

ENERGIES IN THE ARTS

EDITED BY DOUGLAS KAHN

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LEROI-GOURHAN'S HALL OF GESTURES

JOHN TRESCH

THROWN, POSED WITH STRIKER

In 1999 I visited the *Musee de l'homme*— the Museum of Man, the temple to humanity at the Place du Trocadéro in Paris; I'm sure of the year because looking across the Seine from the museum's café, "Le Totem," I saw an electric-light display on the Eiffel Tower counting down the days to the millennium. I knew some of the history of the place: James Clifford's "On Ethnographic Surrealism" and works by Jean Jamin explained how the Neo-Moorish Trocadéro Palace formerly standing on this site—with its African, Asian, and Native American oddities and antiquities—had been a meeting place for anthropologists and avant-garde provocateurs in Jazz Age Paris; it was replaced by the monumental modernist Chaillot Palace and its more scientific vision of a universal science of humankind. I'd also been reading Walter Benjamin's musings, inspired by Baudelaire and the Surrealists, about the ecstatic charge buried in Paris's forgotten passageways.¹ The visit felt like a pilgrimage to a holy site of French theory. I gawped at the grand entrance hall, its spiral staircases, curved interior walls, giant windows, and iconic objects: bones and skulls, an Easter Island head, cases full of textiles and baskets from around the world. That the museum's displays appeared dated—there were few television screens, no animatronics, only decrepit mannequins and black-and-white photos captioned in mid-century modern type—only added to their charm.

One display in particular mesmerized me. It featured hand tools from numerous countries, with photos of men and women at work, next to outlined drawings of their poses and gestures. Coated in a thrift-store patina like documents of an alien past, they were labeled with the name of the gesture and its description: for instance, "Thrown," and "Posed with Striker" (see figure 6.1).

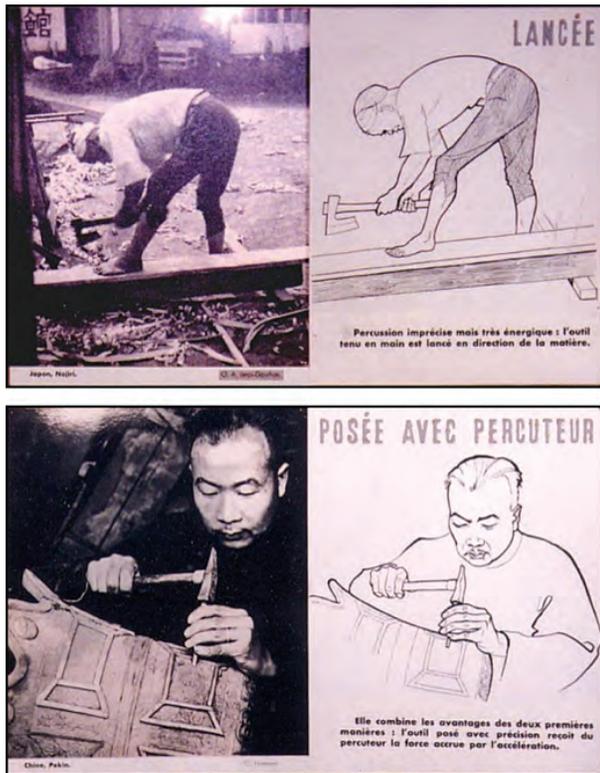


FIGURE 6.1
Musée de l'Homme, 1999. Photograph by the author.

Perhaps because I was so primed to experience the museum's aura, these strangely stylized images of "percussion" struck and resonated. The concentration of the laborers and the doubling of each gesture somehow invited identification, a projection of my own sensorimotor corporeality into the empty spaces inside the lines. The images seemed to demonstrate in a lost idiom the alchemical process of theory. A particular, embodied instance was abstracted into dynamic outlines and assigned a taxonomic tag, wedging it into some unknown, presumably vast systematic edifice. The photos I snapped of these images remained a puzzling, eerie trace.

I tried to visit the Museum of Man again years later, but it had closed for renovation in 2009. It reopened in 2015, with much of its ethnographic material

transferred to the Quai Branly Museum and the Museum of Civilizations of Europe and the Mediterranean in Marseilles. The remaining collection was reorganized to emphasize human biology.²

The paired photos and outlines, no longer on display, are preserved in the digital archives of the Quai Branly Museum. There I learned that they were made under the guidance of the anthropologist of technology, André Leroi-Gourhan, for the Hall of Arts and Techniques (*Salle des arts et techniques*), which served as the centerpiece for the Museum of Man—an important, but neglected aspect of a museum whose birth and development have been studied obsessively by historians of the French human sciences.³ In this chapter I seek to shed light on these peculiar images by placing them back in their earlier settings—the origin of the museum, and the successive regimes of art and energy with which they intersected.

In this way I hope to provide a historical account for their disorienting impact, the “profane illumination” they provoked. I do not claim that these surreal effects were entirely intentional. Unlike other anthropologists of his generation (including Michel Leiris, Roger Caillois, Marcel Griaule, and André Schaeffner), as well as the influential philosopher and para-sociologist, Georges Bataille, Leroi-Gourhan appears to have had minimal contact with the surrealist avant-garde of the 1920s and 30s, and little interest in aesthetic provocation. On the contrary, his analyses—an anthropology that is also a *technography*—were in many ways emblematic of the scientific, universalizing, and totalizing ambitions of the Museum of Man when it was installed at the International Exposition of Arts and Techniques in Modern Life of 1937. Far from sharing in the Surrealists’ antipathy toward scientific explanations and the regimentation of official museums, Leroi-Gourhan devoted his life to building theoretical and institutional frameworks for the human sciences. He trained dozens of ethnologists, archeologists, paleoanthropologists, and museum workers through a nearly forty-year collective pedagogical program run from the Museum of Man; he held France’s second professorial chair of ethnology, and entered the Collège de France in 1969.⁴

Despite this career as a faithful state functionary of human science, his museum displays and the arguments that informed them retain a compelling, subversive force.⁵ His works have been approached largely through his ideas and words; but as he himself argued for the primacy of bodies, actions, and objects, a fuller and more accurate image of his *“technography”* can be conveyed through analyzing the museum displays that embodied his thought. They tell a story of art and energy. At the entrance to the Hall of Arts and Techniques hung a sign in French: “Techniques are creative in the same sense as art. No art can do without

technique.” It presented both utilitarian and aesthetic techniques—tools, machines, and weapons, alongside sculpture, music, and dance. Central to Leroi-Gourhan’s analysis of these technical arts was their capture of “motive force”: the energies of living bodies, air, water, and fire, and eventually, petroleum, electricity, and atomic fission.⁶

His work crossed paths with other attempts to reckon the relationships between art and energy in twentieth-century France. This chapter walks through concentric rings of this historical labyrinth before arriving at the central chamber, the Hall of Arts and Techniques. For Surrealists and anthropologists of the 1920s and 30s, uncanny juxtapositions of high and low, modern and archaic—whether in paintings, collages, magazines, or museum displays—aimed to stimulate and unleash psychic and emotional energies. In the International Exposition of 1937, opposed visions of the political order and energy of industrial modernity were given aesthetic, propagandistic form. After the war, attempts to measure and guide human progress focused on the use and allotment of energy, connecting cave art and atomic destruction.

In several of these contexts, Bataille’s writings offer useful points of comparison with Leroi-Gourhan’s. Though Bataille—who perhaps more than any other figure realized a prewar and postwar fusion of philosophy, human science, and the transgressive aesthetics of the avant-garde—might appear the more radical thinker, Leroi-Gourhan walked the same paths. In the guise of a patient scientific vocation, his work performed a discreet but profound subversion of typical understandings of the human intellect and modernity, guided by Bergsonian intuitions. It inscribed a radical new humanism—reposing not on reason, rights, or even biology strictly understood, but on open-ended tendencies and evanescent gestures. Fueled the anti-fascist commitments of the Museum of Man in 1937, his work holds a lantern to the fissures of our time.

STUMBLING OVER THE ARCHAIC

The Museum of Ethnography in the Trocadéro Palace was first built for the 1898 International Exposition.⁷ Holding in haphazard splendor the “bric-à-brac” from cultures worldwide, it helped inspire the primitivism of Parisian arts in the 1920s. Fallen into dusty and moth-bitten disuse, it was overhauled in 1927 under the direction of Paul Rivet, an expert on the cultures of the Americas, and Georges Rivière, a socialite and jazz aficionado who captivated aristocratic and industrialist patrons; the two made the museum a site for artists and their

patrons. Rivet was a driving force in the development of French ethnography; in 1925, he held one of the first three chairs at the Institute of Ethnology, along with Lucien Lévy-Bruhl (author of *Primitive Thought*), and Marcel Mauss. Thanks to Rivière's evangelization, the museum and the institute were frequented by several young authors associated with André Breton and the Surrealist movement, many of whom would play a significant role in French ethnography.

The wide-ranging and aphoristic lectures of Mauss presented “man in his totality” (at once social, psychological, and physiological), through observations of peoples from around the world. *Essay on the Gift* (1925), subtitled *The Form and Function* (“Raison”) of *Exchange in Archaic Societies*, enacted a complex superimposition of the contemporary and the archaic, whether the historical past or the “preserved past” of “simple” societies.⁸ His own experience with cooperative industries led him to insist that economists must recognize the moral obligations and reciprocities implicated in all exchanges. He also urged investigation of technology and “body techniques,” the specific ways of moving and holding the body across cultures.

The fledgling science of ethnography shared with Surrealism a fascination with methods of collage and juxtaposition: the sewing machine on the operating table of Lautréamont, or, in works of Breton and Aragon, the simultaneous presence of high art and popular culture, the sacred forms of the West and the objects of primitive societies (masks, musical instruments). These uncanny juxtapositions were linked to states of altered consciousness, the heightened emotion and sensation of limit experiences, the activating of repressed energies. According to Jean Jamin, the Surrealists borrowed from ethnography “not the method nor the knowledge, but a pose: distancing, decentering, defamiliarizing (*dépaysement*).”⁹ Both Surrealists and ethnographers sought to destabilize the taken-for-granted hierarchies and divisions of everyday life, with a guiding interest in revealing the currents of chance, mystery, and irrationality coursing through the modern world—whose rationality the great war had shown to be illusory.

In 1928 Bataille broke away from what he saw as the overly psychological, individualizing, and aesthetic orientation of Breton's Surrealism. He founded a magazine, *Documents*, which collected unusual and shocking images proposing a defamiliarizing, “ethnographic” approach to everyday life: ritual objects, modern art, primitive sculptures, butchers' shops, body parts.¹⁰ One notorious article featured grotesquely enlarged portraits of big toes. Bataille wrote that “the big toe is the most *human* part of the human body,” as it differentiates human feet from those of other primates. It gives “a firm foundation to the upright stance of which man is so proud (the big toe, ceasing to grasp branches, is applied to the ground on the same plane as the other toes).” This new posture,

however, made possible a set of categorical oppositions between high and low, pure mind and impure matter. Subject to the pains and humiliations of blisters, corns, warts, and bunions, this digit gives a “shrill expression to the disorder of the human body, that product of the violent discord of the organs.” Protesting against “the bias in favor of that which elevates,” Bataille’s “base materialism” would show the grounding of human civilization in the frequently grotesque and unseemly configurations of both inorganic matter and human physiology.¹¹

The “Gros Orteil” essay emblemized the approach of *Documents*. Bataille and his coauthors produced shock through decontextualizing objects; conversely, they restored meaning to arts and crafts by recontextualizing them in their everyday as well as mythical and ritual settings.¹² Above all it troubled the categorical separation between high and low, modern and archaic. Such concerns continued to drive Bataille and his companions: a new discussion group founded in 1937, the “Collège de Sociologie,” founded by Bataille along with painter André Masson, the philosophers Jean Wahl and Alexandre Kojève, Roger Callois, Michel Leiris, and Walter Benjamin, sought to develop a new kind of social science, focused on “the sacred” in all its manifestations. The life experiences, obsessions, and emotions of the researcher became objects of study alongside the external facts of social life.¹³ Stirred by Nietzsche’s physiological critique of good and evil and an obsession with violence, sacrifice, and transgression, Bataille sought to humiliate the illusions of elevation, nobility, and purity that his society held dear.

In the conflictual political climate of the late 1930s, the alliance between avant-garde art and ethnography weakened, if not unraveled. Clifford and Jamin have seen the widening distance between these two cultural currents embodied in the new Museum of Man, in the place where the Trocadéro Palace once stood.

A CLASH OF MODERNITIES

Plans for the new Museum of Man were announced in 1934, to open in time for Paris’s “International Exposition of Arts and Techniques in Modern Life” of 1937. Since London’s Crystal Palace in 1851, international expositions had staged contests among proposals for organizing the modern world. Expectation and dread were focused on the displays of 1937, as reactivated tensions of twenty years earlier were turning the moment from “postwar” into “prewar.”

The areas around the Champ de Mars and on either side of the Seine were cloaked in monumental Art Deco. A direct line of sight connected the Place du

Trocadéro to the Eiffel Tower; on either side, the German pavilion designed by Albert Speer—a giant Roman column crowned by an eagle clutching a swastika—faced off against the Russian pavilion, on top of which giant statues of a female peasant and a male worker strode against tyranny. These pavilions presented not just two nations rapidly building up their industrial and military forces in distinctive political and aesthetic style, but also “zwei Weltanschauungen, two worldviews” (figure 6.2).¹⁴

Contributing to this clash of ~~views and~~ styles, the new Museum of Man embodied another ~~view~~. Rivet, an ardent anti-fascist and supporter of Leon Blum’s “Popular Front” government—an alliance of socialists, workers, and communists—aimed to make the museum the base for a new, scientific mode for ethnology, demonstrating the unity of humankind through its diverse cultural forms.¹⁵ He replaced the “bric-a-brac” of the Trocadéro Palace with displays of distinct groups—their clothing, arts, religious relics, and techniques—along



FIGURE 6.2

View from steps of Place du Trocadéro in 1937: Nazi pavilion at left (eagle); Soviet pavilion at right (workers). *Source:* Udovički-Selb, Danilo. “Facing Hitler’s Pavilion: The Uses of Modernity in the Soviet Pavilion at the 1937 Paris International Exhibition.” *Journal of Contemporary History* 47, no. 1 (2012): 13–47, <http://kapitel-spb.ru/article/facing-hitlers-pavilion-the-uses-of-modernity-in-the-soviet-pavilion-at-the-1937-paris-international-exhibition/>.

with analysis of general themes, reflecting Mauss's understanding of ethnology as the study of "mankind in his totality."¹⁶

His associate Rivière had toured the United States and Europe to gather the most up-to-date techniques of museum display and organization. He was particularly impressed by the clarity and opulence of the displays in Belgium's Tervuren Congo collection, the scale of Soviet ethnographic museums and their outreach to workers and schoolchildren, and the combination in the United States of research facilities and popular appeal. Rivière hired Yvette Oddon, who brought techniques of library classification she had learned at the University of Michigan.¹⁷ Anatole Lewitsky, a Russian-born anthropologist, took charge of much of the museum's design and communications. Its universal ambition reflected Rivet's political commitments. In the Parisian journal *Avant Garde* in August 1937, anthropologist and surrealist author Michel Leiris wrote: "The goal is to make the Museum of Man an instrument of popular culture as well as a center for specialists. ... It is certain that in our times one of the most urgent tasks is an extensive diffusion of the anthropological sciences, the concrete foundation of a new humanism whose advent no independent spirit can cease to hope for."¹⁸

This "encyclopedia within reach of all" would frame a new theory and ethic of mankind, both scientific and popular. It encompassed the Trocadéro Palace, replacing its crowded, darkened rooms with sleek modern lines and electric lights, reorganizing its hodge-podge collections, adding laboratories and modern research equipment.

This "dream building"¹⁹ announced a new attitude, according to Clifford, in which the grounds for alliance with the avant-garde were ~~erased~~; "though it shared surrealism's scope, the ethnographic humanism of the Musée de l'Homme did not adopt a corrosive, defamiliarizing attitude to cultural reality. The aim of science was, rather, to collect ethnographic artifacts and data, and to display them in reconstituted, easily interpretable contexts."²⁰

With construction slowed by a workers' strike, however, the Musée de l'Homme opening was delayed until 1938, and its Hall of Arts and Techniques had to wait twenty years to open. Yet France did contribute to the International Exposition's nationalist posturing with palaces along the Seine dedicated to the industrial capture of energy. The Palace of Air (figure 6.3) celebrated aviation with dynamic sculptures and murals by Robert and Sonia Delaunay. The pair painted the outer walls of another building, the Palace of the Railroad, with giant frescoes of multicolor wheels and gears. The Palace of Electricity boasted a gigantic light signal, regularly discharging 500,000 volts to illuminate Raoul Dufy's mural *The Fairy of Electricity* (figure 6.4). Proclaimed ~~as~~ the largest



FIGURE 6.3

Palace of Air, International Exposition of 1937. In *Livre d'Or Officiel de l'Exposition Internationale des Arts et Techniques dans la Vie Moderne*. Paris: Ministère du commerce et de l'industrie, 1938.

painting in the world, it was assembled from 250 panels, forming a surface 10 meters high and 60 meters wide: a vast panoramic curve in radiant, dancing pastels. In its upper center was a gathering of Greek Gods sending divine force from Olympus, terrestrially embodied in a modern power station. From right to left, the mural portrayed a movement from pastoral landscapes through to the illuminated urban spectacle of Paris and its orchestras, turbines, and factories. Nearer the ground stood large human figures in dramatic poses (Dufy hired actors as models), 110 philosophers, scientists, and inventors who contributed to electric science and technology—a new Pantheon or *Assemblée générale*.²¹ Dufy portrayed electric technology as a gift of the gods, translated by Great Men into a civilizing, joyful force.

The Spanish pavilion's central mural cut through the exposition's sleek modernism and neoclassicism, as well as the optimism of these palaces of industry. Painted in black, white, and greys—the stark immediacy of a newspaper photograph—this was Picasso's response to the brutal air strike with incendiary bombs on the town of Guernica, ordered by Franco, carried out with Nazi



FIGURE 6.4
(top) General view of La Fée Électricité, taken at the International Exposition of 1937, now at Museum of Modern Art of the City of Paris. (bottom) In Alfred Werner, *Raoul Dufy* (London: Thames and Hudson, 1970). Note hydroelectric equipment in foreground.

help, against Spain's republican government. In contrast to Dufy's remorselessly pretty view of divine electricity, *Guernica* documented one of the first applications of *Blitzkrieg* or "lightning war" tactics: screaming and dismembered bodies in a scene of Dionysian horror, witnessed by matador and bull. At its top hung the malevolent eye of an electric lightbulb.

In 1930, in *Documents*, Bataille devoted an essay to Picasso, which contrasted two suns: one "shining at the moment of Icarus's elevation," tempting us to idealism through illusions of purity and detachment, and the other, an energetic, material and destructive sun, which causes things to ferment and rot, melting Icarus's wax, "causing failure and a screaming fall." Like the big toe, this rotten sun highlighted the excluded, repulsive physicality that resists attempts at order and ranking: the excremental, entropic, "formless" crudity that humanity never truly transcends.²²

According to Bataille, Picasso was unlocking the power of this "rotten sun" that drags us back to earth: "academic painting more or less corresponded to an elevation— without excess— of the spirit. In contemporary painting, however, the search for that which most ruptures elevation, and for a blinding brilliance, has a share in the elaboration or decomposition of forms, though this is, in ever so small a degree, only noticeable in the paintings of Picasso."²³ Picasso painted *Guernica* in the same building where Bataille's *Contre-Attaque* group met, which included Dora Maar, the photographer who documented the painting's creation. Carlo Ginzburg suggests that in *Guernica*, with its imagery of the Minotaur (developed also by Bataille and his fellow authors, who gave this name to an arts journal), the destructive sun-eye-lightbulb reflected Bataille's "rotten sun," evoking "the horror of an incandescent arc-lamp." While Bataille sought to "counter-attack" against fascism, his obsession with the absolute power of "sovereignty," sacred violence, and sacrificial rites created troubling resonances with fascism—some of which, Ginzburg suggests, may have been channeled into *Guernica*.²⁴

In the International Exposition of 1937, the energies and arts of the industrial age were celebrated and questioned in the form of rival modernities. Communism confronted fascism and socialist republicanism; Apollonian Art Deco and exuberant neo-impressionism faced off against jagged, primitivist visions of mechanized brutality. Alongside French palaces devoted to the nation's technical mastery of air, speed, and electricity, the Musée de l'Homme presented cultural goods as well as human remains from France's colonies, asserting its imperial dominance. Yet at the same time, it aimed to convey the long historical continuities and the underlying unity of human cultures.²⁵

Its planned centerpiece was to be the Hall of Arts and Techniques. Yet this hall did not open for another twenty years—the war intervened.

FLINT SPARKS AND MUSHROOM CLOUDS

The director of the Hall of Arts and Techniques was to be Anatole Lewitsky, an expert on Siberian shamanism, aided by the musicologist, André Schaeffner, a member of Bataille's *Documents* group who later accompanied Griaule and Leiris on the Dakar-Djibouti expedition. Schaeffner would develop the standard classification for musical instruments on exceptionally inclusive grounds: "No object with a resonant or musical purpose, however 'primitive' or formless it may appear, no musical instrument will be excluded from a methodological classification."²⁶ As director of "organology" at the Museum of Man, he imprinted his views on the Hall of Arts and Techniques.

After German troops occupied France in 1940, Lewitsky and several colleagues turned the basement of the museum into a center of anti-Nazi action. They printed the clandestine journal *Résistance* and organized passage for insurgents to Great Britain. The Gestapo arrested Lewitsky and other members of the Resistance network, including Yvette Oddon; he was executed in 1942.

When the Hall of Arts and Techniques finally opened in 1959 it was under the direction of André Leroi-Gourhan. A student of Mauss and Rivet, he spent part of the war in Japan on a research trip; on his return he was made a subdirector of the Museum of Man and put in charge of the Department of Technology—in the museum's basement—and a training program in ethnology.²⁷ For its long-delayed opening, the museum's director, physical anthropologist Henri Vallois, sent a letter to each department that showed the shadows of war still hung over the exhibition cases: "The installation of this very beautiful ensemble concludes in a particularly brilliant way the arrangements begun in 1938, and tragically interrupted, of the Museum of Man." He thanked "the entire personnel of the Museum" for its work "as much during the years 1950–1959 as, for those who were there at the time, during the difficult and at times dangerous period from 1941–45."²⁸

Since that "dangerous period," thinking about energy and the arts had taken on new emphases. During the war, nations had turned themselves into factories: weapons, soldiers, and concentration camp prisoners were processed in assembly lines, and the most gigantic deployment of science and industry of all time resulted in the atomic bombs the United States dropped on Hiroshima and Nagasaki. With these shocking accelerations of industry and calculation, humanity's past and future had to be reimagined. Theodor Adorno claimed that writing poetry was barbaric after Auschwitz; the detonation near Los Alamos provoked J. Robert Oppenheimer's recitation of the *Bhagavad Gita*: "Now I am become death, destroyer of worlds."²⁹ At the same time as Europe conjured

horrific new powers and new visions of humanity's end, the discovery in 1940 of Stone Age paintings at Lascaux offered glimpses of its beginnings.³⁰ What kind of creature was the human, that it could be so powerful and so impotent, so mortally divided against itself, so perversely destructive in its creativity?

Among social planners, a grim, rationalist optimism appeared in programs of "development" and schemes of economic standardization and consumption of hydroelectricity, atomic energy, and oil. U.S. anthropologist Leslie White identified a "law of cultural development" in energy use: "culture advances as the amount of energy harnessed per capita per year increases, or as the efficiency or economy of the means of controlling energy is increased, or both."³¹ This view—more energy consumption equals more cultural development—transcended the opposition of capitalist and communist: Soviet astronomer Nikolai Kardeshev drafted a similar correlation between energy use and degrees of civilization that appeared in 1964 (as a means of estimating the likelihood of receiving communications from extraterrestrial "supercivilizations").³² Both White and Kardeshev sought a framework to make sense of and give direction to the twentieth century's unprecedented frenzy of energy consumption.³³

The creative origin and possibly violent end of humanity magnetized Georges Bataille. Moving away from his guerrilla criticism and provocations of the 1920s and 30s, he reworked Mauss's theory of social equilibrium through gift exchange into a cosmic theory of energy accumulation and release. In *The Accursed Share* of 1949, everything came down to energy (as it did for generals and oil executives). Yet while economists insisted on *scarcity*, for Bataille, life constantly overflowed in *excess*. The generosity of the sun, channeled into the lush stirring of vegetation, was routed into animals, fossils, and food, siphoned into human productivity: "if the excess cannot be completely absorbed in its growth, it must necessarily be lost without profit; it must be spent, willingly or not, gloriously or catastrophically." This expenditure took various forms: competitive giving in the Kwakiutl potlach, Aztec ritual sacrifice, or the building of "admirable monuments that had no useful purpose," such as pyramids.³⁴ In addition to creative outlets, the excess of life force could be channeled into wars; "In our time ... it has taken on the disastrous proportions of which we are aware."³⁵ Yet recognizing this excess might make possible a new ethics and politics; the Marshall Plan, for instance, appeared as a hopeful geopolitics based on gifts, dispersing surplus energy without expectation of direct return, as a means of global peace.³⁶ *The Accursed Share* reworked Bataille's concerns with violence and transgression into a general theory of energy and art.

Bataille saw this same play of excess and irrationality at work in the prehistoric caves. In *Lascaux ou la naissance de l'art* (1955), he argued that their

paintings documented the “miraculous” dawn of humankind, a celebratory explosion of creativity in the form of a festival. This implied the establishing of limits, and simultaneously, the joy (and guilt) of transgressing them: “The movement of transgression is the necessary counterpart of the arrest, of the restraint of the interdiction. Above all the festival is essentially the sudden time of lifting the rules.” The cave’s celebratory traces summarize for him “the passage from the beastly human to the mad being that we are”—an emotional expression, revealing the basic conditions of human society through the interplay between law and madness.³⁷

Like Bataille, Leroi-Gourhan saw cave art as evidence of a defining step in human development and used them to assert a profound commonality between contemporary humans and archaic ancestors. Yet where Bataille saw the ecstatic expression of emotion, Leroi-Gourhan, in *Préhistoire de l’art occidental* (1965), found evidence of human perceptual and intellectual capacities.³⁸ The groupings of animals, pairing female and male, indicated crucial perceptual abilities and the establishment of regular categories of space and time as well as technical mastery: “Although, in spite of the surprising degree of efficiency of flint tools, the techniques of manufacture still had 15,000–20,000 years to go before reaching the present efficiency of our machines, the Paleolithic artist himself recognized from the very beginning the possibility of affirming his nature as *Homo sapiens*.”³⁹ The cave painters and modern humans were of the same species. Although Leroi-Gourhan named the species *Homo sapiens*, he also insisted that its intellectual attainments were inseparable from “technical gestures.” For Leroi-Gourhan, cave art indexed an extensive intellectual, artisanal, and technical matrix: “among populations at the stage of a hunting economy, the religious side is inseparable from the technological side ... it may have seemed essential to create these underground monuments, the decorated caves, in order to govern the physical world.”⁴⁰ For Leroi-Gourhan, while we cannot be sure of the art’s function, nor of the social role of the artist—“a priest, a sort of shaman?”—the cave paintings testify to a specific state of physiological evolution, technical mastery, and social complexity that presage the industry and social organization of the present.⁴¹

As Howard Caygill argues, both Bataille and Leroi-Gourhan found in these ancient caverns the conditions for modern humanity: for Bataille, excess, ecstasy, and transgression; for Leroi-Gourhan, organized technical, cognitive, and social complexity.⁴² Against a faith in modernity and progress—in comparison to which the ancient past would be seen as deficient—both found the modern in the archaic and the archaic in the modern, as Mauss had taught, though with distinct emphases.

Both also gave physiology prominent attention. Like Bataille, who celebrated the big toe as the neglected reminder of humanity's base origins, Leroi-Gourhan noted the emergence of the big toe—and the foot—as a decisive stage in the process of “hominization.” It permitted humans to stand upright (figures 6.5 and 6.6). Leroi-Gourhan was insistent on the physical affordances of this “living machinery.” Drawing on remains of various protohumans, he presented upright posture—as he put it in his 1964 compendium, *Gesture and Speech*, “the adaptation of the bodily architecture to bipedal walking ... expressed by a particular disposition of the foot whose toes are in parallel rows”— as a transformation of the entire skeletal-muscular apparatus.⁴³ Bipedal stature lifted the head; the face, no longer a mere tool for biting and grasping, was free to form facial expressions and, eventually, language. Just as importantly, the human foot freed up the hand. No longer needed for locomotion, the front limb could be used for a variety of gestures of great intricacy and complexity.

For Leroi-Gourhan, these technical gestures define our species: “Upright stance, shortened face, free hands during locomotion, and possession of stable tools are truly the fundamental criteria of humanity.”⁴⁴ For many evolutionary

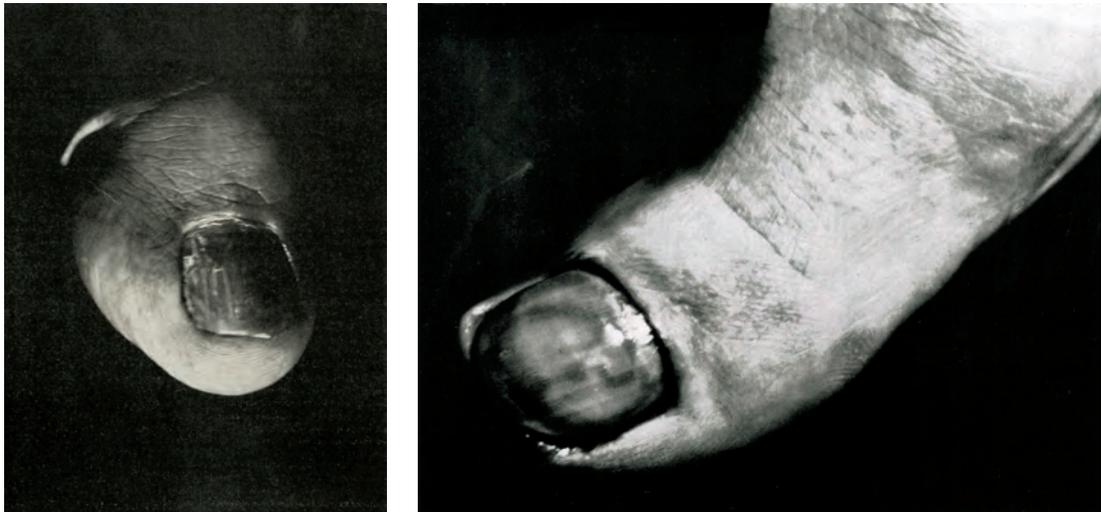


FIGURE 6.5
(left) Big toe, male subject, age 30, Photo by J. A. Boiffard. (right) In Georges Bataille, *Le Gros orteil*, in *Documents* 1, no. 6 (1929): 298.

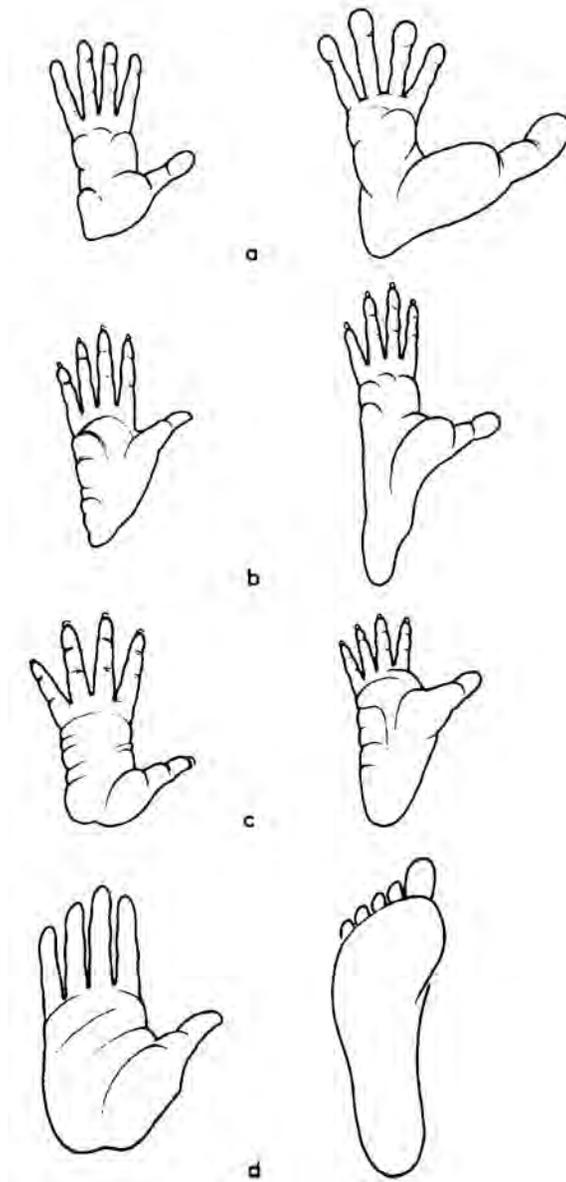


FIGURE 6.6
André Leroi-Gourhan, comparison of pairs of upper and lower members (upper on the left, lower on the right), leading from prehumans (top row) to humans (bottom), from *Gesture and Speech*.

anthropologists, “the significant fact is the always greater development of the brain and the nerves that depend on it.”⁴⁵ Yet for Leroi-Gourhan it was not the brain which made us human but the foot, creating conditions of possibility for “the artificial organs that are tools.”⁴⁶ Henceforth, human evolution took place beyond the individual body, in the culturally specific “sociotechnical organism” and “mesh of techniques” that every human inhabits.

We have here a tale of two toes. Compared to the sober, scientific approach of Leroi-Gourhan, Bataille might appear as the more shocking, emotional, transgressive thinker. Yet Leroi-Gourhan’s analyses of Paleolithic art and the importance of the foot enacted inversions as disturbing as Bataille’s most provocative images: finding the archaic alive in the modern, placing the foot above the brain, the body before the mind. Potentially still more disturbing was Leroi-Gourhan’s view that the human species depends for its essential definition on objects physically distinct from its corporeal limits—on the “possession of stable tools.” Further, where Bataille salted his ethnographic materials with Nietzsche’s insistence on the will to power and the inevitability of hierarchy, Hegel’s master-slave dialectic (as elaborated by Kojève), and a revision of Carl Schmitt’s doctrines of sovereignty, Leroi-Gourhan’s strongest philosophical inspiration came from Henri Bergson—the thinker of the endless creativity of the *élan vital*.⁴⁷

TOTALITY AND TENDENCY

Already in the 1930s Leroi-Gourhan had been developing analyses, in a Maussian spirit, of the place of technological objects in their close relations with all domains of human life, as in his collection of objects in Japan in the 1930s. When his attention turned to ~~the~~ paleontology, the poverty of the prehistorical record posed a significant obstacle. In contrast to the rich textual traditions in history, he complained about the silence of prehistoric stone tools: “we can hardly draw anything from these discoveries other than the certainty of having to do with products of human industry”; more bluntly, “we have nothing: just cut stones.” As Nathan Schlanger has shown, Leroi-Gourhan’s breakthrough was to see more complex tools as an accumulation of gestures used to make simpler ones.

This insight followed his reading of Bergson.⁴⁸ After a heyday at the beginning of the twentieth century, Bergson fell out of fashion, denounced as anti-rational and speculative. Yet as François Sigaut points out, Bergson’s idea of “intelligence [as] a function born in and for material action” had an “extraordinary (the word is not excessive) importance” from 1900 to 1940.⁴⁹

In *Evolution et techniques*, Leroi-Gourhan spoke of *Homo faber* and *Homo sapiens* as separate species but came to argue that there was only one human species, with tool-use as its defining feature.⁵⁰ Here he agreed with Bergson, who wrote: “If, to define our species, we kept strictly to what the historic and the prehistoric periods show us to be the constant characteristic of man and of intelligence, we should say not *Homo sapiens*, but *Homo faber*. In short, *intelligence, considered in what seems to be its original feature, is the faculty of manufacturing artificial objects, especially tools to make tools, and of indefinitely varying the manufacture*” (italics in original).⁵¹ The human is the being that makes tools—and tools to make tools. Against rational science’s tendency to conceive reality in terms of spatial relations, Leroi-Gourhan insisted on the experience of “duration.” A continuous flow of variations and unpredictable differences is pushed along with the fundamental impetus of life, the *élan vital*, which constantly bifurcates, branching into new directions. Against evolutionary theories relying on either chance or teleology, Bergson developed the notion of “tendencies,” a concept with roots in Leibniz, Maine de Biran, and Ravaisson.⁵² Out of a field of virtual possibilities and general directions, the *élan vital* concretizes itself into relatively stable forms: matter itself, organic forms, instincts, habits, or, eventually, static symbols, used by the intellect to overcome obstacles.⁵³

Leroi-Gourhan dramatically realized Bergson’s *Homo faber* as an empirical and museological science. Immersed in the 1940s in over forty thousand files on distinct techniques—some observed in the field, some replicated in the laboratory of the museum—he asked, in distinctly Bergsonian terms, about the possibility of general knowledge: “What can come from thought when a sufficient number of facts is assembled? A rather strange feeling, of unity in the diverse, diversity in unity, a bundle of lines which produce long branches without losing their first direction, unpredictability of changes, real permanence.” Though amassing vast quantities of data, he eschewed any possibility of total knowledge: “embracing tightly the totality of the world is impossible.” A kind of intuition—Bergson’s preferred method—guided Leroi-Gourhan’s inquiry: “the method of H. Bergson: take a minimal fact, not by chance, but guided by a view which seeks to make itself total, determine it rigorously, follow it in its variations and its innumerable consequences, and replace it, finally, in the great general current—I firmly believe that this is the only way at present to draw something from general facts.”

In Leroi-Gourhan’s *Evolution et techniques*, this “great general current” took shape as a theory of technical “tendencies.” A tendency has “an inevitable, predictable, rectilinear character; it pushes the flint held in the hand to acquire a handle, a package dragged on two poles to provide itself with wheels.”⁵⁴ A

technical tendency is never observed, but recognized, through the diverse facts of technical gestures and concrete tools in which it is realized. These variations depend on features of both the “ethnic milieu” and the “external milieu” (which includes both the natural environment and nearby groups). For example:

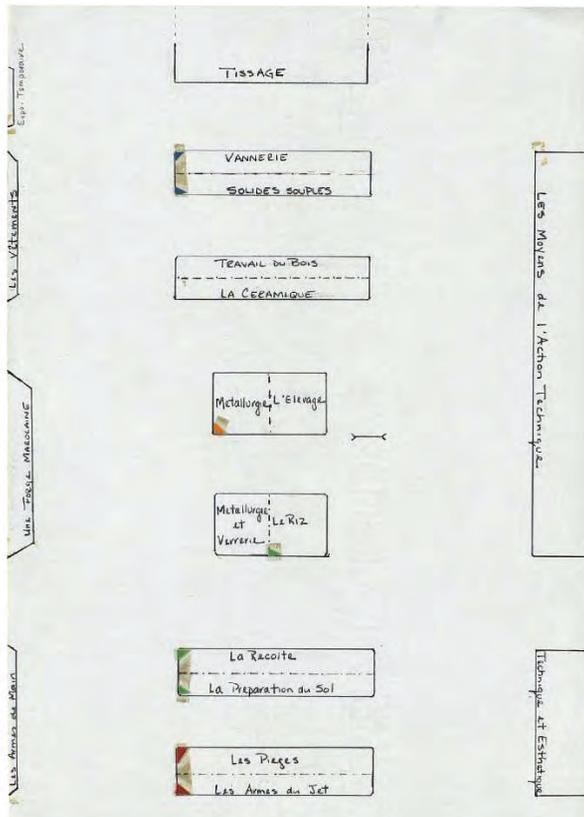
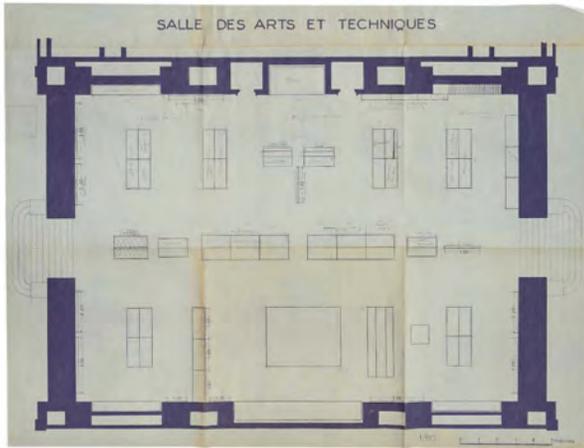
The Malaysian, Japanese, and Tibetan plow represent three neighboring forms which are certainly related in the ancient history of these three peoples; yet each one, by the soil cultivated, by the details of its assembly, by the mode of its hitching, by the symbolic or social meaning attached to it, represents something unique, categorically individualized. Yet everything appears as though there was at the same time a “plow” tendency, realized at each point of time and space by a unique fact and specific historic relations, over often considerable scales of time.⁵⁵

A taxonomy of such tendencies—virtual evolutionary directions permitting a range of forms, realized according to ~~the~~ historical and environmental pressures—emerged from Leroi-Gourhan’s comparative study of thousands of “technical facts.” The general principles of this technography were summarized both in books and in the Hall of Arts and Techniques.

A HALL OF ART AND ENERGY

From its inception in the late 1930s, the Museum of Man was designed to give visitors “a tour of the world in eighty minutes.”⁵⁶ The building’s outer rings held cases with objects meant to capture general traits of diverse geographical regions, offering a “synthetic” overview; on the inner rings were more detailed cases containing detailed, “analytic” examinations of general themes. Visitors were expected to pass through these exhibits in succession, concluding in the Hall of Arts and Techniques. Techniques were literally central to the species.

The room was completed in 1959 under the guidance of Leroi-Gourhan with a team including, prominently, the expert in basket-weaving, Hélène Balfet, and other staff from the department of technology.⁵⁷ Combining objects from across the world, it proposed a materialized theory of techniques; relying on diagrams, photos, and objects as much as verbal argument, it was a manifesto of technography (figure 6.7).⁵⁸ The room was separated into two halves. The first was dedicated to “the products or the agents of an aesthetic activity, whether or not this is linked to religious or magical ends: art objects, but also *instruments* of



art, and in the first place, instruments of music.” Its displays reflected musicologist André Schaeffner’s insistence on the importance of the musician’s body; it also aligns with Leroi-Gourhan’s view that “there is no *technique*, but instead *ensembles of techniques* commanded by general mechanical, physical, or chemical knowledge.”⁵⁹ Visitors were shown artworks in various media, the tools that made them, and photos and sketches of (unnamed) artists at work. A sign explained that the human body “can be at once the object of a decoration, its support (as for a mask for example), and, by its movements, can engender a dance or serve a dramatic expression.” Tools, artworks, and skillful bodily gestures were woven into a circuit, all parts of which made up an “art.”

This insistence on the body as itself an object—or instrument—of art and technique was reasserted in the other half of the room, devoted to “means of technical action (tools and mechanics); techniques of fabrication (basketry and weaving, woodwork, metallurgy, ceramics) and of acquisition (hunting and fishing, agriculture, breeding), and habitation, clothing” (figures 6.8 and 6.9).

This second half of the room presented “in abridged form” the development of “the techniques of material life.” Refusing to focus on “technical curiosities,” it aimed to demonstrate “how much the efforts to master matter and to use the natural milieu are common to all men.” Its cases reflect the threefold empirical analysis of technics Leroi-Gourhan introduced in *Evolution and Techniques*: first, elementary means of action on matter (notably, ways of grabbing and striking, *préhensions* and *percussions*); second, materials (liquid and supple, plastic, or semi-plastic solids); and forces, “which extend or complement the technical effects of the human hand” (including fire, air, and water). While he wrote of techniques as forms of “action on matter,” the specific resistances of different kinds of matter were crucial.⁶⁰ Thus the tool, though an important object of analysis, is a kind of “minor motif,” between an action and the matter upon which it is exercised.

The displays insist on commonality and continuity. Despite the “variety and ingenuity of responses to the same fundamental needs,” basic technical elements recur across the human family. For example, “Until the arrival of industry, the means used by the blacksmith or the peasant in France were not fundamentally different from those of their brothers in Africa or in Asia.” A developmental

FIGURE 6.7

Two plans for the Hall of Arts and Techniques: entire room (top), and the half concerned with “Comparative Technology” (bottom), in Archives of the Musée du quai Branly–Jacques Chirac. For this and all images from the Quay Branly Museum Archives, the author thanks Sarah Frioux-Salgas for her kind assistance.



scheme is noted—from hunter gatherers to agriculturalists up to the “arrival of industry”—yet commonalities derive from the fact that all technics originate in the body, which, with only inconsequential variations, is the same across all cultures.

Accordingly, a series of glass cases on “Means of technical actions” begins with “The Human Body,” followed by “Tools,” “Energy,” and “Machines.” The first notes: “For all techniques, the *body* is fundamentally necessary to *integrate the tool into efficient operations*. The mechanical possibilities of the human body are the same, with few differences, for all men, but the traditions belonging to each culture give birth to differences in the *postures* for work, in the *rhythm* and the *direction* of gestures, in the manners of holding, pushing, and pulling tools.” Shared physiological givens and necessities nevertheless branch into diverse ethnic milieus, characterized primarily by variations in posture, rhythm, and styles of movement. In this glass case (at the right, below), we see ghostly images of the human body: one cloaked and hooded, carrying a jug bound to its (absent) head, another crouched at a spinning wheel, turning its crank with one hand while drawing out thread with the other. Running down the left, a series of photos, taken from around the world, show bodies at work (figure 6.10).

The lines surrounding these absent bodies suggest the crucial but evanescent foundation of all techniques: the physical gestures, structural support, and productive energy offered by the human body.⁶¹ They also suggest the universality of this foundation: although the ghost weaver’s breasts indicate femininity, no facial features give any indication of the race or geographical location of these ghosts. The empty spaces invite viewers to empathically insert themselves into the frames.

FIGURE 6.8

Musée de l’Homme. Java, Indonesia. Gift of Madame Van Vleuten to the Musée du Conservatoire national de Musique in Paris, 1887, on loan to the Musée de l’Homme (formerly Musée d’Ethnographie du Trocadéro) in 1932. Photo by the Musée de l’Homme, Dorine Destable. PP0094032-01. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais/Art Resource, New York.

FIGURE 6.9

Musée de l’Homme. Gamelan from Cirebon, West Java, Indonesia. Gift of Madame Van Vleuten to the Musée du Conservatoire national de Musique in Paris, 1887, on deposit to the Musée de l’Homme (formerly Musée d’Ethnographie du Trocadéro) in 1932. Photo by the Musée de l’Homme, Christian Lemzaouda. PP0094014-01. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais/Art Resource, NY.

The same play of object, gesture, and outline is at work in the central series of displays, “Elementary Forms of Action on Matter,” beginning with “Tools,” containing the paired images I photographed in 1999 (figures 6.11 and 6.12). The case presents a typology of basic gestures: The “fundamental action of nearly all fabrication” is percussion, “by which the tool acts on matter, whether to shape it, soften it, hammer it, polish it.”⁶² It then lists three defining characteristics: “*application* or the manner in which the force is imprinted to the tool and applied to the matter; the *direction* according to which the tool encounters the surface of the mater; and the *form* of the part which strikes.”⁶³ The *different* applications are *placed, thrown, and posed with striker*.

The analysis of these skilled gestures leads to consideration of energy sources and their modifications. “The evolution of movement determines the unleashing of motive force (*motricité*), and ever since the first agricultural societies, the conquest of force becomes, along with the conquest of new matters, the dominant fact of the contemporary world.” From this perspective, the room is not about objects, or even gestures, but more fundamentally about energies ~~and their distinct sources of energy~~ and their modifications.⁶⁴

The glass case called “Energy” contains a butterfly-shaped kite, miniature boats, and flints. A sign reads: “The principal *means of man’s action on first matter*, setting aside his own body and the tools that prolong it, are *water, air, and fire*, natural forces that he uses in the three sectors of his technical activity: fabrication, acquisition, consumption” (figures 6.13 and 6.14). Photos, diagrams, and objects indicate water’s use in transport, irrigation devices and preindustrial mills; the kite and sailboat illustrate air’s uses, which also include fanning flames and “refreshing habitations”; firestones and rubbing sticks confirm the caption: “Methods of *production* of fire by friction are universal.” The shared physiology of the human body engages with the shared energetic resources harnessed by elementary technics.

As the next case argues, however, such motive forces are rarely applied directly: “Energy, at times used just as it is, must most often be transformed.” Long in the past humans discovered the principles—levers, inclines, weights—that

FIGURE 6.10

Musée de l’Homme. Vitrine: Le corps humain [Showcase: The Human Body]. Seen at the Musée de l’Homme, Hall of Arts and Techniques, section “Les moyens de l’action technique” [“Means of Technical Action”]. Photo by the Musée de l’Homme, 1960–1964. PP00940000–01. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais / Art Resource, NY.

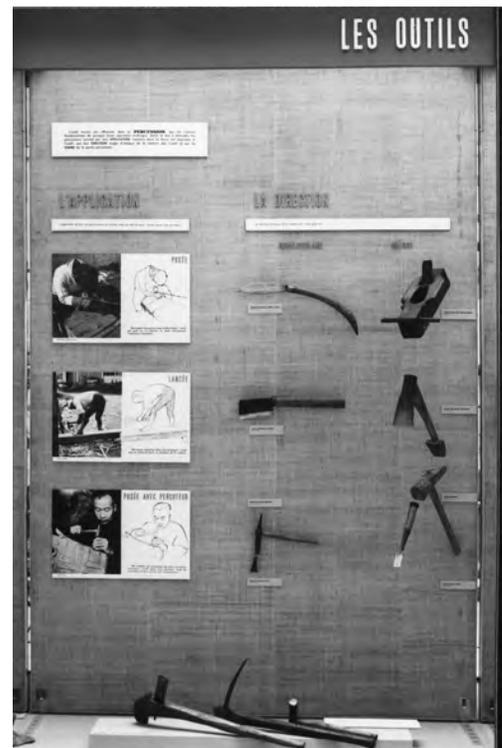
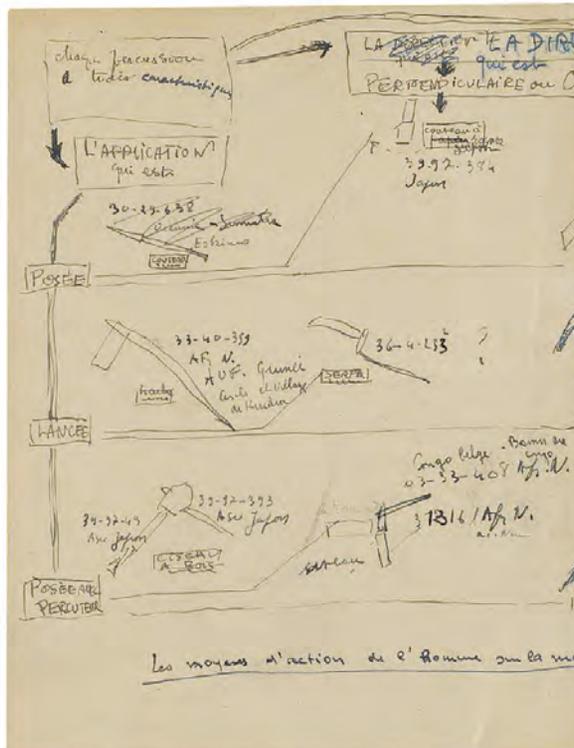


FIGURE 6.11
Tools, draft sketch. Archives of the Musée du quai Branly–Jacques Chirac.

FIGURE 6.12
Musée de l'Homme. Vitrine: Les outils [Showcase: The Tools]. Photo by the Musée de l'Homme. PP0093991-1. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais/Art Resource, NY.

allowed them to modify energy: to “augment it, adapt it, store it up.” These, the case says, are the basis of “modern mechanics” (figure 6.15). The display called “the transformation of energy” introduces more complex machines. It focuses on uses of the wheel: spinning yarn, crushing grain, sharpening knives.

The *storage* of energy is exemplified in crossbows and traps, where tension is added to the apparatus before being deliberately released. This case anticipates a later one, focused on “Capture”: nets, decoys, snares, lassoes (figures 6.16 and 6.17).⁶⁵

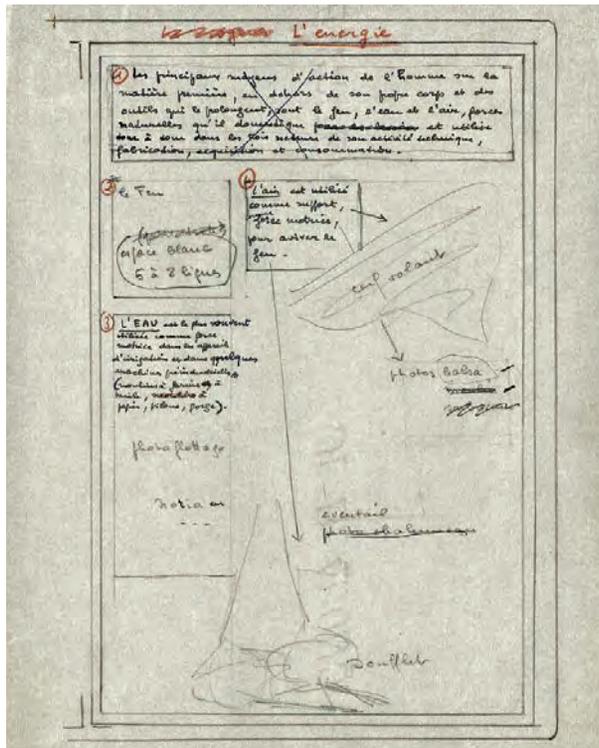


FIGURE 6.13
Energy, draft sketch. Archives of the Musée du quai Branly–Jacques Chirac.



FIGURE 6.14
Musée de l'Homme. Vitrine: L'énergie. Les moyens de l'action technique [Showcase: Energy. Means of Technical Actions]. Photo by the Musée de l'Homme, 1960–1962. PP0094036-01. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais / Art Resource, NY.

The shift traced through these cases, from simple tools to more complex mechanisms, represented no fundamental break. Tools are externalizations and modifications of gestures, while machines are ensembles of tools: “the machine appears as an apparatus [*dispositif*] which incorporates frequently not only a tool but, above all, one or several gestures.”⁶⁶ While noting the increased complexity of successive machines and the greater quantities of force they employ, there is no categorical difference between these modes of energy—and thus



FIGURE 6.15 (above)

Means of technical action: Mechanics; showing “Amplification of energy” (left); “Transformation of energy” (right). Musée de l’Homme. Vitrine: le moyens de l’action technique. [Showcase: Means of Technical Action. Panel of “Amplification of Energy” with some objects, drawings, and photographs]. Photo by the Musée de l’Homme. PP0205036-1. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais / Art Resource, NY.

FIGURE 6.16 (facing page, left)

Musée de l’Homme. Vitrine: La mécanique. La conservation de l’énergie [Showcase: Mechanics. The Conservation of Energy]. Photo by the Musée de l’Homme, 1960–1962. PP0093983-01. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais / Art Resource, NY.

FIGURE 6.17 (facing page, right)

Musée de l’Homme. Vitrine: La capture. Les armes et les pièges [Showcase: Capture. Arms and Traps]. Photo by the Musée de l’Homme, 1960–1962. PP0094040-01. Musée du quai Branly–Jacques Chirac, Paris. © Musée du quai Branly–Jacques Chirac, Dist. RMN-Grand Palais / Art Resource, NY.



no categorical difference between the Stone Age and the Electric Age. As Leroi-Gourhan put it in *Man and Matter*: “While industrial technology is not addressed in this book, it must be emphasized that nothing, other than reasons of pure convenience, justifies a categorical separation; the interest which phenomena of mechanical adaptation of artificial forces offers is no more and no less than that which is offered by the distant innovations of prehistory.”⁶⁷ As in his analysis of cave painting and the big toe—and in keeping with Mauss’s teachings—the archaic and contemporary were woven together, sometimes standing side by side: “these two awls resemble each other a great deal, even though one is some 30,000 years old and the other is contemporary with interplanetary rockets. Such is often the way when a tool, simple or complex, is perfectly suited to its function: it can cross the centuries, even millennia, without being notably transformed.”⁶⁸

In early hominids, changes in tools went along with changes in physical capacities: “*cortex et silex*,” brain and stone tool, evolved in tandem. After hominization—the emergence of *Homo sapiens*— evolution spread through the “mesh of techniques” that maintained the balance between internal and external environments; the subject of evolution is no longer the individual organism, but the “sociotechnical organism.”⁶⁹ Here Leroi-Gourhan’s study of techniques opened into a properly “ethnological” study of cultural difference and historical change. The room’s cases on habitation and village morphology—the different dwelling patterns of Bedouins, Eskimos, Pygmies, the Kabyle, contemporary Greece, and Mecca—demonstrate how technical arrangements cluster into specific morphologies with distinct rhythms and styles: “The distribution of the village expresses its social structure.”⁷⁰ The room configured the history of humanity as a history of energies engaged, transformed, amplified, and redirected; these clustered into machines, economic forms of life, patterns of settlement, demonstrating at once the commonality and the variety of collective forms of adjustment to the environment.

At the core of his analysis is the weaving together of sequences of action. Leroi-Gourhan’s main contributions to the study of techniques was the concept of “operational sequence” (*chaîne opératoire*). After observing and participating in extensive experiments with flint-knapping, he came to see distinct forms of tools as the product of repeated series of gestures, building on each other to make objects of increased complexity: “Techniques involve both gestures and tools, sequentially organized by means of a ‘syntax’ that imparts both fixity and flexibility to the series of operations involved.”⁷¹ Thus the cutting and tearing accomplished by teeth are externalized into stone choppers, blades, and eventually knives; pounding by a paw or fist is shifted and intensified by using a stone, eventually a hammer; throwing is amplified by a spear or a bola. (On this point, Canguilhem observed: “By assimilation to the movement of an amoeba pushing out of its own mass an expansion that seizes and captures the object of its craving in order to digest it, A. Leroi-Gourhan seeks to understand the phenomenon of the construction of the tool.”⁷²) These smaller techniques are then joined together into chains: the carving of the wood handle joined to the knapping of stone blade by knotting of ropes to make an axe, employed eventually in a coordinated pattern of forest clearing and settlement. Making Bergson’s elusive vitalist metaphysics visible, these displays put objects in motion, showing them as part of the “general current” of creative evolution that actualized itself in the diversity of human forms of life.

In these cases, technology is not a kind of thing—not “technical objects,” tools, or machines. Nor is it simply a mode of instrumental rationality, adjusting

means to ends. Among the different displays and their elements a continuity between different artistic modes, between technical tools and art objects, and between human bodies and actions creates the sense of a dynamic and ingenious circuit. The exhibit conveys a basic, shared humanity—not in anatomy, not in genes, but in the ephemeral regularity of the gesture that, encountering the resistance of diverse matters and social conventions, branches into a variety of forms, layering and weaving into new and more complex condescences.

The technical arts gave form and direction to the energies of the body, the earth, the atmosphere. “Techniques” was a set of skillful, repeatable gestures, evoked by objects and photographs that reveal the diverse “facts” through which technical “tendencies” have been actualized. In the human-shaped outlines of the actions—some filled in, some just spectral traces—visitors became more than viewers: they were invited to imagine themselves into the action, to see their own bodies as participating in the same flowing stream of technical creativity that first formed the human.

Beyond its Bergsonian resonances, we have here an iteration—delayed by two decades—of the “ethnographic surrealism” of the 1920s, when Schaeffner, along with other dissenting Surrealist authors in *Documents*, deplored the way museums reduced the objects they collected, transforming them from dynamic elements of lives and sacred rites into inert tokens of a static and decontextualized “art.” Schaeffner was nevertheless committed to museology; he sought novel techniques to display and evoke the setting, material basis, and transformative power of music: “Beside the exhibited instrument should be displayed a photograph of its player; the mute object, and its position between the hands of the person who awakens and suddenly multiplies.”⁷³ Innovative presentations including objects and photos would animate museum displays, evoking gestures otherwise lost. Similarly, Marcel Griaule’s essay “Poterie,” also in *Documents*, proposed a museum that surpassed objects’ formal and aesthetic properties: “Instead of being the man who looks at a vase, the spectator must enter into its space and place himself in the position of the man who drinks.”⁷⁴ This notion of the museum as an invitation to empathic projection—addressed, in Hollier’s expression, to “the ghost of the man who drinks”—helps us make sense of the uncanny effect of Leroi-Gourhan’s comparative technology.

As Hollier observed, Griaule and Schaeffner—also good students of Mauss—sought to introduce “the body into the space of the museum,” thereby “opening the space of the museum to the world of the body and its needs”; the “central concept of this museology is that of bodily techniques.”⁷⁵ Leroi-Gourhan’s anthropology of technics—ultimately, a new science of humanity—resonated with Schaeffner and Griaule’s museological views. To grasp the technical gesture,

and the evolutionary movement that coursed through it, viewers were invited to recognize their own bodies—and the technical apparatus that surrounded them—as a part of a universal movement of energy in various forms. Though Leroi-Gourhan’s work was in many ways orthogonal to the products of the artistic avant-garde—whose links to academic social science were attenuated by the 1940s—we might see the Hall of Arts and Techniques as practicing a *technographic Surrealism*: an experimental set-up for inducing an experience of techniques and machinery that unsettled stable and reassuring categories.

Yet this experimental and ritual space aimed at more than cultural critique: as an outgrowth of the Museum of Man’s project for a new science of “man in his totality,” we can discern in this exhibit reformist, even utopian goals.⁷⁶

HUMANISM RECRAFTED

According to a promotional article in *Journal de la femme* in 1939, “the new Museum of Man will be the most modern museum *in the world*”; the italicized words appeared in English, indicating the ambition “to rival American modernity.”⁷⁷ Borrowing from cutting-edge examples in the United States, Belgium, and Russia, George Rivière’s plans aimed at brief and consistent labels and nomenclature, and displays combining objects, photographs, diagrams, and maps, to enable a rapid and informative overview.⁷⁸ Though these are now regular features for today’s museum goers, they were innovations in the 1930s.

Yet beyond increased clarity and wider public outreach, the Museum of Man participated in broader changes in the design of museums. Fred Turner has attuned us to the political aims of the “extended field of vision” that Bauhaus designer Herbert Bayer developed for mid-century exhibitions at New York’s MoMA (Museum of Modern Art), in which immersive, open-ended displays aligned with the democratic sensibilities they sought to encourage.⁷⁹ Similarly, the Hall of Arts and Techniques’s multisensory, empathic communication style served a message of profound unity among humans, akin to the “Family of Man” exhibit launched at MoMA. In aiming to overcome national and racial differences, it also pushed past one of the most deeply rooted divisions of Western cosmology: the dualism separating subjects and objects.

Surrealism, Dada, and other early twentieth-century avant-gardes often employed images of automatism, androids, and the fusion of machines with humans to produce effects of shock, confusion, or unexpected forms of beauty: Picabia’s *Ballet mécanique*, Breton’s automatic writing, Dali’s clocks, Grosz and

Ernst's automata, Duchamp's "appareils." Frequently these effects depended on transgressing an underlying certainty of the difference between human and machine; the shock comes from a visceral resistance against the cold, regular brutality of the machine. Of Ernst's machine imagery, Hal Foster states: "it is an insult to the humanist ideals of art and individuality cherished by the classes that forced the war."⁸⁰ Yet without ripostes or insults, Leroi-Gourhan's biological approach to technology blurred the technical object and the human so thoroughly that the shock of the juxtaposition subsided, and humanity appeared simultaneously technical and creative in its essence. Leroi-Gourhan's representations of techniques undermined, more devastatingly than his avowedly artistic contemporaries, the West's self-congratulatory insistence on mastery of nature through reason and intellect. Rather than deposing humanism, he offered it a new basis.

Significantly, he did so within the framework of science. His work relied on human physiology, technical objects, and energy—keystones of materialist and mechanist sciences—and aimed at a "science of man" that was in many respects as technophilic as any other totalizing mid-century project. Yet the ontological foundations of his project were evanescent, open, and fluid, subverting the mechanical and materialist reduction toward which cold war science most frequently veered.⁸¹ If there was a reductionist aspect to Leroi-Gourhan, it lay not in a reliance on any of the usual concretized "building blocks" of modern science, nor even the "abstract relations" of Lévi-Strauss's structuralism.⁸² Instead, his ontological starting point was the elusive *tendency*—a virtuality indicating a direction but no necessary form, borrowed from Bergson's *élan vital*—and, in the case of humans, the precise, repeatable, but insubstantial phenomena of *gesture*.

This scientific framing granted the display a political force, in keeping with the cosmopolitan universalism and anti-fascism present at the museum's birth. Institutionally, the Museum of Man fused the Ethnographic Museum of the Trocadéro Palace with the section of the National Museum of Natural History concerned with the human species.⁸³ Opposed to the racial hierarchical thought that drove extreme nationalism and fascism, it sought to show differences as valuable in themselves, while participating in a larger international framework.

Yet questions of racial difference remained. As Alice Conklin has argued, the Museum of Man's universalism was closely linked to France's colonial holdings and ambitions; according to De L'Estoile, the passage from "the postulation of a racial hierarchy to recognizing differences" on display at the museum represented a change in the "cardinal direction for a new colonial policy, more differentialist than assimilationist."⁸⁴ In Rivet's terms, it aimed at both "the study of man" as a unified species, as well as the study of "our colonial populations." Physical characters of distinct races were discussed and displayed in the cases for

different cultures—a fundamental ambiguity in the liberal aims of this national project.

Yet after the war—and revelations of the genocidal consequences of German racial theories—the Museum of Man helped launch UNESCO's declaration in 1950 that “the biological fact of race and the myth of ‘race’ should be distinguished. For all practical purposes ‘race’ is not so much a biological phenomenon as a social myth.”⁸⁵ Lévi-Strauss and Michel Leiris both wrote books to popularize this anti-essentialist view: *Race and Culture* (1951) and *Race and History* (1952) insisted that “the history of the cultural experience which each group has undergone is the major factor” that explains the differences observed among them.⁸⁶ Leroi-Gourhan's work prolongs this anti-essentialist view of ethnic difference. His vision of technics as the defining characteristic of humanity was a way of reinventing physical anthropology in nonracializing terms. In 1940 he wrote:

The conscientious anthropologist expresses himself in fairly byzantine terms and spends his life on specific problems to avoid committing suicide or changing professions. Race exists and we know of no pure races. Race does not exist and yet the Australian has a unique skull whose origin we cannot trace. ... No conscientious [scientist] has ever escaped this circle, not one. Those that have made positive assertions have done so while hiding half of one of the preceding philosophical propositions.⁸⁷

Leroi-Gourhan's mature theory, written in the 1940s and enshrined in 1959, still gave biology a foundational role: humanity was a consequence of bipedalism and the technical gestures it permitted, and despite his emphasis on the basic of unity of mankind, he observed that humanity “changes its species a bit each time that it changes tools and institutions.”⁸⁸ In other words, human physical and mental capacities could be enlarged and altered by repetition and habit, forming distinct technical and ethnic milieus with, in some sense, a physiological component. Yet these physiological distinctions were never his object, and his work offered no support for attempts to classify groups on the basis of skin color, facial angle, craniometry, or any other features dissected by race science.

The Hall of Arts and Techniques embodied a humanism radically distinct from predecessors which relied on individuality, rationality, freedom, or imagination as the defining characteristic of our species. Rather, he showed how the human becomes human by making and using tools, which themselves join together to make machines: the human being was identified, essentially and

ontologically, with the process of technical creation.⁸⁹ This was neither the enlightenment humanism of rights and reason, nor Lévi-Strauss's cognitivism. Nor was it the anti-humanism of Bataille's and Heidegger's successors, whose rejection of enlightenment ideals could lead to celebrations of violence and power.⁹⁰ In his subtle technographic synthesis, Leroi-Gourhan's humanism—distributed across objects and systems, soliciting individual and collective creativity, superimposing the contemporary with the archaic—contained energies much in demand today.

EPILOGUE: CATCHING UP WITH OUR TECHNIQUES

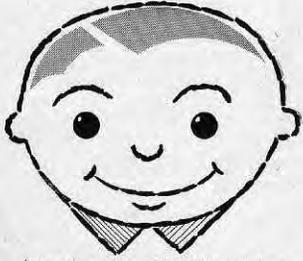
While known for his work in prehistory, in *Gesture and Speech*, the 1965 work that followed the opening of the Hall of Arts and Techniques, Leroi-Gourhan went beyond “elementary forms of technical activity” to speech-writing and other writing, addressing new, unprecedented energies and arts. He was centrally concerned with machines that ran by pushing a button. In the Hall of Arts and Techniques, the case on the “Human Body” stated: “Industrial motive forces tend to eliminate completely the action of the body as a motive force and automatic machines even lead, to a large extent, to the disappearance of the differentiated operations of the hand.”⁹¹

The archives of the Museum of Man contain an advertisement—unmarked by any comments—for a slide projector that boasts of the decline of gesture and the externalization of memory (figure 6.18). Showing an entwined pair of hands, thumbs twiddling in idleness, the advertisement reads: “Don't make a single gesture—it is ENTIRELY AUTOMATIC.” If humans are defined by their technical actions in dialogue with their environments, the prospect of a society run by automatic machines might appear an existential threat.

Leroi-Gourhan noted that “every rise of civilizations has been done with the same physical and intellectual man who lay in wait for the mammoth,” resulting in a temporal lag in the present: “our electronic culture, barely fifty years old, has for its support a physiological equipment which is forty thousand years old.”⁹² Cybernetics' self-regulating, quasi-intelligent machines allowed him to resketch human history, via a series of analogies with imagined electronic machines. He compared the nervous system of snails and earthworms to the “electronic apparatus for missile command”⁹³; lower vertebrates could be modeled by a machine capable of adjusting its motions to observations, with efforts at trial and error “recorded in programs in a series of memories” triggering “complex operative

**ouvrez bien
les yeux ...
... ne faites
pas un geste
il est
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A MARSEILLE : FIMBEL, 5, place de la Joliette — A SAINT-SEVER (Landes) : ARRECHEA, 10, place de Verdun
A NANTES : GIGLI, 12, rue A.-Higuard

FIGURE 6.18

Advertisement for slide projector in folder, *Corps Humain*. Archives of the Musée du quai Branly-Jacques Chirac.

chains.” Humans go a step further, containing an “apparatus which would allow for internal confrontation,” offering the choice between possible programs of action.⁹⁴

Yet at present, a new threshold has been crossed: “evolution has attacked a new level, that of the exteriorization of the brain.”⁹⁵ Memory and imagination can be externalized in data banks and data processing, which allow for the almost seamless weaving of a semi-aware net of “planetized techniques,” “a sociotechnical organism that seems increasingly to reflect properties of the living thing.”⁹⁶

This new environment—powered by ceaseless consumption of energy and emitting deadly byproducts—may no longer suit the creatures who created it: “The compression of times and distances, the increase in the rhythm of activity, the inadaptation to carbon monoxide and industrial toxins, and radioactive permeability—all raise the curious question of the physical adequation of mankind to the milieu to which he has long been called to make his own.”⁹⁷ Having spent three decades examining the origins of humanity and its diverse means of adapting to its environment, Leroi-Gourhan now imagined a society in which human life would be entirely regulated by planning and by “a body of master illusionists whose role will be to study the psycho-physical diet of human masses,” directing their subjects into recreation zones “to balance out the period of sedentary productivity” while “supported by the vitamin element of tele-diffused emissions.”

Under such conditions, in which “the *homo sapiens* of zoology is probably near the end of his career” and at the same “on the verge of exhausting the planet,” Leroi-Gourhan imagines four possible conclusions. First, atomic destruction (which renders any further reflection moot). Second, and rather more optimistically, he considers Teilhard de Chardin’s apocalyptic “Omega Point” in which human and divine minds unite. This might well happen, he drily notes, but meanwhile humanity must “organize itself while waiting, and continue to live.” A third outcome would be a soft dystopia of “infinitely socializable” individuals under the complete control of “an artificial world” far more comfortable than the uncertain life of hunting and gathering. Yet in such a world, where creativity and intelligence (and implicitly, masculinity) are superfluous, it would be necessary to “find another Latin word to attach to the generic *homo*”⁹⁸; neither *sapiens* nor *faber* would apply to such passive, thoughtless creatures, like the effete Eloi in Wells’s *The Time Machine*. A final possibility would require a sudden raising of consciousness (*prise de conscience*): a resolution to remain *sapiens*, while fundamentally rethinking relations of individual and society and human relations with “the animal and vegetable world.” This would mean treating the direction of the planet as “something other than a game of chance.”

This vaguely sketched hope to take earthly matters and human destinies in hand, avoiding a future of self-destruction by drawing on the full (and untested)

reservoir of human capacities, is in line with wider 1950s and 1960s-era attempts to refigure the technical, industrial, and spiritual futures of the planet. Yet in prolonging the utopian aims of the Museum of Man—realized in a particularly original and open-ended form in the Hall of Arts and Techniques—Leroi-Gourhan’s prehistory remains prophetic and energizing. His displacement of both the technical object and the technician into *chaînes opératoires* that weave a quasi-autonomous “curtain of techniques” is in deep alignment with more recent accounts of embodied cognition, distributed agency, and techno-political assemblages.⁹⁹ While such perspectives have at times been associated with anti-humanism and posthumanism, *Gesture and Speech* ends with an affirmation of a humanistic balance: “The species is still too tied to its foundations not to seek spontaneously the equilibrium which brought it to become human.”¹⁰⁰ Such equilibrium may be a chimera; yet equipped with a conviction of human unity, practices of empathy, knowledge of the past, and hope for the future, its pursuit takes us past the temptations of fatalism. We need compelling images of the cosmos and of humans’ place within it—such as those of the Hall of Arts and Techniques—to feed and guide our hopes. Its unsettling displays carried forward the utopian *flash* of the Museum of Man: a monument to unity and a refuge of resistance in a time of danger.

NOTES

1. James Clifford, “On Ethnographic Surrealism,” *Comparative Studies in Society and History* 23, no. 4 (1981): 539–564; Jean Jamin, “Un sacré collège ou les apprentis sorciers de la sociologie,” *Cahiers internationaux de sociologie* (1980): 5–30; Walter Benjamin, *Illuminations: Essays and Reflections*, ed. Hannah Arendt, trans. Harry Zohn (New York: Schocken Books 2007), 217–251.
2. N. Schlanger, “Back in Business: History and Evolution at the New Musée de l’Homme,” *Antiquity* 90, no. 352 (2016): 1090–1099; Nélia Dias, “Le musée du quai Branly: une généalogie,” *Le débat* 5 (2007): 65–79.
3. Notable recent contributions to this historiography include Alice L. Conklin, *In the Museum of Man: Race, Anthropology, and Empire in France, 1850–1950* (Ithaca: Cornell University Press, 2013); Claude Blanckaert and Yves Coppens, eds., *Le Musée de l’Homme: histoire d’un musée laboratoire* (Paris: Éditions Artlys, 2015); Benoît de L’Estoile, *Le Goût des Autres: De l’Exposition coloniale aux arts premiers* (Paris: Flammarion, 2007); Nélia Dias, *Le musée d’ethnographie du Trocadéro (1878–1908): Anthropologie et museologie en France* (Paris: Editions du CNRS, 1991).
4. Jacques Gutwirth, “La professionnalisation d’une discipline: le centre de formation aux recherches ethnologiques,” *Gradhiva* 29 (2001): 24–41.

5. Commentary on his works in France, especially after his death in 1983, has been steady from paleoanthropologists, archeologists, and philosophers; interpretations by Jacques Derrida, Gilles Deleuze, Bernard Stiegler, and Tim Ingold have brought his work to English-language scholars working on media, technology, and embodied cognition. See, for starters, Jacques Derrida *Of Grammatology*, trans. Gayatri Chakravorty Spivak (Baltimore: Johns Hopkins University Press, 1977); Bernard Stiegler, *Technics and Time: The Fault of Epimetheus*, vol. 1 (Stanford: Stanford University Press, 1998); Tim Ingold, "'Tools for the Hand, Language for the Face': An Appreciation of Leroi-Gourhan's *Gesture and Speech*," in *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 30, no. 4 (1999): 411–453. Yet only two of his books have been translated into English, and the aims, core notions, and historical location of his work remain little appreciated—not least because the overviews of French ethnology of this period have tended to obscure the distinctiveness of his approach. For recent appreciations: André Leroi-Gourhan, *L'homme, tout simplement* (Paris: Éditions De Boccard, 2015); and Nathan Schlanger, ed., *Autour de l'homme: Contexte et actualité d'André Leroi-Gourhan* (Paris: Éditions APDCA, 2004). My account is particularly indebted to the persuasive reconstructions and explications of Nathan Schlanger, "L'insaisissable technologie d'André Leroi-Gourhan," in *André Leroi-Gourhan, "L'homme, tout simplement,"* ed. Philippe Soulier (Paris: Travaux de la MAE, René-Ginouès, 2014), 27–146; Nathan Schlanger, "'Suivre les gestes, éclat par éclat': la chaîne opératoire d'André Leroi-Gourhan," in Schlagner, *Autour de l'homme*, 2–25.
6. "Les Techniques sont créatrices au même sens que l'art. Aucun art ne se passe de technique." The first sentence is an echo from the chapter on "Technologie" in Mauss's *Manuel d'Ethnographie*. For Mauss, however, the point was the distinction (however difficult to establish) between the domain of properly "technical" activity and that of both fine arts and religion: "Il sera parfois difficile de distinguer les techniques: 1) des arts et des beaux-arts, l'activité esthétique étant créatrice au même titre que l'activité technique ... 2) de l'efficacité religieuse. Toute la différence est dans la manière dont l'indigène conçoit l'efficacité" (Marcel Mauss, *Manuel d'Ethnographie*, [Paris: Payot, (1926) 1967], 23). See François Vatin's exceptionally helpful notes and presentation to Mauss, in Marcel Mauss, "Les techniques et la technologie," *Revue du MAUSS* 1 (2004): 434–450; see Marcel Mauss, *Techniques, Technology and Civilization*, ed. Nathan Schlanger (New York: Berghahn Books, 2006).
7. Dias, *Le Musée d'ethnographie du Trocadéro*.
8. Keith Hart, "Marcel Mauss: In Pursuit of the Whole. A Review Essay," *Comparative Studies in Society and History* 49, no. 2 (2007): 473–485; Bruno Karsenti, *L'Homme total: Sociologie, anthropologie et philosophie chez Marcel Mauss* (Paris: Quadrige, 1997).
9. Jean Jamin, "Documents revue: La part maudite de l'ethnographie," *L'Homme*, no. 151 (1999): 257–266.
10. *Documents (1929–1930), édité à partir des originaux avec les illustrations* (Paris: Jean-Michel Place, 1991).
11. Georges Bataille, "Le Gros orteil," *Documents* 1, no. 6 (1929): 197–302. In *Documents (1929–1930), édité à partir des originaux avec les illustrations*, collected and reprinted by Les Cahiers de Gradhiva (Paris: Jean-Michel Place, 1991).
12. See Marcel Griaule, "Poterie," *Documents* 2, no. 4 (1930): 236; and André Schaeffner, "Les instruments de musique dans une musée d'ethnographie," *Documents* 1, no. 5 (1929): 248–254.

13. Denis Hollier, ed., *The College of Sociology (1937–1939)*, trans. Betsy Wing (Minneapolis: University of Minnesota Press, 1988).
14. Carlo Ginzburg, “The Sword and the Lightbulb: A Reading of *Guernica*,” in *Disturbing Remains: Memory, History, and Crisis in the Twentieth Century*, ed. Michael Roth and Charles Salas (Los Angeles: Getty Publications, 2001), 178–206; James D. Herbert, *Paris 1937: Worlds on Exhibition* (New York: Cornell University Press, 1998); Robert Kargon et al., eds., *World’s Fairs on the Eve of War: Science, Technology, and Modernity, 1937–1942* (Pittsburgh: University of Pittsburgh Press, 2015); Jean-François Pinchon, “La Conception et l’Organisation de l’Exposition,” in Bertrand Lemoine (dir.), *Cinquantenaire de l’Exposition internationale des Arts et Techniques de la vie moderne*, (Paris: IFA/Le Moniteur, 1987); Ihor Junyk, “The Face of the Nation: State Fetishism and Métissage at the Exposition Internationale, Paris 1937,” *Grey Room* 23 (2006): 96–120.
15. Nélia Dias, “What’s in a Name? Anthropology, Museums, and Values,” in *Die Schau des Fremden. Ausstellungskonzepte zwischen kunst, kommerz und wissenschaft*, ed. Cordula Grewe (Stuttgart: Franz Sterner Verlag, 2006), 169–185. See also Blanckaert and Coppens, *Le Musée de l’Homme*.
16. This shift was comparable to the transformation in museum displays brought about earlier by Franz Boas, away from a single line of evolution to distinct cultural groupings around “cultures.” It also reflects Mauss’s notion of the “total social fact,” and the connections he drew between social rhythms, arts, bodily practices, economic forms, and the production of material goods. See Karsenti, *L’Homme total*.
17. See Conklin, *In the Museum of Man*; Benoît de l’Estoile, “À quoi sert un musée de l’homme? Vies et destins d’une utopie,” in Blanckaert and Coppens, *Le Musée de l’Homme*, 238–259.
18. “L’exposition. L’Encyclopédie à la portée de tous,” *Avant-Garde* 14 (August 1937), quoted in Conklin, *In the Museum of Man*, chapter 3.
19. Vincent Debaene, “Les surréalistes et le musée d’ethnographie,” *Labyrinthe* 2 (2002): 556.
20. Clifford, “On Ethnographic Surrealism,” 558.
21. Now in Paris’s Museum of Modern Art.
22. Yve-Alain Bois and Rosalind E. Krauss, *Formless: A User’s Guide* (New York: Zone Books, 1997).
23. Georges Bataille, “Soleil Pourri,” in *Documents* 2, no. 3 (1930): 173–174; on Picasso and Bataille, see also Dawn Ades, Simon Baker, and Fiona Bradley, *Undercover Surrealism: Georges Bataille and Documents* (London: Hayward Gallery, 2006).
24. Cf. Susan Rubin Suleiman, “Bataille in the Street: The Search for Virility in the 1930s,” *Critical Inquiry* 21, no. 1 (1994): 61–79; Stefanos Geroulanos, *An Atheism That Is Not Humanist Emerges in French Thought* (Stanford: Stanford University Press, 2010); Jean-Christophe Marcel, “Bataille and Mauss: A Dialogue of the Deaf?,” *Economy and Society* 32, no. 1 (2003): 141–152. Mauss wrote in strong terms to Bataille’s colleague Caillois in the Collège de Sociologie after receiving his *Le Mythe et l’homme*: “What I believe to be a general going-off-the-rails, of which you are yourself a victim, is this kind of absolute irrationalism by which you end, in the name of the labyrinth and Paris as modern myth—but I believe you are all victims of it at the moment, probably under the influence of Heidegger, that Hitler-infatuated Bergsonian, legitimating an irrationalism-besotted Hitlerism—and particularly

- this kind of political philosophy you try to get out of it in the name of poetry and a vague sentimentality.” Letter to Caillois, June 22, 1938, in Fournier, Marcel, *Marcel Mauss* (Paris: Fayard, 1994), 710, quoted in Marcel, “Bataille and Mauss,” 150.
25. See Conklin, *In the Museum of Man*; De l’Estoile, “À quoi sert un musée de l’homme?”
26. In Hollier, *The College of Sociology*, 14; Schaeffner, “Les instruments de musique,” 252; Olivier Roueff, “L’ethnologie musicale selon André Schaeffner, entre musée et performance,” *Revue d’histoire des sciences humaines* 1 (2006): 71–100.
27. Gutwirth, “La professionnalisation d’une discipline.” On Leroi-Gourhan’s biography, see André Leroi-Gourhan, *Le fil du temps: ethnologie et préhistoire: 1935–1970* (Paris: Fayard, 1983).
28. Henri Vallois, NOTE DE SERVICE No 59–22. Archives of the Musée du quai Branly–Jacques Chirac.
29. Antony Rowland, “Re-reading ‘Impossibility’ and ‘Barbarism’: Adorno and Post-Holocaust Poetics,” *Critical Survey* 9, no. 1 (1997): 57–69; J. Robert Oppenheimer, “Now I am become deat...,” *J. Robert Oppenheimer’s Reflections of the First Atomic Bomb Test* (2015), http://www.atomicarchive.com/Movies/index_movies.shtml.
30. See Douglas Smith, “Beyond the Cave: Lascaux and the Prehistoric in Post-War French Culture,” *French Studies* 58 (2004): 219–232.
31. Leslie White, *The Evolution of Culture: The Development of Civilization to the Fall of Rome* (New York: McGraw-Hill, 1959), 40. White’s first such statement had appeared in print in 1943; his views had a demonstrable impact on American anthropologists including Marshall Sahlins, as in *Stone Age Economics* (Chicago: Aldine-Atherton, 1972).
32. Nikolai Kardashiev, “Transmission of Information by Extraterrestrial Civilizations,” *Soviet Astronomy* 8 (1964): 217.
33. W. W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto* (Cambridge: Cambridge University Press, 1960); Frederick Cooper, “Writing the History of Development,” *Journal of Modern European History* 8, no. 1 (2010): 5–23; Victoria De Grazia, *Irresistible Empire: America’s Advance through Twentieth-Century Europe* (Cambridge, MA: Harvard University Press, 2009).
34. Georges Bataille, *The Accursed Share: An Essay on General Economy, Part 1*, trans. Robert Hurley (New York: Zone Books, 1988), 21, 24.
35. *Ibid.*, 24.
36. Stefanos Geroulanos, “Heterogeneities, Slave-Princes, and Marshall Plans: Schmitt’s Reception in Hegel’s France,” *Modern Intellectual History* 8 no. 3 (2011): 531.
37. Georges Bataille, *Lascaux: ou, La naissance de l’art: la peinture préhistorique* (Geneva: Skira, 1955). See Howard Caygill, “Digital Lascaux: The Beginning in the End of the Aesthetic,” *Angelaki: Journal of Theoretical Humanities* 7, no. 1 (2002): 19–26, the quote is Caygill citing Bataille, 22; André Leroi-Gourhan, *The Dawn of European Art: An Introduction to Palaeolithic Cave-Painting*, trans. Sara Champion (Cambridge: Cambridge University Press, 1965).
38. André Leroi-Gourhan, *Préhistoire de l’art occidental* (Paris: Mazonod, 1965), translated as *The Dawn of European Art: An Introduction to Palaeolithic Cave-Painting*.

39. Leroi-Gourhan, *Dawn of European Art*, 13.
40. See Mauss, *Manuel d'Ethnographie*, on the close relations between technology and “magical efficacy,” in the section on “Technologie,” 29.
41. Leroi-Gourhan, *Dawn of European Art*, 75–76.
42. Caygill, “Digital Lascaux.”
43. André Leroi-Gourhan, *Le Geste et la parole* (Paris: Albin Michel, 1964), 93 (hereafter cited as GP).
44. *Ibid.*, 33.
45. *Ibid.*, 86.
46. *Ibid.*, 33.
47. Like a vast proportion of early twentieth-century thinkers, Bataille himself owed a significant debt to Bergson; see Suzanne Guerlac, *Literary Polemics: Bataille, Valéry, Sartre, Breton* (Stanford: Stanford University Press, 2000).
48. See Schlanger, “Suivre les gestes.”
49. François Sigaut, “Le culte des ancêtres et la critique des héritages,” in *Penser le concret: André-Leroi-Gourhan, André-Georges Haudricourt, Charles Parain*, ed. Noël Barbe and Alban Bensa (Paris: Créaphis, 2011), 105.
50. See Schlanger, “Suivre les gestes,” 10–12.
51. Henri Bergson, *Creative Evolution*, trans. Arthur Mitchell (New York: Dover, [1911] 1998), 139.
52. See Clare Carlisle, *On Habit* (London: Routledge, 2014), 7–13.
53. After an astounding level of celebrity in the first decades of the twentieth century, by the 1950s, with striking rapidity, the author of *Creative Evolution* had fallen out of fashion, seen as the loser in a debate with Einstein and as a dangerous influence—vitalist and mystical—for the postwar sciences. Nevertheless Bergson remained a powerful (if long neglected) influence on twentieth-century French philosophy, as a precursor to phenomenology and existentialism: Sartre directly acknowledged his influence as did Lévinas, and even before Deleuze’s deliberate (and successful) attempt to revive “bergsonism” he remained a crucial source even for epistemology and philosophy of art. Elie During, “A History of Problems’: Bergson and the French Epistemological Tradition,” *Journal of the British Society for Phenomenology* 35, no. 1 (2004): 4–23; Caterina Zanfi, *Bergson et la philosophie allemande: 1907–1932* (Paris: Armand Colin, 2013). His conception of static and dynamic modes of society influenced Claude Lévi-Strauss, Karl Popper, and Norbert Wiener, with their notions of open and closed, hot and cold; cf. Frédéric Keck, “Assurance and Confidence in *The Two Sources of Morality and Religion*: A Sociological Interpretation of the Distinction between Static Religion and Dynamic Religion,” in *Bergson, Politics, and Religion*, ed. Alexandre Lefebvre and Melanie White (Durham: Duke University Press), 265–280.
54. André Leroi-Gourhan, *Evolution et techniques I: L’homme et la matière* (Paris: Albin Michel, 1943), 27 (hereafter cited as HM).
55. *Ibid.*, 15.

56. Conklin, *In the Museum of Man*, 114.

57. The archives of the Musée de l'Homme include successive drafts and sketches of the text and layout, along with the specific objects, photos, and images, taken from Japan, Greenland, Morocco, Bali, and North America. They indicate a division of labor and a distribution of cultural capital and rewards of a particularly mid-century French kind. Many of the texts appear to be written by Balfet, co-director of the museum's training program; they are written in a voice of neutral authority, though in the few instances where an external expertise is cited, the name quoted is Leroi-Gourhan's. These rooms were central to the oeuvre that legitimated him as a "maître" (though he preferred to be called "patron"), granting him an intellectual authority and making him a model of epistemic virtue for a subsequent generation, while rendering the contributions of the rest of the team (many of whom were female) relatively invisible. See Pierre Bourdieu, *Homo Academicus*, trans. Peter Collier (Stanford: Stanford University Press, 1989); see also the *festschrift* by C. Bromberger et al., *Hommage à André Leroi-Gourhan. Leçons et images d'un "patron"* (Paris: Ministère de la culture/Maison des sciences de l'homme, 1986), 61–76.

58. The term *technique* in French refers to skillful methods for any art or handicraft, as well as what in English we call *technology*: inventions, objects, and mechanical arrangements that serve useful ends. Leroi-Gourhan used "la technologie" to refer to the rational analysis and classification of "techniques," following a tradition going back to Gérard Christian's *Technonomie*. Further, "Les arts" has often had a technological sense, as in Diderot and D'Alembert's *Encyclopédie des Sciences et Arts* or the museum of machines at the *Conservatoire Nationale des Arts et Métiers*, as well as referencing "beaux arts." The relation between *la technique* and English *technology* and German *Technik* has been discussed at length; like art, the root of all these terms, *Techné* refers to a craft or skill, and was applied to works of beauty. For a start on these questions, see Jacques Guillerme and Jan Sebestik, "Les commencements de la technologie," *Documents pour l'histoire des techniques. Nouvelle série* 14 (2007): 49–122; François Sigaut, "More (and Enough) on Technology!," *History and Technology, an International Journal* 2, no. 2 (1985): 115–132; Leo Marx, "'Technology': The Emergence of a Hazardous Concept," *Social Research* (1997): 965–988; Liliane Pérez, "L'histoire intellectuelle des techniques au Centre d'histoire des techniques et de l'environnement du Conservatoire national des arts et métiers," *Revue de synthèse* 130, no. 1 (2009): 147–164; on the tradition of "mechanology" developing during Leroi-Gourhan's time, see Brian Iliadis, "Mechanology: Machine Typologies and the Birth of Philosophy of Technology in France (1932–1958)," *Systema* 3, no. 1 (2015): 131–144; see also François Vatin, "Machinisme, marxisme, humanisme: Georges Friedmann avant et après-guerre," *Sociologie du travail* 46, no. 2 (2004): 205–223.

59. HM, 39.

60. On Matters, see notes for the "matter" display in the Hall of Arts and Techniques, reference Cf-C-64-1, Archives of the Musée du quai Branly–Jacques Chirac. Leroi-Gourhan would later note his attention to diverse materials as a point that differentiated his approach from Mauss's study of techniques, claiming that Mauss's framework was that of the English and German theorists of his era: "This frame, which distinguished, for example, rope making, sparterie, and weaving, remains very abstract if one does not have access to abundant data technologically perceived." In contrast, Leroi-Gourhan noted his own emphasis on materials: "The technological ensemble is based on solids (stable, semi-plastic, plastic ...) and percussion (posed, thrown, posed with striker). It is the materials and means of action on matter which condition all the rest." André Leroi-Gourhan, *Les Racines du monde*, (Paris:

Belfond, 1982), 34, cited by François Vatin in his presentation of Mauss's "Les techniques et la technologie," 444n19. Though Bruno Latour has criticized Leroi-Gourhan for presenting an impoverished view of technics as "action on matter" (in Barbe and Bensa, *Penser le concret*, 263–266) and François Sigaut (in Sigaut, "Le culte des ancêtres et la critique des héritages," 107–108) takes him to task for an insufficiently differentiated view of forms and directions of percussion, Leroi-Gourhan laid important foundations for recognizing the variability, resistances, and capacities of diverse forms of matter. While he does speak of "mastery," he also frequently describes technics as a "dialogue" with matter.

61. See Hollier and Ollman's gloss on Griaule's vision of "Poterie" in *Documents*: "In the museum he evokes, Griaule requires, next to the vase, the ghost of the man who drinks" (Denis Hollier and Liesl Ollman, "The Use-Value of the Impossible," *October* 60 [1992]: 8–9).

62. For a critique of this emphasis on percussion, see Sigaut, "'Le culte des ancêtres et la critique des héritages,'" in *Penser le concret*, a volume that also contains works on Georges Haudricourt, a contemporary of Leroi-Gourhan who worked in botany before studying the relations between technics and social forms, frequently mentioned as an anthropologist of technology whose contributions have been (unjustly, for some) overshadowed by Leroi-Gourhan's. Cf. Jean-François Bert, "De Marcel Mauss à AG Haudricourt," *Revue d'histoire des sciences humaines* 1 (2009): 163–181.

63. Showcases for "Tools" and "Energy," Archives of the Musée du quai Branly–Jacques Chirac (reference DA001268/67578).

64. GP, 58.

65. The influence of Leroi-Gourhan's notions of faciality and technical assemblage on Deleuze and Guattari have been noted; this vitrine suggests a likely source for *Mille Plateaux's* "apparatus of capture." Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, [1980] 1987).

66. HM, 39.

67. HM, 87.

68. Showcases for "Tools" and "Energy," Archives of the Musée du quai Branly–Jacques Chirac (reference DA001268/67578).

69. This sense of a dynamic interchange between inside and outside characterized the object of ethnology, "the subtle movement which animates the totality of facts, the play of actions and reactions whose specific assemblage constitutes the ethnic group." "L'expérience ethnologique," in *Ethnologie generale*, ed. Jean Poirier (Paris: Gallimard, 1968), 1823–1834, cited in Gutwirth, "La professionnalisation d'une discipline," 34. On earlier attempts to capture this interplay between interior and exterior milieus as a keystone to French theories of both biology and life, see John Tresch, *The Romantic Machine: Utopian Science and Technology after Napoleon* (Chicago: University of Chicago Press, 2012), esp. pp. 270–273.

70. Archives of the Musée du quai Branly–Jacques Chirac (reference C-62-867-493).

71. Leroi-Gourhan, *Gesture and Speech*, trans. Anna Bostock Berger (Cambridge, MA: MIT Press, 1993), 114; see Françoise Audouze, "Leroi-Gourhan, A Philosopher of Technique and Evolution," *Journal of Archaeological Research* 10, no. 4 (2002): 287; for an illuminating history of this concept's emergence in the 1950s, and regarding its Bergsonian roots, see Schlanger, in *Autour de l'homme*.

72. Georges Canguilhem, "Machine and Organism," in *Knowledge of Life*, trans. and ed. Paola Marrati and Todd Meyers (New York: Fordham University Press, 2008), 94.
73. Andre Schaeffner, "Les instruments de musique," quoted in Hollier and Ollman, "The Use-Value of the Impossible," 9.
74. Griaule, "Poterie," 236, quoted in Hollier and Ollman, "The Use-Value of the Impossible," 9.
75. *Ibid.*, 10.
76. See Carol Duncan, *Civilizing Rituals: Inside Public Art Museums* (New York: Routledge, 2005).
77. De l'Estoile, "À quoi sert un musée de l'homme?," 246.
78. Conklin, *In the Museum of Man*.
79. Fred Turner, *The Democratic Surround: Multimedia and American Liberalism from World War II to the Psychedelic Sixties* (Chicago: University of Chicago Press, 2013).
80. Linda Dalrymple Henderson, *Duchamp in Context: Science and Technology in the Large Glass and Related Works* (Princeton: Princeton University Press, 1997); L. Rainey, C. Poggi, L. Wittman, eds., *Futurism: An Anthology* (New Haven: Yale University Press, 2009); Hal Foster, *Prosthetic Gods* (Cambridge, MA: MIT Press, 2006). See also David Lomas, "Modest Recording Instruments': Science, Surrealism and Visuality," *Art History* 27, no. 4 (2004): 627–650.
81. The strong preference toward materialist and mechanical reduction was nevertheless met by a countercurrent (traceable in some respects to Bergson himself), including in cybernetics'-influenced systems and information theory, which ~~also~~ tended to undermine dualism. Leroi-Gourhan's technocentric update of Bergson's vitalism ~~is comparable to~~ Bateson's cybernetic reworking of neo-Lamarckian monism. See Andrew Pickering, *The Cybernetic Brain: Sketches of Another Future* (Chicago: University of Chicago Press, 2010); R. John Williams, "World Futures," *Critical Inquiry* 42, no. 3 (Spring 2016): 473–546; Bernard Dionysius Geoghegan, "The Family as Machine: Film, Infrastructure, and Cybernetic Kinship in Suburban America," *Grey Room* 66 (2017): 70–101; John Tresch, "Heredity Is an Open System: Gregory Bateson as Descendant and Ancestor," *Anthropology Today* 14, no. 6 (1998): 3–6.
82. To put it simply, where Lévi-Strauss worked with words and symbols, Leroi-Gourhan began and ended with gestures and things. See Françoise Audouze, "Leroi-Gourhan, A Philosopher of Technique and Evolution," 282; Alexandra Bidet, "Le corps, le rythme et l'esthétique sociale chez André Leroi-Gourhan," *Techniques & Culture* 1 (2007): 15–38.
83. See Dias, "What's in a Name?"
84. De l'Estoile, "À quoi sert un musée de l'homme?," 243; these ambiguities and contradictions are explored in Conklin, *In the Museum of Man*.
85. UNESCO/ SS/1, "Statement by Experts on Racial Problems," Paris, July 20, 1950.
86. UNESCO/ SS/1, See Conklin, *In the Museum of Man*, 330.
87. Leroi-Gourhan to Jean Buho, February 20, 1940, in André Leroi-Gourhan, *Pages oubliés sur le Japon* (Grenoble: Millon, 2004), 101–102, quoted in Conklin, *In the Museum of Man*, 34.
88. GP, 50.

89. Stiegler's *Technics and Time*, vol. 1, notes how Leroi-Gourhan's evolutionary framework leads him to retreat to a classic "logocentric" stance, ~~by~~ using language and thought as markers of the threshold of humanity. Despite this deconstruction, ~~he~~ makes clear Leroi-Gouhan's consistency in treating techniques, skeletal-muscular development, brain development, and social organism as intrinsically intertwined through feedbacks and mutual dependencies.
90. Bruno Karsenti, "Techniques du corps et normes sociales: de Mauss à Leroi-Gourhan," *Intellectica* 2, no. 1 (1998): 227–239.
91. Archives of the Musée du quai Branly–Jacques Chirac (reference DA001268/67578, "Labels for showcases.")
92. GP, 259. Bergson ~~had~~ pointed out a similar time lag between inventions and the perception of their effects in *Creative Evolution*: "A century has elapsed since the invention of the steam engine, and we are only just beginning to feel the depths of the shock it gave us. But the revolution it has effected in industry has nevertheless upset human relations altogether" (Bergson, *Creative Evolution*, 138).
93. GP, 15.
94. GP, 17.
95. GP, 58.
96. GP, 15, 17, 58, 180. Out of these chapters Stiegler notes three forms of memory or "programs": those carried by genetic inheritance, those learned and embodied as habits and skills, and those stored outside our bodies, in writing and other media supports.
97. GP, 58.
98. GP, 267.
99. See, for example, Edwin Hutchins, *Cognition in the Wild* (Cambridge, MA: MIT Press, 1995); Evan Thompson, *Mind in Life: Biology, Phenomenology, and the Sciences of Mind* (Cambridge, MA: Harvard University Press, 2010); Alva Noë, *Action in Perception* (Cambridge, MA: MIT Press, 2004); Andy Clark, *Being There: Putting Brain, Body, and World Together Again* (Cambridge, MA: MIT Press, 1998); Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005); N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 2008); and Andrew Pickering, *The Mangle of Practice: Time, Agency, and Science* (Chicago: University of Chicago Press, 1995).
100. Leroi-Gourhan, *Gesture and Speech*, 408. See discussion of "equilibrium" in Christopher Johnson, "Leroi-Gourhan and the Limits of the Human," *French Studies* 65, no. 4 (2011): 471–487.