MITOCW | 4. Normative Theory III: The City as Organism

JULIAN BEINART: This is the third in the last of the three models of city form that I've been putting forward. To repeat these models, which is deduced in classes between 1956 and 1980 by Kevin Lynch and published in *A Theory of Good City Form,* I've adapted them and added an enormous amount of them subsequently. But the basis of the idea was to put forward some generalizations about the form of cities, and try to see to what extent they had validity in relation to current urbanism.

If the cosmic model paid attention to the regularity of nature through the study of the ecclesiastical systems, if the machine model preoccupied it with the speed with which you could build new places, and started off at the beginnings of modern commercialism and colonization, the appreciation of nature as a model for cities is even vaguer than the others. Nature has always been difficult to define. Although it's palpable and existentially accurate, its breadth is so large, and it needs a lot of acquisition in order to transform it into a viable theory of form of this form of the city. Not that it hasn't been used.

In the class today, we'll look at the examples of urban form which have set forth principles of natural accommodation. I start with a piece from a German town planner. First war-- 1948 this man who had been a Nazi, a regime architect of the city of Stettin, says the following in his 1948 book *Organische Stadtbaukunst, Organische Baukunst, Organische Kultur,* which in English means organic city planning, organic architecture, organic culture.

AUDIENCE: What's the name of the city?

JULIAN BEINART: Forget about the city. It's unimportant. Stettin, it's a northern city in Germany. The importance is his proposition.

The metaphors in his book are familiar-- the branching of a tree, the structure of a leaf, the human lung. He condemns all inorganic city forms, be they simple grids, the machine model, or products to the Grand Manner, the cosmic model. He says they are static, which is nonsense.

He faults advocates of linear cities for presenting this model as a complete urban solution. In itself, the linear city is incomplete. City expansion is organic when it occurs along radial lines without losing power.

A radial-- an organic town is not clearly described, but city expansion is organic when it occurs along radial lines without losing its interpretal power. And analogical to the human body, it would be like the heart being able to sustain an extension of arms and the legs in the human body beyond measure.

Of course, it's nonsense. It actually it doesn't work that way, certainly not in the organicism of the human body. The heart is in the place where it is for reasons of geometry, as well as reasons of performance.

I conclude, "The city will stop growing when it has filled its natural space." Here, again the term "natural" is used loosely. What is the natural space of a city-- one which is 20 million people in size, or one which is the size of Springfield, Massachusetts? It's nonsense. He ends up by saying, "The freedom of appearance is a precondition of all natural beauty."

We will then discussing the sea attributes given to nature, which are beautiful. In this crazy phenomenon of biomorphism in architecture, in one of the textbooks published by Yale University Press-- God forbid that they should publish books like that, you are instructed to avoid the rectangle because it doesn't perform for human beings as much as the curved surface does. It's nonsense. They are metaphors to be gained from organic material and organic processes, which are close to rectangular form as it is to bent form.

What is by and large argued is that man has the capacity, or should have the right to borrow processes and forms which have worked in previous conditions. This is an element of history and an element of science which we abide by. How selective you are and how much learning it requires to choose a particular biomorphic example is open to question. It is not categorical at all. The piece I've handed out to you today-- I haven't got a copy myself,

Here's some examples of cases which I'm going to go into in some detail. At the top of the first page, it tries to set out some of the characteristics of an organic system. And then it tries to argue for the depiction of these protocols in the form of settlement.

The diagram below from the regional plan of New York 1923, which says, "The possible state of the future in which each part serves its logical function in support of wholesome activity and good living." And a version of Patrick Geddes' linear valley section, which I'll go into later, is below that. What is the appropriate space that something has in a natural system? Patrick Geddes, the great Scottish biologist and town planner, argues for in this valley section, which is on the next part.

For him, there is a natural logic in the location of quarrying at a distance from the water. That a fishing village would be next to the water, and that cattle farming would be somewhere between market gardening and arable farming. In the same way, he tries to build a section through a town. Iron and steel far from the, center from the port.

What locates the furrier between a woodland goods store and, I think, a timber and paper merchant? It's not explainable. It's only explainable according to a geography of purpose, which is assumed by this man at the time. As you'll see, when we talk more about theories which derive from the social sciences, from economics, they are economic theories, von Thunen and others which locate things in a certain degree of relationship with other things.

To argue that this is a natural state, I debunk. It's not the natural state of a shopping center in 2013 in the United States. I will share in the case study the Tennessee Valley Authority, which I'll do later in this class, that the conception of nature, which Roosevelt and Benton MacKaye and Lewis Mumford and others, regionalists and transcendentalists had in mind in 1933 for seven American states, has been modified constantly since then to today when there are protests every few months against the use of nuclear power, against the Manhattan Project, all of which locate within the TVA idea.

The next page is from a book by an Englishman, D'Arcy Thompson, called *Growth and Form,* which argues that the organic species, as these fish, do not achieve a new form every time they change marginally. He shows that within these parameters of geometry, these transformations take place. However, in the natural system, there you reach the threshold beyond which if you change, you start a new entity. You don't keep on growing and growing. Ants don't get to be as large as elephants.

Cities do apparently grow to large sizes without distinctively or disassociating themselves from smaller, newer items. This is the velocity of new towns. New town construction follows the organic model more than generalized metropolitan expansion.

The next pages deal with stages of the Tennessee Valley Authority, which I'll go through with you in due course. They say a few things about the organic idea, and then followed by four major case studies of its application. An organism is an autonomous individual. Secondly, it has a definite boundary. Thirdly, it has a definite size and shape.

The enlargement of an organic item beyond its normal size and appropriateness of size increase is comedic. If you enlarge a mouse to the size of something that parades down the street at the Macy's Day Parade, it is humorous. It is not a mouse any longer. It's the human brain, which has activated an unnatural premise-- that of rampant enlargement of an item beyond.

Reduction in natural size and enormous enlargement to all the products of the human brain, not of nature. If the human brain is part of nature, of course everything is natural. It's interesting to argue as to whether the human being, as a superorganism like ants, does things in similar ways. How do ants find a new site for their queen mother ant.

Do you know the phenomenon of the pheromone? What is a pheromone? It's what an ant secretes when he wishes to make a mark on the ground. The way a site is chosen is through a decision made by the community to choose a particular cavity which has the most pheromones secreted on it. Each person has the right to choose a site, but the site which has the most pheromone secreted on it becomes the maternal site for the leader of the community.

The grammaticus in the Roman argument uses a measuring stick, a geometrical measuring [INAUDIBLE] for casting a shadow. The astrobiologist in the cosmic model uses a system of rules derived presumably from nature. I think Feng Shui is a derivation of natural observation of sun and stars and so on. So in that sense, ants, who are probably the most sophisticated of the superorganisms use techniques for locating a new city in similar ways than the human beings does. We could secrete pheromones as voters and decide on the best site for a new capital for the United States, unlikely though that would be.

This very tension is [INAUDIBLE] in the notion of the organic unit, which is turned over into the organic settlement idea. It's best explained by an example from Patrick Geddes in India. Patrick Geddes is asked by the Maharajah of Bahadur to do something about the malaria in the town of Balrampur. Balrampur has water tanks which are polluted. And the primary impulse by the maharajah is to follow the British example and get rid of the tanks-- to use what is called urban surgery.

Geddes says no. There's something good about these tanks. So he says, let us rather employ old men to clean them every day setting up a daily ritual of cleaning, of cleansing, which will be picked up by the kids in the town. They will deviate from the ritual. They will increase the size of the activity, and you will have no more malaria.

So the notion is to use the organic model to retain. Geddes does this in his plan for the reconstruction of Balrampur. He says narrow the streets. Use the space alongside the buildings to create greenery and trees. This will help the health of the settlement.

So he looks at the chowk, the traditional enclosed linear market inside blocks. And he says, instead of taking these away, let's built on them. Quite the opposite of what Corbusier does in Chandigarh in 1949, where he uses a sector form which is derived either from his work in Bogota or from the work of Clarence Stein and Henry Wright in the American version of the organic settlement.

I've said before that the organic [INAUDIBLE] form reaches limits or thresholds at which time the change in form is radical. The organic idea has differentiated parts. These parts are in close contact, whether they work together in from each other in subtle ways.

If I were to improve the human body, I would put the heart lower down in the body. As we have grown in size, particularly American men, the distance from the heart to the toes becomes enlarged. And one of the phenomenal problems with diabetes is that the vein system from the heart down to the legs is at such a large distance that you get problems with your feet. And in severe cases, you have to have your feet amputated.

So nature doesn't always work. Obviously, we die, which an organic model is something which is difficult to take account of. The towns then die. Yes, in pre-modern times they did die. We spoke to our friends who are not here today, on Tuesday, about [INAUDIBLE] and the towns that did die.

It's not clear to me that urban death is as finite a phenomenon as human death or organic death. We all know we're going to die. Detroit doesn't know whether it's going to die or not. It's lingering in perpetual disease. A perpetual disease may be a prolongation of the inertia of the settlement ever since its first form.

I come back again to Marx's quotation, which I said in the first class, where he said one of the things about the creation of human settlements is, for the first time, the distinction between what is outside and what is inside. For a long time, what is outside with nature and it was dangerous. Exeunt [? leones-- ?] there are lion out there. Exeunt-- some Latin phrases, which describe this phenomenon regarding nature as both beneficial and dangerous.

To survive requires an understanding of nature as both beauty and the beast-- when the sun shines after the floods in Egypt of the Nile. Idiosyncracity becomes a major form of culture of phenomenon. You get a town like Heliopolis On the other hand, if the flood destroys half of your settlement, because you can't predict the flood's behavior, you're dealing with an untamed beast.

In some strange way, we have come full circle around our appreciation of nature. We are with climate change, both facing on the products of the wonders of nature, but for the first time, as a universe, perhaps facing the beast-like qualities of hurricanes and floods. So human beings have always posited, in my view, between a romantic appreciation of nature independent of things.

The closing of the agricultural communal lands in England prior to the Industrial Revolution, in order to make land for parks or for the wealthy, took away the living substance from poor people, but created the great provenance of British romantic parks. Who decides on nature being good or bad in that respect? Nature's value-free. That's what makes it so difficult for one to easily assign value to natural circumstance.

Let's look very quickly at two more phenomena. The two are-- the first one is fear of homeostasis. One of the major characteristics of a human or any animal organism is its capacity to repair itself.

When it's too hot, as in this room this morning, you start sweating to cool down your temperature. You don't need to turn on a machine-like switch. It happens. It's built into the organism's performance.

Homeostasis is an important phenomenon. I've used it at times to explain urban behavior, such as the notion that perhaps the return in the United States to the center of the city, after years of suburban expansion, is a homeostatic phenomenon. There is something in the organic model which says if you stretch resources too far, you will return to an original state of balance.

The other one is optimum size. The organic model of an elephant is easily understood by virtue of its major size as a male elephant. What is the optimum size of a dinner party? What is the optimum size of most social activity? You'll recall my using Dunbar's theory of 150 people as the appropriate community for the rapid increase of brain size.

What about the history of optimal size? Aristotle, 30,000. Leonardo, 50,000.

Ebenezer Howard, 1905 and 1920 Letchworth and Welwyn Garden City, 30,000. The first of the British new towns, 30,000, second [? mark II ?] generation 50,000, next 100,000. Milton Keynes, 250,000 is an optimum.

What do you read that graph as saying? What determines the optimal size of a city? Come on, you must have-- you've thought about these things in some way or other before. Have a guess.

AUDIENCE: [INAUDIBLE] geographic boundaries [INAUDIBLE]?

JULIAN BEINART: Los Angeles has geographic boundaries? It started off as a [INAUDIBLE] small community in 1781. Yeah, please.

AUDIENCE: How we can communicate or transport each other? If there's technology, we can do it for further away, and the boundary of the city [INAUDIBLE].

JULIAN BEINART: Yes. You could do that here, and it still remains 30,000. I don't know how to answer this question absolutely. I can make a couple of guesses. The one has to do with urban health. If you have high rates of mortality and low rates of birthrate accomplishment, you probably end up with something like 30,000 people as being the largest number you can secure in general.

I mean, it took from Rome at the birth of Christ to London in 1850 for a city to be a million people in size. There are guesses in fact that Angkor Wat reached a couple of hundred thousand. There were cities in India which perhaps did. But the basic proposition might have to do with reproduction of population.

There's also a comparative index. The world's population is probably increasing and doing this is with the Industrial Revolution being here. So there's a notion that we constitute an approximate size, at least to optimum size, based on the social context of demography and of other cultural phenomena. Yes, absolutely, you have to be able to move one part to another. What is it in our contemporary ethos and scientific model of life that allows us to build cities of 20 million people?

AUDIENCE: Penicillin and drugs?

JULIAN BEINART: Yeah, I mean, since the Industrial Revolution the world changed phenomenologically in almost every respect. That's why I will start teaching the second section of this class largely beginning with the Industrial Revolution. The rest is a waste of time.

Not a waste of time. I'm exaggerating of course. But in one class, one can't do everything. My preference is to start with the major changes which took place with urbanization and industrialization.

So let's leave optimum size theory for a moment. It's a strange phenomenon. We still have a natural inclination to order our world according to certain basic rules.

In the British New Towns of Ebenezer Howard, Letchworth and Welwyn Garden City, Raymond Unwin, the architect and collaborator said 12 units per acre is an ideal distribution of population. What measures 12 units at 12 houses per acre, as an optimum for whom, under what conditions, and so on. So just some characteristic form tools which emanate from this model of organic item. Each community should be a separate social and spatial unit as autonomous as possible.

Number 2, the community should be balanced. The idea of a healthy community is heterogeneous. Again, the modeling it after the human being, the heart and the pancreas are not the same thing.

They have different shapes. They have different entities. They work. You can't have a human-- you can't have an organic element which is singular. It has to be multiverse.

And the nuclear family in many of these settlements is taken as a model with these differentiated supporting roles. In Sunnyside Gardens, the development, which the American Garden City people did in the Bronx, Mumford claims that there were 116 mechanics, 79 office workers, 55 small tradesmen, five chauffeurs, and 49 salesmen, plus architects, writers, intellectuals as well. This, he was happy to-- he lived there. He was happy to testify this as a good town based on its balance.

Seldom does the organic system produce indefinite similarity. So the argument that it is a model in nature for support of systems in harmony with each other is interesting. Why the nuclear family should still be the model for urbanization, given that we have large numbers of people who are not married, people who choose not to marry, for example. Plus if we wish to extend the model to a universal model, what success have we had in nurturing each other as a universe? We cannot, in facing the fundamental challenge of climate change, come to agreement about [? sustenization. ?]

One has to remember that it was as recent in 1920 that Woodrow Wilson, the American president, went to Paris, and was received by the largest crowd in the history of Paris, which is a large crowd, because he proposed that the world take account of its organization and prevent wars, such as the dastardly 1914 to 1918 war, which the world had just experienced. So the idea that there is something organically universal about co-operative systems is not true. Maybe at the scale of a single family, if it works out, if you love each other-- which more and more, seeing that 50% of Americans are divorced, no longer seems to be the model as described by organicism.

The neighborhood unit, Clarence Perry divined an organic sub-model called the neighborhood unit for the regional plan of New York in 1923, I think it was. A neighborhood unit, again, is organic in its nature. It argues that a community should be the size of a quarter mile walk of a child to school.

Again, the organic model comes in. What is the species which has the least protection naturally? A child. So you'll use that as the model for building a circular community around the primary school. The fact that people take their kids to school by automobile, the fact that people choose schools in a democracy based upon the quality of school, based on the fact that the linear model doesn't allow one to use this model is distinctive, and so on and so on, renders this model. But Radburn, New Jersey, was based on the quarter mile walking distance to schools, as well as Greenbelt Maryland, and the American greenbelt towns. 160 acres around a school.

The next growth optimum size is the greenbelt. If you have an optimum size, you can protect it from the forces that work against optimization-- nasty forces like the market, developers, politicians. When we were working on Chandigarh as recently as 1990-something, we noticed that land was being sold north of the Capitol Complex, in the path of this wonderful diagram that Corbusier [INAUDIBLE] made of this town stretching in an untrammeled fashion towards the Himalayas. What we discovered were real estate signs for politicians selling land illegally in this sacred area.

We needed a studio with the Cambridge University in England. We found that the greenbelt around Cambridge had, of course, increased land values, and Cambridge significantly had been pocketed with political development. The notion which Ebenezer Howard so favored in the city of Adelaide, for building parks around the center of the city, has not proven to be another solution. First of all, how do you keep the land green? You need a maintenance system.

AUDIENCE: [INAUDIBLE]

JULIAN BEINART: This is a small example from a mining town in South Africa. Gold is discovered-- gold and uranium. Here's a center built. An open space is left around the center so it might grow. And housing starts here.

This is a hot climate. No money in the design of the town has been invested in maintaining an open space. It's a dusty, horrible bubble. It prevents the centers from growing, and it's a silly idea.

To be a junior teacher at Cambridge University, if you are married, you have to live beyond the greenbelt. The British have not built enough roads to take care of your commutation every day. If you've got two cars, which you probably haven't at that stage in your career, the wife has to carry-- you can't afford to live in Cambridge, because the university has preoccupied most of the land, and raised the rent levels of the rest in the center to such a degree that you can't afford to live there. So the greenbelt has turned out to be a weak weapon against expansion

I'm generalizing. There are cases where protective legislation has changed the pattern of growth. But the greenbelt as a generalized idea is not sufficient in itself.

There's also two other items with these settlements. There's a fascination with the organic quality of production. Why we believe that the food which we buy on stalls next to the road outside of town are better and healthier than food, water in the supermarket is beyond me.

Perhaps the cost is less and they seem fresher. Maybe they are. Sometimes, they are directly tilled from the gardens of the farm next door. But there is something assumed to be natural in the conjunction of a producer and a purchaser.

This is an archaic form of goodness. That if you buy from a farmer without a middleman-- that the middleman is an alien phenomenon in the natural system, the heart sends blood directly to the toes. He doesn't need support systems. Maybe I don't know human biology well enough. Maybe there's this halfway heart in your knees which take care of the support system.

Sometimes these things happen through complex instruments of market and culture. There are now 124 farmers markets in the County of Los Angeles-- 124, spontaneously developed without any government intervention, without any government subsidy. Just simple rules about where you may create a weekly farmer's market. The attraction of buying at a farmers market, as opposed to buying at a supermarket, are complex.

I have a thesis student at the moment working-- doing a thesis in Seoul, where the advent of the shopping mall has caused havoc with the informal market system. And this is true also in the case in Hong Kong, which somebody is trying to replicate a traditional market system. These are pointers to elements of goodness and difficulty in the blatant acceptance of organic systems.

One last one is the question of social equity. There's a long tradition of believing that the value of land or activity in the city is not the function of individuals. It is the function of the community's activities and investment. Therefore, a private lot should not be the beneficiary of communal growth.

This philosophy was made explicit in this country by a man called Henry George, a middle 19th century economist philosopher who wrote a book called *Progress and Poverty.* The Lincoln Land Institute here in Cambridge is a follower of the Henry Georgian view. It raises difficulties. In English town planning up till reasonably recent times, there was always a conflict between the payment of betterment or the penalizing of people.

For instance, if I have a gas station on a normal arterial road and a decision is made to build a national highway, and I'm given the right to put my gas station on the national highway, I contributed nothing to the world to pay me for this goodness. But can I be penalized? Can I be given a negative option on its location? It's much like if you decide to wash my car without my permission. Am I entitled to pay you or not?

AUDIENCE: [INAUDIBLE]. No.

JULIAN BEINART: No. You're right, no. On the other hand, if I own a gas station on an arterial road, and the government decides to close the road, I mean, am I entitled to compensation? These are all elements in the land change system that we now have rules about.

But according to Henry George, and before him even our great Abraham Lincoln-- I won't be able to find his quotation, has this notion that land is only a temporary gift. That the communal work done by the government-- of course, Lincoln is a big government sponsor. It is a strange idea, seeing he was a Republican. But the organic model in Sunnyside Gardens, for instance, the communal value increase of the property over a certain period is returned to the seller of a particular unit of land.

Let's carry on and see if we can get through this stuff more quickly. There's also an organic model, as I mentioned before. Interest in non-orthogonal forms-- radial patterns, bounded units, focus centers, anti-geometrical layouts, irregularly curving organic shapes, natural materials, and so on.

Three years after he designed Central Park, Olmsted laid out a piece of flat prairie land a couple of miles outside Chicago. He suggests, and I quote from him, "Curved streets suggest and imply leisure, contemplativeness, and happy tranquility. In contrast is straight streets, which imply eagerness to press forward without looking to the right or left. Riverside was called a suburban village."

I will show you in the slides the plan of Riverside. Its separate parts are all designated by curved roads. In 1873, the Northern Pacific Railroad asked Olmsted to do a layout for a new town of Tacoma, Washington, a plan that exploited the topography of the site.

According to some reporter, "Olmsted's plan was the most fantastic plan of a town that was ever seen. There wasn't a straight line, a right angle, or a corner lot. The blocks were shaped like melons, pears, and sweet potatoes.

One block shaped like a banana with 3,000 feet in length and had 250 plot. It was a pretty plan for a park, but condemned itself for a town." It was never built.

Let's look at some of these individual cases. Patrick Geddes was a young Scottish biologist who went to work for one of the great 19th century biologists, Thomas Huxley, and according to legend, deciphered the mechanism by which a frog's eye operates. He didn't get the benefit of it, so Huxley did. But Geddes went on to be interested in urbanism.

He is regarded as one of the great minds in urbanistic history-- modern urbanistic history. Charles Darwin said, "I have read several of your biological papers with very great interest and I've formed, if you'll permit me to say so, a high opinion in your abilities." Einstein, Rabindranath Tagore, Mahatma Gandhi all speak highly of, Lewis Mumford says of Geddes, one of the truly seminal minds, and so on. I'm just going to go through a couple of ideas of Geddes' that emerge from our understanding of the best uses of nature.

First of all, he believes in the civic survey. He [INAUDIBLE] in India to do a plan for a new town that has trouble. He insists on the town first doing a civic survey.

A civic survey is not only a method of capturing what exists accurately on the land. It is a way of revealing the possibilities of retaining the pieces that work. In his plan for Balrampur, the civic survey shows what is existing in the land. He then decides to extract from those the elements that need improvement, the elements that can be retained, the elements that can be built on.

Secondly, he believes in the synoptic version of nature, getting multiple visions to coincide with similar ends similar to native elements of life in nature. For him in nature, it is possible for all things to come together, and for us to understand that. He uses a diagram from the French philosopher Laplace, which is a right angle crossing in which the corners are acts, deeds, dreams, facts. If you begin this piece of paper along these vertical and horizontal lines, each of them comes into each other.

He then breaks down the components of each sector. What is it about dreams of the imagined? What is it about the imagination that has to do with work? It's a diagram which a child can play with. But it's, for me anyway, more of an indication of his notion that simultaneity is a fundamental property of organicism, and can be utilized effectively in practice.

He's asked to do a plan for the Hebrew University of Jerusalem after 1917. And his son-in-law, who was an architect, does a plan with him. Again, everything about the plan of the universities, which I show you in these slides, deals with synopticism.

At the center of the university plan is a domed space. Why does he use the dome? He says the dome is the only architectural form that is revered by Christians, Jews, and Muslims. So even an architectural form, which resonates with different often conflicting cultures, he says there's no reason for these people to kill themselves over things like a dome.

The fingers, which move out from the dome locate aspects of the knowledge system of the university in sequence, one after the other. For you to get from architecture to the center, you have to go through biology. Much like the folded the diagram of a piece of paper which connects dreams and work and play and ideas, this planned university is an attempt to resonate along the same system. MIT's perhaps closer in its stupid grid system to this synopticism than anything that Geddes ever envisioned.

He put something called the [INAUDIBLE] tower in Edinburgh to take people up into the top of the tower to look down at the town. For him, understanding and learning about the town was an important element in civic education. You needed to know about the town in order to fulfill your role as a member of a community, which had something to do with the change of the shape of the place.

He proposed things like civic exhibitions. He made a civic exhibition of the ideal town. It was damaged and destroyed en route to India on a ship. He nevertheless maintained this fundamental idea of human nature is learning. It is what Kevin Lynch stressed as distinguishing the human being from other animal species-- brain size and its capacity to learn.

For Geddes, the human being was central as a humanist. But he had observations about the way in which nature we could accompany the human learning capacity in the generation of good systems. Participation of people is now an accepted political of creation of modern urbanism.

The attempt by some of the people we'll see in a few minutes to coordinate and make sense of the inner world and the outer world of transcendentalists, like Benton MacKaye in the United States-- the notion that you can both cooperate nature and the economy, such as the Tennessee Valley Authority the new regionalism. God, can you imagine in the United States today getting seven states in the American South to agree that the central government would make a plan for all of them? It's nonsense.

This capacity to see natural regions as natural phenomena outside of political boundaries is Geddesian idea. The greatest piece of human intervention in our time in this country must be the Tennessee Valley Authority. I'll end up these profiles with a quick look at the Tennessee Valley Authority.

Ebenezer Howard was a young Englishman who drifted to the United States at the age of 21 because he had uncle in Nebraska. He was a dreamer. He learned rapid transcription in Chicago. Came back to England, made a living as a court reporter, but had the idea that new towns could be the salvation of industrial chaos.

He was the founder of what is called the Garden City movement, and he built two towns. Can you imagine a man with that economic background being the sponsor of two towns? Letchworth in 1905, about 80 miles from London, and Welwyn Garden City in 1920, these were towns which followed certain naturalistic principles. They were meant to take what is best of the center city, take what is best of the countryside, and amalgam the two in a kind of urbanistic master mix machine. It would be identifiable parts of this community, and so on and so on.

The Garden City movement had universal appeal. Mumford regards it as the most extensive influence. He says that the book *Garden Cities of To-Morrow* has done more than any other single book to guide the modern town planning movement toward its objective.

We can't pay much more attention to this movement. In the United States, we have Clarence Stein and Henry Wright's book *Towards New Towns for America.* The Regional Planning Association of America in 1923 was a group of architects, planners, exponents of conservation, sociologists, and economists who came together to make greater sense of American urbanism. They were influenced by the British Patrick Geddes, who was invited to come and talk to them in 1923.

They mixed a strange kind of religious element of transcendentalism, the movement started here in Cambridge, Massachusetts, on the 8th of September 1836 by people like George Putnam, Ralph Waldo Emerson, and Frederic Henry Hedge. Nature was the vehicle which associated the mind and nature, and not nature was [INAUDIBLE]. Combining the mind and the body through the element of nature was one of the-- there was not enough to be argued in the functional plan of things. There had to be some transcendental-- some larger, ethos associated. And this ethos was not in conventional theism or religion, but in an invented religion without religion-- a naturalist religion of a kind. And so we go through Sunnyside Gardens in Radburn in New Jersey. [INAUDIBLE] another 5 or 10 minutes.

I'd rather spend the time on talking about the Tennessee Valley Authority as a case study. In 1930, the condition of the region was as follows. 30% of the region was afflicted by malaria, others by hookworm, pellagra, and black lung disease. The income was $639 per year per family. Much of the farmland had been eroded or depleted.

In Tennessee alone, 14 million acres needed reclamation. 10% of the forests were being burnt each year, and the river long used for transportation by Native Americans had been clogged by floods. The area covered by the-- over 90% of the people had no electricity in 1930. 30% had no toilets, and 65% had to walk over 250 meters to get water.

There are a number of responses to this situation. The first was the response by a group who called themselves the Southern Agrarians, an intellectual group who claimed that farmers were ancient pioneers of hardy stock, capable of sustaining themselves and only wanting to be left alone. Twain had eulogized the great rivers of the South in the new language of nature. Beaten by the North in the Civil War, the South resisted the invasion of their nature by metropolitanization by the [INAUDIBLE] centralized and the impersonal nature of modernism, machines, and the central government, which the TVA represented.

See, here, we have a reaction to this kind of condition. Leave it to us. Do not intervene.

Do not bring large-scale intervention to bear on us people. We have lived through turmoil before, and we have managed. This is an ethos of conservation.

The second perspective was that held by Roosevelt and his colleagues, who led to the creation in 1933 of an authority which had large rights to change this seven-state environment. Roosevelt was very influenced in regionalism by people like Benton MacKaye. Mumford strongly supported-- who met with Roosevelt before he signed the TVA proclamation. The ethos, if there was one in Roosevelt's team, was, I quote, "Multi-use use and seamless environments, trees and nature are means to solve almost any human problem, touching every river and creek and [INAUDIBLE] touches and gives life to all form of human concerns." If this isn't a naturalistic view, I don't know what is.

Yeah. The TVA proceeded after '33 to develop fertilizers, told farmers how to have great crop yields and replant forests, controlled forests. Devastation floods created an irrigation channel, which carries more than 50 million tons of goods on the Tennessee River. They built 29 hydroelectric dams, which made the TVA the nation's largest power company, and so on.

A third alternative view of what was seen as socialist intervention was that proclaimed by Henry Ford. Henry Ford in 1921 offered Congress $5 million to buy the Wilson dam and the power facilities to develop his alternative to Roosevelt's TVA. Ford soon saw nature through the lens of agriculture, which he believed had been mistakenly ignored in the making of American Industrial cities.

To create a machine-agriculture balance that is a machine-nature balance, Ford proposed to build a city in a town called Muscle Shoals-- muscle in-- muscle, like on the human body, and shoals, S- H- O- A- L- S. 120 kilometers long and 24 kilometers wide, made of a string of small towns from which workers commute to his factories. Ford was rejected by Congress, led by Senator Norris, who claimed this act of revitalizing the Tennessee Valley Authority should be done by the public, not by the private sector. A strange thought these days.

Since 1973, there have been new conceptions of nature that have little to do with the romance of tradition nor with the efficiency of relational regionalism, nor the reclamation of agriculture through industry. First, in 1973, the construction of the Tellico Dam on the Little Tennessee was halted when a rare 9 centimeter long fish was discovered in these waters. The fish, which was claimed to be a unique species and a potential demise became a watershed event in the growing American environmental movement.

It was taken to the United States Supreme Court, who upheld the environmentalists' protests. Since the controversy, the small fish has been relocated to another in Tennessee, where it's thriving. The snail darter [? conservaty ?] still stands.

The interesting thing about a 9 centimeter fish-- it's not quite interesting about it, I must admit. But what is interesting is that it's within the large Tennessee Valley Authority, which we've seen in relation to differing views about nature. Here's a microscopic element of nature causing an attempt to stop a dam.

In the 1950s, as the demand for electricity was outstripping the capacity of the hydroelectric facilities, the TVA began to build coal-fired electric plants, which account for about 65% of its electricity output. Why I'm telling you this story is to indicate for you, in one project over 70 years, the conflicting and differing ways in which nature is introduced as the basis for critique and for revision. Nobody cared about small fish in the dams in 1933. Cultural and technological change produced a new way of discovering nature in the water.

The original idea to generate electricity through the building of hydroelectric turned out by 1950 not to be producing enough electricity. So they switched to coal, which now is the predominant energy source. On December the 22nd, 2008, an earthen dike at one of the plants at Lincoln broke, spilling a billion gallons of wet coal ash across 300 acres of land and into the tributaries. The *New York Times* in the next day called it quote, "The largest environmental disaster of its kind in the United States." In 1943, the US government built the Oak Ridge Laboratory in Tennessee as part of its Manhattan Project to separate and produce uranium 13 for use in developing a nuclear weapon.

We start with a problem. We have reactions to probably invoking the best use of nature. The idea of nature, the level at which it had seen and discriminated changes over time, over 80 years, we now have a completely different view-- not a completely different view. We have a different set of tools with which to understand nature. So it argues as much for there not being a fixed and determinant view of nature superseding almost every possible alternative view, but a fluctuating view of nature as an important phenomenon in human existence.

This adds strength to the idea that the city is a phenomenon of change. And we will, in our subsequent classes, be looking carefully at theories which attempt to accommodate these changes. How Roosevelt in 1933 could have known about the snail darter, I don't know. But I do know he couldn't have known.

This is the forward to [? Ilya ?] [INAUDIBLE] father's book on the city. It shows plans of London. There is no evaluation, other than visually, it looks like cancer.

That it may be performing better in terms of social equity than under Henry VIII is not an issue. He is an architect and looks at patterns of architecture, and derives the observation that not only is this a more complicated and more complex problem to be resolved pattern-wise. He would apply that solution to it that is identifiable small units, either neighborhood or idiosyncratic environments or patterns, in a way which isn't as fragmented and difficult as this.

This is a plan for the metropolis of tomorrow by Victor Gruen, who simplified things everywhere he could. The task is to learn how to identify patterns in this kind of environment which are good and which are bad, as opposed to creating a new geometry, which for elementary reasons cannot accept a city form, which is on the bottom on the left. Next.

Patrick Geddes, the Scottish biologist and town planner. The Laplace diagram-- if you follow the black lines, you follow the acts, deeds, thoughts, facts all together. Experience and ideation, work and synergy, all are part of segments of thought and feeling, experience emotion, ethnopolity, synergy and so on. The whole idea is that everything in the human experience touches on everything else. It was a kind of vision of a synoptic world which could make sense of everything, but particularly in the relationship between things. Next.

So one would expect the Hebrew University plan, which he did with his son-in-law, who was an architect. The center is a center. That is a biological constant. It's fundamental. If you believe [INAUDIBLE], it's built into archaic man.

The dome on the building is a form which is the only architectural form which is accepted by Jews, Islam, and Christianity. So bringing all these things together suggests a form which can deal with all three at the same time. The ideation context, the branches of science and the humanities, and the various aspects of knowledge are branched out in arms from the center in order to go from the bottom on the left.

I don't know what it is. In order to get to the center you have to pass through other bodies of knowledge. Again, the whole idea is that what makes a human environment most powerful is the capacity to capture more than one element of human experience.

When I talked today about a number of social science theories of city form, this aspect will be particularly missing. The valley section-- there is a natural place for things in a system. He's wrong. There is nothing natural about that at all.

The soil condition will determine to some extent the kind of-- but we will see another version of this in von Thunen's diagrams in southern Germany in the beginning of the 19th century, which also lays out a pattern of distribution, but it's largely as a function of transportation costs. Milk is produced close to the center of the city. Further out is cream. Why? What is natural about cream being further from the center?

Cream is produced in smaller volumes than milk. Therefore, the transportation costs are less. It's assuming all transportation is towards the center.

Secondly, cream perishes less rapidly than milk, so it's resistant to longer transportation possibilities. Here, the valley diagram just assumes there's a natural rightness of location. There is no natural rightness of location. Next.

OK, he's working in one of the Indian towns. This is Balrampur, and he uses items, such as conservative surgery. Rather than bulldozing what the maharajah called the slum, he looks to the possibilities of cosmetic surgery, investing energy and money in key items. But basically, probably what is there is considered as good in itself, rather than the erasing.

The notion here is that you cannot-- by erasing a system, you retain very little of its capacity to introduce new items. It's one of the problems of new settlements. They don't have the built-in connection between history and memory and newness.

You can see how Geddes' mind as a biologist exerts itself in a number of items. Ebenezer Howard, on the other hand, sees the distinction between the central city and the country as the basis of making a division between the two. Next. He postulates the town country has low rents, high wages, plenty to do. Town is bad, country is great. But country is dumb, town is too expensive.

Town-country brings together all the best things. No sweating, pure air and water, cooperation, no smoke. Why should there be more cooperation in a town-country phenomenon than in an urban setting?

You may argue that in fact, quite the opposite is probably true. That the higher proportion of people likely to cooperate learn to cooperate in a dense environment than in a loosely-- but that's not at issue for Howard. Howard's a man who learned to be a court reporter, but had the practical genius of an Englishman to build new towns. Next.

Here, you can see it again. Yesterday, this is Manchester as described by Engels. Today, tomorrow, living and working in the sun at Welwyn Garden City, one of the two cities that Ebenezer Howard proposed.

The early romanticization of suburbia, it produces nature in a domesticated form. Here's this benign husband and wife and little daughter sitting in a man-made garden. People are friendly. Next.

The greatest asset-- the Garden City movement became an international phenomenon. It was taken up by the Regional Planing Association of New York in 1923 as one of its great goals. Here, you can see some of the charm. There's a lot of invention in site planning in these towns.

Let's skip and go on to some of those. Next. The idea-- this is Letchworth, 1905. But there was also the idea that you could break up the facade of a street, largely straight because of a mechanical system, by identifying opportunities or creating a different relationship to the street. Next.

You can see some of the items of this invented idea. First of all, the cul-de-sac-- traffic should not run along its clearly identified path. It should be stopped. The cluster, the road which bends informs the curve, the retention of our buildings.

So again, here is a combination of the old and the new. And landscaping became an important part of the manifestation of space. Different types of landscaping in the form of large trees, small trees. This, in my view, is the major contribution of Garden City knowledge. Next.

Here is Nuovo Quartiere of Villini, a Garden City suburb in Milano. They occur in Cape Town. They occur all over the world.

The shopping center, again, underscaled. In relation to in the United States, the ratio of parking space to floor space would be phenomenally larger than here. And one of the problems with these kinds of towns has been the increase in car population. Next.

The Regional Planning Association in the United States-- this is again a diagram of Victor Gruen, showing how unsubtle the simultaneous relationship with Patrick Geddes spoke of. Yes, there are people who walk and there are people who travel longer distances. That they need to be separated by a mechanical system is stupid. It involves an introduction of a new infrastructure, which is relatively purposeless. You can take apart all the elements.

But the idea of cleanliness, of a kind of-- the Victor Gruen plan, the Washington plan, has a kind of clarity of fundamentalism, which is supposedly attractive, whereas in fact, the cancer-like planned of London has items in it which have a higher degree of intelligence than this. This is a lower level of intelligence. The organic model again. The possible state of the future in which each part serves its logical function in support of wholesome activity and good living. Each part has its right place.

Central Park, a model of the insertion of a natural phenomenon by Olmsted and Vaux. I think it's 1859, I'm not sure. And Olmsted, the progenitor of much the idea of the cosmic model-- sorry, organic model, planned for Riverside just outside of Chicago. The curved surface, no straight lines, idiosyncratic, speed at movement through the complex. Next.

Sunnyside Gardens. Well on the left Clarence Perry neighborhood theory measuring the safe walking distance of a child to school is giving a density of an appropriate walking [INAUDIBLE]. And Sunnyside Gardens, Stein and Wright's complex, where you internalize the urban world into a safe environment and treat it as a communal asset, with everybody contemplating the unity of the social circumstance which created.

Over time, each owner started building particular private space enclosures eating into the public space. But in recent years, there's been an attempt to reformulate the original open space. I don't know if that's Lewis Mumford, but he lived here. Next.

Chatham Village, a number of these layouts occurred. Chatham Village in Pittsburgh. Next. The phenomenon is the same-- the predominance of nature, the separation of places to walk and places to drive, the capacity to fix things in your own property, the kind of control of the world, and really good neighborly relationship between houses, at least that is accepted without somehow the community is energized by the fact that the whole system is made pro-humano in some way-- so it is thought. A good biological system will animate its users to believe in it. You have no way of not believing in your body. Next.

That's Radburn, New Jersey, on the left based on walking distance of children and the externalization of automobiles. Next. The greenbelt towns built under the Roosevelt administration-- again, the walking distance of children, and the use of major curved geometries to enhance the fact that the buildings and the streets are not subject to simple mechanization. But the patterns of the street in themselves would animate or lead to an understanding of the natural quality of this place.