

EIR Feature

Lazare Carnot's grand strategy for political victory

by Dino de Paoli

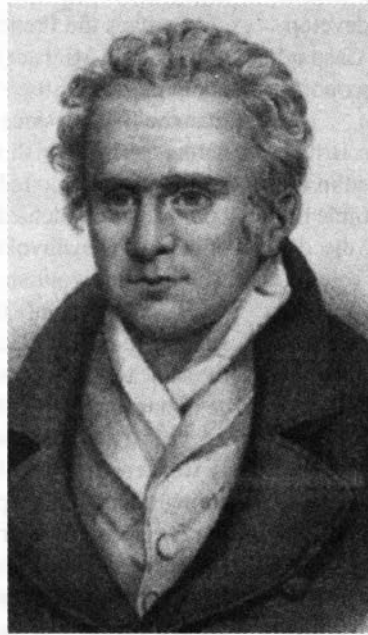
Editors' Note: Lyndon H. LaRouche, Jr., during his 1996 campaign for the Democratic Presidential nomination, frequently referred to the conceptions of the great French military strategist Lazare Carnot, as an example of the kind of approach that is needed today to achieve victory over the British-backed forces of oligarchism and usury.

At an *EIR* seminar on July 17, for example, LaRouche described his own campaign to impeach Tom Ridge, the Republican governor of Pennsylvania, whose cuts in medical and social service budgets amount to a Nazi-style crime against humanity. LaRouche introduced the campaign with reference to Carnot:

“Back in 1793, France, under a *terrible* government, was overrun by invading armies which were victorious on every front. The word in Paris was that the defeat and consequent dismemberment of France, was a military inevitability. At that point, they found a ‘sucker’ to take over the defense forces of France. His name was Lazare Carnot. He was a rather famous military genius, who had once spent time in the Bastille because of court politics; who had been a student of Gaspard Monge, who was the leading scientific thinker of France, and, at that point, of Europe.

“Lazare Carnot, under conditions of imminent defeat, reorganized the policies, the military policies of France, and its armies—often fired major-generals to replace them with sergeants, quite successfully, if he found the major-generals keeping the troops in the barracks too long, or if they didn’t cross the river that night, but rather waited for the next morning, things like that—terrible crimes.

“But, a very specific thing which he did, apart from revolutionizing modern warfare by use of development of mass mobile field artillery fire and things of that sort, was to change the policies of France: that rather than attacking the adversary on a broad front, in a kind of federated approach of mass attacks on every front simultaneously, which only a jarhead would do, was to focus the military power of



Towering figures of the French republican tradition, who developed the nation's physical economy, educational system, scientific capabilities, and military might, as part of one coherent plan (left to right): statesman Jean-Baptiste Colbert; scientist Gaspard Monge; and Lazare Carnot, the "Organizer of Victory".

France at each point, at certain specific points. And, by picking a point on which to attack, to turn the flank of the enemy, and rout him.

"Now, that's *exactly* what we're doing with the campaign in the Commonwealth of Pennsylvania. We have limited forces, we must change the policy of the United States, we must ensure that the Democrats take over the House of Representatives, and, hopefully, also the Senate. We must *panic* the country into a perception that *everything that Contract with America represents is gone*, so that people who are elected to Congress on the Democratic line, will behave above their level of personal morality, as moral figures in the Congress.

"The way you get troops to function, is you move them: Get them out of the barracks, and move them. The way you get politicians to function morally, is to panic them into doing so. You create a rush in which they have no alternative but to do it, or the guys behind them will trample them. That's how you do it. And, that's our objective."

Looking through *EIR's* archives for research material to fill out the picture that LaRouche had sketched, the editors discovered the following article by Dino de Paoli. It appeared originally in the French newspaper *Nouvelle Solidarité* on July 2, 1981, under the title "An Open Letter to Republicans: The Combat of Lazare Carnot," and was translated into English by Garance Upham. The version we publish here has been edited and expanded to make the complex historical events clearer to an American audience.—*The Editors*

I. Creation of the republican concept

Though France was a well-developed nation in the seventeenth century, the definition of a clear notion of political economy only came to the fore by combining the work of Gottfried Leibniz (1646-1716) and Jean-Baptiste Colbert (1619-1683). That is what Lazare Carnot represents.

For Leibniz,¹ economics was the science that was to ensure the progress of nations, through technological development and the education of the labor force. The whole society had to be reorganized to encourage progress, to productively reinvest surplus, and to uplift man culturally. Leibniz established the founding theoretical instruments for the analysis of economic processes, not in terms of simple accounting, but by analysis of the capacity for social reproduction.² Carnot and his friends used that knowledge, as we shall see.

Colbert was the statesman who developed the concept of a planned economy, and organized the French Academy of Sciences, where Leibniz worked. For the first time, Colbert put together an "R&D department." He recruited the best

1. Gottfried Wilhelm Leibniz, *Society and Economy*, Hanover 1671. (See *Fidelio*, Fall 1992, p. 54.)

2. See Lyndon LaRouche and Jacques Cheminade, *La France après de Gaulle* (Paris: European Labor Party, April 1981).

scientists, gave them financial backing (unlike the British Royal Society), and linked their discoveries to the development of technology. This is the model that Carnot and Gaspard Monge would follow, in reorganizing the French economy and creating the famous Ecole Polytechnique.

This heritage represented a mortal threat to the British oligarchy, which determined to destroy it. To succeed in destabilizing a country, the enemy must combine economic harassment with cultural hegemony, and thus, orient the discontent within the population in such a way that no better solution to the crisis may be found. At the beginning of the eighteenth century, when the British decided to attack their main enemy, France, the latter's principal flaw was Cartesianism. Only the Oratorian schools,³ those who trained Monge, Carnot, and Claude Antoine Prieur de la Côte d'Or, taught the work of Leibniz. Cartesianism is a synthetic, nominalist philosophy, which is not capable of bringing students to a comprehension of natural law. The criticisms which Leibniz formulated concerning Descartes speak for themselves.⁴

When the English oligarchy began to deploy its agents in France, the flanks were many on the cultural side. The principal British agent was David Hume (1711-1776), an aristocrat of Scottish origins, who encouraged Adam Smith, Montesquieu, Voltaire, and Thomas Malthus, and initiated a synthetic operation against the European and French Colbertists. He declared sarcastically: "The French still believe that human society is capable of perpetual progress in the direction of perfection." He attempted to destroy that belief by counterposing his own philosophy, in which morality has no place. "Only personal utility can be a motive for action," he wrote in his *Treatise on Human Nature*. One can say that this was Hume's personal motto.

At the same time, the French salons initiated an Anglo-philic cult combined with a cult of the Chinese mandarin system. The priests Abbé Prévost and Etienne Condillac spread this "aesthetic mode." The novels of Prévost⁵ suggest that reason is useless, since man is slave to his passions. What passions? "The individual sensations, the desire to possess," Hume answers. Some Physiocrats published books advocating the cult of Isis⁶ and attacking the city-builders who "piti-

3. The Oratorians, founded by Cardinal Bérulle, were a teaching order which adopted the ideas of Leibniz after Malebranche had introduced them into the order.

4. G.W. Leibniz, *Remarques sur Descartes*, in *Opuscles Philosophiques Choisis* (Paris, 1969).

5. For example, *Manon Lescaut*.

6. Isis, the "Whore of Babylon," is the central figure in the irrationalist cults, created and spread by the oligarchy since Aristotle. According to the legend, Osiris killed and cut up by his brother Seth, was brought back to life—in general without his genitals—by his sister-wife Isis. Isis, the magician queen, was adored as the universal mother in Egypt and was the model of the *Magna Mater*, etc. of the Roman cults. The worshipper of the Osiris mysteries identified himself with the fate of Osiris, occasionally going so far as actual castration of men (even self-castration). The sect members "sacrificed" the "power"

lessly destroyed" the "healthy" and "peaceful" rural life.

Perhaps the French might find it shocking today to read what British Minister Robert Walpole was writing at the time about their ancestors: "The French are ten times more idiotic than the British, since they are so easily duped by the British nature." The British did not conceal their game then, any more than they do today. The economic conception of those "progressives" denied the role of man in the transformation of nature. They invoked a phantasmagoric "natural fertility," which would nourish each and all. These so-called progressives fought against the work of the great Turgot, who was striving to initiate an extensive program of rural education of the same type as that begun by Benjamin Franklin in America.

Thus, the "progressive" Voltaire wrote:

"Most manufactures vitiate the workers' bodies, their race is weakened. Agricultural labor, on the other hand, has a strengthening effect, provided the debauchery of holiday festivities does not alter the positive effect of both work and sobriety. . . . Many persons have established schools on their land. I have established some myself, but I fear them. . . . I think it proper that most children only learn how to cultivate the land, because there is only need for one writer for every two or three hundred manual laborers. The labor of agriculture only requires a common form of intelligence."⁷

Voltaire was not naive; he wanted to crush republican education, because it was essential to do so in order to destabilize France.

All these traitors have a common ideology: the hatred of science, of progress and education, disgust for man as a self-perfecting being. Such is the true face of the ecology movement today: return to the land, under the boot of the feudal lords for whom the peasantry has less value than cattle.

Carnot, the Leibnizian

Benjamin Franklin, whose efforts to secure French support for the American Revolution are well known, fought against such nostalgic defenders of feudalism in America and in Europe. Less well known, is that he reorganized the French Leibnizians, and trained Lazare Carnot. Carnot, the "moralist," was a happy man. His wine cellar full of Burgundy wine, his poetry, his jokes, all show that in him, morality did not rhyme with morosity. Carnot studied at a school run by the Oratorian Fathers, where he was taught the work of Leibniz, before pursuing his studies under the direction of another pupil of the Oratorians, Gaspard Monge. The latter was the pedagogical director of the school of military engineering at Mézière. His educational method deeply influenced a whole generation of European scientists.

of rationality, and entered into an infantile regression, in order to "be reborn" in the love of the Great Mother, the Virgin-Whore, Isis. She also symbolizes Mother Nature among the ecologist cults today. Hébert repeatedly showed his attachment to Isis.

7. Voltaire, *Dictionnaire Philosophique*, in the article on "Fertilisation."

In 1783-84, Carnot came into contact with Franklin's Parisian circles, and began the fundamental political endeavor which was to determine his later activities. In his "Essay on Machines,"⁸ Carnot defined himself as a Leibnizian, in the broadest sense of the term. Society can only progress through the scientific study of technological innovation, he maintained. It was from that standpoint that Carnot would establish the new bases for a study of mechanics, defined as the search for the best possible way for a machine to transform the energy flux. This conception is opposite to fixed Cartesian analysis. The true science of thermodynamics was born.⁹

At about the same time, Carnot helped his friends the Montgolfier brothers, in their experiments on the first aerostatic balloons, the development of which inflicted a terrible defeat on those who claimed that man would never achieve mastery over nature and vanquish its laws, notably that of gravity. Carnot went even further, and, the following year, after the launching and ascent of a *montgolfière*, in 1784, he presented to the Academy of Sciences a memorandum on the ways in which balloons could be directed with engines, and perhaps even a steam engine:

"It is heat which, producing systolic and diastolic expansion in the balloon, must give the impulsion to the wheels. . . . You must note, in passing, gentlemen, how many arms will be spared in manufacturing, when the mechanics of fire are better known. . . . Within ten years, this will produce astonishing revolutions in the [mechanical] arts."¹⁰

Carnot later collaborated with inventor Robert Fulton on naval propulsion with steam engines, and on the use of submarines to beat the British fleet. "It is a newborn child!" Franklin exclaimed, when he saw the experiments.¹¹ It is from these beginnings, that hydrodynamics and aerodynamics were developed, proceeding from a conception of man fundamentally opposed to that of Voltaire and Rousseau.

In 1806, Carnot wrote in a report to the Academy of Sciences on the work of the physicist Nicéphore Niepce on a combustion engine:

"The discovery of a new motor force in nature is always a precious thing, when we can succeed in regularizing its effects, and use it to spare man's efforts. . . .

"Antiquity knew little of those motor forces; they only employed living human beings, weights, waterfalls, or wind. Those forces all being developed by nature itself, it was necessary, in order to apply them, to know only the effect of the lever. . . . But those assemblies of levers are only inert masses,

8. See J. Cheminade, C. Albert, D. De Paoli, et al. *La Science de l'Éducation Républicaine—le Secret de Monge et Carnot: Polytechnique et les Arts et Métiers* (Paris: Campaigner Publications, 1980).

9. Ibid. Carnot's definition of the transformation of energy is Leibnizian, not Cartesian. See also, Dr. Morris Levitt, "Lazare Carnot and the Leibnizian Machine," *Fusion*, December 1978.

10. Quoted in Hippolyte Carnot, *Mémoires sur Carnot*, Vol. 1, p. 122.

11. Ibid.

merely able to transmit the action of moving forces without ever increasing them: It is the motor force which is everything. Modern man has discovered several motor forces, or rather has created them: because, though their elements be necessarily pre-existing, in nature, their dissemination nullifies them in this respect; they only acquire the quality of moving forces through artificial means, such as the expansive force of water reduced to steam, as the upward force which launches the aerostatic balloon."¹²

This notion fundamentally refutes the mechanical interpretation of the laws of thermodynamics, as well as the simplistic interpretation of the principle of conservation of energy attributed to Carnot. It also destroys the stupid arguments of today's ecology movement for solar energy, for new "diffuse" sources of energy.

If man wants to progress, he must create new forms of energy of greater and greater densities. This implies precise social and political considerations which Carnot was to elaborate in his first writings, "Eloge de Vauban" ("In Praise of Vauban") (1784) and "Memoire sur les Places Fortes" ("Memorandum on Fortifications") (1788).

In those two works, Carnot for the first time clearly presents his idea of a republican nation-state, and that idea is very different from simple anti-monarchism. Republicanism can take diverse institutional forms, among them, the American model of parliamentary democracy. Carnot used the work of French military engineer Sébastien Le Prestre de Vauban, to present his own credo on the necessity for the spiritual and material progress of the labor force.

This was the cornerstone of the reforms Carnot later introduced, notably when he reorganized the army. Like Vauban, Carnot was not attacking the king, so much as he was attacking the court, that gathering of lazy and parasitical aristocrats who ruined the French economy.

Led by the Orléans family, the court sabotaged the attempts of the Marquis de Lafayette to build the French republic in the image of the American republic. Thus Carnot wrote in his "In Praise of Vauban":

"May the triumph of reason be regarded as the most sublime effort of virtue. . . . If victory over our passions elevates us above human nature, the natural inclination to do good makes us divine. . . . Vauban did a special study of [the peasant's] labor, of his way of life. He researched the value of land, the way to cultivate it. . . . According to his calculations, for every 24 inhabitants in the kingdom, only one cultivates the land; thus, it is he who will feed the 23 others. What a difference between that father nourishing the fatherland and the man of leisure (the courtier)! The latter only begins to be useful when he dies. . . . He replenishes the earth only when he returns to it; however, it is that man of leisure who enjoys the fruits of all. . . . Vauban looked for the cause of disorder

12. L. Carnot and Berthollet, report read to the Institute on Dec. 15, 1806.

and found it in the excessive inequality of fortunes, in a revolting multitude of useless jobs, in a barbaric tax distribution system. . . .

“The population was always regarded as the cause, the sign of prosperity of empires, but the number of citizens is proportional to the sum of their useful labor altogether.”¹³

13. Sébastien de Vauban (1633-1707), Marshal of France, Commissar General of Fortifications, member of the Academy of Sciences. Best known as a military architect, he was also a great economist, and wrote an economic work, *Projet d'un Dîme Royale*, where he developed Leibnizian ideas that earned him royal disgrace.

Lazare Carnot's France

1753: Lazare Carnot is born in Burgundy (May 13).

1773: Carnot studies under Gaspard Monge at the military academy in Mézières, where he meets Benjamin Franklin.

1783: Carnot becomes a captain in the army.

1789: French Revolution begins. Storming of the Bastille in Paris (July 14). Abolition of feudalism. Declaration of Rights of Man and the Citizen. Church property nationalized.

1791: Flight and capture of King Louis XVI. Proclamation of new constitution. Carnot is elected to the new Legislative Assembly (Oct. 1), in charge of education. He writes his first proposals on reform of the army.

1792: France declares war on coalition of Austria and Prussia. First use of guillotine (April). Storming of the Tuileries (Aug. 10); overthrow of the monarchy. Chaotic situation in the army, with losses on all fronts, massacres in Paris. Carnot slowly begins to impose his policies. Carnot elected to National Convention (September); goes to the Pyrenees to organize defense against a possible attack from Spain. Carnot writes a report saying that without educated soldiers and a general economic reorganization, there can be no victory.

1793: Louis XVI is executed (Jan. 16); his wife, Marie Antoinette, is beheaded later. France declares war on Britain, the Netherlands, and Spain. Carnot writes a proposal for a new constitution, “Declaration of the Duties of the Citizens,” stressing education and military service for all citizens from 20 to 25 years. Northern front is collapsing. Carnot is sent there, writes a famous report stressing the need to hit the enemy on the flanks. He turns the military situation around, winning some battles. It is here that he

Carnot goes on to describe how activity can be promoted by correctly orienting the redistribution of wealth. Then he warns:

“When the hard-earned bread which the poor farmer produced, and which he was going to share with his children, is pitilessly stolen from him, what can be expected of that monstrous system, except depopulation of the countryside, sowing jealousy and hatred among the citizenry, the spread of apathy, the crushing of trust and happiness in the hearts of men, and making them all indifferent to the success of the state and the destiny of the fatherland, by breaking all the ties which united men to it? . . .

realizes the importance of logistics, mobility, and intelligence. Girondists are driven from power by Jacobins (July). France is ruled by Maximilien Robespierre and the Committee of Public Safety. Reign of Terror results in guillotining of 1,251 people by July 1794. Revolutionary calendar introduced. British Navy intervenes in the Mediterranean. France responds with total mobilization (*levée en masse*). Carnot reforms the army and brings its strength to 1 million men (4% of the population). Carnot named member of the Committee of Public Safety (August). He reorganizes and takes all military operations under his control, installing, against the will of Robespierre, a military staff composed of officers from the pre-revolutionary school. His general strategy is defensive for all the French border regions, except in the north, where there will be an *offensive* against England. Military situation begins to change, starting in September: French victories in Hond-schoote (north), Lyons (southeast), Toulon (south), Dunkirk (north). Carnot participates personally in battle of Wattignies, where he develops the idea that it is not enough to make the enemy retreat; he has to be destroyed.

1793-94: Carnot's reforms: 1) formation of a new, mass-based army; 2) organization of military forces to fight “total war”; 3) new political strategy: Obtain the neutrality of Prussia. Disrupt communications between Austria and England. Concentrate efforts on attacking the English, leading to an invasion of England. All this, in the midst of chaos in Paris and opposition from the leftist sans-culottes.

1794: Christianity is officially abolished in France, in favor of Robespierre's “Cult of Reason” (May). France occupies the Netherlands (until 1795). French victory at the battle of Fleurus (June), in the north, followed by retaking of all the northern ports, crucial to getting U.S. help for the French. The geopolitical contrast between the anti-Prussian Robespierre, and the anti-English Carnot, now chief of military operations, leads to the coup of 9-10

“Vauban believed that any right which is damaging to society, is unjust, that those who have labored equally for it, have the same rights to its benefits. . . . The government must prevent that odious multiplicity of prerogatives which condemn the most valuable class of men to indigence and scorn.”¹⁴

Today, that concept is forgotten, thrown away as “Marxist.” How stupid! The Marxist apostles of those times, Gracchus Babeuf, the socialist Jacques-René Hébert, were guil-

14. This quote and those following all come from *Eloge de M. le Maréchal de Vauban*, part 2, p. 26 and following.

lined, with Carnot assenting. Fabian socialists despise the labor force.

Carnot also details Vauban’s economic reform proposals, adding his own view of what it means to be a wise man:

“How rare it is that the wise man is able to obtain the fruits of his labor! He is ahead of his century, and his language can only be heard by posterity, but that is enough to sustain him. . . . He is a friend of those yet to be born; he converses with them in his profound reflections. As a citizen, he watches over the fatherland, he takes part in its triumphs; as a philosopher, he has already overcome the barriers which separate empires; he is the citizen of every land, contemporary of all ages; he

Thermidor, led by Paul Barras, which ends the Reign of Terror and leads to the arrest of Robespierre. Danton and Robespierre are executed (July). The authority and military influence of Carnot are used to remove Robespierre, although Carnot will never accept the reactionary policies of the Thermidorians. In the meantime, the French armies continue to regain territory after territory. Creation of the Ecole Polytechnique (September).

1795: Dutch fleet captured by France. Prussia, Spain make peace with France. Carnot leaves the Committee of Public Safety, in opposition to the right-wing policies of Barras. He returns to power on April 11, becoming a member of the Directorate, which rules France with a five-man executive committee.

1796: Napoleon Bonaparte leads French army in conquest of most of Italy by 1797. Carnot elected president of the Directorate (April 30).

1797: Coup d’état of 18 Fructidor by General Pierre Augereau (Sept. 4). Carnot is removed from the Directorate, escapes first to Switzerland, then to Germany. The Directorate, now a triumvirate under Barras, becomes dependent on Napoleon.

1798: French occupy Rome, invade Switzerland. Bonaparte leads expedition into Egypt (until 1799), takes Cairo. British fleet defeats French in the Battle of the Nile.

1799: Bonaparte invades Syria. Coalition formed of Britain, Austria, Russia, Portugal, Naples, and Ottoman Empire against France. French driven out of Italy. Coup d’état of 18 Brumaire: Bonaparte returns to France, overthrows the Directorate, and sets up a Consulate, which rules until 1804. Carnot returns, is named minister of war, but resigns in opposition, 1800.

1801: Treaty between France and Austria leads to breakup of Holy Roman Empire. France gains left bank of the Rhine, and keeps most of Italy.

1802: Treaty of Amiens between Britain and France. Bonaparte is created First Consul for life, over opposition

of Carnot, who was against the establishment of the empire.

1803: War breaks out between Britain and France.

1804: Bonaparte crowns himself emperor. First Empire lasts until 1814. Third Coalition is formed by Britain, Russia, Austria, and Sweden against France.

1805: France defeats Austria at Battle of Ulm. British Navy defeats Franco-Spanish fleet at Battle of Trafalgar. France defeats Austria and Russia at Battle of Austerlitz.

1806: Napoleon dissolves Holy Roman Empire. Prussia defeated by France at Jena and Auerstädt.

1807: Carnot withdraws from public life.

1808: French occupy Spain; Joseph Bonaparte becomes king of Spain.

1810: France annexes Holland.

1811: French driven out of Portugal.

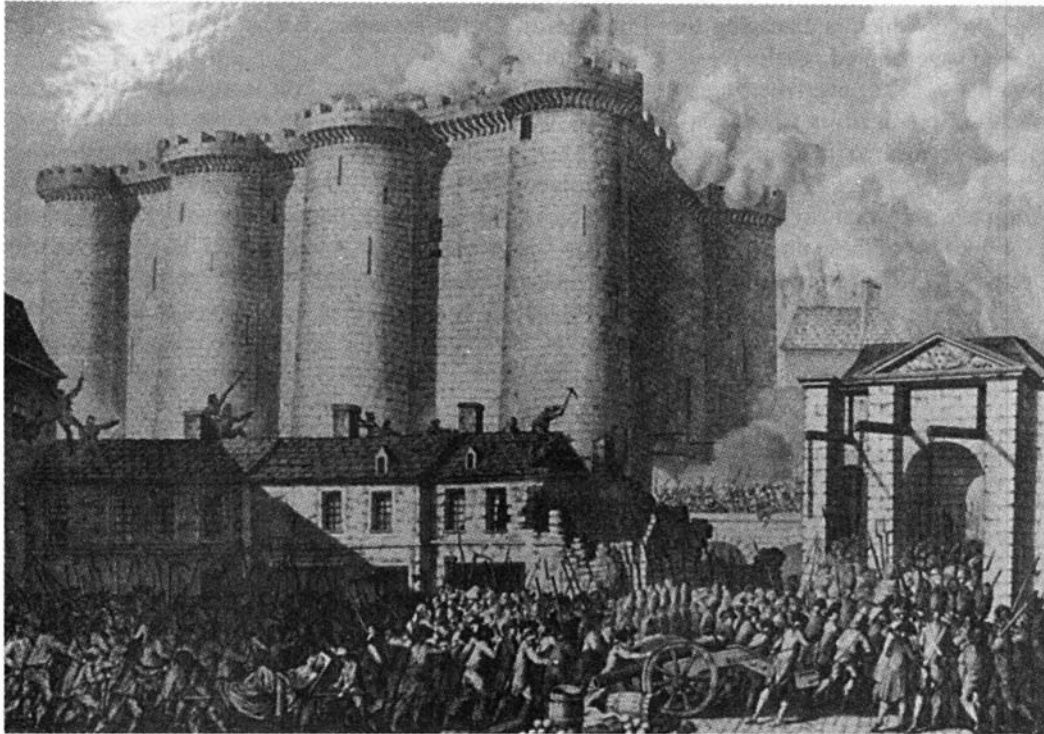
1812: Napoleon invades Russia; occupies Moscow. Greatest extent of Napoleon’s empire, encompassing 50 million of the 175 million inhabitants of Europe. Napoleon forced to retreat from Russia. Only 100,000 survive, from his army of 600,000.

1813: Prussia begins War of Liberation from France. Coalition against France formed by Russia, Prussia, Britain, Austria, and Sweden. French defeated at Battle of Leipzig, Battle of Vittoria. Allied forces invade France.

1814: Coalition forces enter Paris in March. Carnot is appointed governor of Antwerp by Napoleon. Napoleon abdicates and is exiled to Elba. Louis XVIII becomes King of France. Treaty of Paris ends Napoleonic Wars. Congress of Vienna (to 1815).

1815: The Hundred Days: Napoleon returns to Paris. Carnot serves as minister of the interior. Battle of Waterloo: Napoleon defeated and exiled to St. Helena. Carnot is exiled from France (July), settles first in Warsaw and later in Magdeburg, Germany. France’s boundaries are restored to those of 1790.

1823: Carnot dies in Magdeburg.



The storming of the Bastille in Paris, July 14, 1789. From the very beginning, the French Revolution was a battleground between two factions: a pro-American grouping of true republicans that included Carnot, and a pro-British gang of lunatics, including the Jacobins.

follows man from his fragile origin to the final perfection of his being. From the moment when, weak and alone, he is the plaything of all that surrounds him, up to the times when, reunited with all his fellow men in a unanimous concert of all the means allocated to his species, he commands the universe as a master: What an immense gap between these two extremities! . . . When, through those very convulsions, man has come to know the sum of his capabilities, the immense scope of his power. . . . Then, I say, will anything remain impossible for him? Ah! In spite of the dissipation and difficulty of his individual efforts, he has learned to master thunder, to force gravity itself to reach the regions of the thunderbolt. . . .

“What will he not do, when he brings together so many forces antagonized and broken by innumerable shocks, when private interest will have become general interest and virtue, the enlightened desire for happiness? Then the elements will be tamed, man will be respected by the entirety of nature; he will penetrate into the sanctuary of its laws; he will know its interconnections and causality.”¹⁵

Such is the true spirit of the American Revolution, that of Franklin, so profoundly antagonistic to that of Voltaire, Rousseau, and, later, to the Jesuits associated with Augustin Cauchy under the reign of Charles X. The thoughts cited above are the life-force, the *vis viva* of Monge, Carnot, Franklin, and the republican movement of the nineteenth century.

15. *Ibid.*

II. The struggle for a republic during the Revolution

We must keep in mind the ideas put forth by Franklin, Carnot, and their friends, in order to define more precisely what tendency stood behind which idea during the Revolution. It is only in that way that we will have in our possession the criteria indispensable to understand the role of Carnot in the creation of the first republican army capable of crushing foreign enemy forces, operating in coordination with French royalists, which were technically far superior.

From the beginning of the Revolution, two broad tendencies fought for power. There was the “American” tendency, as it was called—that of Lafayette, Thomas Paine, and others—which did not so much seek the establishment of a new regime, as the implementation of an economic and social policy modelled on that of the American Revolution. The opposing tendency was a British-protected and -directed tendency: the House of Orléans and their lackeys, Danton, Marat, et al.

The latter essentially wanted to create a liberal monarchy of the British type, and to sweep away the last remaining Colbertists who had fought for France’s independence and economic growth. The House of Orléans never endeavored to organize anything positive, or to work with the progress-oriented social forces, which would have meant at least maintaining the existing moral and political level of the population, if not increasing it. Rather, they wanted a destabilization, and



Lackeys of the British among the leadership of the French Revolution (left to right): Maximilien Robespierre, Georges Danton, and Jean-Paul Marat. Wrote Carnot: "I had the same aversion for Danton and Robespierre, but, as a member of the Committee of Public Safety, I was alleged to belong to the latter's faction, without it being known that I denounced it ceaselessly for its cruelty and its tyranny."

all they needed for that was the rabble. Carnot, who ceaselessly fought to safeguard the highest spirit in the French population, described the various factions this way:

"Barras was of that faction which horrified me, always; that faction which first sought to put Orléans on the throne; which, not having succeeded, conceived of working for its own ends, and which ended by splitting into two others: one, the Danton faction, which predominated among the Cordeliers, and the other, the Robespierre faction, which predominated among the Jacobins and the Paris Commune; the latter faction, so opposite from the republican system, came to exalt its principles when it saw that it could take advantage of it, to put itself at the head of the Republic. I was equally the enemy of the Cordeliers and of the Jacobins. . . . I had the same aversion for Danton and Robespierre, but, as a member of the Committee of Public Safety, I was alleged to belong to the latter's faction, without it being known that I denounced it ceaselessly for its cruelty and its tyranny."¹⁶

This is a rather undiplomatic description of the revolutionaries! Most historians see through the Orléans' gameplan, but few admit that the "revolutionary ideas" of Danton, Marat, and Hébert were only the fruits of a deliberate attempt at a destabilization, whose aim was certainly not the improvement of the French population's mental and material conditions. After a series of provocations, such as the Champ de Mars

shooting (July 17, 1791) had weakened the tendency of Lafayette, Carnot and the friends of the Engineering School of Mézières were elected to the Legislative Assembly, and attempted to build a movement which would be sufficiently powerful to take leadership over the unfolding events.

For the "city-builders," this was their chance to form a government that would, among other things, give priority to education, so as to increase the productive powers of society. This question of education, as we have seen, had already played a leading role in the struggles that preceded the Revolution.

This question now became the dividing line between republicans and destabilizers. The reason, to which we shall return, was simple. The attacks against the ongoing need for improvements in the knowledge of citizens can come from the "right" or the "left." The ideology of the feudal lord, for whom man is a beast, fit only for manual labor, was also that of the "progressive" Voltaire.

The education of the citizenry

In the new Legislative Assembly, Carnot was elected to the Committee for Public Instruction, where he elaborated a reorganization of the entire pedagogical and educational system. But the aim of Marat, Danton, and company was quite the opposite. Suffice it to recall the famous statement, "the republic has no use for scientists," declared by the judges who condemned the great chemist Antoine-Laurent de Lavoisier, or the even more vile diatribes of Marat against the Academy

16. Carnot, L., *Réponse à Bailleul*, 1789, p. 166.

of Sciences (an Academy which had had the “poor taste” to refuse the candidacy of Marat, who had been found to be a charlatan, a few years earlier):

“Bread is taken from the poor and given to clowns and vile plotters [Academicians]. Persons contribute to their desire for enjoyments, their taste for idleness. These do-nothings, these parasites . . . met 11,409 times, published 380 eulogies, approved 3,954 experiments, all on new recipes for cosmetics, pomade for the hair, ointments for foot sores.”

Or elsewhere:

“I am denouncing here the epitome of charlatans, Lavoisier, son of a peasant, would-be chemist, pupil of a Genevan speculator, the greatest intriguer of the century.”

The reforms envisioned by Carnot and his friends required time and a certain political tranquillity. That was why the Orléans incited the Parisian populace into a revolt and “permanent revolution.” It was the insurrectional Commune, originating from the 48 sections of the left-wing *sans culottes* of the capital, which practically imposed upon the Legislative Assembly the quasi-dictatorship of Danton during the day of Aug. 10, 1792. Danton was completely under the sway of the sensualists, the circles of Choderlos de Laclos (author of *Dangerous Liaisons*) and of the Marquis de Silley, who manipulated Laclos’s propensity for infantile “pure passion.”

Danton was an avowed advocate of an Orléanist monarchy and for an alliance with England. In July 1793, suspected of trading intelligence with the English, the Convention threw him off the Committee of Public Safety. Carnot describes the climate created by the Dantonists and Marat’s enraged hordes:

“A generation comes after us, whose education has been abandoned for three years; were that generation to linger in that state of affairs a bit more, it would no longer be capable of enjoying liberty. . . . To pursue such a path would transform the French nation into a horde of savages.”¹⁷

To fight those hordes of modern savages, Carnot presented in March 1793 a new constitutional project. In contrast to the 1789 Declaration of the Rights of Men and Citizens, Carnot proposed a Declaration of the Rights of Citizens, because, he explains, men can only exist under the social form of citizens. This difference is reinforced by the fact that the Declaration of 1789 did not really define what a citizen of the Republic is, but spewed out mere generalities on liberty as such. Carnot, on the contrary, specified in a few articles how the Rights and Duties of the Citizen of the State must be defined:

“**Article VII:** Every citizen is born a soldier. . . .

“**Article VIII:** Society has the right to demand that any citizen be instructed in a useful profession. . . . It also has the right to establish a mode of national education to prevent the evils which could be inflicted upon it by ignorance or the corruption of morals.

“**Article IX:** Each citizen has the reciprocal right to expect from society the means of acquiring the knowledge and instruction which can contribute to his happiness in his particular profession and to public usefulness in the employment his fellow citizens may wish him to fulfill.”

Those essential republican notions were left out of the 1789 Declaration. The continued emphasis on the need to educate the citizenry is the prime goal of Carnot and of his collaborators.

Britain, Venice steered the French Revolution

The French Revolution started far earlier than the July 14, 1789, storming of the Bastille, with which it is popularly associated. It began with the American Revolution, and the French-American alliance—without which the American fight for independence from Great Britain would have been doomed.

Throughout the American Revolution, there was a constant barrage of pro-American propaganda circulating throughout France, which promulgated the republican ideas of the Revolution itself. In 1777, the *Courier de l’Europe*, subsidized directly by the French government, published the Declaration of Independence. Another journal published long extracts from Thomas Paine’s *Common Sense*.

Upon the foundations of this Franco-American partnership, Benjamin Franklin and France organized the League of Armed Neutrality—the alliance of France, Spain, Prussia, Sweden, Holland, and Russia—against Great Britain and in defense of the American colonies’ fight for independence.

Personifying the French-American alliance was the Marquis de Lafayette, who fought alongside the Americans with other French volunteers, and returned to France to promulgate the ideas of the American Revolution at home. It was the aim of this “American faction” in France to bring the ideas of the American Revolution into Europe, by extending the wartime alliance into a peacetime partnership. This faction constituted the leadership of the early period of the French Revolution, with Lafayette playing the most prominent role.

Such a Franco-American alliance, the oligarchs of Britain and Venice were determined to prevent. First, Venetian agent Antonio Conti built up a pro-British party in France, the so-called Enlightenment philosophers, including François Voltaire. Conti’s descendants Giacomo

17. L. Carnot, *Correspondance Générale*, Jan. 12, 1793.

Carnot, 'Organizer of Victory'

Late in 1792, Carnot and his friends prepared themselves for a seizure of power, so as to stop the destruction of France. Carnot's military strategy is a model which is useful to study, because it was a republican political approach to the art of war, on the part of a man who had thoroughly grasped the links among science, the economy, technology, and a victorious military strategy. His reforms are all the more remarkable, in that he succeeded in bringing them about amidst anarchy,

economic collapse, and foreign invasion.

From his earliest writings on military strategy (notably in his work on Vauban), Carnot enunciated a concept of the art of war which is very important, though underrated by his biographers. He stressed the connections among defense works, the reorganization of economic production, and the large-scale utilization of modern technologies. This understanding of the necessity of using a superior culture to vanquish the enemy made Carnot the organizer of victory, not merely a brilliant

Casanova and Count Cagliostro, then orchestrated the destabilization of Louis XVI and his wife, Marie Antoinette. Next, the British unleashed a lunatic, anglophile faction, the Jacobins, led by Georges Jacques Danton and Jean Paul Marat.

The taking of the Bastille by the Parisian mob was led by Danton, the agent of the Duke of Orléans, the premier patron of the British- and Venetian-inspired philosophers in France. In 1790, Danton founded the Cordeliers Club in Paris. This was not to be a mere debating society, Danton said, but what we would today call a "political correctness" gang. Its purpose, he said, was "to denounce before the *tribunal of public opinion the abuses of the various authorities* and every sort of infringement of the rights of man" (emphasis added).

The Cordeliers wanted a radical democracy—targetting Lafayette, the court, and the priests who had come over to the revolution. It was from the Cordeliers Club's base among the unemployed and hungry people of Paris that the Terror was launched. "It is by an upheaval that we have overthrown the despotism," Danton proclaimed. "It is only by a great national upheaval that we shall make the despots retreat. So far we have only waged Lafayette's sham war; we must wage a more terrible war. It is time to tell the people that it must hurl itself in a mass upon the enemy."

And so, the guillotine was put to work. Scientist Antoine Lavoisier was among those put to death, with these words from the people's judge: "The revolution has no need of science."

Paine and the Girondins

The battle between the American faction and the heirs of the anglophile philosophers came to a head, so to speak, around the killing of King Louis XVI in January 1793. The king had been caught, ignominiously attempting to flee France in disguise. The Cordeliers Club and the Jacobins demanded that he be brought to summary justice and executed.

"To propose a trial for Louis XVI, in whatever form," said Maximilien Robespierre, "is to retrace our steps, toward royal and constitutional reform. It is a counter-

revolutionary idea, since it put the revolution itself on trial. I demand that the convention declare him [Louis] forthwith to be a traitor to the French nation, and a criminal against humanity."

Paine and the Girondins, as the American faction had come to be called at this time, argued that Louis's life should be spared. Paine proposed that he be banished to the United States. The Girondins lost the vote; within weeks of Louis's execution, the Girondin leaders such as Brissot and Condorcet were dead; and Paine—that son of liberty—was in prison. Lafayette was languishing in an Austrian prison. The American faction had been destroyed.

The revolution collapsed in an orgy of violence, and France was saved only through the strength of her armies and those patriots around Lazare Carnot and Gaspard Monge, who would later build the Ecole Polytechnique as the center of French republicanism and scientific achievement.

The terror was denounced by Paine, who wrote that "my despair arises not from the combined foreign powers, not from the intrigues of aristocracy and priestcraft, but from the tumultuous misconduct with which the internal affairs of the present Revolution are conducted." The lack of morality in the method of the Revolution would discredit liberty throughout the world, he said. The constitution drafted by Paine and his friends for France was rejected.

From Germany, the poet of freedom, Friedrich Schiller, wrote that the "attempt of the French people to gain possession of the rights of man and to win political freedom has only shown its incapacity and unworthiness, and has swept back along with it a considerable part of Europe into barbarism and serfdom."

This report is drawn from the work of Linda de Hoyos and Webster G. Tarpley. See especially de Hoyos, "New Gingrich: Britain's Jacobin in the United States," New Federalist, Sept. 25, 1995; and "The Enlightenment's Crusade Against Reason," New Federalist, Feb. 8, 1993; and Tarpley, "How the Dead Souls of Venice Corrupted Science," EIR, Sept. 23, 1994.

tactician. He considered war from a global political standpoint. At the same time, he constantly improved on his tactical approach, always using the most advanced concepts available. Thus, for example, he took some advice from the great strategist Guibert, a man with whom he had had disagreements in 1784, to resolve several aspects of military deployments. It is this clear strategic political vision which Napoleon—being a good captain, as opposed to a great strategist, one who only sought to accumulate victories on the battlefield, without an overall political conception—sorely lacked.

From the moment Carnot undertook a tour to reorganize the armies, he realized how disastrous the situation was, because of the stupidity of the revolutionary leaders. In a report sent from the Pyrenees in 1793, he described to his compatriots in the Convention, the demoralization of the older officers, the uselessness of the anarchist volunteers; he proposed a few measures, and put forth some sound advice:

“Among the objects which have been drawn to our attention, none have deserved more than roads and navigation canals; without them . . . it is impossible for agriculture and the [mechanical] arts to prosper. . . . Everywhere it is easy to do, instruction spreads, industry awakens. . . . Citizens, we have rarely written to you without mentioning the need for public instruction; it is because everywhere those needs are manifest by the expression of the liveliest impatience.”

After having explained the reorganization necessary for victory, he concluded:

“A yearly status of France must be written up by scientists and craftsmen who would be sent everywhere, in every locality. . . . Everything which those scientists could gather on the state of the population, on agriculture, on mines, manufactures, communications, production, commerce, and generally everything under the heading of political economy, combined with observations, reflections, and projects they think could contribute to the greatest prosperity for the state.”¹⁸

After the Pyrenees, he was sent to reorganize the Northern Front, where he had to face an even worse situation. There again, he reorganized what he could, then gave some strategic advice:

“It is shameful to stay on the defensive, when you have available 10,000 men, against 6,000. . . . The enemy should perish right there, if we run things properly. Instead of acting on the flank or the rear of the enemy, we always take him head-on; that is the best way to be sure you are always beaten.”¹⁹

Carnot realized more and more clearly that he could not rebuild the army, if strategic decisions were not made, or if bad strategic decisions were made, by Danton and company. To win militarily, first there had to be the political will to win, and, second, the army, logistics, production, etc., had to be revamped to further that objective.

When Carnot and Prieur de la Côte d’Or acceded to the

Committee of Public Safety on Aug. 14, 1793 and took the military operations in hand, the situation was practically desperate; the British had blocked Dunkirk; Maubeuge was besieged; Valenciennes had just capitulated; Lyons and Marseilles had revolted; the insurrection in the Vendée was going on; Saumur had just fallen; and Toulon would soon be handed over to the British fleet. In the interior, the Hébertists and Dantonists were provoking successive waves of terror.

As soon as he acceded to power, Carnot surrounded himself with the greatest scientists of the time, to reorganize military supplies and logistics. It is not accidental that they all came from Mézière: the mathematician Alexandre Vandermonde, the engineer and geometer Gaspard Monge, the chemist Jean-Antoine Chaptal, the industrialist and metallurgist Jean-Claude Perrier, the chemist Claude Berthollet, Victor Dupin, the chemist Antoine-François de Fourcroy. These constituted a group which reorganized the military sector, as well as education and the economy. In a five-month period, despite the fact that the revolutionary *sans culottes* were carrying out intensive sabotage, they succeeded in turning around the military situation.

The French army became at the same time the model for, and the nightmare of, enemy troops. For the first time, the brilliant ideas of Niccolò Machiavelli were realized on a grand scale: The first republican national militia had been formed, and was triumphing. In less than a year, the internal situation in the country also changed: Hébert fell in March 1794, and a few days later, the Dantonists, and, finally, Robespierre was overthrown the 9th of Thermidor (July 27), and was executed the next day with 20 of his partisans.

The method behind the victory

To draw a lesson from Carnot’s actions, we must look at the method employed, rather than the particular results obtained. First, as both his writings and his military victories showed, Carnot fought politically: His aim was to beat the principal enemy, the English, as rapidly as possible. That is why he concentrated so much effort on the battles of Dunkirk, Hondschoote, and Ostende—these were the northern areas controlled by the English. That is also why he later collaborated with Robert Fulton to perfect the means of destroying the British fleet and invading England; it is also the reason why he wanted to conclude a peace with Prussia and Spain in 1795.

During the battle of Dunkirk, he wrote: “We must eliminate Pitt, by winning Dunkirk.” For Carnot, not only had victory to be obtained, but the British had to be obliterated. Thus he wrote to a French general who abstained in that second necessity: “I express my deepest satisfaction to the Committee [for the victory]; however, I regret that the enemy was not pursued.”²⁰

The enemy began to feel the effect of the changes in army

18. Ibid., Jan. 12, 1793.

19. Ibid., May 26, 1793.

20. M. Reinhard, *Le Grand Carnot*.

deployments in October, November, and December 1793. Enemy troops were overcome by a deluge of artillery; they saw for the first time the reconnaissance balloons floating over their heads at the battle of Fleurus; they fought a volunteer force, whose belligerent ardor was coupled with a new organization, discipline, and competence; they endured the new cannons designed by Monge and the most powerful gunpowder that Berthollet and Chaptal could manufacture. In short, the enemy had not understood the true nature of a republican army.

How could Carnot obtain such results amidst such turmoil, when the economy and the domestic political situation were such a hopeless mess? His strategy had the following main features:

1. Instead of waging frontal battles, he chose a war of mobility, and the utilization of flanking maneuvers. He always insisted, when speaking to his generals, that it was essential to hit the enemy's weak flank, not to limit oneself to small skirmishes for show, but to go all-out to destroy the enemy.

2. He centralized all the operations under his supervision and that of his friend Prieur. He fully utilized scientists and industrialists. Their men, such as Monge and Chaptal, were placed at the head of key sectors, such as military production and mapmaking.

3. He established an inventory of all the available resources in manpower and productive capacity.

4. He reorganized the production of cannons, gunpowder, etc., by creating the psychological conditions which favored innovation and the invention of new technical manufacturing procedures, instead of simply using preexisting resources.

5. He reshaped the organization of the armies, reducing cavalry, restoring infantry, and naming quality officers at the head of the volunteers who, in any case, underwent intensive training before their assignment. He emphasized artillery and the training of artillery officers.

Carnot the "pacifist" knew that specific operations, directed with inflexible determination, would avoid prolonged and ruinous hostilities in the long run. He systematically refused to allow the plundering or destruction of civilian populations in enemy territory. "In an occupied country . . . you will not take the laborer's horses, nor the supplies necessary for his family and farm. You will pay for all the goods he would sell on the market."²¹

He also set up better coordination of artillery with infantry during the battle.

6. He created a bureau of military engineering composed of the republicans who represented the tradition of Henri IV, Colbert, and Leibniz. This bureau was made up of an operational section, a section for mapmaking and historical research, and an intelligence section.

About the latter, he wrote:

"Obtain good spies, know what is happening with the enemies, sow divisions among them: All means for crushing tyranny are good."²²

This approach brought about Carnot's well-known victories (see timeline, p. 18). Of course, when we speak of his global reorganization, we must understand it in relative terms, considering the power struggle which raged in the country and the lack of time. For example, one of the weaknesses of Carnot's organization was the difficulty in the selection and recruitment of the generals who would fully understand the new military method. If Carnot had been able to develop his model in a calmer domestic environment, it is doubtful whether there would have been a Napoleonic Empire at all.

Carnot's son Hippolyte describes the importance of the drive for a cultural revival in Carnot's approach:

"The most illustrious scientists came to place themselves at his disposal. . . . They took on the task of teaching a youth eager to pay tribute to the fatherland. After the lessons, the students would go visit the workshops to immediately get down to practice; the lessons were printed up."²³

All this was accomplished in a tumultuous period, in which many of the so-called revolutionaries sought the destruction of the country. Robespierre and Saint-Just resisted Carnot's plan: The Hébertists and the *enragés* mobilized the *sans culottes* to kill officers, under the pretext that they were not "good revolutionaries," and that only passion, and not a General Staff, is important in the art of war. It is interesting to note that Hébert combined this sabotage of the French Army with the advocacy of the doctrine of "perpetual war against the enemy." It is somewhat surprising in this context, that Carnot could not only survive, but that he won.

Carnot's Thermidorian coup d'état

Between September 1793 and April 1794, Carnot straightened out the French military situation. But this was also the height of the Terror led by the "revolutionaries." When, finally, in July 1794, Robespierre attempted to go after Carnot, the latter deployed the Army in such a way as to eliminate the partisans of Robespierre, without a bloodbath.

Carnot was free, from then on, to act as he saw necessary. However, instead of taking advantage of the situation to avenge himself by eliminating rival factions—which factions were later to eliminate him from power in 1797—he sought rather to consolidate the fragile bases of the republic.

Carnot always thought, not in terms of short-lived victory, but in terms of building institutions and ideas which in the long term would influence the development of the nation. Within a few weeks, in September 1794, he set into motion two ideas which were dear to him and which were to be the linchpin of a global development program, aiming at stabilizing the economic situation.

22. Reinhard, op. cit.

23. H. Carnot, op. cit.

21. Carnot, L., *Correspondance Générale*, July 18, 1794.

In September, he created the Ecole Polytechnique. That school constitutes, thanks to the pedagogical genius of Monge, one of the world's most beautiful monuments to the human spirit. In a few years, the best European scientists were formed there. It was to become a model for the whole world in the nineteenth century.

The creation of the Ecole Polytechnique is a most striking example of a "negentropic process." A social situation characterized by entropic disorder and miseducation is transformed, not because of a simple, formal reordering, which in any case could not have functioned, but through the concentration of the greatest possible quantity of free intellectual and economic energy. The outcome is a new and qualitatively superior solution to the problem of education.

It is interesting to cite the description which Prieur de la Côte d'Or gave of the school to Hippolyte Carnot:

"We had often discussed, your father [Lazare Carnot] and I, the necessity of creating a school for the recruitment of diverse classes of engineers; it was one of our favorite occupations. But the torrent of immediate business dragged us along, urgent matters tyrannized us. After the 9th of Thermidor [July 27, 1794], we talked about it again. Carnot had stayed in the Committee, I had left it; he told me to use my leisure time to develop that idea; which I did. As soon as the idea seemed to be ripe, we conferred with Monge, our former professor from Mézière, who took hold of it with his usual enthusiasm, and became the cog of the Commission to prepare the teaching program. . . . Its direct aim was the application of scientific studies to all the needs of the state."²⁴

24. Ibid.

Carnot: Beat the English with flanking operations

From Lazare Carnot's "General System for Military Operations in the Next Campaign," Jan. 30, 1794:

All the armies of the Republic must act offensively, but not everywhere with the same extension of their means. Decisive blows must be delivered at two or three points only; otherwise, we would have to spread out our forces rather uniformly on all borders, and the campaign would end, on each, with a few advantages that would not be enough to prevent the enemy from starting up again next year, while the resources of the Republic would be totally drained.

The point where everyone thinks we should deliver the major blows is the North [held by the British], because that's where the enemy, already master of a portion of our territory, himself is directing the largest portion of his forces; that is where he is in the best position to threaten Paris and carry off its provisions; lastly, that's where he is most easily attacked, since it is open country, far from the city, where the enemy has no strongholds, where our armies could live at his expense, and where there exist the seeds of insurrection, which successes could develop.

The army of the North is therefore where we should principally fix our attention. . . .

There remains discussion of operations that must be undertaken by the armies of the Coast of Brest and those of Cherbourg, which we should consider as acting as one. These armies have three objectives to fulfill: 1) finish the war in the Vendée; 2) guard the coastline; 3) carry out a

projected landing on the shores of England. For the first, we need light cavalry, several massed infantry corps, and very little artillery; for the second, good garrisons in the forts and good guard corps on the coasts; for the third, the same arrangements as the second, with a numerous and ever-ready flotilla.

It should be noted, on the subject of this landing, that even were we unable to carry it out this year, the preparations alone would hold all the English naval forces in check during the campaign, and would prevent them from attempting anything substantial elsewhere. They would force the English to have a considerable land army on foot, which puts their constitution in great danger, drains their finances, and prevents them from bringing help to the Low Countries. It is therefore essential to push forward the preparations with all possible vigor and to be ready to take advantage of the first opportunity to carry it out.

To the system laid out above, we need add several general rules, which had been taken as basic in all the ordinances of the Committee of Public Safety on military operations.

These general rules are to always act *en masse* and offensively, to maintain a discipline in the armies that is severe, but not nitpicking; to always leave the troops out of breath, without exhausting them; to leave behind no more than is absolutely indispensable to guard a place; to make frequent changes in the garrisons and residences of the general staff and temporary commandants, so as to break up the plots which proliferate as a result of staying too long in the same place, and which give rise to the treachery that hands the defenders over to the enemy; to exercise the greatest vigilance at the guardposts; to obligate general officers to visit these very often; to engage in bayonet combat on every occasion; and to constantly pursue the enemy to his complete destruction. . . .

The same year, on Oct. 13, 1794, the Abbé Henri Grégoire, a friend of Monge and Carnot, proposed the creation of the National Conservatory of Arts and Trades,²⁵ which, together with the Ecole Polytechnique, was to produce the qualified engineers to promote the technological progress of France. This reform in teaching was associated with the idea of creating credit for industrial development. It is thus that the Bank of Intervention came into being, under the impulse of Carnot, Monge, Dupont de Nemours, Montgolfier, and the Abbé Grégoire. That bank had the task of supplying credit to agriculture and manufactures, an idea copied from that of the American Treasury Secretary Alexander Hamilton, who in 1791 had created the First National Bank to the same end.

Carnot explicitly referred to the American model. In 1804, for example, Carnot gave a speech against Napoleon, during which he explained that the latter could have chosen America and George Washington as models, but unfortunately had preferred Rome and Julius Caesar.

To make a nation-state out of France, Carnot envisioned a European-wide peace plan that would have established either republican regimes, or monarchies with republican economic systems. That plan required, above all, the destruction of the feudal oligarchy which had led all the operations against France—what Carnot called “the worst tyranny that ever existed,” meaning England and its feudal aristocratic allies in France. Of course, the English did everything possible to sabotage Carnot’s work.

As soon as Robespierre fell, other forces or individuals tied to the English, such as Paul de Barras, used leftist or rightist groups to oppose Carnot. Barras had the Parisians under his control. In 1795, Barras and Talleyrand established an important power base of those who are commonly called “Thermidorians.” (It is important not to confuse Carnot with the Jacobins before Thermidor.) Here is what Carnot had to say about the Thermidorians:

“Barras was of Danton faction *par excellence*, like most of those called Thermidorians; but who, on the 9th of Thermidor, independently of the danger threatening them and which urgently had to be faced, thought much less about destroying one tyrant than about avenging another, and reestablishing that tyranny in their own hands. . . . Who were, in effect, those alleged avengers of humanity? . . . The men who had drenched in blood the cities of Paris, Bordeaux, Marseilles. My great crime, in their eyes, was to have signed the arrest warrant against Danton.”²⁶

And what he says of Talleyrand:

“There is in the obsequiousness of that man something beneath even a beast.”²⁷

These were the people who in October 1797 used the Paris militia against Carnot, while the armies that were loyal to him

25. *La Science de l'Éducation Républicaine*, (cf. *supra*).

26. L. Carnot, *Réponse à Bailleul*, p. 111.

27. H. Carnot, *op. cit.*

were away. Carnot barely escaped death, and had to take refuge in Switzerland, while Barras published false information which asserted that Carnot was committing treason and working in concert with the royalists!

Even at that time, the real reason behind that struggle was known to be the peace plan which Carnot wanted to offer to Prussia and Spain in order to defeat England. The monarchists, the English, and their French agents were interested in seeing the war with Prussia continue, albeit each for their own reasons. The fall of Carnot was certainly an important short-term victory for the feudal lords who manipulated the confrontations between right and left.

But it was not so easy to root out the work, the institutions and the ideas of Carnot.

Here is how Carnot described the situation under the Directorate which took power in 1795:

“Anarchy and royalism fight one another as to who will bathe in republican blood; everywhere they fall beneath the dagger of fanaticism, of the emigrés, of Babouvism. No means of repression at home, no more hope of peace abroad, the enemies go to work with a fury, the friends fall into slumber.”²⁸

Later, came the coup of 18th Fructidor (Sept. 4, 1797), led by Barras, which resulted in Carnot’s ouster from power. Here is how Carnot described the strategic situation at that time:

“Had France concluded a general peace instead of the 18th Fructidor, its prosperity would today surpass that of the happiest people history has recorded. France will plunge into ruins, if we don’t quickly look into the state of its finances, if we do not finally lay the basis for a system of political economy.”²⁹

III. The polytechnical science of Carnot and his followers

The Napoleonic period

As soon as he took power on Nov. 9, 1799 (18th Brumaire), Napoleon recalled Carnot to France, named him Inspector of War, and placed him in charge of the recruitment and training of officers, as well as of the reorganization of the French Army in Germany. But because it was impossible to orient Napoleon to republican ideas, away from a monarchical regime, because of his infantile approach to the arts of war, Carnot resigned in October 1800. During his stay in office, he still attempted to indicate the direction which reforms should take, especially in the domain of education. In 1815, he commented on the period:

“If the Republic had had time to organize public educa-

28. *Ibid.*

29. L. Carnot, *Réponse à Bailleul*, p. 111.

British sour grapes

The Encyclopedia Britannica concludes its entry on Lazare Carnot with a vicious attack on the man who mobilized France, under the most desperate conditions, for a war with England. (For what Carnot really thought of Robespierre's Terror, see de Paoli's article.)

Carnot was indeed "the Organizer of Victory" but only in collaboration with the other members of the Committee of Public Safety, with whom he shared responsibility for the Terror as well. For although the Committee of Public Safety was able to raise, equip, arm, and feed 14 armies and lead them to victory, it succeeded only by means of a mass levy, mass requisitions, and nationalization of military production—measures that were based on the revolutionary government's use of force, that is, an authority relying on the Terror. The characterization of Lazare Carnot as "the Organizer of Victory" is a legend created by the victors of the Thermidor coup, who, holding those vanquished in the coup responsible for the Terror, surrounded the survivors with all the brilliance of the victory.

tion, it have been imperishable."³⁰

Secondly, he continued to implement reforms in order to increase the power of the French Army. He created a corps of telegraphers, and, with the aid of Robert Fulton,³¹ he sought to create a special unit of naval infantry, utilizing Fulton's "diving boats" (submarines) to beat the English fleet. Napoleon opposed the project. Carnot quit the government, no doubt because of that rejection, and soon afterwards wrote to Fulton:

"If I were still Minister of War, I would not hesitate for a minute to give you the means of carrying out this effort, whose positive outcome is beyond doubt, and whose consequences for the future I deem considerable."³²

From 1800 to 1804, he worked to put his scientific ideas in writing; it was in 1803 that his excellent works on geometry and machines appeared: *Géométrie de Position (The Geometry of Position)*, *Sur la Correlation des Figures Géométriques (On the Correlation of Geometrical Figures)*, *Principes Fondamentaux de l'Équilibre de Mouvement (Fundamental Principles of the Equilibrium of Movement)*, and others.

30. H. Carnot, op. cit.

31. Robert Fulton (1765-1815), American engineer, built the first submarine in 1798 (the *Nautilus*). Taking up the work of Joffroy d'Abbans, around 1807, he built the first steamboat, which assured a trade link on the Hudson River.

32. H. Carnot, op. cit.

While we cannot detail these contributions here,³³ let us simply underline that the methodological combination of questions of topology and technology, in the purest Leibnizian tradition, would become the main pole of interest for the republican scientists of the nineteenth century.

From 1802 to 1804, Carnot was practically alone in fighting Napoleon's imperial ambitions. He declared in a speech to the Senate:

"We are called upon to pass judgment on the formal proposition to reestablish the monarchical system and to crown the First Consul [Napoleon] with imperial hereditary dignity. I voted against the idea of consul for life. I would similarly vote against the reestablishment of the monarchy. . . . It is not on account of the nature of their governments that the great republics lacked stability: It is because, being improvised amid turmoil, it is always euphoria which led to their establishment. Only one was the work of philosophy; calmly organized, this republic persists, full of wisdom and vigor. The United States of America presents this phenomenon, and every day its prosperity grows in leaps which strike other nations with admiration and astonishment.

"Thus it was reserved for the New World to teach the Old that one can live peacefully under the reign of liberty and equality."

After that speech, one can easily understand how Carnot was able to devote himself to the education of his son Sadi Carnot, and to his work in the scientific section of the institute which he had created in 1795.

He also worked actively at the time in collaboration with Monge to form new generations of republican scientists; the names of the mathematicians Joseph Fourier, Jean Poncelet, Michel Chasles, Gustav Dirichlet, Carl Jacobi, of the inventors Wilhelm Weber and Alessandro Volta, of Abel, of Crelle, are all connected by a common methodology of scientific thought. Carnot worked in collaboration with the Humboldt brothers, Alexander and Wilhelm, on different projects aimed at creating in Prussia institutions similar to those of France.

Wilhelm von Humboldt, for example, presided over the founding of the University of Berlin in 1810, and his brother Alexander sought to create in Germany, in collaboration with Freiherr vom Stein, republican institutions at the beginning of the nineteenth century.

In 1814, when Napoleon's stupidity and the quality of the Prussian generals who had understood Carnot's teachings, brought about the collapse of the empire, Carnot saw that France was in danger. Despite his 60 years, he went back into service, and was named governor of the city and garrison of Anvers. He defended the town with such brilliance, that it alone did not fall into enemy hands. His prowess so struck the Prussians that they spared his life when he finally stopped defending the town, under orders of the new King Louis XVIII.

33. See *La Science de l'Éducation Républicaine*, (cf. *supra.*) and "Lazare Carnot and the Leibnizian Machine" (cf. *supra.*).

Napoleon, upon his return from exile on the island of Elba, named Carnot interior minister for the "Hundred Days." Immediately, Carnot created, on April 10, 1815, the Council of Industry and Welfare, which brought together the men of the Defense Committee of 1793: Chaptal, Berthollet, and Monge, as well as the Duc de la Rochefoucault-Liancourt, Ternant, d' Arcet. The program, rapidly drawn up by Chaptal, principally consisted in gathering the scientific, technical, and industrial capacities of the nation to encourage industry by means of innovation and economic assistance. By allocating a bonus of 50,000 francs to the inventors of any new industrial machine, Chaptal and La Rochefoucault-Liancourt promoted the education of workers and peasants.

In May 1815, Carnot passed a law that called for the generalized extension of primary schools. That law (the *Enseignement Mutuel*) read, in part:

"When the Americans of the United States decided on the location for a town, or even a village, their first concern was to bring a teacher there, at the same time that they brought in the instruments of agriculture; grasping as they did—those men of good sense, students of Franklin, of Washington—that what is as pressing for the true needs of man, as clearing the land, raising a roof, and clothing oneself, is to cultivate one's intelligence. But, when in Europe, the inequality of fortunes, the consequence of a grand society, leave men in such inequality of means, how can we invite the most numerous class of society to become educated? Education without morality would be . . . even more dangerous than ignorance. So, how can we raise the morality at the same time as the education of the largest possible number of men? Here is the problem which deserves to occupy the friends of humanity, and which Your Majesty would resolve by establishing a good primary education. In France, 2 million children clamor for that education. . . . Through those means, the greatest part of the generation moves forward in the benefits of primary education, the true means of elevating all the individuals of the human race to the dignity of man. What is in question here, is not to turn them out as small-time scientists or courtiers; it is to give to each the appropriate enlightenment. . . . In every part of political economy, great art consists in accomplishing a lot with little means. . . . Hence . . . it is to make children educators of one another for moral behavior as well as intellectual learning. . . . The master is thus multiplied by his young representatives."³⁴

This method was that which Gaspard Monge had already adopted when founding the Ecole Polytechnique, where he had set up a system of "brigade leaders," in which the best students were chosen to teach their comrades, in such a way that the teaching would never be passive and so as to multiply, as rapidly as possible, the number of students who could thus be trained.

34. *La Science de l'Education Républicaine*, pp. 121-136. La Rochefoucault-Liancourt was, on the initiative of Abbé Grégoire, the founder of the Conservatory of Arts and Trades.

Carnot also proposed to create a Normal School of the Mechanical Arts, and attempted to set up what would today be called social security and a retirement pension system.

Carnot thus endeavored to convince Napoleon to abandon his imperial designs and to strive instead to reinforce the economy and to simply fortify Paris and the important border towns. Then, when the economy was restored, Carnot explained to the emperor, one could envision a grand design for continental Europe. In the meantime, the enemy would not have the strength to attack France on its borders. Napoleon formally accepted that plan, but then reneged, exclaiming: "You are right, but I need a brilliant exploit,"³⁵ an exploit which he thus went to seek beyond the frontiers, on the plains of Belgium, and which he was to find, just a few days later, at Waterloo (June 18, 1815).

Hippolyte Carnot reported that the emperor even rejected Lazare Carnot's tactical advice, that he should attack the English first, and not the Prussians.

A short while after the defeat, even though the greatest part of his Army was still untouched, Napoleon refused to continue to fight, and instead resigned. Once again, under these difficult circumstances, Carnot took full responsibility, and was elected president of the Assembly. He immediately sought to establish a constitution similar to that of the United States, and began to organize the defense of Paris. The weakest flank was north of the capital, which was totally without fortifications; Napoleon had refused to build any. While Carnot sought to remedy the situation to defend the capital, the traitor Joseph Fouché, designated head of the government by the Assembly which had betrayed Napoleon to the English, committed treason against Carnot and sabotaged his attempt to defend the capital.

For his efforts, Carnot was thanked by Louis XVIII, who arrived with the occupying English troops, with the portfolio of minister of the interior. But, despite this appointment by Louis, the first measure taken by Fouché was to set up a list of persons to be exiled. The first name on that list was that of Carnot.

Exile in Magdeburg

Carnot was forced to flee to Magdeburg, where he was well received by the Prussians. There he found again the old republican circles of the Cincinnatus Society, led by vom Stein. He met there with Alexander von Humboldt and his friends, as well as General Gneisenau. In opposition to Metternich, the friend of Talleyrand, the German republicans sought to build in Germany a republic which would be based on the ideas of Franklin and the French. As early as 1816, Prussia was ahead of the other European countries in its educational system, followed by France, where Carnot's program was not fully applied. England was far behind.

In Magdeburg, Carnot collaborated directly with Alexan-

35. H. Carnot, *op. cit.*

der von Humboldt and General von Mueffling, Chief of Staff of the Prussian armies, on the project to create a school on the model of Polytechnique in Berlin. Felix Klein writes on this subject:

“Those circles encouraged enterprises; it is they who created our technical schools, and launched the idea of creating a polytechnical institute of high scientific level on the model of the Ecole Polytechnique.”³⁶

Those same Franco-German networks contributed to the creation of a group of scientists around *Crelle's Journal*, which Carnot helped to create. That group brought together the greatest names in the sciences at that time: Dirichlet, Jacobi, Abel, Gauss, Riemann, Poncelet, Liouville, and others.

The corrupt influence of Cauchy

While Germany was developing these ideas fully, in France, Charles X and his protégé Augustin Cauchy³⁷ ran a wrecking operation against the scientific community. Jean Victor Poncelet (1788-1867), the inventor of projective geometry and republican pupil of Carnot and Monge, described the demoralization of the French scientists after 1816, under the patronage of Cauchy:³⁸

“One would have to evoke the sad memory of the state of intimidation and degradation into which we had been plunged, in the period up to 1830, by reactionary, moral or political passions, which have exercised more influence than is presumed on the future of science.”³⁹

Cauchy, a mathematician close to the Jesuits, had taken the place of Carnot and Monge during the Bourbon Restoration. He deliberately attacked the “school of Monge” and, in so doing, created a deep feeling of demoralization in the schools. He used the classical oligarchical model to replace creative intuition in the sciences with pure Aristotelean formalism. Poncelet describes Cauchy’s method in the following way:

“Such a way of proceeding, while it is reminiscent of the Ancients’ without being better, gives much too much preponderance to particular facts over general facts; it breaks the link between theory and ideas, substituting a given series of theorems, recipes, so to speak, of the science of the discrete

numbers. . . . Obviously, one could not impose such a method as a model without forgetting the true aim of Mathematics, and without taking the chance of bringing us back to the scholasticism of the Middle Ages, whose narrow spirit has been . . . much too propagated in the teaching in our high schools and colleges.”⁴⁰

And further:

“Isn’t it most discouraging to see nowadays, that the most delicate geometrical discoveries under the heading of the philosophy of science, should be thus distorted, degraded by shallow minds, who have indeed contributed not a small part to throwing education into the disorder and indiscipline of which I spoke?”⁴¹

In 1826, Poncelet was forced to publish his works in Germany, in *Crelle's Journal*. He wrote:

“Finally, deeply humiliated and wronged . . . I have resolved, not without bitter patriotic regrets, to take recourse in the impartial Journal of Mathematics published . . . by the

40. J. Poncelet, *Polémique et Fragments divers*, p. 554.

41. *Ibid.*

36. *Ibid.*

37. Felix Klein, *Développement des Mathématiques au XIX^e siècle*.

38. Baron Augustin Cauchy (1789-1857) was considered by many to be the founder of the French school of mathematical analysis. In fact, he was completely attached to formalizing prior results, and, a violent royalist reactionary, to extirpating the works of the republican mathematicians. He violently opposed the genial mathematician Evariste Galois right up to the latter’s strange death.

39. Jean Victor Poncelet (1788-1867), a student of Monge, French general and mathematician, revolutionized geometry by his researches, especially those undertaken during his imprisonment in Russia. He led the Ecole Polytechnique, where he patronized a large number of great mathematicians and physicists. See Pierre Beaudry, “The Metaphor of Perspective,” *Fidelio*, Summer 1995, pp. 63-83.

British economics vs. the American System

Although after Lazare Carnot’s death, French intellectual life came increasingly under the corrupt influence of Augustin Cauchy, still Carnot’s legacy did not die out. It was continued, especially by Jean Victor Poncelet and his student Charles Laboulaye. The following excerpts from Laboulaye’s Dictionary of Arts and Manufactures give a vivid description of the approach to economics taken by the Ecole Polytechnique circles, who aligned themselves with the American System of political economy, against the English free-marketeers.

“Man can act on surrounding nature not only as animals can, but with his intelligence. The discoveries which the latter makes every day, far from perishing with the individual, on the contrary accumulate in the diverse sciences which successive generations transmit to one another. Through such progress, man . . . can satisfy his needs and desires. Compare our demands with those of the savage who has only his physical force at his disposal. . . . Well, civilization could only develop among people capable of producing a quantity of products greater than what is consumed every day. It is the surplus which, brought together in the form of buildings, machinery, etc., forms the accumulated capital which is the strength and wealth of nations,

honorable and knowledgeable Dr. Crelle.”⁴²

How can we simultaneously pass judgment in politics, geometry, mechanics, and morality? How could we accuse the famous Cauchy, the founder of the French school of mathematical analysis?

Carnot and his followers would laugh at that question. Comparing the social and methodological aims of Carnot and Monge with those of Cauchy, one can understand that there is no separation between the quality of education, the pedagogical method, and the capacity of society to progress.

Compare the quotes from “In Praise of Vauban” by Carnot, with the following text, “On the Limits of Human Knowledge,” written by the young Cauchy in Cherbourg in 1811, still under the influence of his Jesuit teachers:

“When one rapidly surveys the productions of the human mind, one is tempted to believe that human knowledge can grow and multiply to infinity. . . . However, if one observes that all our intelligence and our means are enclosed within limits from which they may never break free, one will become

42. Ibid.

convinced that our knowledge is limited . . . that if man has not been able to visit the poles, he is left in eternal despair of ever coming close to those icy regions. . . . Who will ever dig a well 1,500 leagues deep? . . . Man has risen 1,500 fathoms into the atmosphere, but the rarefied air . . . will constantly bring back to the surface of the earth those who would want undertake a bolder enterprise. . . . An undecomposable body will ultimately be found. . . . The exact sciences are the sciences which can be regarded as brought to a close. Man can by force of sophistry be brought to doubt the truths taught him, but he cannot discover new ones . . . !”

Here is the man who is considered the glorious founder of the French mathematical school! Only a generation of mindless accountants could emerge out of Cauchy’s ideas.

When Carnot died in Magdeburg in 1823, France was sinking into decadence, while Prussia was on its way to the summits. Had Carnot prevailed, it is probably not an exaggeration to say that we might have put the first man on the Moon in 1880. Just think of what the American model could have accomplished, in countries endowed with the density of scientists that France and Germany had!

and allows the individual, liberated from the imperious slavery of hunger, to develop his mind and enlarge the domain of human intelligence.

“The civilization which Aristotle considered possible only at the price of slavery, is made by progress dependent more and more on the accumulation of instruments of labor.”

Laboulaye rejects the “statism” of Louis Blanc as well as the “anti-statism” of the Anglophile economists, and shows that the role of the state is precisely to encourage progress, by fostering technological development and education. He clearly differentiates the British from the American model:

“The creation of large companies must be avoided; the British-style industrial expansion which leads to pauperization and demoralization must be stopped. . . . In England, the country which, to this day, is still the most affected by the feudal era, where the descendants of the Normans have become large landowners . . . and have permitted the building of British industry in a most aristocratic fashion . . . industry is found to be organized on the model of ever-divisible territorial property, on the model of its fully aristocratic political society, totally feudal.

“In the United States of America . . . the organization of industry is totally democratic. The worker only works today, so to speak, in the hope of being his own master tomorrow, and the industrial enterprises grow in number more than in size. In the two countries, the industrial organization is the faithful image of the political laws; it is

aristocratic in the first, democratic in the second. . . . The feeling that one’s elevation in society is impossible has indeed largely contributed to the revolution of 1848, the laboring classes always hearing talk about the increase in bankers’ wealth, in that of rich speculators, and amidst the crisis of industry, never seeing one of their own ranks rise into property through labor and innovation. Those are the unhappy seeds planted in times of demoralization, which have produced the false ideas that today pose the greatest dangers to the country. Oh, if we could get all the theoreticians to look at the beautiful American industrial scene! . . . Either the plain, dumb desire for improvement will lead us into communism . . . or it will surely lead us into a frightening equality of misery, through the degradation of everything and everyone; or we shall see an industrial democratic power with a broad base, gifted with an immense energy for productive work, well-being becoming the ensured reward of talent. . . . [This] will bring about growth in the wealth of the nation, to undreamed-of proportions.”

Laboulaye lists several prescriptions for reaching that goal, including the following:

“*Credit*. The only country with the goal of putting credit at the disposal of any capability that will make it bear fruit, is America. Thus have we seen that country, in a few years, realize undreamed-of progress. . . . Of course, the goal was sometimes missed . . . and that nearly always happened when credit was turned into an instrument of speculation, instead of a means of fostering labor.”