DEBATES

The Jacobs Hypothesis of the Urban Origins of Agricultural Activity: Twenty Years Later

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1. Introduction

In a rare show of consensus, most social scientists agree with Lewis Mumford concerning the origin of cities:

> "If we are to identify the city, we must follow the trail backward. Before the city there was the hamlet and the shrine and the village; before the village, the camp, the cache, the cave, the cairn; and before all these there was a disposition to social life that man plainly shared with many other animal species" (1961, p. 5).

According to this consensus, nomadic people of the Neolithic Age began to form permanent villages after discovering agricultural activity. By persistent and concerted effort, the new rural class made progress in cultivating grain and raising livestock. This resulted in a surplus of food and an expanding population, which, in turn, prepared the way for the founding of cities.

A hypothesis set forth by Jane Jacobs twenty years ago turns this widely accepted scenario upside down. Unfortunately, her hypothesis has not generated much interest among economists, perhaps because Jacobs was primarily addressing historians and anthropologists. Actually, Jacobs's contribution should be quite useful to economists, especially those grounded in agricultural economics, urban economics, and regional science.

2. Jacobs and the origins of agricultural activity

Jacobs believes that cities preceded the first farming villages. According to her, the origins of agricultural activity should be sought in prehistoric cities.

Jacobs first attacks the standard notion that proto-agricultural people led a nomadic life. Although prehistoric man evidently migrated, Jacobs makes

the point that a migrant need not be a nomad. As we observe in our time, migrating people customarily leave permanent settlements and reestablish themselves in other permanent settlements. Jacobs believes there is sufficient paleolithic evidence to show that:

> "... permanent settlements within hunting territories were ordinary features of pre-agricultural life. They would have been as natural for men as burrows are for foxes or nests are for eagles. Almost all activities would have been carried on in the settlement [which] would also have served as the base for work carried out in the field — hunting, foraging, defending the territory, and raiding adjoining territories. This implies that permanent settlements which grew as cities were, from the first, city-states. There would have been no such thing as a pre-agricultural city without a surrounding territory belonging to the city" (Jacobs, 1969, p. 43).

Jacobs contends that the conventional theory of urbanization fails to explain just how hunters took to sowing grains and learned selective cultivation. The standard answer is that crossed seeds arose owing to abrupt changes in river levels, temporarily bringing together plants that did not normally grow together.[1] But Jacobs finds this answer unsatisfactory, since it begs the question why certain wild grasses were transformed in the process while others were not. She asks:

> "How does such a theory account for the development of crossed, hybrid, and mutant wheats and barleys? To be sure, it used to be supposed that purposeful plant selection would be practised, as a matter of course, by hunting and gathering peoples, once they reached a stage of expertise at gathering and sowing wild seeds. But that supposition was plausible only before the botanical problems had been appreciated. Moreover, the supposition begs the question why grain culture, then, originated in so few centers instead of in hundreds of centers or perhaps in thousands" (Jacobs, 1969, pp. 41-42).

Jacobs's second attack is on the "rural" origins of agriculture. She observes that agriculture is never productive unless it incorporates the many goods and services produced in cities. Food is produced most abundantly precisely in those countries that are thoroughly urbanized. If cities had waited to grow until a surplus of rural products could support their growth, most of them would still be waiting. Jacobs invokes Japan as a case in point. She asserts that by reinventing its agriculture, that is, by building rural productivity upon a foundation of city productivity, Japan has accomplished rapidly what the United States did more gradually, and Western Europe more gradually still.

[1] For a detailed explanation of this view, see Kingsley Davis's Introduction in *Cities: Their Origin, Growth and Human Impact*, (Enlarged Edition), San Francisco: W.H. Freeman and Company, 1973. Also refer to Richard Macneish's article (No. 6) in the same book.

But because we are used to thinking of agriculture as a manifestly rural activity, we tend to overlook the possibility that new agricultural technologies might have originated in cities. Jacobs reminds us that the hybrid corn that changed the face of American agriculture was developed not in Iowa corn farms but in plant laboratories in New Haven. Similarly, the great California fruit and vegetable industries did not evolve in the state's vast fields but were organized in San Francisco to supply fruits to that city's canneries (Jacobs, 1969, pp. 13-14).

3. The city origins of agricultural activity

One conclusion that Jacobs draws is that the first villages and cities might have been built *before* agricultural activity was discovered. She uses Catal Hoyuk as a telling example.

Catal Hoyuk is the earliest city yet found. It was discovered in 1961 while Mellaart, its discoverer, was looking for nothing more than a village in central Anatolian plains.

> "[Mellaart] had already unearthed [in Anatolia] a late Neolithic farming village that had been established in about 6000 B.C., its culture already fully developed, upon the older site of a long abandoned pre-pottery settlement. Mellaart was seeking the parent culture of this farming village. He assumed it would be found in another village, older, of course, and more primitive. [What he found was Catal Hoyuk which]... proved, as Mellaart had hoped, to be older than the farming village, a good thousand years older. It spanned the period 7000-6000 B.C. Also, just as Mellaart had surmised, it was evidently the source from which the culture of the farming village derived. But, surprisingly, Catal Hoyuk was a more highly developed settlement, with a richer and more complex culture, than the younger farming village. Indeed, Catal Hoyuk was not a village at all. It was a city which remains as urban as those of any site from the succeeding Bronze Age yet excavated in Turkey. It was a city of crafts, of artists, manufacturers and merchants and of buildings of standardized mud bricks which densely covered thirty-two acres. A population that must have run to many thousands was closely concentrated." (Jacobs, 1969, pp. 31-32).

Mellaart discovered that Catal Hoyuk's bustling city life was based on commerce, mostly the trade of obsidian, a hard volcanic glass used for making cutting tools. But, to Mellaart's surprise, the city was a direct offshoot of a hunting, not an agricultural, life. He found no remains of agricultural crafts; the crafts were all derived from hunter's materials and skills.

Jacobs supplies an answer. According to her, Catal Hoyuk had something even more valuable than obsidian, and that was:

> "... a creative local economy. It [was] this that set the city apart from a mere trading post with access to a mine. The people of Catal Hoyuk had added one kind of work after another into their own local city economy... A city

> does not grow by trading only with a rural hinterland. The incipient flickers of a creative city economy could actually be sustained only if several little cities were simultaneously serving as expanding markets for one another... It was not agriculture that was the salient invention of the Neolithic Age. Rather it was the fact of sustained, interdependent creative city economies that made possible many new kinds of work, agriculture among them" (Jacobs, 1969, pp. 35-36).

4. The city of New Obsidian

To demonstrate how grain culture and domestication of animals could have emerged in proto-agricultural cities of hunters, Jacobs envisages the city of *New Obsidian* which is, in turn, the parent city of Catal Hoyuk. The mental journey she takes is like the one that led Mellaart to Catal Hoyuk.

New Obsidian is the centre of a large trade in obsidian, a commodity neighbouring hunting tribes need constantly. Traders come to *New Obsidian* from greater and greater distances to get this material, bringing with them two categories of goods for barter: ordinary produce of their hunting territories, and special goods such as shells, copper, and oils that they have procured from other settlements.

> "In this way, settelements that possess unusual treasures — copper, fine shells, pigments — have become minor trading centers for obsidian too. They exchange with nearby hunting tribes some of the obsidian that has been brought to them in barter and are paid in ordinary hunting produce. And *New Obsidian,* similarly, is a regional trading center for other rare goods besides obsidian. *New Obsidian,* in this fashion, has become a 'depot' settlement. It has two kinds of major export work, not one. Obsidian, of course, is one export. The other export is a service: the service of obtaining, handling, and trading goods that are brought in from outside and are destined for secondary customers who also come from outside" (Jacobs, 1969, pp. 20-21).

Because of *New Obsidian's* large trade with foreign hunting territories, large quantities of non perishable food flow into the city. The nonperishable food comes under the custody of local stewards, and it is here, in the city, that animal husbandry and grain selection first take place. These techniques are then transferred to the rural hinterland.

One might ponder at this juncture whether obsidian (or any one local resource, for that matter) could be instrumental in triggering an economic process of such magnitude. Are there any more concrete examples in which hunting villages evolved into cities without first treading the agricultural path? It is to explore this question that the next section delves into archaeological literature and finds some evidence to support Jacobs' hypothesis[2].

[2] Ironically, most of such evidence will be formed in the works of authors who support the conventional theory of urbanization.

5. Tepe Yahya, Altintepe, Lubaantun, Arabia Felix etc.

Although a firm believer of the rural origins of agricultural activity, Kingsley Davis adopts a scenario quite consistent with that of Jacobs. Like Jacobs, Davis recognizes the importance of a locational monopoly in the emergence of the ancient city. He states:

> "Tepe Yahya, for instance, was well located to be a 'central place' in trade between resource-poor Mesopotamia and resource-rich Persia. In addition, it had a local resource, soap stone, which was much in demand elsewhere and was exported as far as 1500 miles away. Altintepe dominated two mountain passes from eastern to central Asia Minor. Lubaantun, which stood at the center of the largest zone of top-quality soil for cacao tree culture in its region, traded cacao beans for obsidian, lava stone, and jade. The earliest cities thus arose because men found it advantageous to concentrate in particularly favored spots for specialized production and trade. Such concentration minimized the 'friction of space'. Its accomplishment represented a major step in human efficiency. The transition from nomadic camps to larger settlements and eventually to cities was remarkably swift" (Davis, 1973, pp. 15-16).

Other evidence shows that Tepe Yahya was an important trade city around 3800 B.C. It abounded in imported materials and tools made of obsidian, beads made of ivory, carnelian, turquoise, and statuettes carved out of alabaster (Lamberg-Karlovsky, 1973). Yet, to the surprise of Lamberg-Karlovsky (who, incidentally, subscribes to the conventional theory) Tepe Yahya, despite a population that knew to read and write, was devoid of domestic animals and crossed seeds. This should be no surprise to Jacobs.

Similarly, the Semitic cities of Arabia Felix (the Biblical Sheba) which controlled the trade in frankincense and myrrh (each as valuable as gold), did not have agricultural activity. When King Solomon's fleet transported frankincense and myrrh in the Fertile Crescent in Xth century B.C., the camel had only recently been domesticated in Sheba. Moreover, it was the Arabia Felix city dwellers, not villagers, who domesticated the camel and developed the irrigation systems which enabled the entire region to be self-sufficient in food (Van Beek, 1973, p. 45). This brings us back to Jacobs's hypothesis.

6. The city origins of animal husbandry and grain selection: the case of *new obsidian*

Let us keep in mind that there is no agriculture at this point in *New Obsidian*. The food that flows from hunting territories to the city is in the form of wild animals and wild edible roots and seeds. These resources come under the custody of *New Obsidian's* food stewards.

A. *Animal Husbandry*. Lacking any concept of animal domestication, stewards of wild animals simply try to manage the city's food reserve to the best of their abilities. They notice, however, that some species of animals are pre-

ferable to others because they are easier to keep, they mingle with other wild stock, their offspring withstand captivity, and their meat tastes better. In *New Obsidian* sheep may meet the requirements of convenient maintenance while in some other city wild goats may be preferred because they thrive better in mountainous terrain, and so on.

B. *Grain Selection.* Seed stewards in *New Obsidian* have no conscious preference for saving one kind of seed over another. "Here in *New Obsidian,* the world's best market, for edible wild seeds, the seeds flow together for storage" (Jacobs, 1969, p. 29). In a situation like this, crosses cannot be avoided. Some seeds remain after the winter: they are used for wild patch sowing. It is noticed that some seeds yield more than others: thus, grain selection is born. Once the people of the city know which kind of seeds are the best, grain selection becomes deliberate.

Although Jacobs scenario explains the phenomenon of cross-hybridization of seeds and livestock better than the conventional theory, the question arises as to why it should take place in a city and not in a village. But, having anticipated this criticism, Jacobs explains in detail the conditions that make grain selection possible only in a city:

1) Seeds that normally do not grow together must come together nevertheless, frequently and consistently over considerable periods of time;

2) In that same place, variants must consistently be under the informed, close observations of people able to act relevantly in response to what they see;

3) That same place must be well secured against food shortages so that in time the seed grain can become sacrosanct: otherwise the whole process of selective breeding will be repeatedly aborted before it can amount to anything. Although time is necessary, time by itself does not bestow cultivated grains on *New Obsidian.*

> "[And] gradually, *New Obsidian* grows more and more of its own meat and grain. But it does not, as a consequence, wallow in unwanted surpluses of imported food. First, the very practice of growing food in new ways requires new tools and more industrial materials. The population grows and so does the work to be done in *New Obsidian*... The city, in short, is now supplying itself with some of the goods that it formerly had to import. The substituted local production makes a big [difference] in the city's economy. In place of unneeded food imports, *New Obsidian* can import *other* things — a lot of other things" (Jacobs, 1969, p. 29-30).

This activity creates the illusion that the city's imports have increased enormously. Actually, the have not: the city has simply shifted its imports. Now even more exotic materials flow into the city and an explosion of new kinds of work — and new kind of exports — occurs:

> "The traders of *New Obsidian,* when they go off on their trips, take along *New Obsidian* food to sustain themselves. Sometimes they bring back a strange animal or a bit of promising foreign seed. And the traders of other

> little cities who come to *New Obsidian* sometimes take back food with them and tell what they have seen in the metropolis. Thus the first spread of the new grains and animals is from city to city. The rural world is still a world in which wild food and other wild things are hunted and gathered. The cultivation of plants and animals is, as yet, only city work. It is duplicated, as yet, only by other city people, not by the hunters and of ordinary settlements" Jacobs, 1969, pp. 30-31.

C. *Agricultural Work Transplanted.* During the time in which animal husbandry and grain selection are being developed in *New Obsidian*, people live in permanent settlements. These are not farming villages, for there is no agricultural activity outside of cities. Eventually, however, agricultural work is transplanted to the rural world around *New Obsidian*.

The first agricultural work to be transplanted is tending the herds, which requires open pastures. At this time, grain growing is done in the hinterland of cities on small patches of land — as was true in the Middle Ages in Europe. Eventually, grain cultivation spreads to the entire rural world. Not all existing villages benefit from the transplantation, however. For a long time, traditional hunting villages coexist with new, radically different agricultural villages.

7. Evaluation of Jacobs' hypothesis and some additional evidence

The idea that agricultural technology was first developed in cities seems somewhat less alien — and the conventional theory of agricultural primacy seems somewhat less convincing — in the face of evidence that:

> "the majority of [ancient] cities contained only a few thousand inhabitants and continued to be partly agricultural centers. Many of those inhabitants still went out daily to work their farms, or, among the upper classes, lived off the income of estates, even though the cities also served other functions of manufacture, commerce, government, religion, or culture" (Hammond, 1972, p. 7).

The theory of agricultural primacy maintains that a surplus of food formed the basis of urbanization. But how does this theory explain why, say, Manhattan Indians, who had an abundance of food, did not build cities while, conversely, half-starved Japan created an agriculturally self-sufficient society in less than fifty years? The present study refers to two different prehistoric settings in an attempt to find some answers.

A. *The Mayan Experience.* The inexplicable relation between Mayan cities and the lowlands seems to have perplexed many social scientists interested in urbanization. Kingsley Davis states:

> "The rapid rise and fall of Mayan cities and their easy spread to new geographical areas suggest that the technology did not wholly originate in the

> lowland [where the first hunting villages emerged] but rather came there in an already developed state, capable of quickly exploiting but soon exhausting the fragile resources of that region. If [corn had been grown] in the Guatemalan lowlands, [these lowlands] could have been made sufficiently productive to support small cities" (1973, p. 13).

But if one agrees with Jacobs' hypothesis, there is nothing inexplicable in this relation. The reason for the inconsistency is simply that the corn production techniques had originated in Mayan cities and not in the lowlands.

Macneish finds that during the millennia before the first Mayan cities were built, Mayans in the lowlands were ignorant of grain selection, irrigation, and animal husbandry. The corn of the lowlands was a mere wild grass with a cob about 1/100 the size of modern corn (1973). In the lowlands, corn yield was so meager that a corn surplus — the purported prerequisite of Mayan urbanization — was unthinkable. Accordingly, the conventional theory provides no explanation as to how Mayan cities came into existence.

Actually, it was religion, not economics, that played the leading role in Mayan urbanization. The first Mayan city was probably nothing else but a ceremonial centre, visited during certain seasons of the year. But, as other services were added, Mayan cities eventually flouurished as knowledge centres and assumed a permanent character. Surplus food probably followed rather than preceded Mayan urbanization, as Mayan city people began to cultivate the land around their city for food. It was in Mayan cities that the wild corn was domesticated and irrigation techniques were developed. Undoubtedly, much time passed before the agricultural techniques developed in Mayan cities were finally transferred to the lowlands.

Incidentally, one can infer from Jacob's hypothesis a tentative answer to the question that continues to haunt anthropologists: why were Mayan cities later abandoned? It is likely that Mayans built their cities in high altitudes for religious reasons. Eventually, however, the advanced agricultural technology created in these cities exhausted the limited potentials of their immediate hinterland. Hence, the exodus.

B. *The Sumerian Experience*. Historians generally agree that it was here, in Sumer, that the first cities emerged. Lagash, Eridu, Erech, and Jericho are the names of just a few splendid prehistoric cities of this region. But one cannot help noticing the evidence that all these cities were surrounded by "farms, villages, and pastures that were directed to feed the city populace (Hammond, 1972)." While these hinterlands produced abundant food, the rural world was likely to be a vast hunting land whose people lived off wild food.

As in Mayan highlands, so in Sumer flatlands the first cities were probably built for religious reasons. At the centre of the city invariably stood the Ziggurat. The temple was the hub of the cross-fertilization of ideas. It is conceivable that agricultural and mechanical feats took shape in the minds of

priest-scientists rather than in the minds of the man roving the wild terrain in search of food.

In fact, as though lending support to Jacobs, Hammond states:

> "The temple of Bau in Lagash... possessed a square mile of land used for grain, root-crops, fruit, timber trees, and pasturage for oxen, sheep, goats, and pigs... The temple received fish from both salt and fresh water fisheries... It provided tools and equipment to its farm workers and possessed breeding stock to keep up the quality of its herds. As Childe [1951] concludes, the temple was, on the one hand, an enormously enlarged farming household in which specialization had taken place and, on the other, an organization for the exploitation of its agricultural property (1972, pp. 39-40).

And, as if further to support Jacobs, who suggests that grain selection originated in city warehouses, Hammond adds that "Lagash... had public granaries" (1972, p. 40).

8. Conclusion

According to the conventional theory, cities are nothing but overgrown farming villages. As such, cities are a secondary phenomenon in the development of human history, since they differ from lesser settlements only by virtue of size and complexity. It follows then, that regional and urban economists must be concerned primarily with the development of *rural* resources, because rural resources purportedly spur city economies, rather than the other way around. This is certainly not the main premise of mainstream regional, urban, and urban economics. This study suggests that Jacobs has provided sufficient reason for the economist to question the postulate of the conventional theory of urbanization. Further research seems likely to strengthen her hypothesis.

References

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