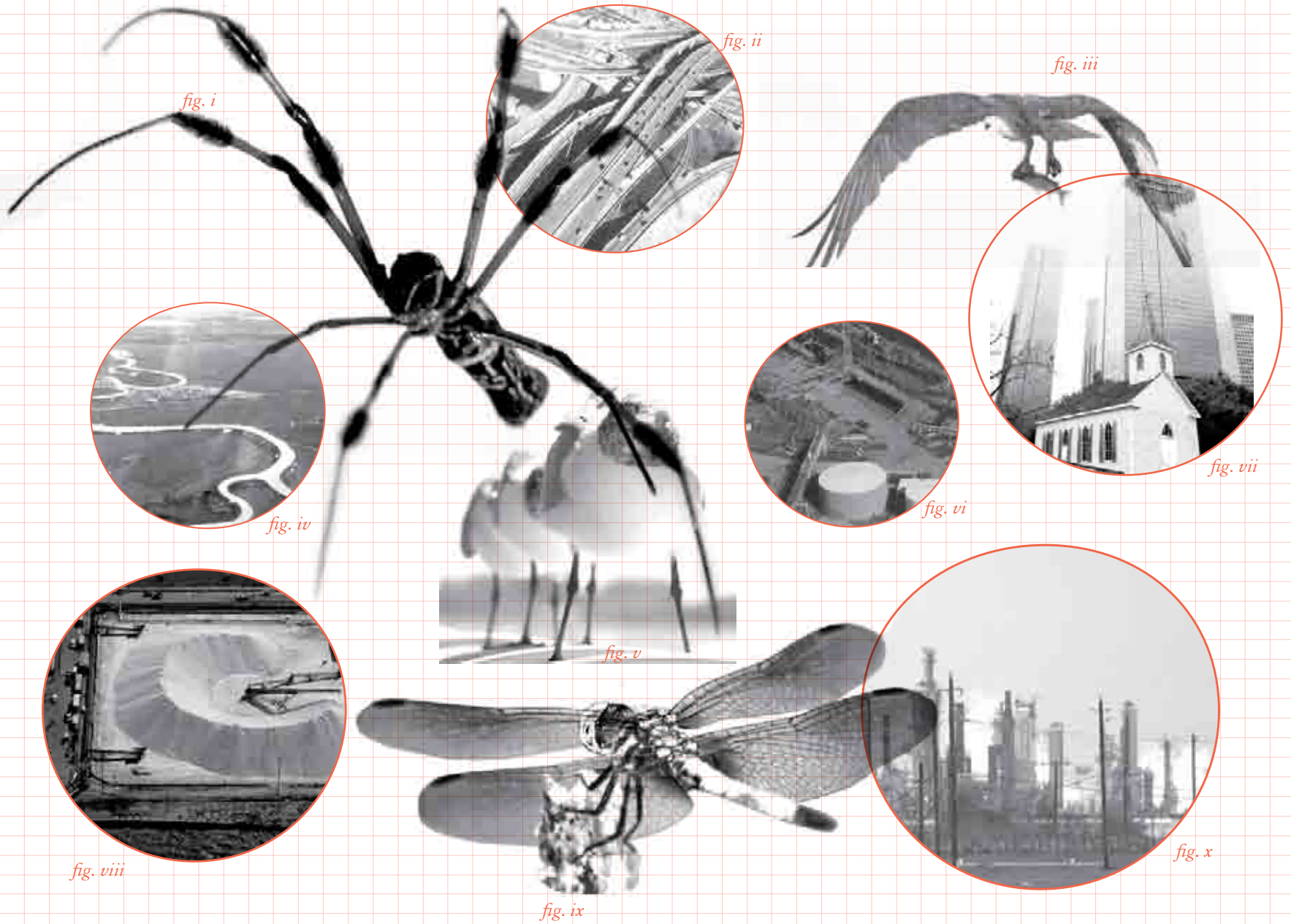


# MORE THAN A **SUM** OF PARTS

HOUSTON, **INFRASTRUCTURE**, AND IDENTITY | words and photography by John H. Lienhard



**BEFORE** we delve into infrastructure, I offer a bit of autobiography: a particular arrangement of living cells first saw the light of day in 1930, and it was named John Lienhard.

The soft tissue cells in that gaggle have died and been replaced countless times since then. Many are replaced more than once daily. Only skeletal cells last for years. As a result, nothing of that 1930 cellular gaggle is left today and very little remains even from the late 20th century.

The present me has almost nothing material in common with the 1930 me. Yet those cells, each with a very rudimentary form of intelligence, have succeeded in forming an ongoing system. They die, but the system in some sense survives. It constantly changes, yet its identity persists because its cells are linked by something that doesn't have a proper name—call it institutional memory or a collective presence. Maybe

this is what infrastructure really is.

We humans (and other creatures as well) are cells in another organism—that which we call the city. But since you and I are *Homo technologicus*, the city has cells of an additional kind. More than any living creature, we need the

help of a huge exoskeleton to survive. That exoskeleton is the sum of our technologies. Our intelligence is not contained in our brains and ganglia alone; it is also contained in the engines, buildings, and artifacts of our ingenuity. They form a very real external memory and are part of a collective intelligence that we comprise together with them. The same, of course, is true of any other overarching infrastructure we comprise—say, for example, the clan, the nation, or the world. But our concern is Houston.

Houston was founded in 1836. The oldest of its remaining architectural “cells” is possibly the 1847 Kellum-Noble House. It still stands where it was built in today's downtown, occupying land that has become Sam Houston Park. Other old houses and one old church have been moved into the park to keep it company. There they lie in the shadow of the skyscrapers that rose up around them years later (fig. vii). Every animate being in Houston was born after these denizens of Sam Houston Park were built. How many people living in Houston remember even as far

back as the outbreak of World War I? I doubt that any do.

So, Houston's identity as a city persists despite the ongoing replacement of its people, its buildings, its electric and sewage systems, and its roads and bridges. It persists just as you and I persist despite the ongoing replacement of our cells. The sort of individual factors that allowed me to recognize classmates at my 60th high school reunion are the same that allow Houston's unique personality to outlive us. And Houston does have a personality—its own special continuity of texture and style. Outwardly one is struck by its unique drive toward ongoing renewal, resting as it does upon deep-seated egalitarianism and pride in hands-on functionality. Functional renewal is manifest in making buildings and in making music—in creating art, goods, and hardware—but “function” is the key. *Doing* trumps all else.

This uniquely functional personality arises for a reason: it grows out of several accidents of geography. Most important is Houston's window to the sea: Buffalo Bayou. Though an inland city, Houston is defined by its role as a seaport. It gives the city cosmopolitanism, diversity, and vitality. Geography grounds Houston solidly in the material world of commerce and industry. That's why the taproot of Houston's infrastructure—or rather its aorta—is its Ship Channel (fig. vi). The city's identity grows out of the vast industrial sprawl that lines the Channel for fifty miles. Oil refineries at present dominate the Channel's industrial presence (fig. x), but other products have also loomed large along it.

From the Civil War until World War II, millions upon millions of bales of cotton flowed through Houston to the sea. Meanwhile, in the early 20th century, the Frasch process gave us access to previously inaccessible coastal sulfur deposits. Houston became the sulfur capital of America, and still today, at the lower end of the Channel, we find great shining hills of pure sulfur (fig. viii). So the material has varied, while the shipping industry has steadily burgeoned. Houston is America's fourth-largest port and its largest international port. The flow of material (and of matériel) is blood in our city's veins, its spiritual as well as its physical nourishment. Anyone who takes time to walk Houston's wharves comes away with a deep awareness of this driving pulse.

And when we do that, we see more than just ship-

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ping and offshore oil rigs—more than outgoing sulfur and incoming automobiles (fig. ii). On the wharves especially, we are also struck by the living creatures that are everywhere.

For Houston is marked by the trees, flowers, birds, bugs, and animals indigenous to the upper Texas Gulf Coast. In birds alone, we are uncommonly rich. Pelicans hurtle down from out of the sky to dine on our plentiful fish, while cormorants simply submerge like submarines to catch them. We are surrounded by egrets and ibises, gulls and spoonbills, by a vast diversity of hawks that feed upon fish, vermin, and pretty songbirds alike (fig iii, v). Birds wreath the ships, coming and going. They ride on their cargo and clean up their garbage. Other birds come and go in great migrations as seasons change.

But is it right to call birds and bugs part of our infrastructure? Do they define our personality? They surely do, both by playing their part in shaping our ecology and by taking a large subjective role in forming our perception of place. By analogy, microbial creatures in our own bodies play a huge role in shaping us. A few bacteria make us ill, but most help to secure our health. They are essential to digestion, they stem acid reflux and eczema, they improve our immune system. Moreover, your particular stable of bacteria sets you apart from me. Our city's body likewise has cockroaches, dragonflies (fig. ix), golden silk orbweaver spiders (fig. i), bats.... All might bother most of us at some level. But the cockroaches clean up organic debris and help to pollinate flowers. Those large, gentle spiders are a mixed blessing: we're

This great **SPRAWLING SYSTEM** is no less beautiful than an egret landing on the bayou, the wings of a dragonfly, or the soul-settling calm of our sultry salmon sunsets.

pleased when they eat flies and less happy when they kill bees. Bats keep the mosquito population down.

People and plazas; bats, birds, and bugs; music and museums—all those microelements ultimately shape themselves around geography. And the single geographic feature that sets Houston apart from other cities is its system of bayous. Here in the flat landscape of coastal Texas, the land is laced with lazy watercourses (fig. iv). They fill after every rainfall and carry water off our flat surfaces to the ocean. They are richly laden with birds and fish, and they lay their own gentle rhythm on the city. They shape transportation corridors and identify neighborhoods. Each forms a long winding city park that serves everyone near it.

Natural bayous meander about the landscape in crazy loops and flourishes. Our urban bayous, in contrast, have been contained—frozen in place with concrete banks. We're tempted to call them a composite of nature and human technology, but to do so would miss a very important point. Once we realize that we

humans and our actions are a part of nature—that nature adapts to our presence just as we adapt to it—the whole concept of unspoiled nature falls apart. Take, for example, that fine piece of “unspoiled nature,” Africa's Serengeti Plains. What we celebrate as pristine is, in fact, the result of African land clearance and management that goes back over the past two thousand years. William Blake understood this without knowing anything of the Serengeti when he wrote, “Without man, Nature is barren.”

The fact that inanimate nature and living creatures always adapt to one

another brings us directly back to the slippery concept of infrastructure, defined in the Oxford English Dictionary (2nd ed., 1991) as “a collective term for the subordinate parts of an undertaking; substructure, foundation....” That is exactly what I've been describing.

Yet, despite the fact, obvious when we think about it, that the whole system is nothing but its skeins of infrastructure, we try to talk about specific infrastructures as appendages to larger reference systems. If the system is an army camp, infrastructure might mean mess tents and latrines. If it's a university, perhaps food service and dormitories. The word is of little use to us until we elevate one function to primacy and regard all else as service to that one.

Yet that is precisely what is impossible to do when we look at Houston. Once we regard bugs, birds, cats, and dolphins as co-equal members of a larger animate symbiosis, girded about with an inanimate technological exoskeleton and resting in a geography with which every element interacts, we realize that

we have nothing other than infrastructure. Problems always follow when we try to isolate a part of that infrastructure to the exclusion of the rest. Yet none of us is wise enough to digest it all at once.

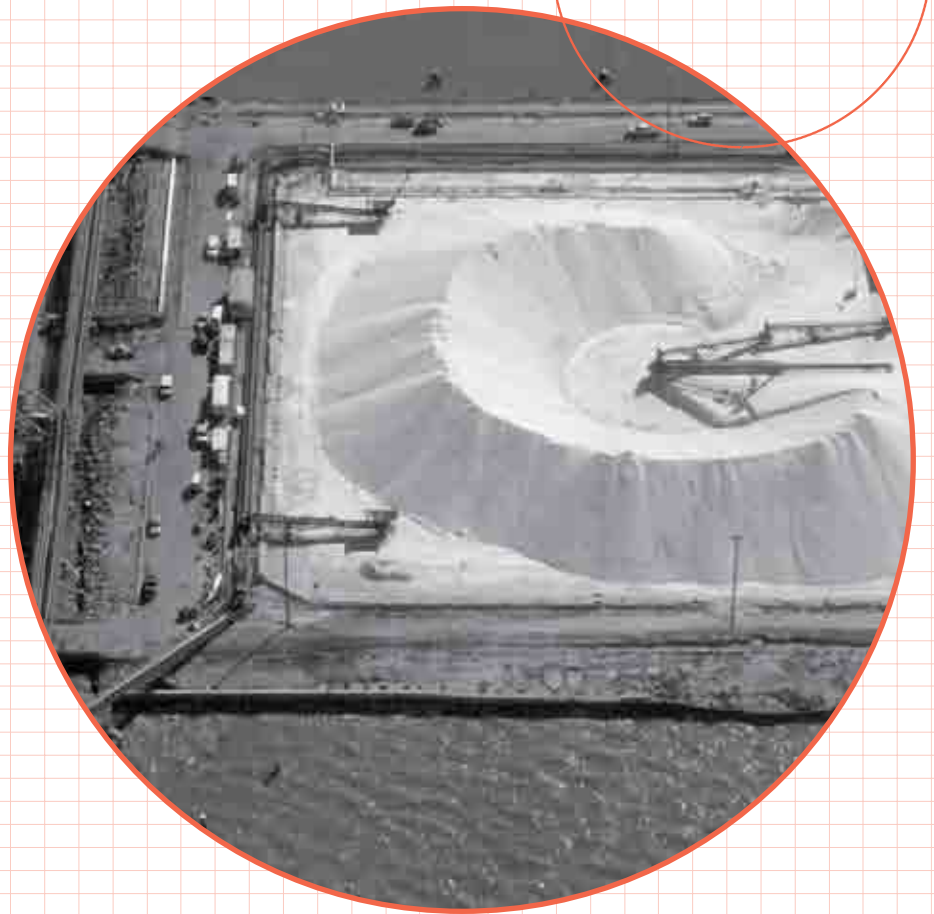
Consider this example: Hitler set out to bomb London into submission in 1940. He failed. Then we set out on a much larger scale to bomb German cities into submission. They kept right on going until our armies walked into Berlin. When we tried to bomb Hanoi into submission, we lost Vietnam. Even Hiroshima is still a living city. Cities are oddly indestructible, and historian J. W. Konvitz talks about our failed assumption that they ought to be. Ever since we've had airplanes, he points out, analysts have been telling generals that their bombs could destroy cities by destroying their "infrastructures." A 1931 expert flatly said that cities were too fragile to weather aerial assaults—they were too dependent on transportation and supply systems, on electricity and plumbing. A 1938 British book, *The Air Defence of Britain*, announced London's vulnerability: "If it had been done deliberately, we couldn't ... have produced a social pattern ... more favorable for aggression from the air. Our millions are bottle-fed ... by a system ... so intricate, and so haphazardly evolved, that once dislocated beyond the power of immediate repair, they would be as helpless as newborn babes...."

Of course, London, Berlin, Hanoi, and even Hiroshima proved far tougher than that. At first, that seems to defy all reason. Then we look at the way cities evolve in symbiosis with the people who shape them. Just as a human brain can suffer great damage and continue functioning by rewiring its own processes, so too can a city. The city is an element of

nature as robust as any of the creatures that nature evolves—as robust as a cockroach, robust as a human being. Cities can and do die, of course, but they die of old age. They die from within, just as some human beings die of old age long before they stop walking about. We can all think of examples. When cities do die, it is with a whimper, never a bang.

But Houston is so very much alive. And as we view its aggregate infrastructural sinews and synapses, the same way we view those of any living creature, we're struck not only by the robustness but also by the ever-shifting beauty of that aggregate. It is the beauty of function, the beauty of synchronicity, the beauty of mental youth. This great sprawling system is no less beautiful than an egret landing on the bayou, the wings of a dragonfly, or the soul-settling calm of our sultry salmon sunsets. For it is all of a piece. 🏠

>> Sulfur at the lower end of the Ship Channel.



... For nature then

(The coarser pleasures of my boyish days,  
and their glad animal movements all gone by)

To me was all in all...

William Wordsworth, Tintern Abbey