INVENTING A MODERN PARIS
THE DYNAMIC RELATIONSHIP BETWEEN EXPOSITIONS, URBAN DEVELOPMENT AND MUSEUMS*

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1.- Introduction.

Between 1855 and 1900, Paris was the site of five major expositions: 1855, 1867, 1878, 1889, and 1900. These temporary agglomerations of stuff not only served to showcase scientific and technological innovations. They were stimuli to the embedding of science and technology in the fabric of modern life on a long-term basis. Their construction not only altered the development of the city's infrastructure, but through the design and content of their scientific and technologically based exhibits, the five expositions helped to restructure time and space. This paper will explore some of the ways in which this dynamic played out in the Parisian context.

The commissions charged with overseeing the 1878, 1889, and 1900 fairs saw them as opportunities to push urban development in new directions—and by the end of this period to introduce innovations that ushered in a highly mechanized vision of Paris[1]. Among these inventions were novel fiscal arrangements that wedded democratic Republican government and industrial capitalist objectives. On a symbolic level, each exposition communicated a particular idea of the Republic to the nation and the world:

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1   The prefaces and introductions to the official reports for each exposition are good resources for statements on the innovative nature of organizers' intensions and the organizational and symbolic significance they invested in the expositions. On arrangements for the 1889 exposition, see LEVIN, Miriam R. (1982) *Republican Art and Ideology in Late 19th Century France*, Ann Arbor, UMI Press, 61-62.

1878 was intended as a vigorous statement that eight years after defeat at the hands of the Germans and a civil war France was back on track as a leading modern nation. 1889 and 1900 ratcheted up the boosterism, asserting France's claim to be the country continuously inventing the future. In essence, they reimagined Paris as the nexus of a democratizing evolutionary process. If the 1889 exposition signaled the future made possible by the revolution of 1789's liberation of science and industry; that of 1900 proposed to be an accounting of science and industry's benefits to humanity so far and in years to come[2]. These gigantic events, filling ever-larger spaces in the city, were symbolic expressions of liberal democratic progress and imaginative experiences for visitors of the future to which these symbols alluded.

2.- Expositions and Infrastructure Development.

The very process of constructing the fairs helped move the city into the future. The three expositions are identified with four districts whose development furthered the reach of science and technology in different parts of Paris: the areas surrounding the Trocadéro Hill and the Champ de Mars; the *Métropolitain*; and the complex of streets and buildings that included the Champs-Élysées, the Grand and Petit Palais, the Pont Alexandre III, and the Left Bank. These projects in turn had a ripple effect on development in adjacent areas of the city and on Parisians and others visiting and doing business in the city.

Development of the Trocadéro Hill provides a good example of how the Third Republic used expositions to extend imperial initiatives and turn them to its own ends. Under the Second Empire, the lowering of the Trocadéro Hill for the 1867 exposition was the beginning of development on what was then the edge of the city. In 1878, the new government built the Palais du Trocadéro on the site; agricultural products were displayed there in 1878. Designed by Gabriel Davioud, architect and inspector of city buildings for the City of Paris, and the engineer Jules Bourdais, the Moorish-flavored, domed and turreted edifice sat above elegant gardens and a fountain designed by Alphand. The space behind the hill and to the west had begun to be devel-

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2   PICARD, Alfred (1890-1891) *Exposition universelle internationale de 1889 à Paris. Ministère du commerce*, Paris, Imprimerie nationale, 10 vol.; PICARD, Alfred (1906) *Le Bilan d'un siècle (1801-1900)*, Paris, H. Le Soudier; LOCKROY, Édouard (1890) "Préface". In: MONOD, Emile (1890) *Exposition universelle de 1889*, vol.1, Paris, E. Dentu, I-XXX.

oped, but after the exposition of 1900, the wealthy 16th arrondissement and bourgeois Passy experienced development analogous to that occurring around the Champ de Mars.

The Trocadéro was conceived in such a way as to make it evident that modern technology could surpass the venerable monuments of traditional architecture, and that French builders could once again outdo the English. The dimensions of the main auditorium surpassed those of its English competitor, the Albert Hall. The dome of the Trocadéro was some twenty-three feet higher than the dome of St. Peters, and the flanking towers surpassed Notre-Dame's tower by forty-five feet[3]. This was the beginning of the audacious humbling of the city's great religious monuments by the secular republic – a movement that would culminate eleven years later in the Eiffel Tower.

Across the river, for the 1889 exposition, the government tore down the decrepit housing that flanked the Champ de Mars to allow the exposition more room. After the 1900 exposition, the department of the Seine released the adjoining land to the city, which in turn sold it off to developers for construction of expensive residential and commercial neighborhoods. Here lighting, sewers, water, and wide streets – modern amenities already introduced to serve the expositions – were easily extended[4].

Exhibition-related transport improvements also spanned two very different political eras. Beginning in 1867, the railway station at the Champ de Mars underwent a number of remodelings to accommodate changing circulation patterns and needs as expositions came and went, and as rail connections with the *Métropolitain* were built in the 1890s. In 1900 the Gare d'Orsay, fitted to allow electrically powered engines, opened in time for the 1900 exposition with the express purpose of welcoming visitors to the exposition from the south and west of France. With its rail connection to the Gare d'Austerlitz, it served as the point of debarkation for foreign delegations from the Austrian Empire to the fair, the National Academy, and the Quai d'Orsay[5].

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3   *Harper's Guide to Paris and the Exposition of 1900* (1900), New York-London, Harper & brothers, n.p.

4   REID, Donald (1991) *Paris Sewers and Sewermen: Realities and Representations*, Cambridge, Mass. ; Harvard University Press.; GUILLERME, André; BARLES, Sabine (1998) *Histoire, statuts et administration de la voirie urbaine, Guide*, Paris, Conservatoire national des arts et métiers, n.p.

5   Tramway and rail connections for Orsay and other rail stations in Paris during the exposition, see PICARD, Alfred (1902-1903) *Exposition universelle internationale de 1900 à Paris. Rapport général administratif et technique,* vol. 12 :401, 405. For similar arrangements during the 1889 exposition, *Exposition universelle internationale de 1889 à Paris. Rapport général. Tome Troisième. Exploitation, services divers, régime financier et bilan de l'exposition universelle de 1889,*

As during the Second Empire, the expositions helped disseminate the culture of change even beyond their brief lifespans. As in the case of the *Métropolitain* and the complex linking the Champs-Élysées with the Left Bank, they left behind inventions geared to new urban experiences and needs. The *Métro*, an idea that dated back to the 1840s, was finally constructed in advance of the 1900 exposition because organizers realized it offered a solution to the street-level congestion that would only increase as the event approached. No doubt competition with New York, Chicago and London was also a factor in the decision[6]. Fulgence Bienvenüe supervised construction and designed the electrically powered system, which, he planned, would be built in stages. The first line, opened in time for the 1900 exposition, ran on the east-west axis of the city from the Étoile, under the Champs-Élysées, to the Porte de Vincennes where sporting events drew exposition visitors to stimulate development on the eastern edge of the city. Later lines also followed the routes of the streets above ground, echoing Haussmann's circulation plan for Paris. However, the left-wing Paris Municipal Council prevailed over the prefect of the Seine when it came to control over the design and construction. It insisted on narrow-gauge tracks, preventing the railroads and railroad interests from entering into the heart of the city, while the placement of projected lines would make inexpensive, rapid transportation available to Parisians of all social classes[7].

The specially designed entrances to the *Métro* aptly symbolized this subterranean break with Haussmann's urban plan for circulation. Aesthetically and technologically, architect Hector Guimard's fantastical green-iron vegetation and orange, insect-eyed electric lights signaled a shift in this culture of change. Their elongated tendrils stood out against the stone geometry of gaslit streets and opened the way to new, electrified experiences of space and time below ground[8].

Paris, Imprimerie nationale, vol. 3, 261-262.

6   A useful modern history of the Paris *métropolitain* is GUERRAND, Roger-Henri (1986) *L'aventure du métropolitain*, Paris, La Découverte.

7   A number of recent studies on the Paris "Métro" have appeared in French, in addition to GUERRAND (1986). Among them are : BINDI, Armand ; LEFEUVRE, Daniel (1990) *Le Métro de Paris: histoire d'hier à demain,* Rennes, Ouest-France; Gasnault, François; ZUBER, Henri (1997) *Métro-Cité : le chemin de fer métropolitain à la conquête de Paris, 1871-1945*, Paris, Musées de la Ville de Paris; JACOBS, Gaston (2001) *Le métro de Paris : un siècle de matériel roulant,* Paris, éditions la Vie du Rail.

8   WEISBERG, Gabriel P. (2000) "The Parisian Situation: Hector Guimard and the Emergence of Art Nouveau". In: GREENHALGH, Paul (ed.) (2000) *Art nouveau: 1890-1914,* New York, Harry N. Abrams, 264-273

Exhibition planners returned to Haussmann's Paris in the plan to join the lower end of the Champs-Élysées with the Left Bank. The idea to link the two sides of the Seine at this point originated with Alfred Picard, who wanted to make the area the keystone of the 1900 exposition[9]. Planners incorporated a number of Eugène Hénard's ideas to integrate the exposition on the left and right banks of the Seine, to enhance traffic circulation, as well as provide an appropriately grand approach perpendicular to the Champs-Élysées. The project required intercepting the Champs-Élysées and constructing two large exhibition buildings (the Grand and Petit Palais) at this point, as well as a bridge over the Seine. It also made use of the boulevards, railway stations, sewers and lighting systems already in place. Hénard's contribution, the Pont Alexandre III, was the organizing structure for a monumental urban ensemble; the bridge links the Champs-Élysées with the broad, open Esplanade des Invalides[10]. Visually, the bridge, with its innovative single-span design, was part of an urban perspective closed off by the dome of the Invalides. Functionally, it allowed traffic to flow across the Seine in both directions, from one part of the exposition and of the city to the other[11].

3.- Expositions and the Liberal Democratic Order.

Such celebrations of industrial might also inaugurated changes in the way the Parisian population and those contracted to build the exposition did busi-

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9   The plan to integrate the left and right bank via a bridge at the Esplanade des Invalides at the time of the exposition was Picard's. See PICARD, Alfred (1902-1903) "Programme du concours sur les dispositions générales des bâtiments, jardins et agencements de l'Exposition (partie urbaine)", Art. 4. In: PICARD, Alfred (1902-1903) *Exposition universelle internationale de 1900 à Paris. Rapport général administratif et technique. Pièces annexes. Actes officiels. Tableaux statistiques et financiers*, Paris, Imprimerie nationale, 79, art. 7.

10   For Hénard's contribution, see HÉNARD, Eugène (1896) *L'Exposition universelle de 1900 devant le Parlement. Pourquoi il est nécessaire d'exécuter le projet issu du concours public de 1894 et des travaux du Jury*, Paris, G. Delarue ; and WOLF, Peter (1968) *Eugène Hénard and the Beginning Of Urbanism in Paris 1900-1914*, Paris, Centre de recherche d'urbanisme, 29; WOLF, Peter (1967) "The First Modern Urbanist", *Architectural Forum*, vol. 127, num. 3, 52.

11   SILVERMAN, Debora L. (1989) *Art Nouveau in Fin-de-Siècle France: Politics, Psychology, and Style*, Studies on the History of Society and Culture, 7, Berkeley, University of California Press, 169. EVENSON, Norma (1981) *Paris, A Century of Change*, New Haven, Yale University Press, 24-34, 66-68, and figure 16, discusses Hénard's plans and shows his traffic circle idea. Hénard's later traffic circle plans include that for the *Étoile* constructed in 1907. This "carrefour a gyration" was an ingenious attempt to deal with the existing congestion of carriages, horses, and with the automobiles he predicted would soon increase the snarl.

ness. Contracts with private firms that supplied materials (especially iron), required that they work within the protocols, standards, and methods set by the exposition planners. More dramatically, the Republicans created funding arrangements that wedded the objectives of democratic government with liberal economic commitments to efficiency and profit-making investment in technological projects. Judging from the comments of Édouard Lockroy, the Republicans were out to disprove Le Play's critique of expositions as wasteful economic endeavors by using them to demonstrate that democracy and industrial capitalism could work together for a better future[12]. Under government direction, funding for the expositions came from a combination of taxes, exhibit charges, and collaborations with business[13]. The collaboration between state and private enterprise was reflected in the choice of architects and engineers for the 1878 exposition. While both Gabriel Davioud and Jules Bourdais were state employees, the state commissioned an engineer from the private sector for the main entryway to the exposition: Gustave Eiffel's firm built the façade of the *Palais de l'Industrie*, designed by Leopold Hardy[14].

The expositions altered the physical city and also allowed Republican elites to reify and vivify their visions of the new industrial order. And no monument of the Third Republic symbolized these open-ended possibilities better than the Eiffel Tower. Eiffel himself saw the tower as a thing of beauty, its asymptotic curves the material equivalents of geometrical laws and the laws of physics[15]. Lockroy chose to interpret the form in more political terms:

> "[The Eiffel Tower] *summarizes the industrial grandeur and power of the present. Her immense spire, buried in the clouds, has a symbolic quality; it is the image of progress as we conceive it today: an unending spiral where humanity gravitates in its eternal ascension*"[16].

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12 LOCKROY (1890) XV and XX; LEVIN (1982), 56 and 249, n. 94.

13 See, for example, PICARD (1902-1903), *Pièces annexes,* art. 9-13, 84-93, and Tableaux nos. 7-12, 739-910

14 Eiffel also received some attention for his role in another project: the iron interior of the statue of Liberty, whose head was on view in the Trocadéro Garden.

15 EIFFEL, Gustave (1900), *La Tour de Trois Cent Mètres*, Paris, Lemercier.

16 [The Eiffel Tower] "résumait la grandeur et la puissance industrielle du temps présent. Sa flèche immense, en s'enfonçant dans les nuages, avait quelque chose de symbolique ; elle paraissait l'image du progrès tel que nous le concevons aujourd'hui : spirale démesurée où l'humanité gravite dans cette ascension éternelle", LOCKROY (1890), XXV, quoted in Levin (1982), 45.

Most important for Lockroy was the fact that the tower engaged millions of visitors from Paris, the nation and the world in an experience that touched their imaginations and sensibilities, inspiring them with a feeling of controlled ascent and comradely support they would bring back to earth[17]. Eiffel and the French government committed to sharing the costs of construction. Looking ahead to the profit-making potential of the giant edifice, Eiffel agreed to repay the state's investment in exchange for the right to the concession for the tower –which he would turn over to the state at a prearranged date[18].

The great iron edifice stood as a gateway to the 1889 exposition, where as part of a vast ensemble of iron structures it served the function of a giant triumphal arch. Through it one entered a "U"-shaped arena in which the placement of the Galerie des Machines and the palaces of the fine and liberal arts constituted a schema of industrial society, where fundamental production processes supported and benefitted from the products of intellectual and artistic labor. The entire exposition, Lockroy argued, like the revolution it celebrated, was "a glorious event in our history… the point of departure for the entire world of a new era"[19].

As if to show what that new era turned out to be, the 1900 exposition –which added "Internationale" to its name– was a gorgeously clothed and larger version of 1889, reworked to emphasize the promises of growing consumer markets and the world empire in which Paris participated. The exposition's theme was "An Accounting of the Century", as Picard's introduction in the official catalogue is careful to explain[20]. In overwhelming amounts of evidence on display, it attempted to prove that the outcome of scientific and technological innovation had been and would continue to be a better life for everyone in the world. This message was communicated to visitors as they moved from the painted and bejeweled entry arch crowned by the fashionably dressed figure of Peace, towards the Champs-Élysées across the Pont Alexandre III onto the Esplanade des Invalides. Flanking their path were the Grand Palais and the

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17 The details of the contract are discussed in PICARD, Alfred (1891-1892) *Exposition universelle internationale de 1889 à Paris: Rapport général,* 10 vols., Paris: Imprimerie nationale, vol. 2, 266-269; *Harpers Guide to Paris* (1900), 150-151; LEVIN (1982), 42-43 and 239, n. 130.

18 *Ibid.*

19 LOCKROY (1890), XXV, quoted in LEVIN, Miriam R. (1989) *When the Eiffel Tower Was New: French Visions of Progress at the Centennial of the Revolution*, South Hadley, Mass., [Amherst] University of Massachusetts Press, 22, n. 34 [Electronic reproduction. Boulder, Colo.: NetLibrary, 2000. Available via the World Wide Web].

20 PICARD, Alfred (1891-1892) *Exposition universelle internationale de 1889 à Paris, op cit.*, vol. 1, 10-12. Picard elaborated on this point in a later publication: PICARD, Alfred (1906) *Exposition universelle internationale de 1900 à Paris. Le bilan d'un siècle (1801-1900)*, Paris, Imprimerie nationale, vol. 1, "Avant Propos", I-IV.

Petit Palais, housing fine arts exhibits. Art Nouveau reigned as the style of middle-class domestic interiors, and decorative arts objects from armoires, desks, and electric lamps to innovatively processed glassware[21].

If visitors chose to enter from the Trocadéro across the Seine, they passed through gardens where the colonial holdings of France took up one side and those of other world powers the other. The Trocadéro Palace itself, used for numerous international scientific and technological congresses at the fair, might be considered the cerebral cortex of that great Parisian brain Zola had conjured up almost twenty years earlier. Crossing the Seine, they passed under the Eiffel Tower to face the Château d'Eau and behind it the stuccoed Palace of Electricity, designed by Hénard, stretched across the Champ de Mars. The Palace was adorned with electric lights. On exhibit there were "all the applications of electricity, telephonic systems and all recent electrical inventions", while hidden from view were the dynamos that supplied this newly tamed power source to the entire exposition, through "invisible wires and powerful motors"[22]. The complicated negotiation of past, present and future that electricity posed for fair organizers had perhaps no better example than the display at the center of the Château d'Eau. Here, colored electric lights played on a giant Louis XV-style waterfall fed by water electrically pumped from the Seine that exited into a pool where a thirty-foot tall Beaux-Arts sculpture group allegorized "Humanity Guided by Progress Advances toward the Future".

As the examples of Eiffel Tower, Château d'Eau, and Palace of Electricity suggest, the 1899 and 1900 expositions gave elites the opportunity (or, perhaps, even forced them) to think about how to construct time and space in more fluid ways. Like the fairs mounted during the Second Empire, each was an attempt at bundling human products, activities, and cultures into intellectually coherent, political narratives that privileged industrial society, and in the case of the 1889 and 1900 exhibitions, the Republic's sense of its historic mission. This organizing was done via standardized rules and regulations for submission and display, but materialized in the catalogue and especially in the site plans of the expositions themselves.

In Lockroy's view, the nationally organized exhibits at the 1889 exposition constituted an *Encyclopédie*, referring specifically to the eighteenth-century compendium of Enlightenment ideology that set France at the head of Western progressive ideas. If it showed what national adherence to science and technology could accomplish, it also acknowledged the great revolution of 1789 as inaugurating the economic and

21 SILVERMAN, Debora L. (1989) *Art Nouveau in Fin-de-Siècle France,* 160, 169, 284-289.
22 *Harper's Guide to Paris* (1900), 164.

political liberty necessary for intellectual freedom to function in society's interests[23]. In the context of international competition, the present on view in Paris was but a spur to further improvement for each nation under the aegis of French Republicanism.

Picard devised a novel organization that downplayed the old national competitions in favor of broad classifications corresponding to economic and social categories around which industrial societies were now structured[24]. The fact that a statue of *La Parisienne* (a statue symbolizing, some said, "Peace") topped the fair's ornate entry arch, while the Seine was filled with warships from the participating nations, speaks of the contradictions and hopes alive in Picard's plan. In an exposition that measured the century's accomplishments and wished to set a course for the future, organizers hoped emphasizing international perspectives on the benefits of science and technology might deflect current hostile competition into future peaceful ends[25]. Thus, countries competed within palaces such as Instruction and Education, Chemical Industries, and Civil Engineering. On the Trocadéro Hill, private enterprises and agencies doing business in (or with) the colonies mounted exhibits of everything from Parisian-built hydraulic and transport systems to reports, charts, and graphs on plantation administration and schools[26]. Following official guidelines for all participants, French exhibitors played down the race for world domination by showing how circulation of industrial goods and ideas under the aegis of the mother country was a force for mutual, if unequal improvement[27].

The narrative of industrial progress was alive at the fairs, and showcased in exhibits that provided popular experiences of what might lie in store for urban consumers in the future: the moving sidewalk that carried visitors along the Seine between the entry and the Champ de Mars; the electric automobiles manufactured in the city, used to set hundreds of tables for the visiting mayors' banquets and available for private rental; the lifts for the Eiffel Tower; the aeronautic demonstrations across the

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23 LEVIN (1982), 108 and 251, n. 117.

24 *Harper's Guide to Paris* (1900), 156 p.; Picard (1891-1892), see note 20 above.

25 PICARD (1902-1903).

26 See explanations and lists of exhibitors in *Groupe XVII Colonisation, Classes 113 a 115, Catalogue général officiel. Exposition Internationale Universelle de 1900* (1900 ?), Paris, Imprimeries Lemercier, v. 19, *passim*; CHARLES-ROUX, M. J. (1902) *Rapport général. L'organisation et le fonctionnement de l'exposition des colonies et pays de protectorat, Exposition universelle de 1900*, Paris, Imprimerie nationale; (1900) *Guide illustré de l'Exposition coloniale française au Trocadéro en 1900*, Cambrai, imprimerie F. et P. Deligne; *Harper's Guide to Paris* (1900), 167-168. On colonial exhibits at the 1889 exposition, FONTAINE, Louis (1891) *Rapports de M. Louis Fontaine, Ministère du Commerce, de l'Industrie et des Colonies. Exposition universelle internationale de 1889, à Paris*, Paris, Imprimerie Nationale.

27 Official guidelines for exhibiting ethnographies, colonial products: Official catalogue on Colonial exhibits.

city's skies; and the electrical powering of numerous domestic, urban, and industrial technologies on view, to name only a few. But Paris was very much present in exposition participants' plans for shaping the future path of several pressing issues: public health, meteorology and aeronautics, and social economy. In the case of public health, Paris took the lead in 1900 when the international commission created by the medical congresses there adopted the city's methods for keeping track of mortality rates and causes[28]. Their efforts standardized nosology and data analysis internationally, based on the system devised by physician Jacques Bertillon, head of Paris's municipal department of vital statistics.

In 1900 scientists from Paris-based institutions dominated the international congresses devoted to meteorology and aeronautics[29]. While the meteorologists focused on aerial achievements that would increase knowledge of earth's atmosphere and might eventually allow humans to escape it, the French Minister of War sponsored a private tour for attendees showing off the army's nearby balloon factory. With Germany's scientists and military very much in mind, organizers of the aeronautic exhibition on the Champ de Mars featured a variety of French inventions, including the Avion flying machine designed by Clément Ader. A batlike construction based on Marey's studies of birds, it was powered by a steam engine and offered a promising – if as yet unproven – approach to conquering the skies. A seven-mile dirigible race, between Vincennes and the Eiffel Tower, was planned, and the Aero-club de France sponsored demonstrations and competitions that filled the skies of Paris with balloons and newly developed gasoline-powered steered dirigibles. Contests pitted nations against one another in races to go higher, farther, and faster with greater accuracy.

A number of scientists at the meteorological and aeronautical congresses

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28 *Foreign Correspondence* (1900), "System for Death Statistics: International Commission Wants Adoption of Bertillon Method", *New York Times*, September 2, 1900, http://www.proquest.com/ (accessed January 3, 2008).

29 The distinguished astronomer Jules Janssen, head of the French astrophysical observatory and president of both congresses, introduced the disturbing spectre of what progress in aeronautics on view at the exposition augured for the international industrial order. Rather than focus on possibilities opened for mail delivery or rapid commercial travel between distant cities, the American journal *Science* reported: "M. Janssen predicted that the nation which first learned to navigate the air would become supreme, for while the ocean […] has its boundaries, the atmosphere has none. What then […] will become of national frontiers when the aerial fleets can cross them with impunity?" See: ROTCH, A. Lawrence (1900) "The International Congresses of Meteorology and Aeronautics at Paris", *Science,* 12, no. 308, 796-799.

worried that working to achieve these goals, they opened possibilities for destroying the very society they had participated in building. The distinguished astronomer Jules Janssen, head of the French astrophysical observatory and president of both congresses, introduced the disturbing spectre of what progress in aeronautics on view at the exposition augured for the international industrial order, as reported in the American journal *Science*:

> *"M. Janssen predicted that the nation which first learned to navigate the air would become supreme, for while the ocean…has its boundaries, the atmosphere has none. What then…will become of national frontiers when the aerial fleets can cross them with impunity?"*[30]

German dirigibles, floating in to bomb the city in 1915, would soon prove Janssen's fears correct. Mastery of the air threatened the destruction of the modern city Republican progress had wrought.

The organizers of the social economy exhibits in 1889 and 1900 were more optimistic and literally more down-to-earth in their focus on using science and technology to solve social problems. The exhibits and projects on view included both direct and indirect approaches to integrating workers into modern society, and to proffer scientific solutions to achieve this end. Not only did they distill their existence into scientific data, statistical charts, and photographic evidence; but among these solutions were proposals and plans for inexpensive urban housing that was connected into sewers and other infrastructural improvements. Government officials and ministries and private societies were involved in mounting these exhibits, which in turn generated congresses, new organizations, committees, and international exchanges of research and individuals all focused on bringing the culture of change to bear on the lives of working-class people[31].

While the exhibits were not entirely devoted to Paris, the capital city as subject and home to the government agencies and nongovernmental organizations that organized the displays held a primary place in the pavilions. Likewise, the congress held in the Pavilion d'*Économie sociale* in June 1900 turned Paris into a major center for the international organization, coordina-

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30   *Ibid.* On Paris during World War I, WINTER, J. M. (1997) *Capital Cities at ar: Paris, London, Berlin, 1914-1919,* Cambridge [England] and New York, Cambridge University Press.
31   Social economy exhibits at the expositions - Musée Social.

tion and dissemination of information on social economy, setting into motion a series of historically important institutional developments centered in Paris.

As mentioned above, enthusiasm among followers of Le Play and conservative Republicans led to the formation of the Musée Social in 1894. It attracted the support of conservative Republican politicians, most notably Jules Simon and Jules Siegfried. The Musée took a special interest in urban housing, working to draw up legislation to encourage investment in low-cost housing construction, and early on establishing sections on urban hygiene and urban housing[32]. Along with the Société française des habitations à bon marché (1894), and later the Société française des urbanistes (1911), the Musée Social constituted a novel and important nexus for architects, politicians, sociologists and reformers to develop proposals for housing design and social hygiene and legislation to encourage investors to build it[33]. In combination with its broader vision of the modern city and the nation as social systems necessary for the operation of the modern industrial order, the Musée Social's support for urban housing research would make it one of the cradles of French urbanism in the decade before World War I.

Eugène Hénard was perhaps the most important architect among the men who met at the Musée Social in these years. He was also a charter member of the Société française des urbanistes and contributed an important paper to the first meeting of the international society of urbanists in London in 1911. While his architectural impact on Paris, as discussed above, was more significant than is usually acknowledged, he is arguably more important as a quintessential urbanist. In essence, he helped found a new profession that saw the city as a rational whole, a system that could be scientifically planned, designed, and built to accommodate new industries, new power sources, and new modes of transport. By the first decade of the twentieth century, he had proposed a universal plan for the city of the future. Like Jules Verne in *Paris in the Year 2000*, Hénard identified nascent industries and extrapolated a picture of their technologies as dominant animators of the future city. Unlike Verne forty years earlier, as a practicing architect Hénard could make use of statistics and research to forge a convincing, plausible plan. He replaced the old hodgepodge of different systems (roads, sewers, lights, transport, buildings

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32 HELBRONNER, Jules (1890) *Report on the social economy section of the Universal International Exhibition of 1889 at Paris, description*, Ottawa, Printed by Borwn Chamberlin.

33 HORNE, Janet R. (2002) *A Social Laboratory for Modern France: The Musée Social & the Rise of the Welfare State*, Durham, NC, Duke University Press.

made of stone and wood) with one rationalized, mechanized, and integrated system of circulation, including the automobile, the airplane, and electricity, which extended into the air as well as below and above ground[34].

In seeming contradiction to the focus on the urban future in Paris, a number of exhibits and concessions took a "forward to the past" approach toward historical continuity, congenial to Lockroy and Picard's progressive programs for 1889 and 1900. Rather than providing escapes from the present, they evoked the history of urban life in very modern terms. Connections between present and past in the city were evident in Parisian-themed popular amusements. In 1889, visitors to the Bastille attraction rode on wheeled wooden horses, which sped them up and down on a roller coaster track through a mock reconstruction of the fortress where the Revolution –here defanged by arcade machinery– had begun. The messy deaths, popular uprisings and profound emotions the Bastille had once brought to mind were now smoothed into safely historicized thrills of technologically driven motion. In 1900 visitors could take the new *Métro* to the popular Old Paris concession on the Right Bank. There they wandered through plaster and paint reconstructions of medieval buildings on cobblestone streets bordered by artisans' shops and restaurants, but unencumbered by churches or prelates. In this mock city, the present was always "present"[35]. Electrically illuminated at night and free from the premodern historical realities of rotting sewage, poverty, and religious and social strife, Old Paris seems to have idealized the city's past, attributing to it the standards of modern Republican Paris, whose roots could be found there and whose "real" spires – Notre-Dame, the Conciergerie and the Eiffel Tower – were clearly visible.

The City of Paris pavilion itself offered an official variant of this collapsing of past and present with the future. Built of wood rather than iron and glass, in a style reminiscent of the old Hôtel de Ville, the pavilion sported Paris's medieval coat of arms and emblems, recalling the city's ancient trades and corporations. Inside, their supposed contemporary incarnations, the city's

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34 See in CHAMBELLAND, Colette (ed) (1998) *Le Musée social et son temps*, Paris, PENS: CHAMBELLAND, C. "Avant-propos: Des réseaux et des champs d'intervention du Musée social", 9-10; ROSANVALLON, Pierre "Préface: Figures et méthodes du changement social", 7-8; GUERRAND, Roger-Henri "Jules Siegfried, la 'Société française des habitations à bon marché", 157-174; MAGRI, Susanna "Du logement monofamilial à la cité-jardin. Les agents de la transformation du projet réformateur sur l'habitat populaire en France 1900-1909", 175-220.

35 See notes 45, 51 and 53 above.

newly founded departments of "Public Roads, of Light, Water and Drains, and those of the Quarries and new Metropolitan Railroad", mounted statistical charts and photographic evidence of the latest infrastructural improvements to the city. On the floor above, the major educational institutions and libraries of the city had organized exhibits[36]. A cinematograph projected educational movies of these departments at work, adding to the impression that these organized and organizing municipal activities stretched from the present into the future[37].

By comparison with these efforts, Charles Garnier's large exhibit on the History of human habitation at the 1889 exposition offered a more abstract approach, one that did not include Parisian dwellings. His vision of change could be applied to any contemporary example. As Garnier explained in the book that accompanied the exhibit, he imposed a modern system of chronological development on a panoply of ideal types, starting with the shepherd's hut and ending with the modern city house. In creating this taxonomy, he seems to have followed a procedure that combined analytical approaches well established among his colleagues at the École d'architecture with those of professors at the Muséum d'histoire naturelle], and a nod to ethnography as well. It is a method that Ronald Pickstone has called the "analytical/comparative or museological/diagnostic", linking social and cognitive forms –in Garnier's case abstracting out and comparing select characteristics of middle-class domestic living spaces. Although he sidestepped the more politically charged issue of comparing the design of worker housing across historic cultures, his exhibit nevertheless focused on a topic of intense interest among contemporaries[38].

There is no doubt that expositions under the Third Republic materially advanced the Haussmannian plan for the city. These mammoth fairs did contribute to Paris's becoming a more technologically organized space through urban rebuilding and construction of the *Métro* and rail links, and they increased the connections between the city, the hinterlands, and the world beyond France's borders, including the expanded empire. Yet, they were distinctive too. Following Ferry's hopes, late nineteenth-century expositions in Paris extended the international and institutional reach of liberal science

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36 REARICK, Charles (1986) *Pleasures of the Belle Epoque: Entertainment and Festivity in Turn-Of-The-Century France*, New Haven, Yale University Press.
37 Description in: *Harper's Guide* (1900), 161-162.
38 *Ibid.*, 162.

and technology into future oriented projects that attempted to reign in or steer capitalist agendas into democratic objectives. The Paris *Métro*, although designed by a *polytechnicien*, was a project of a left-leaning city council using the exposition as an opportunity to keep railroad interests at bay. Moreover, the expositions generated French-led international organizations of rising professionals from the emerging bureaucracies of industrial nations. Through these networks for collecting, exchanging, and disseminating knowledge about science and technology, urban society, and urban planning, the French led the way in setting standards and regulating cooperative arrangements between governments, private industry, and commercial establishments. Metaphorically these organizations might be considered expressions of Zola's vision of Paris as a great brain where intellectual liberty was a force for peace. But the opposite was also true of the expositions: In turning the city into a stage for demonstrating electricity, the automobile and airpower at the fair, Republican elites helped open the door to a wholly different level of industrial existence, one characterized by greater interconnection at a faster pace, yet threatened by new forms of disorder.

To step back a bit, we can see these expositions also demonstrated a palpable shift in perceptions of time in the city and conceptions of history itself. Organizers and participants in committees, congresses, and commissions redefined Paris under Republican auspices as a place where elites increasingly evaluated scientific and technological achievements more in terms of their organizing power and effects on progress, than in terms of their actual contribution to the material improvement of city life. At the same time, in the process of creating organizational structures, they turned the products of science and technology into artifacts of an ongoing history.

4.- Expositions, Museums and the Making of History.

In comparison with the Second Empire, which isolated mementos of the Parisian past in a municipal museum set amid a sea of new construction, Paris in the early Third Republic was what can only be described as a city "museified" on scientific and technological terms. Spurred by the staggering growth of the tourism industry as a result of the expositions, Paris emerged as a vast showcase, where science and technology linked past and industrial present. Simply as the result of the aesthetic character imposed on it by the

building codes, the city became a panorama integrating past and present structures into one continuous experience. Moreover, with encouragement from Republican ministers bent on making Paris the intellectual center of its new empire and the civilized world, a new breed of specialists worked to make the growing number of Parisian museums into important centers for collecting, organizing, and disseminating information about the natural and human world. An evolutionary schema set forth Paris as the great organizer of industrial progress.

The museification of the city was accomplished partly through the officially mandated system of proportions for street width and building and story height. In conjunction with the official preference for neoclassical, neo-Baroque and Beaux-Arts styles, sandstone, and limited color schemes, these formulae created modern architectural frames aesthetically compatible with older buildings.

To some, including the artists and writers who signed the infamous petition against it, the Eiffel Tower seemed a shocking anomaly in this Parisian display. Visually, culturally, and even morally it represented a break between a preindustrial past and the modern capitalist present[39]. But supporters saw the Tower – through the lens of Republican reform – as integral to the modern city, arguing that this iron skeleton laid bare the same rational principles and values at work, though hidden, in great historic monuments such as the Arc de Triomphe and Notre-Dame[40]. This particular vision of Paris emphasized its role as a museum of technology, the city as the site of an ongoing engineering tradition[41].

Guidebooks both reflected and helped create the panoramic conception of Paris as a place filled with scientific and technological points of interest. While these guidebooks provide an outsiders' view of how museums in Paris were shaping notions of the past and present, their need to be "au courant" makes them a good means for identifying changes going on within the institutions themselves. From them we can tell that some of the most important museums contained scientific and technological collections, some

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39 Quoted in PICKSTONE, John (1994) "Museological Science? The Place of the Analytical/Comparative in Nineteenth Century Science, Technology and Medicine", *History of Science,* XXXII, 111 and 118-124.
40 LEVIN, Miriam R. (1993) "The City as a Museum of Technology", *History and Technology*, vol. 10, num.1-2, 27-36.
41 The Lockroy's Préface contains a reprint of the artists' petition and Lockroy's reply; LEVIN (1993).

sought scientific and technological information about the objects in their collections, and that most of their curators wanted to organize their collections using classification systems that reflected natural laws governing change. Hence, the Musée de la Ville de Paris, reestablished and reconstituted in the decade after the Commune, divided its collection by chronological periods in the city's history, ending with the Revolution. A nineteenth-century section was planned. The original mission of the Musée des arts décoratifs, founded in 1882, included the classification, by period and culture, of manufacturing processes and materials used to produce objects such as ceramics, textiles, glass, and furniture[42]. At the Conservatoire des arts et métiers, curators did extensive research and reinstalled the galleries during this period, publishing a detailed catalogue of the mechanical arts collections in 1911; this was designed as a visitors' guide through the history of this important branch of nineteenth-century technology[43]. The Muséum d'histoire naturelle and Musée d'anthropologie at the Jardin des Plantes and the Musée d'Ethnographie at the Trocadéro, all contained scientific and technological artifacts; at each institution the concern was to develop and apply schemas that privileged differences in time and place among like types of objects so as to rank them in a progressive order with Western civilization at the forefront[44].

Officials in the ministry of Public Education and Fine Arts encouraged museums to pursue these goals through legislation[45]. In addition, societies (both *privée* and *d'utilité publique*) were important forces for mobilizing museum programs and founding specialized museums to pursue scientific agendas. Among the most active advocates of museums were the Union

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42 On the history of the Musée des Arts décoratifs and its origins, BRUNHAMMER, Yvonne (1992) *Le Beau dans l'Utile. Un musée pour les arts décoratifs,* Paris, Découvertes Gallimard, nº 145. Ernest Hamy, in *Les origines du Musée d'ethnographie,* fac-simile de l'éd. de Paris, E. Leroux, 1890, Paris, J.-M. Place, 1988 (*Les cahiers de Gradhiva, 7),* provides an idea of Jules Ferry and Antonin Proust's efforts in the ministry of Education and Fine arts to found museums during this period.

43 *Catalogue des collections du Conservatoire national des arts et métiers* (1905, 8th ed.), premier fascicule, 8th ed., Paris, E. Bernard.

44 DIAS, Nelia (1991) *Le musée d'Ethnographie du Trocadéro: 1878-1908: anthropologie et muséologie en France,* Paris, Éd. du Centre national de la recherche scientifique; HAMY, Ernest-Théodore (1890; reprint 1988) *Les origines du Musée d'ethnographie.* Fac-simile de l'éd. de Paris: E. Leroux, 1890 ; Paris, J.-M. Place, *Les cahiers de Gradhiva, 7.* Just to give an example of ethnographic museum foundings in France, between 1841 and 1860, 78 were founded, and 92 between 1861 and 1880 (DIAS, 1991).

45 See HAMY (1890; reprint 1988), for documents and correspondence regarding Ferry and Proust.

centrale des beaux-arts appliqués à l'industrie, the Société du Musée des arts décoratifs, the Société d'anthropologie, and the Société d'ethnographie. Organizations often competed with one another for control over emerging areas of specialization and the associated artifact collections[46].

The government and specialists did agree on the main reasons for supporting museums – all of them replete with Republican historical consciousness. Highest on the list were national prestige, economic benefits, and usefulness to science[47]. Both also succumbed to the opportunity to increase national treasures by purchasing quantities of artifacts and even entire exhibits on view at the international expositions[48]. In the highly competitive climate of late nineteenth-century industrial societies (Berlin, Chicago, and London already had impressive sets of new museums), institutional acquisitions promised to place France at the head of modern historical forces.

The history of the Musée d'Ethnographie du Trocadéro under its first director, Ernest Hamy, provides a good example of how specialists, charged with classifying collections, added goals that reflected their own research and disciplinary objectives[49]. Hamy started the ethnographic collection as a curator of the anthropology collections at the Muséum d'histoire naturelle, where he sorted out and attempted to classify what he felt were ethnographic rather than anthropological artifacts. Hamy saw the announcement of the 1878 exposition as an opportunity to add ethnographic materials to those he had already culled from the anthropological holdings. It also inspired him to begin lobbying the government for a separate building that was well placed in the city and architecturally suited to exhibiting the collections in a coherent way. With the support of a commission that included Jules Ferry, the result was an ethnographic museum, officially founded in the east wing of the Trocadéro Palace in 1879 (it was a predecessor to the acclaimed *musée de l'Homme*, established in a new building on the same site in 1927). Here Hamy could consolidate materials previously dispersed in a number of museums,

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46 BRUNHAMMER (1992), 33-37 and 45. The UCBAI and SMAD were fused into the Union central des arts décoratifs in 1882, when it was declared by government decree as an *Association reconnue d'utilité publique.*

47 DIAS (1991), Préface, ii.

48 Photographic exhibit of French mechanical engineering from 1900 and the Political Economy exhibit from 1889 went to CNAM, for example: See *Catalogue des collections du Conservatoire national des arts et métiers* (1905, 8th ed.), Avis and 45-46; and Dias (1991).

49 On Ferry and Proust's involvement in the society and the museum, see BRUNHAMMER (1992).

sort through artifacts obtained from the expositions, and analyze, classify and display them for research, public education and profit[50]. The 1889 exposition allowed him to fill out the collections with objects from the new South Asian and African colonies, as well as from North Africa, China, Japan, and Amerindian cultures. The 1900 exposition served the same purpose, while also helping to highlight the museum's collections in the Trocadéro wing, located just above the French colonial exhibits.

His definition of ethnography was broad, and he made certain to couch the new field of study in terms of the contributions it made to understanding human history, human activity generally and to the other disciplines with whom he was competing. The "new" science of ethnography was really the binding agent in a growing knowledge network[51]. Taking his cue from the historian Hippolyte Taine (1828-1893) and from Scandinavian ethnographers, Hamy founded his classification system on the premise that artifacts were expressions of a common human psychology and the products of common human needs. Organizing them by culture and date and focusing on certain traits or physical characteristics of objects allowed for historical and evolutionary comparisons. This approach had the practical advantage of allowing him to include artifacts from both colonial and European cultures within a universal framework. His classification system began with the physical types or races, and then moved to basic human necessities for survival, up a chain of increasingly elaborate activities: food, defense, dwellings and ways of living, furnishings, means of communication, industry and commerce, arts and sciences, religion, and social life[52].

It also might be argued that Hamy's system was a partial realization of that story of human progress found in Condorcet's famous *Sketch for a History of the Human Mind*. Within the museum he could display peoples

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50 HAMY (1890, reprint 1988).
51 DIAS (1991),105-109.
52 This claim to co-opt and link the subject matter of the other human sciences was matched by his classification system that attempted to bring all of human production and invention over time and space, including that of colonized people, into one coherent explanatory order. "Ethnography was the study of all the material manifestations of human activity" and its focus was on "all that which, in the material existence of individuals, families, or societies, bears a characteristic trait [of humanity] [author's insert]." "L'étude de toutes les manifestations matérielles de l'activité humaine […] tout ce qui, dans l'existence matérielle des individus, des familles ou des sociétés, présente quelque trait bien caractéristique, est du domaine de l'ethnographie." In: HAMY, Ernest-Théodore (1988) "Classement général des groupes et projet de classification des collections ethnographique", quoted in DIAS (1991), 154-155.

within a common framework based on selective empirical observations. His developmental comparisons were based on the Enlightenment ideals and values prized by Republican elites: the primacy of the individual, the family as foundation stone of society, the centrality of work and invention in human progress, and the irrational character of religious beliefs and practices[53]. In a very concentrated way, Hamy's museum was a place where the Republicans' vision of a future order was brought around full circle to encompass the past. In this sense, it was fully in tune with other Parisian institutions constructing narratives of the city's evolutionary change in the language of science and technology.

Republican elites transformed the urban past to conform with the direction in which they wished to turn French society. And they made it accessible to the public. While their extension of Haussmann's plan had coherently wedded old to new construction, they had simultaneously museified the city, representing its democratic, industrial present as implicit in the past. Something analogous to this abstraction of the city also occurred within museums—especially those dedicated to scientific and technological subjects. By 1914, curators in Parisian museums had made the city an international center for the invention and dissemination of classification systems that integrated world cultures into an evolutionary representation of the world's past, providing an explanatory framework into which all future discoveries and productions of civilization could be fit.

5.- Conclusion.

Between 1852 and 1914, Paris developed into a modern center of industrial society through the efforts of elites who combined institution building with a belief in the power of science and technology to organize positive change. The mechanisms they used – urban rebuilding and development, universal expositions, and museums – were part of a culture they invented to turn Paris, and through it the French nation, into an organized, powerful society. It is clear that the work of Napoleon III and Baron Haussmann laid the foundations for modernity (historians have long recognized this), but their engagement of industrial capital and urban rebuilding was only the beginning of the pro-

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53   DIAS (1991) on Hamy's classification system.

cess. The elites of the Third Republic eliminated the major blocks to extensive change, founded new educational institutions, and deployed a range of public and private organizations, government agencies, and institutions to extend the reach of science and technology and democratize industrial capitalism. Also as we have seen, one cannot stop at the city's rebuilding to understand how this profound change in culture, in social existence, and in conceptions of time and space came about. Elites' commitment to universal expositions (cities within the city) and museums was an essential factor on all these counts.

The logic of Haussmann's plan and Napoleon III's vision carried through the Third Republic's development of the urban fabric of Paris. Elites did create a very different kind of city by century's end. A sanitary city, a city of engineered streets, with interconnected systems of light, heat, and water was realized for the middle classes, even if it was not extended into the working-class periphery. The *Métropolitain* fit into the general desire for a rapid, mechanized transportation network. It seemed that the plans for the future of the city had come to fruition.

But Parisian elites were to find that the very modern order they created in Paris had unexpected consequences. By 1900 the mid-century idea of the modern city based on steam and railroad industries had played out to its logical conclusion. The advent of electricity, the electric and gasoline driven automobile, and the airplane, as well as steel, were the signifiers of a new, more exciting, and potentially dangerous era, freed from the old earthbound constraints. It was Hénard who saw that Paris was old, and needed to be rebuilt to accommodate the coming ways of life associated with these new technologies, forms of industrial organization, and reconfigured social spaces. He began to design its future on paper, but the political will and economic resources to begin anew were not there.

By 1914, nineteenth-century modern Paris had reached its limits. The interwar period did see the plan for the *Métro* realized, a few boulevards completed, a few museums added in buildings constructed for the *Coloniale* and *Arts décoratifs* expositions, and the Trocadéro Palace replaced by the *Palais de Chaillot*. But these accomplishments simply continued the old solutions rather than addressing how to revise the culture of change for new technological, social, and urban conditions. If the Emperor and the Third Republicans' plans for inexpensive housing and limited amenities remained stalled, their solutions were in any case inadequate and outdated for the traffic-jammed

city and its industrial peripheries, where automobile factories and chemical plants were surrounded by immense worker slums. In the absence of funding and political backing to redesign and rebuild during these hard decades, architects and planners like Le Corbusier turned to their drawing tables and writing pads to imagine a different Paris of the future. Not until after World War II, during the years of the *Trente glorieuses* under the Fourth and Fifth Republics would the dynamics of capitalism once again take hold of Paris. Then, a generation of *dirigistes* elites would appropriate the culture of change to try and reconstruct the city in accordance with another set of industrial ideals.