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The House of Life

A portal, flanked by two arched window-spaces. Above the portal, a stone plaque with the inscription Hôtel-Dieu. Below this inscription, on the portal itself, the Revolutionary motto: Liberté, Egalité, Fraternité. And finally, on a plain white placard at street level: Assistance publique. Hôpitaux de Paris. The name Hôtel-Dieu dates back to the seventh century, when the bishop of Paris founded the hospital. The Revolutionary motto announces the moment when reform of the hospital began, a reform inextricably linked to the origins of modern medicine. Assistance publique: quite literally, the Hôtel-Dieu gave medical aid to anyone in Paris, with the poor (the largest part of its clientele) treated at no cost. Similarly, physicians frequently served at the hospital without pay. Their service reflected a firm belief in medical assistance as a right (rather than privilege) of every city resident. The designation Hôpitaux de Paris points to the administrative nexus that connects the Hôtel-Dieu to other hospitals in the city. In the eighteenth century, it was already associated with the Hôpital St.-Louis and the Hôpital de la Santé, as well as the hospitals of the so-called Hôpital Général de Paris: Notre Dame de la Pitié, La Salpêtrière, the Hospice de Bicêtre, and the Hospice de Vaugirard.

Today the Hôtel-Dieu is situated at the northwest corner of the cathedral of Notre Dame, in the very heart of Paris. A massive structure, it completely fills the space between the Rue d’Arcole and the Rue de la Cité, its shape essentially that of a quadrangle whose principle entrance faces the open square in front of the cathedral. The facade enjoys discreet shade from a row of trees whose foliage takes on a warm russet tint in autumn. The main entrance hall offers a well-lit, spacious foyer enhanced by a studied arrangement of pediments and arches. Meanwhile the inner courtyard displays another Gothic motif, a row of arched windows surmounted by a similar row of arches. The effect is that of a cathedral clerestory. Overall, the architectural eclecticism (a mix of classical and medieval) betrays the taste of the nineteenth century. So it should come as no surprise to
learn that the original Hôtel-Dieu had been gradually destroyed by a succession of fires the century before. Thus the enormous complex between the Rue d’Arcole and the Rue de la Cité can yield no clue about the original Hôtel-Dieu. Here the faint but persistent resonances of the past, typical of every edifice that has endured and witnessed, have been reduced to silence.

From a variety of sources, we can arrive at some sense of the original Hôtel-Dieu. We at least know its location: unlike the present Hôtel-Dieu, its predecessor had been built on the opposite side of Notre Dame, adjacent to the southwest corner. In fact, the earlier structure even partly blocked access to the cathedral itself. A motley collection of buildings thrown together largely at the time of François Ier, the old Hôtel-Dieu meandered haphazardly along the bank of the Ile de la Cité from the Pont-au Double to just above the Petit Pont. Meanwhile a secondary wing arose on the opposite bank of the Seine, at the present-day quai de Montebello. An arrangement of corridors and wards that straddled the Seine via the Pont-au Double and a second juncture linked this secondary wing to the principal one. What we have, then, is roughly a hollow square built over the river. The interior was in many respects equally haphazard. With its first floor reserved for administrative offices, storage of food, wood, oil, wax, and other combustibles had to be relegated to the basement. In addition, candlemaking carried out there added to the danger of fire. As for the floors reserved for patients, a Byzantine scheme of badly designed stairways and corridors connected the different wards to each other, while an endless array of small, cramped rooms only intensified the awkwardness. Clearly, all these circumstances were bound to impede hospital staff efficiency.

When we turn to the quality of patient care, however, the situation took on the semblance of a genuine nightmare. The Hôtel-Dieu contained 486 single beds and 753 slightly larger, for a total of 1,219. With these it would normally accommodate 2,500 patients. But in unhealthy seasons, that number could quickly escalate to 3,500 and, in the event of an epidemic, 4,800. Moreover, many single beds would be occupied by orderlies, who had nowhere else to sleep. The normal complement for a larger bed was four patients. But with even a slight increase in admissions, this easily became five or six. In the smallpox ward as many as eight children might be found in a single bed. With patients crammed together so that the feet of one lay beside the head of the next, blankets became impossible: to warm the feet of one person would suffocate others. Instead the patients’ only source of warmth came from fellow patients afflicted with fever. Nor could they even move. Restricted to eight and a half inches of bed space per patient, they suffered constantly from stiffness. Sleep was absolutely
out of the question. Often, babies assigned to beds with their mothers were overlaid and smothered.

Overcrowding, though, was just a minor problem. A bigger one was infection. Within a single bed, patients with different illnesses were indiscriminately mixed together. Even more horrifying, those who had died often weren’t removed for hours or even days. Scabies and vermin were universal, and went completely untreated. And beds were almost never changed despite the fact that sweat, pus, and secretions from the sick inevitably soaked through the mattresses. Likewise, unwashed linen would pass from one patient to the next. Even the air was a source of contagion: small, cramped rooms made the atmosphere humid and close, and in hot months especially, with almost no ventilation, patients could only inhale air already breathed many times by others. Lack of space also meant everything had to be done in the wards themselves: bandages changed, infections drained, veins bled, and operations performed (trepanning almost always proved fatal because the air infected the dura mater).

If it’s hard these days to imagine operations without anesthesia, those of the Hôtel-Dieu almost surpass belief. For lack of anesthesia was just one difficulty surgical patients there had to face. Situated next to the Rue de la Boucherie, the surgical ward was subject by day to a constant rumble from heavy carts passing by. Night was no better: the screams, convulsions, and fights of the mental patients in the adjacent ward completely destroyed any hope of rest. While the ratio of three surgical patients per bed made even minimal physical comfort hard to come by, the constant presence of attendants with carts of food or linen and outpatients who hovered beside each bed to consult a surgeon only made matters worse. Meanwhile other conditions rendered the plight of those destined for surgery almost unbearable. Since operations were invariably performed in the same room where all surgical patients were kept, anyone not yet operated on could clearly see all the horrors to come. And of course for anyone who’d already undergone the ordeal, the screams and agony of those currently engaged would only revivify the memory of past torment. Next to the surgical ward, moreover, the autopsy room with its unavoidable smell intimated the frequent outcome. At the Hôtel-Dieu, even simple operations were risky. Those of a more complicated kind usually proved fatal. Here statistics tell the tale: of every four patients admitted to the Hôtel-Dieu, one was fated to die there.

Perhaps the most poignant losses concerned those involved in the inception of new life. For every fifteen mothers who entered the Hôtel-Dieu for childbirth, one would lose her own life. The problems were manifold. Typically, three or four mothers at all stages of delivery would be crammed together in a single bed.
Healthy and sick lay together, with expectant mothers often next to patients afflicted by smallpox or syphilis. Of course infections spread. In particular, puerperal fever in the maternity ward (endemic there for twelve years by 1787) went unchecked. On average, maternity patients spent roughly thirty-five days at the Hôtel-Dieu—mostly for recovery from secondary infections. Still, those who lived could count themselves lucky. For anyone who developed complications during pregnancy, the outcome was likely to be worse. Operations almost always proved unsuccessful. Fewer than one out of thirty-five mothers who underwent Cæsarean sections survived surgery. Delivery by forceps was similarly fraught with risk. These, then, were the conditions at the Hôtel-Dieu in 1787, as described by the renowned physician Jacques Tenon in his Academy of Science report for the minister Jean-Sylvain Bailly. Taken collectively they suggest: a house of death, not life.

Nonetheless, the Revolution would make matters worse. Almost immediately, institutions became suspect, tainted by their association with the Old Regime. Ideological purity now counted for more than expertise. As the political situation worsened, the polemics increased. The result: a loss of public confidence. Finally, in August 1792, the blow fell: all university faculties and medical schools in France were abolished. With these went the Paris Faculty of Medicine. No more legal requirements for medical practice, no more exams to prove competence. Suddenly the field became wide open to anyone and everyone. Some legislators even voiced the hope that medicine could now return to a more natural mode, and perhaps eventually to that of ancient Greece. A picturesque idyll. It’s only too easy to imagine the consequences for helpless patients at hospitals like the Hôtel-Dieu. With the collapse of professional medical care, chaos ensued, marked by the eruption of a flood of untrained medical practitioners onto the scene. Quackery and charlatanism now abounded everywhere. War, meanwhile, only intensified an already desperate situation: between September 1793 and the end of 1794, over 600 doctors were lost, casualties of service in the armies of the Republic. The Paris Académie de Chirurgie lingered out its last days, to be abolished in 1794. Clearly, any sense of the need for medical knowledge had disappeared.

Out of the chaos, however, a new discipline gradually emerged. As the consequences of charlatanism and incompetence began to be felt, public opinion shifted toward support for a radical reform of the medical profession. At the heart of the reform effort was Pierre-Joseph Desault. As chief surgeon of the Hôtel-Dieu, he had himself created the surgical clinic there. A contemporary prospectus conveys an idea of what his course was like. Between 6 and 8:30 a.m., Desault made the rounds of all hospital patients, accompanied by his students. Patient examination included comments by Desault on important aspects of each malady
and medical attention either from himself personally or under his direct supervision. The practical surgical lesson (9 to 11 a.m., in the hospital amphitheater) formed the core of the course. Here operations would be performed and observed, accompanied by discussion and possibly prior demonstration on a cadaver by Desault. Also featured were anatomical examination of deceased patients, reports, and intensive scrutiny of a particular disease. At 3 p.m., an anatomy lesson, with questions. At 4:30, visits to patients, with Desault himself present by 5 o’clock. At 6 p.m., further outpatient consultations in the amphitheater. Then, until 8 p.m., more practical preparation: dissections, operations on cadavers, equipment assembly, bandages. Throughout we see constant exposure to the body, dead and alive. By means of such instruction, the house of death began its transformation into a house of life.

Enter, at this moment, a young medical student named Xavier Bichat. With his native Lyon inflamed by Revolutionary disturbances, he had found himself forced to look elsewhere to complete his medical studies. In June 1794 (barely a month before 9 Thermidor, which brought the fall of Robespierre and an end to the Terror) Bichat arrived in Paris. Enrolled in Desault’s course, he quickly became the favorite pupil, assistant, and subsequently successor to the great surgeon. In each capacity, he witnessed the struggle between life and death in countless instances. But not only as observer: in the last years of his own brief life, he felt its imminent end. As a result, his research pace became more frenetic. During the winter of 1801–2 he supposedly dissected 600 cadavers. Then the end: on July 22, 1802, shortly after a fall from a staircase at the Hôtel-Dieu, Bichat died in the arms of his friends Roux, Esparron, and Mme Desault, his last days marked by acute illness. His physicians, Corvisart and Lepreux, had tried desperately to save him, but in vain. The celebrated Corvisart then wrote to Napoleon: “Bichat just died at thirty. He fell on a battleground that demands courage too and counts more than one victim. He has enriched medical science. Nobody at his age has done so much so well.” His funeral service at the cathedral of Notre Dame next to the hospital where he worked drew almost all the elite of the Paris medical faculty as well as the entire body of medical students in the city. Napoleon ordered a monument to be placed in the main hall of the Hôtel-Dieu. Its inscription is typical of the language and emotion of its period: “This monument, dedicated to the memory of citizens Desault and Bichat, is testimony to the gratitude of their contemporaries for services the former rendered to French surgery as its restorer, and that the latter rendered to French medicine, which he enriched by several works whose realm he would have extended if pitiless death hadn’t struck him in his thirty-first year.”

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Here, one might say, life circumstances seem to form a natural prelude to the work. All around him, in the wards of the Hôtel-Dieu, Bichat had seen patients whose vital flame had flickered under the pressure of illness or infection and often gone out. In some instances, a sudden shock would have been sufficient to arrest vitality in an otherwise healthy individual. In other instances, internal examination or autopsy would have revealed a pathological condition in the patient. But what all these examples shared was evidence of the struggle of vitality against adverse conditions or forces. Because of circumstances at the Hôtel-Dieu, moreover, the fragile thread of vitality was more apparent than elsewhere. In addition, Desault’s commitment to careful observation and records of illnesses made it possible to track the vital trajectory of a patient very closely. The autopsy was another source of abundant data about vital processes. Here the high mortality rate of Hôtel-Dieu patients meant a constant supply of new material for study. Finally Bichat had his own condition to think of. If anything, it might give questions about the nature of life a greater urgency. But despite the ample inducement for reflection offered by all these circumstances, they don’t quite suffice to dictate the particular form a vital theory ought to take. For that, we need to turn to Bichat’s work.

Perhaps the first point to make about Bichat’s vital theory is that it doesn’t adhere to the notion of a single vital principle. About this the *Anatomie générale* is quite explicit:

La doctrine générale de cet ouvrage ne porte précisément l’empreinte d’aucune de celles qui règnent en médecine et en physiologie. Opposée à celle de Boerhaave, elle diffère, et de celle de Stahl, et de celle des auteurs qui, comme lui, ont tout rapporté, dans l’économie vivante, à une principe unique, principe abstrait, idéal et purement imaginaire, quel que soit le nom d’âme, de principe vital, d’archée, etc., sous lequel on le désigne.

[The general doctrine of this work doesn’t exactly carry the stamp of those that reign in medicine and in physiology. Opposed to that of Boerhaave, it differs from that of Stahl and the authors who, like him, have attributed everything in the vital economy to a single principle, an abstract principle, ideal and purely imaginary, whether the name be soul, vital principle, first principle, etc., under which one designates it.] (*Anatomie générale* I: vj–vij)

Subsequently Bichat reiterates his point. About the notion of a unitary vital principle he specifically remarks: “Ce principe appelé vital par Barthez, archée par Van-Helmont, etc., est une abstraction qui n’a pas plus de réalité, qu’en aurait un principe également unique qu’on supposeroit présider aux phénomènes phy-


siques” [This principle termed vital by Barthez, primordial by Van-Helmont, etc., is an abstraction that has no more reality than would an equally unique principle that one might suppose to preside over all physical phenomena] (Anatomié générale I: xxxviii–xxxix).

Although Bichat is clearly critical of a single vital principle, the reason isn’t immediately evident. After all, the capacity to encompass a wide range of phenomena is precisely what gives a general principle its explanatory value. And while the notion of a single principle for all physical phenomena might seem far-fetched, the same needn’t necessarily be true for a single vital principle. Consider: whereas physical events have different sources, all vital phenomena occur within any given individual. From that standpoint, for vital phenomena to originate from different sources could even seem counter-intuitive.

The fact that Bichat doesn’t buy the notion of a unitary vital principle points to what counts for him as explanation. Here his rejection of an equivalent principle for physics seems to me highly instructive. It shows his resistance to a unique vital principle isn’t based on any perspective peculiar to the life sciences. Instead, his dislike of a unique vital principle would seem akin to his dismissal of an equivalent physical principle. To understand what it involves, we might look at what he considers valid physical principles. Elsewhere in the same passage, he gives attraction and impulsion as examples. Each of these refers to an activity of some kind. Attraction is about the movement by which particles draw toward each other, while impulsion has to do with motion that can be communicated to others. What characterizes both is a high degree of specificity. In each case, we know exactly what’s involved. By contrast, it would be extremely hard to specify a content for soul, vital principle, or first principle. Thus “abstraction” is equivalent for Bichat to generality. As we move to higher levels of generality, we become progressively more abstract until at the highest level we arrive at pure abstraction. Obviously, the higher the level of generality, the more phenomena we can cover under a single principle. At the same time, we clearly lose specificity: at each level, it’s harder to say what exactly our principle consists of. For Bichat, then, generality always comes at the cost of specificity. And without specificity, there can be for him no explanatory force.

To a significant extent, Bichat’s desire for specificity seems to me to reflect the influence of Desault. The outlook of the new surgical school had emphasized observation. Here we need only recall the routine of the surgical course at the Hôtel-Dieu. Significantly, Desault almost never talks about the ultimate cause of a disease or illness, or the broad links between various vital phenomena. Instead, what we get is almost purely observational: an exact record of the minutiae of
each patient’s illness, postoperative reports on patients, anatomical examination of deceased patients, remarks on illnesses prevalent in the hospital at the time. Even the way Desault tests his students reflects this observational tendency: oral rather than written, and only on material covered in the last ten days. The entire routine clearly expresses a deep suspicion of, and resistance to, the hypothetical or speculative. In that respect, Desault was emphatically a minimalist. His objective might even be described as a replacement of theory by practice, a practice dominated by observation without any trace of the speculative. Given his own immersion in Desault's routine, it's only natural Bichat would have found the notion of a single vital principle, with its implied element of the hypothetical, untenable. If you start with the physiological minutiae that emerge from the daily round of hospital work, to arrive at a general doctrine of vitality would require theory to be buttressed by a massive quantity of inferences. And that, from a purely observational standpoint, could hardly be thought of.

To guard against the dangers of the hypothetical or speculative, then, an explanatory principle has to be endowed with the sort of specificity we obtain from a purely observational standpoint. For Bichat, the best way to achieve that is by properties:

En donnant l’existence à chaque corps, la nature lui imprima donc un certain nombre de propriétés qui le caractérisent spécialement, et en vertu desquelles il concourt, à sa manière, à tous les phénomènes qui se développent, se succèdent et s’enchaînent sans cesse dans l’univers. . . .

Ces propriétés sont tellement inhérentes aux uns et aux autres, qu’on ne peut concevoir ces corps sans elles. Elles en constituent l’essence et l’attribut. Exister et en jouir sont deux choses inséparables pour eux. Supposez qu’ils en soient tout à coup privés; à l’instant tous les phénomènes de la nature cessent, et la matière seule existe. Le chaos n’étoit que la matière sans propriétés; pour créer l’univers, Dieu la doua de gravité, d’élasticité, d’affinité, etc., et de plus, une portion eut en partage la sensibilité et la contractilité.

[In giving existence to each body, nature thus imprinted on it a certain number of properties that specially characterize it, and by virtue of which it concurs in its way with all the phenomena that develop, succeed each other, and connect endlessly in the universe. . . .

These properties are so inherent in one or another [body] that one can’t conceive of those bodies without them. They constitute their essence and attribute. To exist and to possess [such properties] are for them two inseparables. Suppose they were suddenly deprived of these; instantly all natural phenomena would cease, and
matter alone would exist. Chaos is only matter without properties: to create the universe, God endowed it with gravity, elasticity, affinity, etc., and, in addition, one portion received as part of its share sensibility and contractility.] (Anatomie générale I: xxxvj–xxxvij)

While he clearly wants to emphasize the importance of properties, what isn’t clear is why Bichat should want to define these simultaneously as “the essence and attribute” of all material bodies. Typically, essence is supposed to be the base of attributes or qualities. Essence, in other words, is fundamental, while attributes are merely phenomenal or modificational. Yet Bichat obviously wants to make them equally fundamental. To do that, he begins with the remark that “these properties are so inherent in one or another [body] that one can’t conceive of those bodies without them.” But perhaps our tendency to associate the two is simply the result of our experiences. As if to rule out such a possibility, Bichat goes on: “To exist and to possess [such properties] are for them two inseparables.” From his standpoint, then, existence isn’t even ontologically prior. All the same, we can easily conceive of it without material properties. The fact that we can do so, moreover, might well imply actual ontological precedence (note that we can’t imagine the reverse: properties or qualities without existence). Thus the burden of proof falls on the text: it has to explain why properties are ontologically necessary.

Subsequently Bichat tries to explain just that. What he says points to an awareness of our ability to think material existence without properties: “Suppose they [material bodies] were suddenly deprived of these; instantly all natural phenomena would cease, and matter alone would exist.” Significantly, Bichat doesn’t try to claim there would be no matter at all. Instead, he seems to recognize that our ability to think material existence without properties does imply real ontological precedence of some kind. What he does claim, however, is that material existence without properties isn’t matter as we know it: that its lack of properties or qualities means we couldn’t have any perception of it, and hence no knowledge of its existence. Under these circumstances, the result would be simply chaos: “Chaos is only matter without properties: to create the universe, God endowed it with gravity, elasticity, affinity.” His description of chaos shows Bichat as clearly concerned about his admission of matter without properties. Despite our inability to perceive it, any admission of its existence could signify that its ontological precedence is real, which would make properties merely modificational. To avoid this undesirable consequence, the text tries a sort of desperate backdoor move: it posits the “creation” of matter as equivalent to God’s endowment of it with properties. The problem here is that matter would then
exist before it gets endowed with properties, and so conceivably coexist with God. Thus even if we think of creation as the endowment of matter with properties, we still don't arrive at their inseparability from matter.

The reason why this issue is crucial for Bichat has to do with his desire to make properties a kind of ultimate explanatory principle. Immediately after the passage just discussed, he explicitly says:

Cette manière d’énoncer les propriétés vitales et physiques, annonce assez qu’il ne faut point remonter au-delà dans nos explications, qu’elles offrent les principes, et que ces explications doivent en être déduites comme autant de conséquences. [This way of stating vital and physical properties sufficiently announces that there’s no need at all to go back any further in our explanations, that they [properties] offer principles, and that these explanations should be deduced from them as so many consequences.] (Anatomie générale I: xxxvij)

Here the statement “they [properties] offer principles” shows how far Bichat will go in his effort to make properties the basis of theory. Despite a fundamental category difference, he even tries to equate properties with principles. In addition, he clearly wants to believe properties have explanatory value. Thus his expressed hope that “explanations should be deduced from them as so many consequences.” What’s at stake for Bichat in the discussion of properties is the role of observation in the formation of theory. From his standpoint, admission of the ontological precedence of material substance over properties or qualities opens the door, in effect, to various forms of theory that hardly take account of observation at all. Hence the need to make observation central via a doctrine of properties, so that the basis of theory will remain observational rather than purely speculative.⁴

While his discussion of properties has so far been more or less general, it’s important for Bichat at this point to distinguish vital properties from the merely physical. In fact, he attempts to do so in various ways. Because it epitomizes the rest, his first distinction is particularly significant:

Lorsqu'on met d’un côté les phénomènes dont les sciences physiques sont l’objet, que, de l’autre, on place ceux dont s’occupent les sciences physiologiques, on voit qu’un espace presque immense en sépare la nature et l’essence. Or, cet intervalle naît de celui qui existe entre les lois des uns et des autres.

Les lois physiques sont constantes, invariables; elles ne sont sujettes ni à augmenter ni à diminuer . . . Àu contraire, à chaque instant la sensibilité, la contractilité s’exaltent, s’abaissent et s’altèrent: elles ne sont presque jamais les mêmes.
Despite the temptation to assimilate vital to physical properties, Bichat doesn’t go that way. To some extent, he seems to have felt pressure (from the Academy of Science and elsewhere) to make the life sciences conform to the paradigm of exactness favored by the physical sciences. Yet his rhetoric expresses an emphatic refusal to yield to that pressure. Hence the “almost immense space” between the life sciences and the physical sciences. As Bichat sees it, the physical sciences simply can’t grasp what’s essential to vital properties. Specifically, sensibility and contractility “rise, fall, and are altered: they’re almost never the same.” But if these properties don’t remain the same, and if their exact variation is unpredictable, what matters is the kind of movement or activity they embody.

Elsewhere Bichat attempts to define exactly the movement or activity associated with each vital property. His analysis leads him to organize these in a particular fashion:
1°. The sensibilité organique et la contractilité insensible have evidently under their dependence, in the state of health, all the phenomena of the capillary circulation of secretions, absorptions, exhalations, nutrition, etc. Also in treating these functions, it is necessary to go back to these properties. . . .

2°. La contractilité organique sensible, qui, like the preceding, is not separable from sensibility of the same nature, presides especially in the state of health over movements necessitated by digestion, over those required by circulation in the large vessels, at least for red blood and for the black blood of the general system. . . .

3°. De la sensibilité animale dérivent, in the state of health, all exterior sensations, sight, hearing, smell, taste, touch; all interior sensations, thirst, hunger. . . .

4°. La contractilité animale est le principe de la locomotion volontaire et de la voix.

[1°. Organic sensibility and insensible contractility evidently have under them, in a healthy state, all the phenomena of the capillary circulation of secretions, absorptions, exhalations, nutrition, etc. Thus in treating these functions it’s necessary to go back to these properties. . . .

2°. Organic sensible contractility which, like the preceding, isn’t separable from sensibility of the same nature [i.e., organic sensibility], presides especially in a healthy state over movements necessitated by digestion, over those required by circulation in the large vessels, at least for red blood and for the black blood of the general system. . . .

3°. From animal sensibility derive, in a healthy state, all exterior sensations, sight, hearing, smell, taste, touch; all interior sensations, thirst, hunger. . . .

4°. Animal contractility is the principle of voluntary locomotion and of the voice.] (Anatomie générale I: xliij–xliv)

Perhaps the most helpful comment on what Bichat says here is his own schema from the Recherches physiologiques sur la vie et la mort:

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<tr>
<th>Genera</th>
<th>Species</th>
<th>Varieties</th>
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<tr>
<td>Vital Properties:</td>
<td>Sensibility</td>
<td>Animal Organic</td>
</tr>
<tr>
<td>Contractility</td>
<td>Animal Organic</td>
<td>Sensible Insensible</td>
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(p. 130)
What becomes immediately evident is the classificational tendency in Bichat’s definition of vital properties. Essentially, sensibility is passive, receptive. Its faculties have to do more or less with what we “feel.” Contractility, meanwhile, is active. Collectively, its motions embody our response to what we feel. The further subdivision into animal and organic plays a similar role. Animal life “nous met en rapport avec les corps extérieurs” [places us in relation to exterior bodies], while organic life “sert à la composition et à la décomposition habituelles de nos parties” [serves in the habitual composition and decomposition of our parts] (Anatomie générale I: cij). So once again we have, on a different level, the distinction between voluntary and involuntary. Obviously it would be easy for Bichat to continue to apply distinctions of this kind to his schema. At some point, he might accordingly hope to have achieved a detailed enumeration of all vital properties, which would at the same time be exhaustive. Yet even if exhaustive, a detailed, complete enumeration of vital properties would still fail to yield a full knowledge of the essential nature of vitality. As Bichat himself points out, vital properties like sensibility or contractility “rise, fall, and are altered.” In that respect, we might say they’re ultimately defined by their activity. A classificational scheme, however, can’t really explain activity. Instead, its viewpoint is purely descriptive. It allows us, in other words, to specify various forms of sensibility, by which we register external impressions, or contractility, by which we act. What it can’t do is to explain precisely how either perception or voluntary motion takes place. Hence the need for a study of function. If the essence of life is activity, any attempt to understand its basic nature has to involve an analysis of vital functions.

It’s here that the study of tissues becomes crucial for Bichat. If specification of vital properties turns out to depend on an analysis of vital functions, the real question then is how each function gets performed. But a function almost always implies coordinated activity by different individual elements. So the question becomes: what are the elements by which the vital functions get performed? With his description of tissues, Bichat offers an answer to this question:

Tous les animaux sont un assemblage de divers organes qui, exécutant chacun une fonction, concourent, chacun à sa manière, à la conservation du tout. Ce sont autant de machines particulières dans la machine générale qui constitue l’individu. Or ces machines particulières sont elles-mêmes formées par plusieurs tissus de nature très-différente, et qui forment véritablement les éléments de ces organes. La chimie a ses corps simples, qui forment, par les combinaisons diverses dont ils sont susceptibles, les corps composés: tels sont le calorique, la lumière, l’hydrogène,
l’oxygène, le carbone, l’azote, le phosphore, etc. De même l’anatomie a ses tissus simples, qui, par leurs combinaisons quatre à quatre, six à six, huit à huit, etc., forment les organes. [Bichat then enumerates what he considers the twenty-one basic types of tissue.]

Voilà les véritables éléments organisés de nos parties. Quelles que soient celles où ils se rencontrent, leur nature est constamment la même, comme en chimie les corps simples ne varient point, quels que soient les composés qu’ils concourent à former.

[All animals are an assemblage of divers organs that, each executing a function, concur, each in its own way, in the conservation of the whole. These are so many particular machines in the general machine that constitutes the individual. Thus these particular machines are themselves formed by many tissues of a very diverse nature, which actually form the elements of these organs. Chemistry has its simple bodies, which by the diverse combinations of which they’re susceptible form composite bodies: such are caloric, light, hydrogen, oxygen, carbon, azote, phosphorus, etc. Similarly, anatomy has its simple tissues, which by their combinations of four by four, six by six, eight by eight, etc., form the organs. . . .

Here, then, are the true organized elements of our parts. Regardless of where they’re found, their nature is constantly the same, just as in chemistry the simple bodies don’t vary at all, regardless of the composite bodies they concur to form.]

(Anatomie générale I: lxxix–lxxx)

For Bichat to arrive at tissues as the basic vital elements by means of the machine concept points to an emphasis on function in his perspective. He begins with every animal as an assemblage of organs, each responsible for a particular function. Now because it’s composed of different organs, each in itself functional, the body must by definition be a machine, or a functional totality. In addition, though, each organ has its own function. Hence it, too, must presumably consist of parts that contribute individually to the performance of its function. So it, too, becomes a machine, by definition. As a result Bichat can say: “These are so many particular machines in the general machine that constitutes the individual.” But if responsible for a function, each organ must in turn consist of elements by which that function is performed. Thus we arrive at tissues as the basic vital elements from a functionalist perspective.

This functionalist perspective can help to explain why Bichat doesn’t see the need to pursue his quest for the basic vital elements any further (and specifically why he refused to employ the microscope, already available in his time). His use of the machine concept showed his perception of tissues as the basic vital ele-
ments was determined by function rather than purely empirical inquiry. He knows, in other words, that the body is a functional totality because its existence as a vital entity is based on its capacity to perform various functions, each necessary to survival. Moreover, he knows every necessary vital function is performed by a particular organ. Accordingly, he can infer each organ must itself consist of different elements that collectively perform a function. Beyond that, however, he has no reason to assume the different elements are themselves each associated with individual functions. Hence he has no reason to suppose the breakdown into functional elements need go any further. On the contrary: at some point, the cohesion of matter as organic substance is even likely to disappear (so that, on a truly microscopic level, we no longer have any distinction between organic and inorganic substances). At the level of tissue, then, organic substance still has some relation to function. Beyond that, the link to function can no longer be assured.

Finally, the appeal to chemistry points to Bichat’s functionalist perspective in yet another way. In chemistry, our interest is in how substances combine with each other. As Bichat himself observes, “chemistry has its simple bodies, which by the diverse combinations of which they’re susceptible form composite bodies.” By comparison, we feel less concerned about what they themselves consist of. Bichat adopts a similar stance toward tissues: “regardless of where they’re found, their nature is consistently the same, just as in chemistry the simple bodies don’t vary at all, regardless of the composite bodies they concur to form.” But if the nature or composition of tissues is invariably the same, a detailed compositional examination of these can hardly seem very meaningful. Instead, our interest will presumably be in their function. Which is to say: on how they interact with each other.

One crucial effect of a functionalist perspective is to revise our holistic notion of vitality for a more complex picture, one based on the interaction between different vital properties. Up to this point, the life sciences had simply credited each organ with its own life. But if we see every organ as a machine composed of different tissues, each involved in the function performed by that organ, the picture of its vitality alters somewhat:

On a beaucoup parlé, depuis Bordeu, de la vie propre de chaque organe, laquelle n’est autre chose que le caractère particulier qui distingue l’ensemble des propriétés vitales d’un organe, de l’ensemble des propriétés vitales d’un autre. Avant que ces propriétés eussent été analysées avec rigueur et précision, il étoit visiblement impossible de se former une idée rigoureuse de cette vie propre. Or, d’après
l'idée que je viens d'en donner, il est évident que la plupart des organes étant composés de tissus simples très-différents, l'idée de la vie propre ne peut s'appliquer qu'à ces tissus simples, et non aux organes eux-mêmes.

[There has been much talk, since Bordeu, of the proper life of each organ, which is nothing else than the particular character that distinguishes the ensemble of vital properties of one organ from the ensemble of vital properties of another. Before these properties had been analyzed with rigor and precision, it was visibly impossible to form a rigorous idea of this proper life. Now, according to the idea I've just proposed, it is evident that, the majority of organs being composed of widely different simple tissues, the idea of a proper life can only apply to these simple tissues, and not to the organs themselves.] (Anatomie générale I: lxxxiij–lxxxiv)

Although it might seem that Bichat merely shifts the concept of a proper life to a more elementary level, the actual result of his emphasis on tissue is somewhat different. While each organ can be equated with a particular function, the same can’t be said for the tissues concerned. For these contribute to perform a vital function only collectively. Consequently, we can’t quite talk about the proper life of a tissue in the same way. If the notion of vitality involves the performance of a function, a given tissue, taken by itself, remains incomplete. Yes, it’s alive, and yes, it forms the most basic level of life in Bichat’s scheme. Nonetheless, it doesn’t have its own life in the same way as an organ, simply because it must depend on other tissues to help it perform a vital function. So the emphasis on tissues comes back in the end to an emphasis on function.5

Since the discussion of tissue has so far been almost wholly analytical, it’s important for Bichat to have some concrete evidence for his claim that tissues constitute the basic vital elements. Subsequently, he appeals to data obtained from pathology:

Puisque les maladies ne sont que des altérations des propriétés vitales, et que chaque tissu est différent des autres sous le rapport de ces propriétés, il est évident qu'il doit en différer aussi par ses maladies. Donc dans tout organe composé de différents tissus, l'un peut être malade, les autres restant intacts: or c'est ce qui arrive dans le plus grand nombre de cas.

[Since diseases are only alterations of vital properties, and since each tissue is different from others with regard to these properties, it’s evident that it [the tissue] must also differ in terms of its diseases. Thus in every organ composed of different tissues one can be diseased while the others remain intact: and this is what happens in the majority of instances.] (Anatomie générale I: lxxxv)
Here the crucial point is that in a given organ one tissue can be diseased while the rest remain unaffected. Since disease is simply an alteration of vital properties, Bichat can argue for its attachment to one tissue exclusively as significant. Were vitality the same in every tissue, we would have no way to explain why only one tissue was affected. From this, Bichat infers vitality must be different for each tissue. In other words, vitality is tissue-specific. Thus pathology offers support for tissues as the basic vital elements.\(^6\)

Given the close link between tissues and vital properties, it’s odd for Bichat not to try to relate vitality to tissue substance directly. Instead, in a section of the *Anatomie* entitled “Des propriétés indépendantes de la vie” [On properties independent of life] he points out that

*Ces propriétés sont celles que j’appelle de tissu. Etrangères aux corps inertes, inherentes aux organes des corps vivans, elles dépendent de leur texture, de l’arrangement de leurs molécules, mais non de la vie qui les anime. Aussi la mort ne les détruit-elle pas. Elles restent aux organes quand la vie leur manque; cependent celle-ci accroît beaucoup leur énergie. La putréfaction seule et la décomposition des organes les anéantissent.

[These properties I term those of the tissue. Foreign to inert bodies, inherent in the organs of living bodies, they [tissue properties] depend on the texture, on the arrangement of molecules of those tissues, but not on the life that animates them. Moreover, death doesn’t destroy these tissue properties. They remain in organs that no longer have life; however, life greatly enhances their energy. Only putrefaction and the decomposition of organs annihilate these properties.] (Anatomie générale I: lxxii)

Because of the peculiar nature of tissue properties, the link between tissues and vitality becomes somewhat complicated. We’ve already seen how close tissues and vital properties are. Still, this isn’t the whole story. Insofar as they depend on its texture and molecular arrangement, the properties of a tissue must be more or less inseparable from its very nature. And since these properties survive death (a point Bichat makes in the *Recherches physiologiques* as well), they obviously can’t be identical to the vital properties of a tissue. Thus, to the extent that tissue properties represent what’s essential to a tissue, they show that its nature and vital properties can’t really be equivalent. Consequently, Bichat can’t quite get at the nature of vitality simply by a specification of tissue properties. As a result, he has to go beyond tissue substance in his effort to define vitality. His emphasis on tissue had come about from a desire to isolate the
material basis of life. But the failure of tissue substance to answer all the pertinent questions suggests a need to look elsewhere.

In particular, his failure to resolve matters merely by an analysis of tissue substance might well have prompted Bichat to examine the nature of vital activity more closely. The failure of tissue analysis in this respect points to a crucial fact about vitality: it doesn’t exist in particular substances simply by virtue of what they are. Instead, vitality would seem to be somewhat independent of substances, even if based on specific functions they fulfill. Its complex relationship to these implies that in order to define vitality properly, Bichat needs to explore its relation to substances in general. And above all, to know how vitality acts on substances. By an analysis of the process involved, he might then hope to arrive at some insight into the nature of vitality itself. Perhaps one of the best means we have to study the process by which vitality acts on substances can be found in nutrition. On that, Bichat observes:

La nutrition faisant passer sans cesse les molécules de matière, des corps bruts aux corps vivants, et réciproquement, on peut évidemment concevoir la matière comme constamment pénétrée, dans l’immense série des siècles, des propriétés physiques. Ces propriétés s’en emparèrent à la création, si je puis m’exprimer ainsi; elles ne la quitteront que quand le monde cessera d’exister. Eh bien, en passant de temps à autre par les corps vivants, pendant l’espace qui sépare ces deux époques, espace que l’immensité mesure, en passant, dis-je, par les corps vivants, la matière s’y pénètre, par intervalles, des propriétés vitales qui se trouvent alors unies aux propriétés physiques. Voilà donc une grande différence dans la matière, par rapport à ces deux espèces de propriétés: elle ne jouit des unes que par intermittence; elle possède les autres d’une manière continue.

[With nutrition making molecules of matter pass ceaselessly from undeveloped bodies to living bodies and vice versa, one can evidently conceive of matter as constantly penetrated, in the immense span of centuries, by physical properties. These properties took hold of it from the creation, if I may so express myself; nor will they quit it until the world no longer exists. Well, in passing from time to time through living bodies, during the interval that separates these two epochs, an interval measured by immensity, in passing, I say, through living bodies, matter is penetrated at intervals by vital properties that accordingly find themselves united to physical properties. Here then is a big difference in matter, with respect to these two types of properties: it enjoys the one only intermittently; it possesses the other in a continuous manner.] (Anatomie générale I: lvij)
Note, first of all, the mode by which vitality acts on substances. Bichat says that in the course of its existence, matter is “penetrated” at intervals by vital properties. The fact that it happens only intermittently is highly significant. It suggests the properties described are by no means intrinsic to matter by virtue of its nature as a substance. The same must be true even for organic substances: if vital properties pertained to these intrinsically, there would be no way for inert matter to become vital. Obviously matter can’t alter its basic nature. So when matter is “penetrated” by vital properties, we have to imagine an external agency. But if vital properties can act on matter only externally, they presumably need to overcome some sort of inertial resistance within matter itself. To do that, however, demands active exertion by vitality.

Equally important to the question of how vitality acts on substances is its relationship to the purely physical. Since matter is “penetrated” by vital properties as well as physical properties, we have to assume vital properties act on substances in the same way as do the purely physical. In addition, Bichat even says vital properties that penetrate matter “find themselves united to physical properties.” His inference would seem to be that since physical properties “took hold of [matter] from the creation,” any vital properties that now try to do the same must deal with a ground already fully occupied. And since purely physical matter displays no tendency to instability, we have to suppose it has no real need for more properties. In other words, it’s completely defined by its physical properties. So when penetrated by additional properties, vital and physical will inevitably interact.

To some extent, this interaction between vital and physical can help to explain why vitality acts on substances only intermittently. Here the earlier penetration of matter by physical properties is relevant. Even if we allow for some inertial resistance by matter to physical properties, the extent is likely to be minimal (after all, resistance itself is a sort of quality, and matter before its penetration by physical properties has no qualities). By contrast, to endow matter with vitality, a considerable amount of energy might well be required to overcome its disposition to remain purely physical. But the need for a constant expenditure of energy to sustain the predominance of vital over physical properties is ultimately bound to exhaust the vital forces. Hence the merely “intermittent” penetration of matter by vital properties.

Subsequently, Bichat attempts to ascertain how vitality manages to overcome the disposition of matter to remain purely physical. In particular, he looks at the role blood plays in the transmission of vitality to physical substances:
Le sang jouit, pour ainsi dire, des rudiments de la sensibilité organique. Suivant que la vie dont il jouit le met plus ou moins en rapport avec les fluides qui y pénètrent, il est plus ou moins disposé à se combiner avec eux, et à les pénétrer de cette vie qui l'anime. Quelquefois il repousse, pour ainsi dire, long-temps les substances qui lui sont hétérogènes. Je suis persuadé qu’un grand nombre de phénomènes que nous éprouvons après le repas, après ceux surtout où des aliments âcres, des boissons spiritueuses, ont été pris en abondance, dérivent en partie du trouble général qu'éprouve le sang quand sa vitalité commence à se communiquer à ces substances étrangères, de l’espèce de lutte qui s’établit, pour ainsi dire, dans les vaisseaux, entre le fluide vivant et celui qui ne vit pas. Ainsi voyons-nous tous les solides se crisper, se soulever pour ainsi dire contre un excitant qui est nouveau pour eux. Qui ne sait si la vitalité des fluides n’influence pas sur leurs mouvements? Je le crois très-probable. Je doute que les fluides purement inertes pussent, s’ils se trouvoient seuls dans des vaisseaux animés par la vie, cireuler comme des fluides vivants. De même les fluides animés par la vie ne pourroient point se mouvoir d’eux-mêmes dans des vaisseaux qui en seraient privés. La vie est donc également nécessaire dans les uns et les autres.

[En the process by which vitality attempts to overcome the disposition of matter to remain purely physical, the first phase is one of intermixture. By its very nature, blood is especially well suited to its role: as a liquid, it simply can’t avoid mixture with non-vital fluid substances. At first glance, the passage seems

\[\text{Blood enjoys, so to speak, the rudiments of organic sensibility. According to whether the life it enjoys places it more or less in rapport with the fluids that penetrate it, it’s more or less disposed to combine itself with them, and to penetrate them with the life that animates it. Sometimes it repels, so to speak, for a long time the substances heterogeneous to it. I’m persuaded that a greater number of the phenomena we experience after a meal, especially those where piquant food or alcoholic drinks are consumed in abundance, derive in part from the general disturbance blood experiences when its vitality begins to communicate itself to these foreign substances, from the sort of struggle that establishes itself, so to speak, in the vessels, between the vital fluid and the non-vital. Thus we see solids contract, rise up so to speak against an excitant that’s new for them. Who knows whether the vitality of fluids doesn’t influence their movements? I believe it very likely. I doubt that purely inert fluids can, if they find themselves in vessels animated by life, circulate there like vital fluids. Similarly, fluids animated by life can’t move by themselves at all in vessels deprived of it. Life is hence equally necessary in the one and the other.}\] (\textit{Anatomie générale} I: lxxj–lxxij)
to say their mixture will depend on the extent to which it’s “disposed.” And that, in turn, will depend on its “rapport” with those substances. Looked at more closely, however, we find it’s already mixed with these: “in rapport with the fluids that penetrate it.” Just as matter is “penetrated” by physical or vital properties, blood is already penetrated by non-vital fluid substances. In other words, it has no choice. Except in one respect: it can decide whether “to penetrate them with the life that animates it.” So we have a give-and-take here: blood is penetrated by non-vital fluid substances, but can penetrate them in return with its own life. And what makes the whole process possible is the fluid nature of all the substances involved.

The second phase of the interaction between vital and non-vital involves repulsion. Specifically, blood repels “the substances heterogeneous to it.” In fact, however, the process is more complicated. Note, first of all, the apparently involuntary motion by which the vitality of blood gets conveyed: “when its vitality begins to communicate itself to these foreign substances . . . .” While earlier in the passage Bichat seems to maintain that whether blood will “penetrate [non-vital substances] with the life that animates it” would depend on how it’s “disposed,” the text now gives a distinctly different inflection. Second, note the effect on blood itself of its own communication of vitality: “the general disturbance blood experiences . . . .” So the reaction, too, is more or less involuntary. Finally, note the way Bichat portrays the interaction between vital and non-vital: “the sort of struggle that establishes itself, so to speak, in the vessels, between the vital fluid and the non-vital.” As if that struggle had somehow achieved a kind of autonomy and, at the same time, a sort of necessity.

The final phase in the interaction between vital and non-vital is one of assimilation. Simply put, precisely because blood can’t repel non-vital substances indefinitely, it has to animate them with its own vitality. Hence the hint of the involuntary or unavoidable in the movement by which blood communicates its vitality to non-vital substances. By its very nature as a fluid, by its location in the body, blood simply can’t avoid mixture with non-vital substances. For that reason, it has to engage with them in a perpetual struggle. We’ve seen that vitality has no relation to matter intrinsically. Even within vital substances like blood, then, it can sustain its hold only by constant exertion. So its intermixture with non-vital substances forces it to even greater exertion. Since vital and non-vital compete for possession of the same material substance, any introduction of the non-vital into a substance animated by vitality introduces a new danger: the threat of dispossession. Invariably, then, introduction of the non-vital is bound to provoke opposition of some kind. But for vitality, opposition alone isn’t sufficient.
Because of the constant pressure exerted by the non-vital, vitality must either overcome it or, even better, assimilate it into itself. In terms of its own vital economy, it can't afford to engage in a constant struggle with the non-vital, whose tendency to penetrate and hence possess material substances is potentially inexhaustible. In order for vitality to sustain itself, it must find some way to renew its own vital energy. Hence the logic of assimilation: by the absorption of new substances, it hopes to expand and thereby increase (rather than just maintain) its vital resources.

At this juncture, it seems useful to return to our point of departure: the house of life. For it was, after all, his observation of the struggle for life at the Hôtel-Dieu that probably led Bichat on to his quest to define the nature of vitality. And because the development of a thought often returns it to its source, perhaps it isn’t accidental that the most innovative aspect of his work in terms of theory should center on its treatment of the struggle between vital and non-vital forces. Anyone who has studied the history of French medicine knows the famous dictum about life from the *Recherches*: “la vie est l’ensemble des fonctions qui résistent à la mort” [life is the ensemble of functions that resist death] (*Recherches physiologiques*, p. 1). Less well known is the discussion of digestion from the *Anatomie générale* that we’ve just seen, in which Bichat explores in detail the struggle between vital and non-vital that takes place whenever we assimilate food. Yet it’s here that what he says is of most interest. Specifically, Bichat recognizes that in the course of digestion the non-vital (i.e., inert solid or liquid) becomes vital, through the action of vital fluid (i.e., blood) upon it. This transformation of non-vital into vital leads to a number of significant consequences for theory.

To begin with, it radically destabilizes the very concept of vitality, by blurring the boundaries between vital and non-vital. Typically, vital properties tend to be associated with a particular substance. Various forms of vital tissue, for example, exhibit traits we identify as characteristic of life. Consequently it seems unclear how we should deal with non-vital matter that gets transformed into a vital substance of some kind. At what point does it become genuinely vital? Can we distinctly separate its non-vital from its vital phase? If the transformation is a gradual one, any attempt to specify the exact moment at which the non-vital becomes vital is bound to seem artificial. In the case of a non-vital fluid, for instance, we need only visualize its intermixture with our blood: each, as Bichat puts it, would penetrate the other, so as to make it almost immediately impossible to distinguish vital from non-vital. Instead, the liquid mixture would simply seethe in a sort of ferment as the blood attempted to infuse the inert fluid with
its own life. Nor does Bichat make any attempt to discern the exact moment at which the non-vital fluid is chemically altered into a vital one. And similarly with a non-vital solid: surrounded by and immersed in blood, it contracts, as if in response to an excitant. But if capable of such a reaction, hasn’t the solid already become in effect a vital substance? In all these instances, then, our inability to specify the status of a particular substance at a given moment points to a latent instability in our concepts of the vital and non-vital.

A second consequence of the transformation of non-vital into vital is to shift the primacy away from concepts, toward the activity by which substances become either vital or non-vital. And here, I believe, is where Bichat thinks the emphasis ought to be. In order to preserve its own vitality, the vital must convert or assimilate the non-vital into itself. If it fails, it will eventually succumb to non-vital inertia. So the activity by which blood transforms a non-vital fluid or solid into a vital substance is ineluctably necessary. Carefully considered, it might even be the essential condition of life. Because of the constant attrition caused by its interaction with the non-vital, the vital element must renew its own resources. Yet in that very process of renewal, it must engage and transform the non-vital into the vital. Hence the lutte, or struggle, Bichat speaks of. We observe its various stages or moments: the initial contact between vital and non-vital, the resistance of inert solids or fluids as the vital element begins to break them down, the moment of crisis at which the resistance of inert substances forces the digestive system to intensify its own activity, the consequent internal strain, and finally the pivotal moment when resistance is at last overcome. In the process, as we’ve seen, the definability of vital and non-vital as concepts breaks down as well. What remains is the transformative activity of life itself. This, then, is what Bichat must somehow manage to describe. But to describe an activity whose very nature is to be constantly transformative would unquestionably lead to nothing less than a brave new world for theory.

To talk about development, Bichat felt, could only imply a completely different notion of theory. Simply put, theory could no longer be representative. Here we see the paradigm shift away from Bichat’s eighteenth-century predecessors. Their effort had all been for some concept to represent vitality. Yet that was precisely what Bichat’s hospital experiences had called into question. For nearly a century, the surgical perspective Bichat had absorbed from his mentor Desault at the Hôtel-Dieu had taught that a vital principle of this sort was impossible and, in fact, unnecessary. On a more general level, moreover, surgery was anti-theory. Nonetheless, its anti-theory stance didn’t reflect a conservative tendency. On the contrary: to be anti-theory was perhaps, in context,
the most radical move possible. What it did was to question the possibility of
theory (which is to say: representability) from a standpoint that was itself fully
informed by theory.

Once Bichat realized vitality was all about physiological process or develop-
ment, he knew theory would have to change its posture radically. His study of
vital processes like digestion had shown him that traditional theory couldn’t
adequately represent what was essential to these processes. Here a non-vital
element or material becomes vital. And that meant you couldn’t identify vitality
with any particular organ or tissue. It also meant you couldn’t really characterize
vitality as a vital force or principle, because the static quality of such a principle
didn’t explain how non-vital material could become vital. So you had to find
some other way to describe the process or transition from non-vital to vital. If
static concepts like vital force or principle didn’t work, theory would have to shift
its focus to vital activity. So vital theory, for Bichat, has to be about activity. Hence
his move from vitality to vital functions to tissues to physiological process. What
Bichat came to realize was that the quest for a way to represent vitality would
have to find a more fluid conceptual repertory. How exactly it would do that was
a problem he never quite managed, in his brief lifetime, to solve. But he had, at
least, arrived at an awareness of it.

His awareness of the problem that vitality posed for theory also places Bichat
on the threshold of a new era for the sciences. If theory can’t represent what it
wants to describe, its only hope is to immerse itself completely in pure mate-
riality so as to reproduce what it experiences, at a later point, on the level of
theory. For that, however, it would first need to throw out all its theoretical
constructs, surrender itself wholly to the sheer materiality, the purely physiologi-
cal quality of the vital process. Which is to say: observe the entire process, study
the transition from each moment or phase to the next down to the minutest
detail. So we find Bichat in his last year, dissecting one cadaver after another,
always in the hope that he might get a bit closer to the elusive source or sources
of vitality. This, then, was what the brave new world of theory looked like: you
immerse yourself completely in materiality, you give up any hope of trying to
render process directly into theory. And as you do that, you become aware of how
much you can afford to concede to materiality, of the easy give-and-take that
exists between theory and materiality. You realize, on some level, how objectivity
is really permeated by theory, once theory surrenders itself to process, so that the
final result of an immersion in materiality would be a return to theory. What we
then get, as Bichat realized, would be a new kind of theory: not the sort that
simply says what vitality is, but one based on a constant back-and-forth between
observation and theory, experiment and theory. That, of course, would itself necessitate a process of some kind. So theory ultimately becomes, for Bichat, a process by which we gradually work out a new form of objectivity. And in that process, he felt, lay the future of the sciences.

Because of his minimalist posture, Bichat is for Romantic theory in the sciences less a climax than a point of departure. In effect, he marks for the Romantic sciences the dawn of a new theoretical awareness. He comes, you might say, at that magical moment when all the old, static concepts no longer seem adequate to describe what we want to talk about, when the essential no longer looks either stable or solid, when all that’s solid melts into air. Precisely because he appears on the medical scene at a time when the role of experiment hadn’t yet been fully worked out, however, Bichat lacks the sort of reflexivity in theory that would characterize his successors. Out of the fruitful tension between observation and experiment, they would forge a fuller, more developed vital theory. But if the relative newness of medical experiments hindered Bichat from a greater reflexivity in theory, we might look to a different field, where the existence of a longer experimental tradition could help to foster a more developed theoretical awareness.