed within the technology-innovation relationship, the difficulties inherent in the concepts employed, the advantages and disadvantages of the different methodological approaches that had been put forward, were all subjected to thorough critical scrutiny, with the result that they began to emerge with greater clarity and precision — and this, to conclude, was the most valuable outcome of the debates, and served to make the conference a thoroughly worthwhile, constructive and thought-provoking exercise for all those who participated.