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THE ORDER OF THE PROPHETS: SERIES IN EARLY FRENCH SOCIAL SCIENCE AND SOCIALISM

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> Everything that can be thought by the mind or perceived by the senses is necessarily a series.[1]

According to the editors of an influential text in the history of social science, "in the first half of the nineteenth century the expression *series* seemed destined to a great philosophical future".[2] The expression itself seems to encourage speculation on destiny. Elements laid out in a temporal sequence ask to be continued through the addition of subsequent terms. "Series" were particularly prominent in the French Restoration and July Monarchy (1815–48) in works announcing a new social science. For example, the physician and republican conspirator J. P. B. Buchez, a former follower of Henri de Saint-Simon who led a movement of Catholic social reform, made "series" central to his *Introduction à la science de l'histoire.* Mathematical series show a "progression", not "a simple succession of unrelated numbers"; in human history, we discover two simultaneous series: "one growing, that of good; one diminishing, that of evil." The inevitability of positive progress was confirmed by recent findings in physiology, zoology and geology. Correlations between the developmental stages of organisms, species, and the Earth were proof that humanity's presence in the world "was no accident", and that "labour, devotion and sacrifice" were part of the "universal order". The "great law of progress" pointed toward a socialist republic in fulfilment both of scripture and of the promise of 1789. For Buchez, as for many of his contemporaries, series both described and predicted. At the same time, they were a call to action.[3]

This period gave birth to two closely related neologisms: "sociology", coined by Auguste Comte, and "socialism", which entered French in the works of Pierre Leroux. Both terms were shaped by new experiences of time. Michel Foucault offered one perspective on these changes in his archaeology of the human sciences: the modern *episteme*, he wrote, was defined by the replacement of static series by historical series. At the end of the eighteenth century, the temporal pre-eminence of classificatory tables of differences and identities, including the "animal series" stretching from the simplest organisms up to man, gave way to the temporally oriented series of language, life and labour: philology's sequences of roots and inflections, Cuvier's "micro-series" of organs and "macro-series" of organisms, and the "great linear, homogeneous series … of production" identified by Ricardo. According to Foucault these newly historically-minded disciplines provided models for the "hazy" knowledge in the human and social sciences and shaped the temporal orientation

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of the political imaginary: "In the nineteenth century, utopia is concerned with the final decline of time rather than with its dawn: this is because knowledge is no longer constituted in the form of a table but in that of a series, of sequential connection and of development."[4] Frank Manuel confirmed that if most utopias of the eighteenth century were "stable and ahistorical, ideals out of time", in the French Restoration they "became dynamic and bound to a long prior historical series. They should henceforth be called euchronias — good place becomes good time".[5] This paper considers the use of 'series' in the utopian social science of three of the "prophets of Paris" studied by Manuel — the Saint-Simonians, Charles Fourier and Auguste Comte — as well as two less familiar social theorists, Pierre Leroux and, briefly, Pierre-Joseph Proudhon. The diverse uses of the term 'series' in their projects reveal the fundamental link between the appearance of a new, historically grounded science of society and the prophetic call to build society anew.

One development in the social sciences that has received considerable attention is the emergence of statistics in this period. Series played a part here, as statisticians depended on forms of probabilistic reasoning that anticipated future results on the basis of previous instances and employed the calculus with its series expansions and taxonomy of convergent and divergent series. Yet statistics' rise depended on its institutional position between the astronomical observatory, the medical records office, and the administrative offices of a state bureaucracy interested in tracking populations.[6] By contrast many of those who led the charge for a qualitative, historically-oriented social science worked outside the academies and universities and in tension with the state. They frequently made their appeals in public lecture halls, pamphlets, on street corners, and in the diluvial popular press (Figure 1). It was in the same journals that saw the birth of a "serial" popular science including the *feuilleton scientifique* in which new social scientific theories were first expounded, side by side with calls for political and social reform.[7]

For many social reformers the connection with the press was even more direct. The serial imagination of society was grounded in the experience of serial publication. Proudhon and Leroux as well as Jules Michelet and Pierre-Simon Ballanche had all worked as printers or typesetters. This occupational immersion in the logic of monthly, weekly or daily instalments may well have contributed to social reformers' serial orders. For Proudhon the very formation of words was both material and serial: "[T]he typographic case is nothing but a series whose moveable units can serve indistinguishably to reproduce all imaginable letters."[8] While the reformers' extra-institutional location did not exempt their projects from a concern with social control or "governmentality", indeed far from it, it is crucial to recognize that many early projects for a social science were discourses and practices *opposed* to the status quo, sites for "thinking otherwise". Further, the convergence of popular press and sciences of reform helps us understand these projects' persistent reflection on technologies of communication.

Reformers of this period often gave their new social science the combined tasks of retracing the history of mankind, rewriting the contemporary *Encyclopedia* and

FIG. 1. A pump flooding a city with reviews and prospectuses, from J. J. Grandville's kaleidoscopic investigation of utopian sociologies, *Un autre monde* (Paris, 1844), 277.

redrawing the social map. In what we might call a technological Lamarckism, they inscribed human progress within the history of nature by presenting successive technological inventions as the means through which humans adapt themselves to their milieu. Saint-Simon, for example, influentially characterized human life on Earth by the state of the division of labour and the extent of technological and scientific development. From his "physiological" perspective, knowledge was another tool for adaptation. "Series" themselves can thus be seen as a theoretical technology. They were a conceptual tool that made it possible to structure the temporal order of both histories and prophecies; they came to the aid of the new social sciences in both their descriptive and interventionist modes. Ultimately, "series" blurred the natural and the artificial. They helped recast the history of humanity as the progressive integration of humans with nature through science and technology and helped give form to this history's next term.

TABLEAU OF SOCIAL PHYSIOLOGY

In the case of Henri de Rouvroy, Count Saint-Simon (1760–1835) we see "series" as a way to fuse the registers of society, nature and technology. His "organic" conception of society was indebted both to de Maistre and de Bonald, devotees of medievalist

culture and piety, and also to the godless physiology of Bichat and Cabanis.[9] Yet in Saint-Simon's seminal *Mémoire sur la science de l'homme* (1813), considerable praise was lavished on Vicq d'Azyr and his animal series.[10] Although the essay's immediate goal was to raise the status of physiology and create a science of mankind, the ultimate aim was political. A society could enjoy peace only when its system of thought was organized around a single guiding idea. To end the chaos of the Napoleonic wars, it was necessary to re-organize "the scientific system and the system of applications, according to the conception of a unique law". Newton's universal gravitation would serve this role. Physiologists had discovered that the interplay of imponderable and nervous fluids was the cause of life: attraction and repulsion thus ruled over not only "brute bodies" but organisms. A new science of man, grounded in this perfected materialist physiology, would help bring order to the "organized machine" of society.[11]

The term 'series' played a multifarious role. Saint-Simon offered only "*series of facts*, persuaded that this is the only solid part of our knowledge". These were both historical and predictive, for everything that happens is "a sole and same series of which the first terms constitute the past, of which the last compose the future".[12] He suggested "four series" of works, each of which would involve the construction of further series. The first would establish the differences between the science of brute bodies (where solid particles dominate over fluids) and that of organisms (where the reverse is true). The next series of works would compare organisms. Building on Vicq d'Azyr's animal series, his scale of being was ranked according to the increasing complexity of organisms' internal organization and to their increasing power over their milieu: "The more varied are the tubes that an organized body contains, in the dimension of length and diameter, the more they form distinct viscera and senses, the more the body is elevated on the scale of beings, which is to say, *the more action this phenomenon has on that which is external to it.*" This meant that beavers, who manipulate their environment by building dams and lodges, deserve the place immediately next to humans on the scale of being.[13] The third series of works would develop the comparison of animals and humans.

The fourth series had the greatest impact on future socialists. It would trace "the progress of the human mind", arranging "the life of the human species, that is, the physiology of its different ages", according to the state of human intelligence, political organization, social order and technology. This series would start with humans in the state of the wild boy of Aveyron, adding successive stages marked by architecture, chiefs, language and religion. Egypt was a "second starting point" where the intellectual organization of humanity began in earnest, thanks to the appearance of a distinct scientific class which would "coordinate ideas of [visible] causes with those of effects". While in Greece a polytheistic religious system was instituted and natural facts were linked to multiple, invisible causes, the Romans implemented monotheism along with the notion of universal law. In the next stage, the Arabs substituted for diverse laws of nature the conception of God as single "animated cause". The eleventh phase, the present epoch, was inaugurated by Charlemagne, who unified European

society and established the Church's authority as an autonomous "spiritual power".[14]

The culmination of this series lay in the future, in the twelfth term, in which the system of knowledge and the action of society would be re-organized around a single principle. This stage began with Saint-Simon himself. Because "systems of religion, politics, morality and public instruction are just applications of the system of ideas", the new intellectual unity he was drafting would guide the realization of a new age organized around industry. In this final term of the historical series, instead of allowing inherited wealth and ceremonial titles to determine social station, power would be put in the hands of the most capable. "Capacities" would rule: jobs would be performed by those best suited to them and all would be rewarded according to the value of their contributions.

In his later works Saint-Simon continued to argue that a single principle was needed to organize society. However, in his *Nouveau Christianisme* (1825) universal gravitation was replaced by a moral principle: "to work with all one's forces for the improvement of the poorest and most numerous class."[15] This slogan encapsulated the entire teaching of Christianity. In practical terms it required the development of science and industry and the institution of a meritocracy devoted to "the administration of things, not the government of men". Saint-Simon left to his followers the task of establishing a new spiritual authority where science and industry would serve the injunction "to love one another as brothers" by guiding the orderly exploitation of the Earth.

Saint-Simon's message found an eager audience at the École Polytechnique, whose students were predisposed towards a meritocratic and technocratic reformation of society.[16] Their training in mathematics (including series expansions and Fourier series), chemistry, physics, descriptive geometry and the theory of machines was meant to prepare them for any challenge they might encounter in the field as engineers in the service of the state. Classed, ranked, and placed in numerical order from their entrance exams to their daily mathematics drills and military exercises, many of them embraced the "serial" emphases of Saint-Simon.

The *Doctrine of Saint-Simon*, written collectively between 1828 and 1830, systematized the master's teaching into a new social science and a new religion. The concept of "series" played an increasingly specific role: it was the privileged method for establishing "the general laws governing the organization of man". Thanks to Saint-Simon's *Mémoire,* history now "constitutes a science which takes on the rigorous character of the exact sciences" by presenting a "successive table of the physiological states of the human species". The *Doctrine* also noted the "three great secondary series" which trace the history of the arts, the sciences, and industry, expressions of feeling, intellect and material activity. The terms of these "ascending and descending series" could be correlated and compared: "By interpolating corresponding facts to these general stages and formulating series subordinated to them, one may descend to the details of human deeds in history and consider their course of development." These facts confirmed the general "law of progress": an alternation of "organic" and "critical" epochs. In organic periods, exemplified by ancient Greece and medieval Europe, all members of society work together towards a common goal. In critical

epochs, like those launched by the Greek philosophers and the Protestant Reformers, a group of thinkers attacks the established order. An "accumulated rancour" eventually erupts, dismantling social institutions; the result is "a complete divergence of feeling, reasoning and action". The French Revolution and the chaos that followed it were simply the latest manifestations of the critical period begun in the fifteenth century. Like other critical periods, the Restoration and July Monarchy were marked by egotism, specialization and the absence of a shared social goal.[17]

The Saint-Simonians aimed to "organize" society, that is, to create a new "organic age" devoted to industry and the "improvement of the poorest and most numerous class". To do so they created a systematic doctrine and priesthood to administer a new "spiritual power". Saint-Simonian preachers and pamphleteers were supervised by Hippolyte Carnot, whose father Lazare was the "organizer of victories" and whose brother Sadi was the analyst of the motion of heat in steam engines. Under Hippolyte's direction, delegates were sent on "missions" throughout Paris, particularly to workers' districts and the École Polytechnique, and through the industrializing provinces. Literate followers were recruited by publications in Parisian journals, including the organ of liberal romanticism, *Le Globe,* which the movement took over just before the Revolution of 1830.

Saint-Simonian priests did not merely preach; they serialized. In the industrial age, the exploitation of man by man would be replaced by "the harmonious action of man on nature". A centralized system of banks would eliminate unproductive functions, competition, famines and overproduction. This administration, the last vestige of "government", would bring "a better harmony between the means of production and the needs of consumption" by classifying, ranking and placing people and things in hierarchies: "this presupposes a more exact classification of workers and a more enlightened distribution of the instruments of industry, a more exact evaluation of the workers and a more equitable remuneration of work." A *legitimate* hierarchy of capacities and rewards would be the result of the priests' "exact" and "enlightened" serialization of people, tools, raw materials and products.

> To determine the goal of human activity, to command the works by which the goal can be attained, to distribute them, to coordinate them in bringing them back to their goal, to class men, to unite them, this is the *religious* and *political* function, which is entirely resolved in the sacramental function, which has no other object.

Whether scientific, industrial, or social, the priests were those who most fully love humanity, with "the most general view" of how particular tasks connect to the highest aims of humanity. The priest "teaches them to love, he *links* them, he *associates* them". The term 'association', ubiquitous by the 1840s, was given a precise sense. On a base of sympathetic love, the unifying aim of mankind, specific tasks were prioritized, put into serial order and conjoined. The making and co-ordination of hierarchies and taxonomies, the joining of tasks to individuals within the three classes of workers, priests, and artists, was a sacramental function of the new religion.[18]

Although the discovery of social laws indicated the inevitable arrival of a just

industrial society, the Saint-Simonians denied a "fatalist" interpretation. Instead, by learning these laws, man "becomes a free and intelligent agent of his destiny" who might hasten (or uselessly delay) his future. Learning the laws of progress provided a "providential view", allowing the individual to work "in concert with God himself". Providence unfolded gradually: "[T]he doctrine of Saint-Simon does not want to bring about an upheaval or a revolution. It comes to predict and to complete a transformation, an evolution." This social and religious "evolution" was prophesied and accomplished in the same serializing acts.[19]

SERIES AS PASSIONATE MECHANISM

The melding of humanity with the processes of nature by means of serialization was even more flamboyant in the works of Charles Fourier (1772–1837). Fourier's wild predictions and promises of singular delights have overshadowed the logical and practical underpinnings of his visions. His "social metamorphosis" depended on the "attractive mechanism" of *series*. Absent in the first edition of his earliest works, by the mid-1820s series became the central concept of his philosophy.[20] He wrote of simple, composed, mixed, measured, confused, ambiguous, grafted, gelded, infinitesimal, dualized, branching and conjugated series: "Fourier gave the name *series* to the general law that determines the relations of universal movement. The series, its rhythm, is the law which rules over and distributes harmony in the entire universe. It is the key of the all sciences, the compass of destinies." Combining movement, rhythm, law, distribution and harmony, series were means of organizing elements in such a way as to avoid discord, confusion and blockage and thereby harness and maximize natural forces. Their primary point of application was the passions: to serialize human desires was to bring forth a new, harmonious society, and to prepare the birth of a new nature.[21]

Fourier presented his *Theory of the four movements* as the completion of Newtonianism. Gravitation applied only to *material* movement. Yet there was also *organic* movement, "the laws by which God distributes properties, such as form, colour, smell, etc., to all created or future substances in the various globes"; *animal* movement; and *social* movement, "the laws by which God governs the ordering and succession of the different social mechanisms in all the inhabited globes". Between humans, the attractive power is passion. Unlike gravity, however, the passions are multiple and complex.[22] While a small number of passions tend to dominate any given personality, every individual possesses hundreds, thanks to combinations among the twelve fundamental root passions. These are the basic elements of desire, analogous to the twelve notes of the chromatic scale and the twelve colours of Fourier's extended spectrum. The first five correspond to the senses. Next come the four that lead to the formation of groups: individual ambition, friendship, couples or corporatist impulses. Fourier's great discovery was the final three, the "distributive passions". These are the *serial* passions that make it possible to satisfy the other nine passions in interaction with others. The first "serial" passion is the *Cabalist*, which leads individuals to

conspiracy, rivalry and intrigue. Next is the *Composite*, which tends towards union, mixing affection with interest. Last comes the *Butterfly* passion, the tendency to flutter between diverse activities and interests.[23] According to Fourier's calculations, 1620 combinations of passions were possible, the minimum number of residents for Fourier's ideal self-supporting community, the Phalanstery (Figure 2).[24]

In what Fourier dismissively called "civilization", work was a curse and marriage a prison. Forced to do just one kind of labour and to limit our affections to a very narrow sphere, our lives are filled with boredom, deception and vice. Fourier proposed instead to recognize the range of human motivations and feeling tones and to build a society such that these can be expressed and put to work. If people's various desires could be satisfied in the context of labour, an unprecedented productive force would be unleashed: poverty and famine are problems only where work is "unattractive".

His solution was to organize the Phalanstery's work according to series: "A passionate series is a league of diverse groups ranked in ascending and descending order, united passionately by identity of taste for some function, like the cultivation of a fruit, and effecting a special group for each variety of labour that the object of this work includes." This meant, first of all, matching tasks with passions. While many might find flower collecting, painting, building or music playing enjoyable, dirty jobs would be done by the "Little Hordes", the class of boys under ten who delighted in filthy work. Even "Cherubs" of four and five years old would be encouraged to participate in simple tasks such as separating peas from their pods. Further, following the principle of "parcelled exercise", tasks would be broken into segments that could be done in an hour or two, to ensure sustained interest: at the stroke of a bell everyone changed jobs. Each individual would participate in about forty distinct labouring groups organized in "progressive series" according to the members' particular make-ups. The attractiveness of labour was multiplied through the action of the distributive passions. Each group or division would have at least seven members with the greatest possible differences of wealth, age, skill and intelligence among them, encouraging the maximum number of combinations: "The more the passions, struggles and leagues between the Series of a canton can be aroused, the more they will compete in their enthusiasm for work, and the more they will perfect the branch of industry their passions incline them towards."[25] Fourier gave the example of the pear-growing series, which contained at least 224 individuals:

Divisions		*Numerical progression*	*Kinds of cultivation*
1st	Forward-position	2 groups	Quinces and hard, hybrid varieties
2nd	Ascending wingtip	4 groups	Hard cooking pears
3rd	Ascending wing	6 groups	Crisp pears
4th	Centre of series	8 groups	Soft pears
5th	Descending wing	6 groups	Compact pears
6th	Descending wingtip	4 groups	Floury pears
7th	Backward-position	2 groups	Medlars and soft, hybrid varieties. [26]

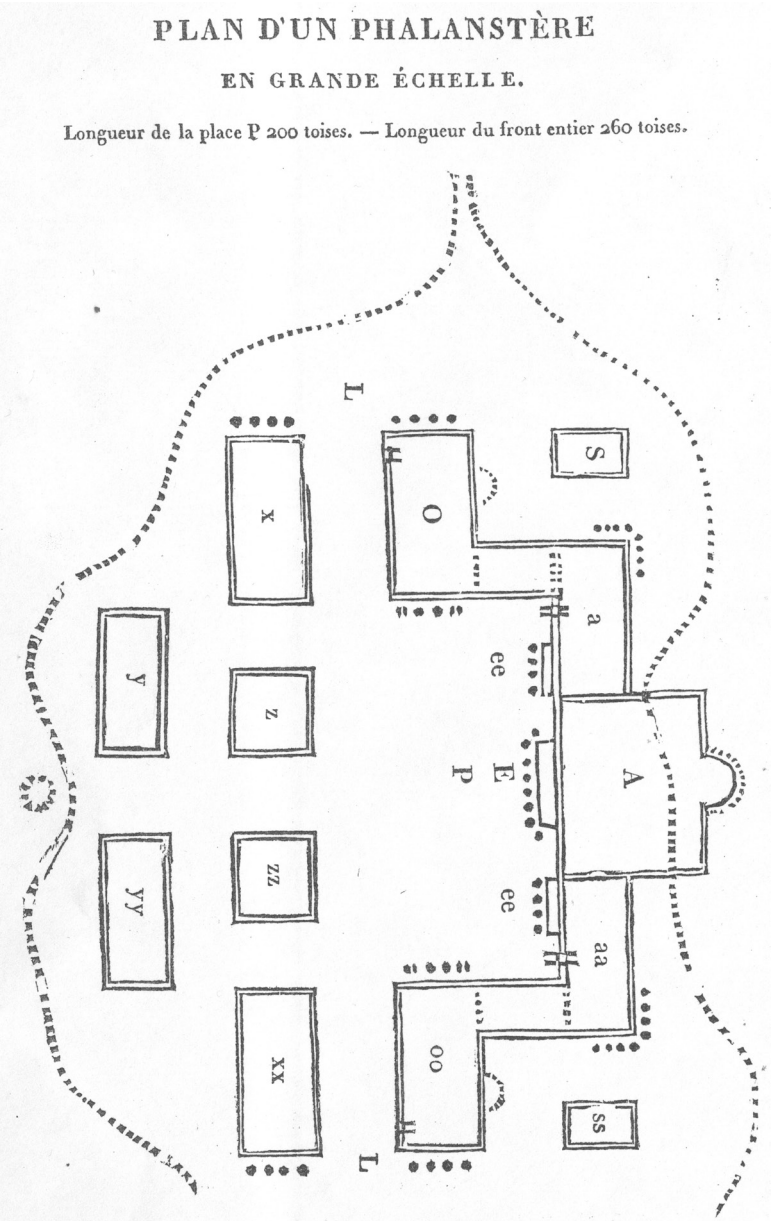

FIG. 2. Phalanstère plan. Dotted lines: branching creek; *L* to *L* large road; *P*: Parade space; *A*: Court of honour, with shady trees; buildings around *A*: peaceful functions: church, market, assembly, tower of order, the bells, telegraph, postal pigeons; *a*: kitchens; *aa*: stables; *S*, *ss*: church and opera; *O*, *oo*: noisy workshops for carpentry, metalwork. From C. Fourier, *Le nouveau monde industriel et sociétaire, ou invention du procédé d'industrie attrayante et naturelle distribuée en series passionnées* (Paris, 1829).

It was here, with groups working together on related but distinct tasks, that the distributive passions exerted their power. The *composite* passion created an unshakeable *esprit de corps* within groups; the *cabalist* spurred them to rivalry and intrigue against others; the *butterfly* was satisfied by changing tasks. The distributive passions thus served as a goad and reinforcement to the others. Further enticements were to be found in the design of the central building, or "seristery", which like all buildings would be heated and extensively ornamented. Work thus became a dance or musical performance, coloured by parades and attendance at the Opera. As the "assemblage of all material harmonies", the opera is a place of "amiable reunion" and "a school of morality in images", preparing children for the dexterity and passionate variety required of "harmonians". The arrangement of work in series would provide the "gears [*engrenages*]" and "springs [*ressorts*]" of this fiercely dynamic and *productive* "social mechanism", producing luxury and riches.

Fourier predicted that the creation of the phalanstery would not only mean the transition in the series of historical epochs from "civilization" to "harmony", but would also turn a page in the history of the Earth and the cosmos, ushering in the copulation of the planets, the birth of new suns and the transition to "the Seven Harmonic Creations". The aurora borealis would form a "Northern Crown" near the North Pole, emitting heat as well as light, raising the temperature at the extremities, making it possible to raise crops year round and to grow oranges in St Petersburg. Famously, the sea would change its nature and taste like lemonade, producing "new sea creatures" and "a host of amphibious servants to pull ships and help in fisheries".[27] The disappearance of "ghastly legions of sea-monsters", which were the "image of the intensity of our passions", was a natural analogy to the creation of new, pleasurable virtues. The serialization of human passions advanced the series of transitions in the life cycle of the cosmos.

The Saint-Simonians made their founder's message more mystical around 1830. Fourier's disciples, who formed one of the most visible schools of reform in the late 1830s and 1840s, moved in the opposite direction. Fourier's delirious statistics, cosmological proclamations and baffling predictions were seen by his followers as ill-adapted to the problems of the July Monarchy. They eventually became a source of conflict between Fourier and his leading advocate, Victor Considerant. Trained at the École Polytechnique and the engineering school at Metz, Considerant wrote to Fourier about a future journal: "Our journal should be purely scientific. It should not have to bother about day-to-day events."[28] Yet after only a few issues followers grew concerned about Fourier's mode of presenting his ideas. One wrote to Fourier:

> In the last number of the *Phalanstère,* you address yourself to the capitalists. You want them to bring you their money… and you talk to them about "tribes" and "choirs" and "internal" and "external" rivalry, about the "three sexes", and about "simple" and "compound" compulsions, etc., etc. To understand all these things one has to read your works. But you know very well that the capitalists have not read them.[29]

They sought to limit damage. In 1832, when Fourier composed an article explaining sidereal creations and the origins of planets, the editors informed readers that "the art of associating in industry, agriculture, and domestic life is independent of the phenomena of creation and of everything that may be happening on the surface of the other planets".[30] Furthermore, a failed attempt to build a Phalanstery in 1832 persuaded Considerant that the movement had to grow before committing itself again to an experiment at "realization"; disciples' funds would be better spent on publicity.[31]

In 1836 Considerant started a thrice-monthly journal which continued to present Fourier's theories while seeking "to grapple with contemporary questions".[32] This goal was reached much more directly with the appearance in 1843 of *La Démocratie pacifique*, the first successful socialist daily. The journal was partly funded by advertising. Considerant himself plugged the *Encyclopédie Roret* and other publications in its pages. It covered current politics, industrial, commercial and agricultural questions, "Varieties" with reviews and previews of performances and novels, reports from the Academy of Sciences, obituaries and stock market reports. It also included a "Revue des Journaux", which reported on different journals' reportage of events, resulting in a cultural barometer.[33] Like other dailies, it published poetry and feuilleton-novels by authors including Alexandre Dumas and Eugène Sue, whose depictions of the seedier side of Paris were presented as confirmation of Fourier's etiology of "civilization".[34]

La Democratie pacifique also contained advertisements for and occasional excerpts from the works of Fourier, who died in 1837. The founder's style was strikingly distinct from that which dominated the journal. In the journal's juxtaposition of quotidian banality and Fourier's cosmogonical and symbolic proclamations, two distinct temporalities were superimposed: on one hand, the ongoing serial unfolding of everyday life in all its practical details; on the other, the oracular utterances of the departed visionary, announcing an end to this world and the creation of a new one. The peaceful, pragmatic reform advocated by *La Democratie pacifique* might bring these two time-scales into synchrony: in 1848, it appeared that these series had converged.

PIERRE LEROUX: PALINGENESIS AND VIRTUAL HUMANITY

Fourier detailed a series of social transformations entwined with a series of natural transformations. Likewise, Saint-Simon's "social physiology" had superimposed a scheme of social progress akin to Condorcet's *Outline of the progress of the human mind* upon the animal series found in the works of anatomist Vicq d'Azyr. His followers embraced the doubled vision of progressive natural and social order yet their use of the term 'evolution' revealed another influence, that of the progressive and liberal Catholic writer, Pierre-Simon Ballanche, author of *Palingénésie sociale*.[35] Ballanche's inspiration was the Genevan naturalist Charles Bonnet, one of the first to use the term 'evolution' in the life sciences to describe the unfolding of embryos. Bonnet also considered the development of the animal series as a whole. To satisfy the Leibnizian principle of plentitude, he argued that all possible places within the scale of nature would be filled over time. In tandem with pre-ordained changes in

the environment, the entire chain of being would be perfected all at once; the relative positions of all organisms would remain the same, as would the "unalterable germ" which defined each of them, even as superficially different species would appear. Bonnet called this process of creation and destruction "Palingenesis", or rebirth.

This notion contributed to the social thought of the 1830s through the work of Ballanche. In *Palingénésie sociale*, Ballanche cast Bonnet's providential developmentalism in social terms: "The social institution is a divine institution; it is by this that humanity improves itself and raises itself."[36] History described a chain of pre-established deaths and rebirths. Notably, the destruction and suffering brought about by the Revolution amounted to a necessary "expiation" which prepared humanity's next stage. These transformations, however, required human assistance:

> The chrysalis, which was a creeping caterpillar, becomes the brilliant butterfly … but this metamorphosis, so prodigious an emblem by the Author of universal life, is wholly organic; it operates without the caterpillar's cooperation. It is not so with the human chrysalis: it must give itself the brilliant wings on which it may rise from region to region, until it rests in immutability and eternal glory.

In *Orphée,* Ballanche argued that poets and prophets were called to rouse human faculties from their "embryonic sleep".[37] Human intervention was needed to fulfil the divine plan.

A similar progressive reading of the great chain of being also thrived in and around the work of Geoffroy Saint-Hilaire, the anatomist whose concept of "the unity of animal type" clashed with Cuvier's view of four fixed "embranchements". For Geoffroy, comparisons among different animal families showed that "there are no longer any different animals. One fact alone governs them; it is as one single being that it appears. It is, it resides in Animality, an abstract being that is perceptible by our senses under different shapes".[38] An infinite number of "distinct arrangements" were possible, but the actual form taken by an organism depended on the degree to which the various parts of this "abstract being" unfolded under the influence of the "ambient molecules" with which it was in contact. This "universal plan" or "animal type" was a field of possibilities, a set of "virtual conditions", whose actualizations depended on the circumstances in which it developed.[39] Geoffroy's protégé, Etienne Serres, applied this perspective in his comparison of the developmental series of embryos from various species, deriving what is known as the "Meckel-Serres" law: the embryos of higher animals recapitulate features found in the adults of lower animals. For Serres the unity of organic composition provided a conceptual foundation for the abnormalities he and Geoffroy's son Isidore studied in "Teratology" and for a historical reconstitution of the animal series.[40] According to Serres, in Geoffroy's "sublime" thought "the Earth becomes a vast laboratory where a succession of beings continually develop, following a progressive and ascending path … the whole animal kingdom appear[s] as but a single being that, during its formation, stops in its development, here sooner, there later".[41]

Geoffroy's vision of unified progress throughout nature was a rallying point for

Romantic authors in the period of the Revolution of 1830. Balzac and George Sand referred to him, and the Christian reformer Buchez discussed his theories. Geoffroy's most pronounced impact was on Pierre Leroux (1798–1871), founder and editor of the *Globe.* Starting around 1832, Leroux launched a series of journals with the help of fellow former Saint-Simonians Hippolyte Carnot and Jean Reynaud as well as Sand. In his introduction to the *Revue Encyclopédique,* Leroux argued that the sciences of his age were united by the notion of progressive series:

> Take nature or society, contemplate the formation of worlds or the formation of civilizations, dive into cosmogonic sciences or into the depths of history, be physicists or historians, consider the animal type in the series of its developments or in any animal whatsoever in its particular life from the foetal state up to death, the Earth in the order of its successive constructions or the matter of stars: inasmuch as our weakness is allowed to pierce the secrets of the heavens, you will always see life developing itself by an incessant creation and a continual series of progress … to transform the formula of Leibniz: *The present, born of the past, is pregnant with the future*.[42]

Leroux's allusion to the "animal type" indicates the important role that Geoffroy's doctrine played in his encyclopedic and synthetic vision. Leroux's very particular notion of "*humanity*" can be understood as an analogue to Geoffroy's *animality.* Just as Geoffroy spoke of the universal plan as providing the "virtual conditions" for individual organisms' transformations, Leroux repeatedly used the Leibnizian language of "virtuality" to describe humanity's metamorphoses.[43]

Leroux sought to balance humans' essentially social nature with their distinct thoughts, experiences and feelings. He rejected English "individualism", "which in the name of liberty makes men like wolves among themselves and reduces society to atoms", and also rejected Saint-Simonian socialism, "this new papacy, overwhelming, all-encompassing, which will transform humanity into a machine where true living natures, individuals, will only be useful material".[44] In *De l'humanité,* he represented the relation of individuals and society as a mirror:

> Human life is the knowledge, the sentiment, and the sensation that result from the co-existence of man and society. Suppress one or the other and life stops and disappears, like the image [in a mirror]…. Even so, man and society are just as distinct, just as independent as are our body and the mirror in which we look at ourselves. But it is the case that between the man and society, between society and the man, there is a mutual penetration by which they merge without ceasing to be distinct.[45]

This image of relations as a fabric of providential reflection recalls Leibniz's world-reflecting monads though with the addition of a 'mutual penetration' between them. In *De l'humanité* Leroux spoke of human society as "an ideal being composed of a multitude of real beings who are themselves humanity, humanity in the virtual state". Reciprocally, man is "a real being in whom lives, in the virtual state, the ideal being

called humanity".[46] Humanity is this virtual, "ideal", and simultaneously real and actual combination of living, dead, and future individuals.

Leroux denounced the fragmentation of contemporary society. In the field of ideas, he argued for a synthetic philosophy that would capture the incessant movement of life; true philosophy would necessarily be a religion. This vision of the unity of knowledge was apparent in his serially-published *Encyclopédie nouvelle*, which combined entries on the arts, sciences and technology with the newest findings of philology and comparative religion.[47] *De l'humanité* described a universal "tradition" stretching from the Vedas and Buddhism through Pythagoras and Plato, the Old and New Testaments, from heretical, communitarian sects such as the Essenes up to the eighteenth-century doctrines of progress, brotherhood and equality. Leroux saw the virtual being of humanity unfolding as a series of religions and social forms, each expressing more and more fully the same great idea: the essential interpenetration of each individual and humanity and, therefore, the recognition of our dependence on and responsibility for each other. The hidden meaning of the Christian communion for example is revealed as the sharing of goods: "We will all eat at the same banquet!"[48] Like Ballanche, he urged his readers to take part in the inevitable movement through which each generation rose toward perfection in its arts, ideas, and institutions, in its feelings, thoughts, and actions. In the present this tradition was revealed in the goal of workers' liberation: "it is in ASSOCIATION around the instruments of labour according to the diverse functions of science, of art, and of industry that the true human society is found."[49] Yet distancing himself again from Saint-Simonian "absolute socialism", Leroux offered no utopian blueprint, although equal rights for all (male and female), representative government and collective ownership of the means of production were inevitable.[50]

More than an empty sentimental communitarianism, Leroux's "socialism of the heart" focused on technology and offered suggestions that anticipate "deep ecology". A man's life "does not belong to him entirely, and is not in him only; it is in him and outside of him; it lives … undivided, in his fellows and *in the world that surrounds him*". Mankind's "incessant communication with his fellows and with the universe" depends on language as well as technology. The tools of labour were for Leroux no mere abstraction: in 1822, he invented a keyboard-based composing machine, the pianotype, an invention with a philosophical meaning:

> All kinds of progress hold together; all discoveries form a chain. *We will liberate the human spirit and we will reorganize human society by dogma, by experimental science, by art, by industry, and not by any one of those things in isolation.* A machine is an instrument in service of the ideal, just as it can be inspired by the ideal. [51]

His later programme for recycling human waste as a means of perpetually renewing the fertility of the Earth (the "circulus") went yet further: the chain of human discoveries strengthened the chains that linked humans and nature via technology. In his early "romantic" literary criticism, Leroux had argued that symbols fuse spirit

and matter, joining humans to each other and the natural world. His later work put technology in the same role, as a means of realizing the "virtual" plan and vital forces of nature and humanity in new, collective actualizations.[52]

SCIENTIFIC SERIES: ANARCHIST, BIOCRATIC

For Saint-Simon, Fourier and Laroux, series were means of identifying and altering relations among discrete but related phenomena. Making laws of nature visible and usable, 'series' was the pivotal term in an epistemology oriented towards action. In two final cases, those of Proudhon and Comte, thinking in series was again central to an interventionist science of society. Yet more extensively than in previous examples, they gave 'series' a foundational role in the production of knowledge.

Proudhon's early philosophical work *On the creation of order in humanity* (1843) was a metaphysics of series. Proudhon was exposed to the literature of social critique when, working as a printer in Besançon, he set the type for Fourier's *New industrial system*. He won a scholarship to study in Paris and read widely, attended lectures and gained notoriety when a set of his economic essays that contained the provocative (if misunderstood) slogan, "property is theft", was threatened with confiscation. *On the creation of order in humanity* reflected his crash course in Parisian intellectual life. It offered a theory of knowledge with examples from zoology, botany, chemistry, mathematics, linguistics, Kant, Hegel, the *Classification of knowledge* of Ampère, Comte, Adam Smith, J. B. Say and the Saint-Simonians that would ground a transformative Political Economy. For Proudhon, the universe was series all the way down. Although he offered lengthy critiques of Fourier, his discussions of series shared his exuberance:

> In all the sciences that are constituted or in progress, the scientific object is SERIATED, that is, differentiated, partitioned into sections and subsections, groups and sub-groups, genera and species; graduated, scaled, woven, symmetrised, coordinated, like the leaf of the palm tree, the flute with seven keys, the lute with four, seven, eight, nine, ten or twelve strings, like the alveolus of the bee, the web of the spider, the chains of a net, the design of a damask tablecloth: we will call all of these innumerable differential figures by the generic name of SERIES.

In every case series meant identifying comparable units and putting them into relations. Series joined all natural and artificial entities into "a general form, which is the metaphysics of nature". Series both separated and united. They revealed how different things could be just one thing and how one thing could be made up of many different things: "It is only in focusing on concrete individuals and their relations to other individuals — the *series* they form — that science can begin." Proudhon noted a distinction between artificial and natural series, with the first containing their law within them and the second as "complements, games of human industry", which could be modified, re-arranged or converted into new forms without resistance from objects.[53] Yet a nominalist streak ran through his discussion, since any element could be made part of an infinite number of different series: "According to the matter and the

relationship among the units, the series takes diverse forms and consequently diverse properties, from which results the infinite variety of the universe." Furthermore, perspective counted: "[A]ccording to the simplicity or the multiplicity of the point of view, the series forms univocal aggregates or composite organisms or vast systems."

The science that interested him most, Political Economy, dealt in series that were both natural (because society is a concrete reality) and artificial (because its elements are capable of thought and choice). This new master science would touch on all aspects of existence, including the "vast questions": "What is man? Where does he come from? Where is he going?"[54] Through series, Political Economy would establish the proper relations among society's "organs". Echoing and altering Fourier, this reformed science would divide and coordinate the labour involved in society's "four movements": organic, industrial, legislative, scientific. Creating the conditions for a just, egalitarian and self-managing society required aligning workers and their tasks into their proper relations: "To organize society is to describe a series: a real series and an ideal series all together; since, if the social series is unalterable in its form, its organic unities are at once living, intelligent and intelligible." The results could not be grander: "To organize society is to bring about the synthesis of matter and spirit, it is to renew the miracle of creation."[55] Serialization founded societies and was part of the endless natural production of order.

Despite apparent contradictions or (according to Marx) unresolved dialectics in Proudhon's work, his "positive anarchy" was consistent on several points. Against the hierarchies of Saint-Simon and the orchestrated diversity of Fourier, Proudhon stressed equality as his starting point and goal: the shoe maker might be a philosopher or legislator if given the same education. His aim was a dignified if austere subsistence for all. He strongly opposed the formation of a state or any centralized authority that would stand over individuals. The only governmental structures that were necessary would allow distinct individual elements to join together and form dynamic combinations while preventing any one group, production sector or individual from obtaining a disproportionate share of wealth or influence. Small groups of farmers, artisans and industrial labourers would live in "free communes" exchanging goods in a system of "mutualism". Larger industries would be owned co-operatively and administered by direct democracy. Local federations would scale up to a national and even international "syndicate". This ideal of "self-managing federalism" embodied the same serial logic that he saw running through all levels of reality, in which distinct elements joined together while retaining their identities — a view of association which resembled that of Leroux: "that which gives all men solidarity while rendering them free." Proudhon's slogan, "la revolution en permanence", suggests the inescapably unfinished process of creating order.[56]

Proudhon's slogan might recall that of Comte's Positivism, "Order and Progress". Series were indeed crucial for Comte. However, while both he and Proudhon emphasized that series depended on the perspective of those who assemble them, for Comte those perspectives were determined by human needs. Further, in contrast to Proudhon, he argued for a strong central authority to regulate the relations among

scientific fields and to coordinate industrial production. His "Religion of Humanity", modelled explicitly on the centralized dogmatism of the Catholic Church, contrasted starkly with Proudhon's ground-up, egalitarian anarchism.

Like many of the serializing reformers, Auguste Comte (1798–1857) was trained at the École Polytechnique. He worked as Saint-Simon's secretary but broke away in the early 1820s. A disastrous attempt to give a mathematical confirmation to Laplace and Herschel's nebular hypothesis, based on the attempt to place observed nebulae into a historical series, definitively alienated him from the French scientific establishment.[57] His later works developed his hierarchy of the sciences into a scientific religion. The later, religious phase of his thought has been dismissed by many of his defenders, but by focusing on the temporality of classifications and series we find considerable continuity between his first scientific writings in his *Course* and his religious "second career".

The best-known feature of Comte's philosophy, the "scale" or "ladder [*échelle*]" of the sciences, was a great chain of disciplinary being, ranked like the animal series in terms of increasing complexity. It stretched from astronomy, physics, chemistry and biology up to the crowning science, sociology, which studied society, the most complex object. The series was eventually completed by the fundamental abstract science of Mathematics and the science of Morality (see Figure 3). The increasing complexity of each science's objects corresponded to their increasing proximity to mankind as well as to their increasing modifiability. Astronomical objects were most distant and least susceptible to human interventions, whereas society was highly mutable and could not be closer us; chemistry and biology were midway on the scale. Comte's disciplinary chain was also a temporal scale, in two senses. The first is well known: it ranked the sciences in the order in which they became positive. The least complex, most distant, least modifiable sciences were the first to escape the superstitions of religion and the mystifications of metaphysics: astronomy was first, followed by physics, and Comte saw chemistry and physiology slowly moving in the same direction. The creation of a positive science of society would be the last giant step in the history of human knowledge. We can note here a striking reflexivity: because a definitive trait of social science was its use of historical sequences, only with the creation of sociology, was it possible to understand the chain of previous sciences that had prepared its arrival. Sociology provided the *ratio* both for itself and its precursors.[58]

The series of the sciences also corresponded to the distinct rates and rhythms of the natural world. For Comte, each science was a set of concepts and tools for registering and coordinating the observed regularities of its objects. Astronomical phenomena provided the model of temporal measurement: the regularity of diurnal rotation, the phases of the Moon and the seasonal revolutions provided the basic units for time passing, while the relatively slow movement of the planets confirmed astronomy's primacy among the sciences. The specific rhythms or "molecular activity of matter" proper to the next three sciences, physics, chemistry and biology, determined their order as well: "Each corresponds to one of three successive degrees of activity, which

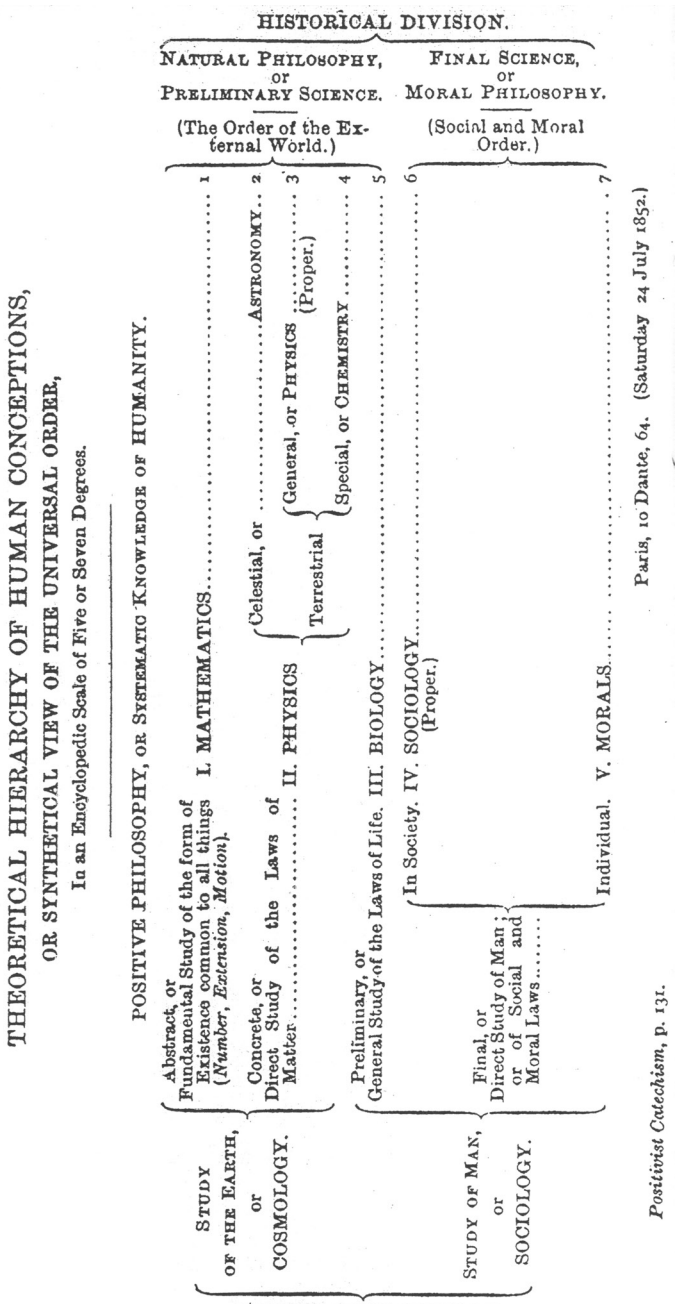

FIG. 3. The discovery and institution of the serial order of humanity are the culmination of the Hierarchy of the Sciences, as it is the expression of the final term in this series, Moral Philosophy. From A. Comte, *The catechism of positive religion*, transl. by R. Congreve (London, 1891).

are essentially and naturally distinguished from each other. The chemical obviously presents something more than the physical action, and something less than the vital."[59] Thus in addition to the order in which they became positive, and alongside the complexity, modifiability and distance of their objects, each science was also defined by the "degree of activity" of the object it studied. As human life was determined by all of these factors, as well as the rhythms of mental and social activity, the degree and complexity of action with which sociology reckoned was the greatest.

The *Course* did not simply describe the two-time scales of the progressive positivity of the sciences and the rhythms of their objects. It also provided the guidelines for perfecting each of the sciences. Further, it set out the means of coordinating the distinct rhythms of the sciences' objects. For example, Comte pointed out the impact of astronomical phenomena on chemical and vital phenomena and noted the limits of humans' ability to modify the phenomena of each other order. The *Course*'s series of the sciences was a coordination of diverse time-scales: a harmonization of convergent series of development within a single, expanding framework. His depiction of this order was meant to guide further research, to make progress in each field "regular" and to harmonize it with other fields.

The goal of the *Course* and of the "Religion of Humanity" which grew out of it can be better understood by noting the continuity between the series of sciences and Comte's conception of the linkage of the animal series and the *milieu*. Cuvier's denial of a single animal series was challenged on the left by Geoffroy's followers and on the right by the Muséum professor, the Catholic Henri de Blainville. Comte was closely linked with Blainville and supported his view of a single animal series ranked by complexity. He frequently cited Blainville's definition of life as a "double interior motion, general and continuous, of composition and decomposition", preferring it to Xavier Bichat's processes that "resist death": "on Bichat's supposition, the whole environment of living beings tends to destroy them". Nevertheless, he felt Blainville failed to give sufficient attention to the *exterior* half of the vital equation, the all-important *milieu* that sustained life: "It is from the reciprocal action of these two elements [organism and milieu] that all the vital phenomena proceed." Comte thus radically displaced "life" from the animal's body. Life existed instead in the interaction between an organism and its surrounding environment. The "great problem of positive biology" was to establish "a scientific harmony" between organs, their functions and the external milieu.[60]

This dynamic interaction was the key to Comte's animal series as well as the basis for his remarkable conception of sociology. Just as the sciences were ranked according to complexity, the "molecular activity" and modifiability of their objects, so the animal series was "coordinated" according to the organism's complexity, its degree of activity, its flexibility and, simultaneously, its impact on its environment: "[T]he living being becomes, as a necessary consequence, more and more susceptible of modification, at the same time that it exercises a continually more profound and more extensive action on the external world."[61] While a simple organism had little power to alter its environment, Comte argued, at the same time its needs were satisfied with

ease and it was resilient in the face of environmental changes. At the other extreme of the scale, the complexity of the higher animals (for example, the more elaborate system of circulation of warm-blooded animals) made them depend for their survival on a wider range of factors in their environment and, accordingly, made them more vulnerable to small modifications in their milieu. But this greater vulnerability was compensated by a greater power to *modify their environment*: they could build nests, dams or burrows. This was an expansion of the insight that led Saint-Simon to place beavers next to humans in the animal series.

The power of modification was greatest among humans. Although highly vulnerable to changes in the environment, "by an indispensible compensation, [man] can endure, in all these conditions, much wider differences than inferior organisms could support, because he has a superior power of reacting on the surrounding system". The scientific hierarchy constructed by the crowning science, sociology, would further enhance and give form to humans' technological power. By showing the proper relations among the sciences, the degree of modifiability of their objects and the concepts, tools and temporalities appropriate to each, the *Course* offered the framework through which humans could most harmoniously and effectively alter their environment. Again, positivism wove multiple rates and scales of progress into a single, developing order at whose point of convergence stood the priests of humanity.[62]

The *System of positive philosophy,* which, along with the more accessible *Positive catechism*, outlined the Religion of Humanity, was the application of the social theory provided in the *Course*. Comte recognized four "organs" or "functions": scientist-priests, industrialists, proletarians and women. To ensure that all four segments of society fulfilled their duties he redefined religion, etymologically, as a linking (*lier*): "Religion expresses the state of perfect *unity*, which is distinctive of our existence, both individual and social, when all its parts, moral as well as physical, habitually converge towards a common purpose."[63] The dogmas and rituals of the *System* were intended to form habits that would draw diverse elements into a shared focus or unity. The *Positive catechism* detailed a twice-daily ritual of prayer and visualization (of loved ones, or of the symbolic mother of humanity, Clotilde de Vaux), along with seasonal holy days and festivals and daily and weekly masses in honour of specific saints of humanity (Figure 4). By tying these rituals directly to the stages and key components and contributors to society and knowledge — to Moses, Pythagoras, Gutenberg and Mozart, as well as to the series of religious stages of fetishism, polytheism and monotheism — the individual's experience of time was woven into the history of humanity and into the time-scales of nature brought together in the *Course.*

Positivist science aimed to unite humanity through dogma and ritual while guiding its technological adjustment to and alteration of its milieu. In his later works, in contrast to Saint-Simon's other followers, Comte laid increasing emphasis on the *limits* to humanity's power to modify nature.[64] Recognition of humanity's dependence on the Earth — the double action of organism and milieu — underwrote Comte's moral approach to nature. The Religion of Humanity was the pinnacle of the sciences as it strengthened humans' sense of responsibility for all of nature. Comte presented

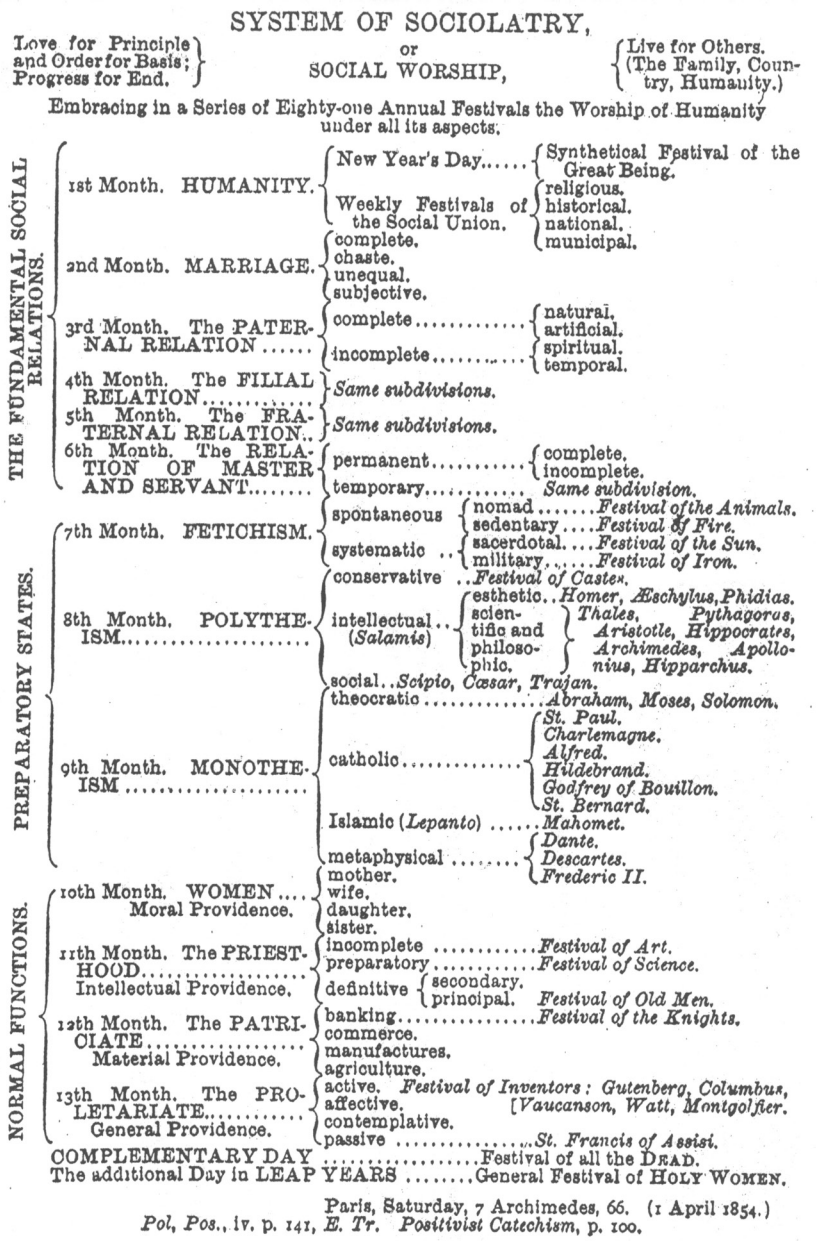

FIG. 4. In Comte's Table of Sociolatry, the serial history and serial order of humanity (the four relationships, the three religious stages, the four social organs or classes) are inscribed at the scale of the yearly, monthly and weekly ritual calendar. From A. Comte, *The catechism of positive religion*, transl. by R. Congreve (London, 1891).

human society as a complex, mutable organism, undergoing constant technologically-assisted modification of its environment.[65] He recognized humanity's dependence on the Earth's complex milieus, urging that science be used to trace the natural bounds to technical development. In his late *System of positive polity* and *Subjective synthesis*, Comte spoke of "Biocracy", an alliance between humanity and those other creatures who help it survive and improve its condition:

> [U]nder the positive system the co-operation of all biocratic organs in the same cause, and the just sense of their fraternity, will place each in the position due to its share in the common service rendered to the Great Being [of Humanity]. In a word, Biocracy and Sociocracy will be alike pervaded by Altruism; whereas during the long period of theological and military training Egoism predominated. Thus it is that Biology in its remodelled form raises us to a point of view from which the true policy of the human race, nay of the whole animal kingdom, stands before us; a policy in which the whole forces of the living world are combined for the social regeneration of Man, who in his turn becomes responsible for the wise government of the other species.… Humanity succeeds Animality, as Animality succeeds Vegetality. This, in its synthetic form, is the Hierarchy of Life.[66]

Recognition of individuals' dependence on society and society's dependence on its environment formed the keystone of his religion. The dogmas of that religion detailed and regulated the interlocking serial hierarchies of nature and society.

WHAT ARE SERIES? WHERE DO THEY COME FROM? WHERE ARE THEY GOING?

In 1848 France prolonged the "revolutionary" series connecting 1789 and 1830. The overlapping, harmonizing and at times conflicting schemes of progress plotted by the Romantic socialists were called to action in the Second Republic. Buchez, Considerant, Leroux and Proudhon all served as representatives while Comte and Enfantin wrote letters in hopes of catching the ear of potential dictators. These schools were themselves perceived as sufficiently similar to make them susceptible to serial alignment. Projects for reforming the regime of property were caricatured as a serial display of commodities (Figure 5).

As many of these social reformers lacked institutional support or a professional position, the cartoon captures the fact that they were compelled to act as salesmen, carving out brands in a crowded marketplace. Hawking their cosmologies, they frequently inquired about the power of words, symbols and narratives to move a mass audience through the material power of poetry, art and religion; they worked with the same imaginative resources and unsatisfied desires as would the advertisers and propagandists of the twentieth century. The hawker was right; these "farces" did not last long. The Second Republic's short-lived experiments were brought to a halt by Louis Napoleon Bonaparte whose *coup d'état* of 1851 was presented as the next link in a different series, one he saw underwritten by an eternal "Napoleonic Idea" — one soon seen as the repetitive series of tragedy and farce.[67]

My presentation of these social visions has also followed a serial presentation:

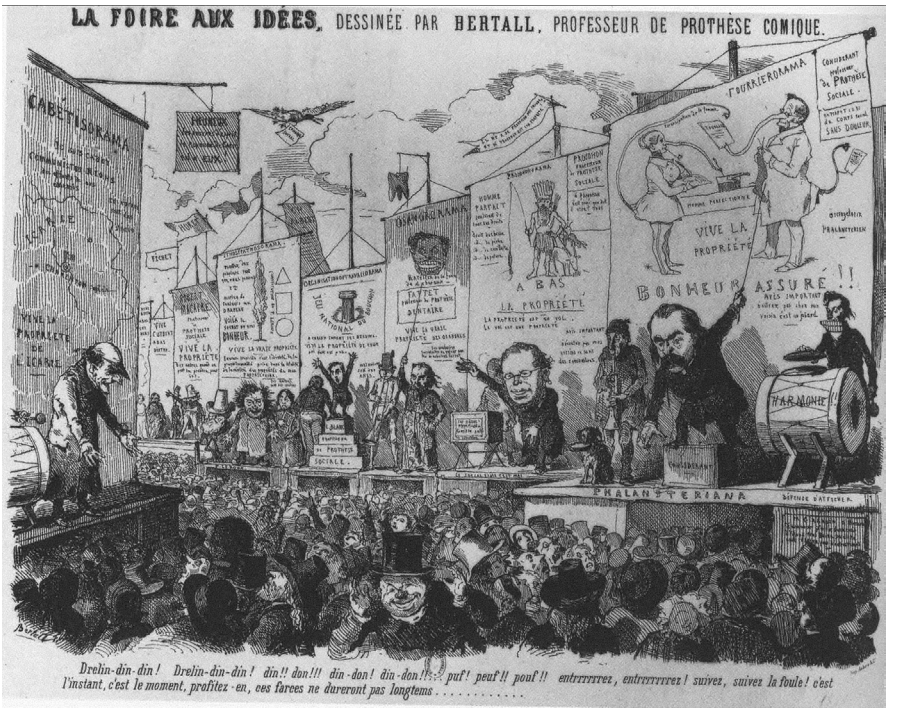

FIG. 5. The Ideas Fair: "… take advantage of it, these farces won't last long…." From the far right we see Considerant, Proudhon, someone advertising a dental utopia (?!), Louis Blanc, Leroux (in wild hair and printer's blouse), the archetypal con-artist Robert-Macaire, and at far left the "Icarian" communist, Cabet with his "Ca*bêtis*orama". From BNF, with thanks to University of Pennsylvania Image Collection.

Romantic socialist trading cards: Collect the whole set![68] We might line their elements up in another synoptic table, opening up and filling in blanks for each school in categories such as theories of property, views on the condition of women, attitudes towards mechanical industry, base of support, impact on legislation, theories of race, conception of science, and so on. We could also align the elements temporally, even teleologically, by tracing the effect of the Saint-Simonians on the interpretation of Fourier in the 1830s and 1840s, detailing Proudhon's modification of Fourier's thought, exploring reciprocal influences between Comte's and Leroux's "religions of humanity", as well each of the reformers' impact on 1848, the Second Republic, the Second Empire and the social thought of the twentieth century. We might also line them up, as has often been done, as precursors (or epistemological obstacles) to either "scientific socialism" or institutionalized sociology. We could also construct more ominous series, in which their visions of unity and social order would be shown to predict later projects of subtle or overt social control, whether imperial, fascist or liberal.

Perhaps another tendency can be abstracted from this sequence. These pioneers of

social science were in agreement on the striking insight that science and technology — including the social sciences, as tools of knowledge and intervention — are privileged means by which humans modify the relations that constitute the perpetually evolving system of life on Earth. Their series, interrupted at the threshold of mass-scale industrialization and separated from us by a century and a half, map underexplored paths and point toward futures in which science, imagination and ethics might combine to create harmonious, sustainable communities preserving the broadest possibilities of both freedom and connection. Their series ask to be followed more closely, and raise the uncomfortable yet unavoidable question: what comes next?

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11. Henri de Saint-Simon, *Mémoire sur la science de l'homme* (1813), in *Œuvres de Claude-Henri de Saint-Simon*, v (Paris, 1977), 3–313, p. 172. Compare R. Richards, *Darwin and the emergence of evolutionary theories of mind and behavior* (Chicago, 1989), and Musso, *op. cit.* (ref. 9), on the "baroque physiology" (Canguilhem's term) of this period as deployed by Saint-Simon.
12. For Buffon, science involved "establishing series of facts"; see P. R. Sloan, "The Buffon–Linnaeus controversy", *Isis*, lxvii (1976), 356–75.
13. Saint-Simon, *op. cit.* (ref. 11), 108, 50. Comte developed a similar theory of human evolution. In Buchez's *Science de l'histoire* scientific theories are seen as "new faculties acquired by the human species", and the progress of civilization modifies individual psychology and physiological "organization": Buchez, *op. cit.* (ref. 3), 151.
14. Although he makes references to Scottish stadial historians, his sequence is closest to Condorcet's *Outline*: see R. Week, *Social science and the ignoble savage* (Cambridge, 1976), 172–8.
15. Compare to the evolution of the concept of 'Fraternité' in W. Sewell, *Work and revolution in France: The language of labor from the Old Regime to 1848* (Cambridge, 1980); and J. Rancière, *La nuit des prolétaires* (Paris, 1981).
16. See B. Belhoste and K. Chatzis, "From technical corps to technocratic power: French state engineers and their professional and cultural universe in the first half of the 19th century", *History and technology*, xxiii (2007), 209–25; and A. Picon, "Générosité sociale et aspirations technocratiques: Les polytechniciens Saint-Simoniens", in *"Pour mémoire": Revue du Comité d'Histoire*, ii (2007), 106–14.
17. *Doctrine de Saint-Simon: Exposition* (Paris, 1854), *première année*. This disorder was visible in the chaotic competition of industry, in the egotism and melancholy of the arts, in the sterile specialization of the sciences: "The disorder of minds has invaded the sciences themselves, and one can state that they offer the painful spectacle of a complete anarchy. Let us declare, finally,

that we must find the cause of the illness in the absence of a unified social vision, and that it is in the discovery of that unity that we will find the remedy" (*Doctrine*, 53).

18. *Doctrine* (ref. 17), *deuxième année*, 426–45. Their slogan, "the organization of labour", was taken up by Louis Blanc. He was put at the head of the Luxembourg Commission after February 1848 to realize this plan: its failure helped spark the riots of June 1848.
19. *Doctrine* (ref. 17), *première année*, 81, 154.
20. Pierre Leroux accused Fourier of plagiarizing the central concept of 'series' from Saint-Simon's "serial law" of history: see P. Leroux, "Lettres sur le Fourierisme, IVème Lettre: Le plagiat de Fourier", *Revue sociale*, xii (1846), 187.
21. *Dictionnaire de sociologie phalanstérienne: Guide des œuvres complètes de Charles Fourier* (Paris, 1911), 398.
22. C. Fourier, *Théorie des quatre mouvements*, in *Oeuvres complètes,* i (Paris, 1846), 36; J. Beecher, *Charles Fourier: The visionary and his world* (Berkeley, 1987); R. Scherer, *Charles Fourier, ou, La contestation globale* (Paris, 1996); and R. Barthes, *Sade, Fourier, Loyola* (Paris, 1971).
23. C. Fourier, *Le nouveau monde industriel ou invention du procédé d'industrie attrayante et naturelle distribuée en séries passionnées* (Paris, 1829), 79–93.
24. C. Fourier, "Du clavier puissanciel des caractères", *La phalange*, xvi (1847), 5–47, 97–135.
25. Fourier, *op. cit.* (ref. 23), 63, 243.
26. Translations from J. Beecher and R. Bienvenu (transl. and eds), *The utopian vision of Charles Fourier: Selected texts on work, love, and passionate attraction* (Boston, 1971).
27. C. Fourier, *The theory of the four movements*, ed. by G. Stedman Jones and I. Patterson (Cambridge, 1996), 50.
28. V. Considerant to C. Fourier, 1832, in J. Beecher, *Victor Considerant and the rise and fall of French Romantic socialism* (Berkeley, 2001), 45.
29. "Anonymous letter signed J…" (1833), in Beecher, *op. cit.* (ref. 28), 49.
30. *La réforme industrielle ou le Phalanstère*, i (1832), 132, in Beecher, *op. cit.* (ref. 28), 49.
31. Beecher, *op. cit.* (ref. 28), 118–23.
32. Beecher, *op. cit*. (ref. 28), 73, 71.
33. For instance, see *Democratie pacifique,* 2 July 1844, which reprints a report in *Le moniteur* about Louis-Philippe's request for a salary for his sons: "*Le Journal des Debats* reproduces the article without comment"; "*La Presse* limits itself to qualifying it as an appeal France's impartiality"; "*Le National* does not know which is more astounding in this circumstance, the imprudence or the audacity of the cabinet".
34. Charles Baudelaire first read Edgar Poe in *Democratie pacifique*, in Isabelle Meunier's translation of "The black cat".
35. See Bénichou, *op. cit.* (ref. 5); A. McCalla, *A Romantic historiosophy: The philosophy of history of Pierre-Simon Ballanche* (Leiden, 1998); R. Schwab, *The oriental renaissance: Europe's rediscovery of India and the East, 1680–1880* (New York, 1984); A. J. L. Busst, "Ballanche and Saint-Simonianism", *Australian journal of French studies,* ix (1972), 290–307.
36. P.-S. Ballanche, *Oeuvres complètes* (Paris, 1833), iv, 29; A. McCalla, "Palingenesie philosophique to palingenesie sociale: From a scientific ideology to a historical ideology", *Journal of the history of ideas*, lv (1994), 421–39.
37. Ballanche in McCalla, *op. cit.* (ref. 36), 435. On the impact of embryology on Marx, see A. Wouters, "Marx's embryology of society", *Philosophy of the social sciences*, xxiii (1993), 149–79, which reaches for a connection with Von Baer. I would argue that more pertinent sources can be found in the works of Geoffroy Saint-Hilaire and Serres, which would have been familiar to social philosophers of Paris in the 1830s and 1840s.
38. Hervé Le Guyader, *Geoffroy Saint-Hilaire: A visionary naturalist* (Chicago, 2004), 118. Rumours

of the death of the great chain of being around 1800, whether blamed on Cuvier (Foucault, *op. cit.* (ref. 4)) or on romantic irrationality (A. O. Lovejoy, *The great chain of being*: *A study of the history of an idea* (Cambridge, MA, 1936)), have been greatly exaggerated. On primarily English continuations into the nineteenth century see W. Bynum, "The great chain of being after forty years: An appraisal", *History of science*, xiii (1975), 1–28.

39. T. Appel, *The Cuvier–Geoffroy debate: French biology in the decades before Darwin* (New York, 1987); and F. Bourdier, "Le prophète Geoffroy Saint-Hilaire, George Sand et les Saint-Simoniens", *Histoire et nature*, i (1973), 47–66.
40. Serres approvingly quoted Isidore Geoffroy Saint-Hilaire's argument for "parallel series", in which varieties of a single species would occupy the same row in the series, instead of lining them up in the single column of the scale: "since it repeats itself in the creation of the diverse parts of the same being, nature repeats itself again in the creation of diverse partial series out of which, in reality, the animal series is composed" (I. Geoffroy Saint-Hilaire, in *Considérations sur les caractères employés en ornithologie* (1832), quoted in E. Serres, "Organogénie", *Encyclopédie nouvelle*, vii (Paris, 1843), 1–64, p. 50). Serres's article "Organogénie" had a massive impact on Jules Michelet: see J. Viard, "George Sand et Michelet: Disciples de Pierre Leroux", *Revue d'histoire litteraire de la France*, lxxv (1975), 749–73; and A. Mitzman,"Michelet and social Romanticism: Religion, revolution, nature", *Journal of the history of ideas*, lvii (1996), 659–82.
41. E. Serres's funeral speech for Geoffroy, cited in Le Guyader, *op. cit.* (ref. 38), 239. Despite promoting both the animal series and Geoffroy's unity of plan, Serres denied that species could ever ascend from their rank in the series (although they could certainly be modified over time), and was an opponent of Darwin in France. See Y. Conry, *Darwin en perspective* (Paris, 1987), 48.
42. From Leroux's preface to the *Revue encyclopédique* ("De la doctrine du progress continu") (Paris, 1833), pp. i–lxxi, p. xvii. Compare p. xx: "Politics, as a philosophy, is nothing but the knowledge of the continuous development of the life of humanity under the relation of sentiments and of association. Art is nothing but the successive and prophetic expression of the epochs of humanity. Physical science is nothing but the knowledge of the successive creations that nature engenders following necessary laws over the course of the ages."
43. Geoffroy to Sand, 13 July 1838, quoted in Bourdier, *op. cit.* (ref. 40), 62.
44. Leroux, in N. Andrews, *Socialism's muse* (Lanhan, 2006), 38.
45. P. Leroux, *De l'humanité* (Paris, 1845), i, 205.
46. Leroux, *op. cit.* (ref. 45), i, 203. On Leroux's metaphysics see P. Macherey, "Pierre Leroux dans le querelle du panthéisme", *Cahiers de Fontenay,* xxxvi–xxxviii (1985), 215–22.
47. Schwab, *op. cit.* (ref. 35). See D. Evans, *Le socialisme romantique: Pierre Leroux et ses contemporains* (Paris, 1948); and J. Viard, *Pierre Leroux et les socialistes européens* (Paris, 1982). On the *Encyclopédie nouvelle*, see D. Griffiths, *Jean Reynaud, encyclopédiste de l'époque romantique, d'après sa correspondance inédite* (Paris, 1965).
48. See Sarane Alexandrian, *Le socialisme romantique* (Paris, 1979).
49. P. Leroux, in Sewell, *op. cit.* (ref. 15), 274.
50. He also entertained doctrines of reincarnation and metempsychosis, like Ballanche and his colleague Reynaud: see Lynne Sharp, "Metempsychosis and social reform: The individual and the collective in romantic socialism", *French historical studies*, xxvii (2004), 349–79.
51. P. Leroux, "D'une nouvelle typographie", *Revue indépendante,* 25 January 1843, 259.
52. "Aux Artistes : De la poésie de notre époque", in P. Leroux, *Aux philosophes, aux artistes, aux politiques: Trois discours et autres textes*, ed. by J.-P. Lacassange (Paris, 1994); Warren Breckman, "Politics in a symbolic key: Pierre Leroux, romantic socialism, and the Schelling affair", *Modern intellectual history,* ii (2005), 61–86; and D. Simmons, "Waste not, want not: Excrement and economy in nineteenth-century France", *Representations,* xcvi (2006), 73–98.

53. Proudhon, *op. cit.* (ref. 1), i, 137, 244.
54. Proudhon, *op. cit.* (ref. 1), ii, 149.
55. Proudhon, *op. cit.* (ref. 1), ii, 192.
56. F. Saint-Louis, *Georges Gurvitch et la société autogestionnaire* (Paris, 2005); and F. Dagonent, *Trois philosophies réconsiderées: Saint-Simon, Proudhon, Fourier* (Hildesheim, 1997).
57. Sylvan S. Schweber, "Auguste Comte and the nebular hypothesis", in R. Bienvenu and M. Feingold (eds), *In the presence of the past: Essays in honor of Frank Manuel* (Dordrecht, 1991), 280–365; J. Merleau-Ponty, *La science de l'univers à l'âge du positivisme: Étude sur les origines de la cosmologie contemporaine* (Paris, 1983); and S. Schaffer, "The nebular hypothesis and the science of progress", in J. R. Moore (ed), *History, humanity, and evolution: Essays for John C. Greene* (Cambridge, 1989), 131–64.
58. B. Karsenti, *Politique de l'esprit: Auguste Comte et la naissance de la science sociale* (Paris, 2006).
59. A. Comte, *Cours de philosophie positive*, ed. by M. Serres, F. Dagognet and A. Sinaceur (Paris, 1998), 569 (Lesson 35).
60. Comte, *op. cit.* (ref. 59), 680, 675–8 (Lesson 40).
61. Comte, *op. cit.* (ref. 59), 773–4 (Lesson 42). Three laws of classification determine the animal series: increasing anatomical complexity; increasing vital activity; and increasing modifiability and power of modification over the natural world.
62. Comte, *op. cit.* (ref. 59), 305. See Karsenti, *op. cit.* (ref. 58); M. Pickering, *Auguste Comte: An intellectual biography* (Cambridge, 1993).
63. A. Comte, *The catechism of positive religion* (London, 1891), 34.
64. G. Iggers, *The cult of authority: The political philosophy of the Saint-Simonians, a chapter in the intellectual history of totalitarianism* (The Hague, 1935).
65. On Comte as ecological thinker, see J. Grange, *La philosophie d'Auguste Comte: Science, politique, religion* (Paris, 1996).
66. Comte, *System of positive polity* (London, 1875 (1851)), i, 500: chap. 3, "Animal life".
67. L.-N. Bonaparte, *Les idées Napoléoniennes* (Paris, 1839); K. Marx, *The eighteenth Brumaire of Louis Bonaparte* (New York, 1985).
68. Many other cards would be needed to complete the collection, including those of Étienne Cabet, planner of the communist utopia of Icaria; Flora Tristan, advocate of the cause of women and of mutualism; Louis Blanc, theorist of the Organization of Labour; the mystical reformer Abbé Constant; the innovative social Catholics Lamennais and Buchez; the Fourierist steam enthusiast Constantin Pecqueur; Alphonse Toussenel, author of both the natural historical allegory *L'esprit des bêtes: Le monde des oiseaux, ornithologie passionnelle* (Paris, 1853), and the screed against Rothschild and finance capital, *Les juifs, rois de l'époque: Histoire de la féodalité financière* (Paris, 1847); the insurrectionist Auguste Blanqui; and, of course, Karl Marx, whose economic and political thought owes as much to his Parisian milieu as to German sources. This series could also be shown to intersect with more firmly institutionalized theorists of liberal Political Economy — J. B. Say, Charles Dunoyer, Michel Chevalier (after he shaved his beard), and Auguste Blanqui's brother Adolphe Blanqui. For a recent survey, see P. Pilbeam, *French socialists before Marx: Workers, women and the social question in France* (Montreal, 2000).