write the promised final section on the issue of Government regulation, the work does contain a brief discussion of the topic. These articles are striking: Edgeworth mentions a huge amount of literature from many countries, and deals with a much greater number of subjects that those mentioned here.

Conclusions

The research carried out so far highlights some interesting aspects.

1. We have seen that Senior, Cournot, J.S. Mill, Walras, the American marginalists, the Italian ones, and Edgeworth, all identified natural monopoly. They realized that some firms became monopolies just because in those industries competition couldn't work. The idea that monopoly implies the absence of competition is linked to a specific notion of competition, that of *perfect* competition. The history of the theory of competition has been widely studied in the literature[46]. It is often stated that the notion of perfect competition emerged slowly, and that only in the 1920s did it start to be generally employed. If we compare the historical reconstructions of the notion of perfect competition with our history of the concept of natural monopoly, we can see that there is a remarkable overlapping between the economists who elaborated that notion, and those who played a role in identifying natural monopolies. This suggests that the traditional notion of natural monopoly emerged gradually as the classical notion of competition was substituted by the neoclassical one. The link between the notion of competition and that of natural monopoly is also confirmed if we consider the criticisms to the traditional notion of natural monopoly occurring after the 1970s, and the related different notions of competition. On the one hand, the Austrian theory of competition as a process leads to consider market power as an expression of competitive rivalry, so the Austrians do not find anything wrong in monopolies, which they consider temporary by definition[47]. On the other hand, the Baumol group replaced the notion of perfect competition with that of contestability: their fundamental idea is that the multiproduct monopolist would be compelled by the threat of new entry to behave according to the principles of the perfect competitive model. In opposition to these approaches, the most recent developments of microeconomics

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[46] In addition to the references cited in Blaug (1997), see DiLorenzo and High (1988), Groenewegen (1999), Machovec (1995), Morgan (1993).

[47] A paper on *The Austrian theory of "unnatural" monopoly* was presented at the 1st ESHET-JSHET meeting in Nice (France) in December 2006.

employ still other different notions of competition[48]. For example, according to Shepherd, mainstream is not "*static efficiency* only, *perfect* competition only, and *total* natural monopoly only … Instead there is an entirely satisfactory competitive standard: effective competition, rather than the pure theorist's textbook idea of perfect competition" (1995: 305-306, author's italic). Also Vickers states that "the concept of competition as equilibrium resource allocator is not the only model of a modern microeconomist" (1995: 18); he uses the "advances in economics of imperfect information, imperfect competition, and dynamic processes" (7) to discuss "incentives, selection and innovation … three of the fronts on which advances are being made" (18). We finally cite Blaug, who encourage scholars to "abandon the concept of perfect competition" (1997: 79), as well as "its near-neighbour, the theory of perfectly contestable markets" (80), to promote the study of "every chapter in every textbook on imperfect or monopolistic competition, on oligopoly, duopoly and monopoly, in short, … industrial organization" (80).With the help of game-theoretic analysis, today's industrial organization, as we have seen in the introduction, studies the strategic contexts in which the potential entrants and the incumbents operate, and in general concludes that there are "a number of reasons why market forces alone are unlikely to reduce market power … Unfortunately even when entry is in principle free, reasons to worry about monopolies still exist" (Motta 2004: 71).

2. Schumpeter, referring to cost function, calls it: "a striking instance of the slowness and roundaboutness of analytic advance", and asks the question: "why results were established in and after 1930 that might easily have been established by 1890" ([1954] 1986: 1049). The same could be said about the historical development of the concept of natural monopoly. In fact, as we have seen, the process of moving toward the standard notion of natural monopoly had been slow and roundabout. But if we gather together and examine all those ideas that here, in order to follow this particular notion closely, we have decided to exclude from our account, il will be seen that we could reconstruct another, quite different history of the concept of natural monopoly, by no means less rich. For example we could reconstruct the history of the idea that natural monopoly is always exposed to competition, or that it is itself an expression of competition. It would be sufficient to follow the historical development of the concept of potential competition, or that of competition defined only in terms of freedom of entry, or that focused on the competitiveness of large

[48] For a history of the concept of competition up until recent times see Backhouse (1990).

firms. Also in these cases we could find that many great economists would readily lend themselves to quotation. This is what Sharkey does, for example, when he points out that before 1970s many economists already noted that "the test for economies of scale is an incomplete test of natural monopoly" (1982: 21). This is what Hazlett does, too, highlighting those economists who believed in "the universality of the competitive assumption" (1985: 5). And DiLorenzo and High di the same, when noticing that economists at the turn of the century "thought that the advantages of competing in large-scale units increased output and benefited the consumer" (1988: 426). Elsewhere DiLorenzo(1996) denies that the theory of natural monopoly was ever accepted before the 1920s; he refers only to the American economists, but we think that his comments could be extended to many European ones, who at that time shared the same view. On comparing those histories and the one recounted here, one would be surprised to find many of the same economists in both. And since we have seen that the ideas on natural monopoly are influenced by different views of competition, this outcome would confirm the thesis, , which many hold, that for a long time in economic thought different, "competing" notions of competition[49] co-existed side by side[50].

3. If it is true, as O'Driscoll says, that: "surely few would argue that monopoly is a concept of any interest independent of policy implications" (1982: 209), then it is well worth reflecting on these implication, too. They are important also because the critics of the concept of natural monopoly claim that it was even intended precisely for its policy implication[51]. And there is no lack of symmetrical allegations from the opposite perspective: the Baumol group, for example, is in fact accused of proposing "the recurrent arguments favoring a cutback to minimal antitrust policies" (Shepherd 1995: 299). In section 6 we have seen that, as soon as natural monopoly was considered a market failure, the economists, including those who supported the free market, put forward claims for antimonopoly policies. This position was adopted by those economists who accepted

[49] I twill remembered that this is the title of an article by Mary Morgan (1993).

[50] Also Blaug (1997), Backhouse (1990), and Machovec (1995), find that the first marginalists (up until the 1920s) had this dual vision of competition. We can confirm that this is also true for the Italian marginalists (Mosca 2005 and 2007). Vickers thinks that even at present "the claim that there are two concept of competition is somewhat misleading" (1995: 7), while the Austrians believe that the two views are completely antithetical.

[51] The "fundamental importance of natural monopoly is a legalistic entity that facilitates the efforts of political coalitions to restrict output in the manner predicted in the capture view of regulation" (Hazlett 1985: 2).

perfect competition as an ideal benchmark, and who later adhered to the structure-conduct-performance paradigm[52]. In effect, if monopolistic power depends on market structure, and if the market is concentrated due to entry barriers, then competition policies are needed. On the other hand, the literature which holds that natural monopoly is not to be considered a market failure does not require Government interventions, such as public ownership or regulation for utilities, and antitrust policies for networks. This view belongs to different school of thought. One is the Chicago school: they reject government regulation of natural monopoly, public enterprise, and any antitrust policy beyond preventing the restriction of output, combating cartels, horizontal mergers and predatory practices (Posner 1976, Bork 1978). Another is the contestable market approach: it implies that industry structure provides no a priori rationale for regulation and antitrust. A third one is the Austrians school: they are in favor of the total repeal of antitrust, even for the cases of natural monopoly due to network effects (Armentano 1999). In the last twenty year, new challenges have been set by the post-Chicago approach, the dominant view on industrial organization built on a solid game-theoretic framework. As a consequence, today the question of how to design antitrust institutions is still in dispute[53].

4. We are facing a typical case of economic thought shaped by reality. In fact the spread of the expression "natural monopoly" in its current meaning, and the elaboration of the related theory, came about mainly with the spread of the situation described by the expression. For instance, when Ely says that "various undertakings … are monopolies by virtue of their own inherent properties", he also specifies that "these undertakings are nearly all of them comparatively new"(1894: 294); also the article by Hadley (1886) clearly shows, through numerous examples drawn from the economy of the time, that the problem appeared particularly in those years. The public utilities and networks determined the theory; it is true that the tools provided by Cournot already existed, but many economists did not use them for their explanations.

5. A by-product of having kept the history of the various elements that contribute to the concept of natural monopoly separate, has brought out the undoubted importance of the work of economists from many countries, and also of the Italian marginalists. In the

[52] This is the thesis of DiLorenzo and High: "Perhaps the clearest link between economist's changing views of competition and their support of antitrust in the post 1920s era is found in the structure-conduct-performance paradigm of industrial organization theory" (1988: 431).

[53] For the present debate see the very illuminating article by Grillo (2006).

secondary literature one often finds the statement that the debate over costs and competition is a phenomenon of the 1920s; we have seen here that the beginning of the debate can certainly be anticipated to the works of the Italian marginalists, and especially to Barone, who deserves priority over the others. Their actual influence on that debate remains to be studied, though in view of their international fame, it was certainly considerable[54].

To conclude, we are aware that the concept of natural monopoly still contains many features it would be well worth while examining more closely. We hope that with this article we have helped prepare the ground for further research.

[54] For example, Marchionatti states that both Sraffa and Knight "take the rigorous notion of equilibrium from Pareto and Enrico Barone" (2003: 66).