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Fecal Matters:
A Proposal for Braddock, North Braddock, and the Lands Above

Synopsis

This proposal makes an argument for channeling surface waters on to the many empty lots in Braddock in order to reduce the flow of surface waters into the existing sewer system. The idea is that after appropriate planting and attention to the over-compaction of earth, waters would then be able to percolate into the ground where they would be purified and slowly find their way into the Monongahela River. To the extent that surface waters would be reduced, sewage overflow would be correspondingly reduced. (We understand the arguments against percolation, but we do not believe they hold in all cases.) This proposal continues with the idea of creating catchment basins or holding areas that could catch the dilute sewage effluent overflow during heavy rainfall that could not be accommodated by the percolation system described above. Further, this proposal argues for a particular treatment system that can rapidly purify rainwater-diluted sewage effluent to better than secondary treatment level that could then be released directly into the river system. We argue that the present sewage system of Pittsburgh is obviously under great stress due to the older engineering systems that tend to overcentralize, and might greatly benefit from taking the risk of decentralization. This proposal argues that Braddock, North Braddock, and the hills above would be an ideal test site for the ideas expressed therein.

The Proposal

We were invited as an artist team to address the township of Braddock by the Studio for Creative Inquiry at Carnegie Mellon. This proposal is the outcome of our investigation.

For approximately one mile, Braddock fronts on the Monongahela River. Most of the frontage land is owned by large businesses that appear to be simply holding the land, waiting for it to appreciate in value. We feel, after spending several weeks on site, that Braddock's reduction of population from 25,000 to 2,500 can be seen as a catastrophe when looked at from the perspective of job loss and the ending of the hegemony of the steel industry in the region. However, our experience suggests that seen anew, Braddock is in a process of resettlement. People are slowly returning due to inexpensive housing, and the multitude of empty lots are going into succession as nature resettles where it can. Basically what we will propose takes advantage of this emerging situation.

Our investigation led us to the only public entry into the Monongahela River that Braddock fronts on. This is a concrete ramp approximately 40 feet wide, where boats can enter the river and where people sometimes fish. There is an old sign there that

says, "Beware of Fecal Matter." We looked at the water, and we became intensely aware of fecal matter, as it was floating all around the sign. In a moment of epiphany, we decided to do a work entitled *Fecal Matters*. It seems that both the surface-water drainage system and the sewage system use the same pipes that normally go to a centralized sewage treatment system but on overload, empty directly into the river. Apparently, it takes only 1/10" of rain to cause this system to overflow. Hence, the fecal matter warning.

We have been made aware of an extended conversation in the city of Pittsburgh about its sewage problem. The cost of rebuilding the large centralized sewer treatment plants and the inflow pipes is estimated at between 3 and 8 billion dollars, depending on who is doing the estimating. The plan currently favored by many is to build large holding tanks to capture the diluted effluent that the down-river sewage plant cannot process during the heavy rains. Then to slowly release it during dry periods. Plans of these kinds, proposals for action and the like, take a long time to develop in the city of Pittsburgh, where funds are so limited. In reflecting on these issues, we perceive Braddock, North Braddock, and the hills above, an area of approximately 1,000 acres, as an ideal site to test this concept that we are evolving.

For instance, if surface waters could be channeled from streets and rooftops into the nearby empty lots when rainwater exceeds 1/10" per day, then effluent would not overfill the pipes and the sewage system would not be stressed. Then, fecal matter would not pollute the river as the river flows past Braddock. The vast cost of separating groundwater from effluent by creating new underground water-transport systems would be replaced by a far less expensive, more ecologically provident system.

The idea here is that channeling rainwaters from the street and various rooftops of Braddock onto the many empty lots appropriately treated and planted will make these lands amenable to percolation. Then, from the perspective of the land, Braddock becomes a place with wetland gardens that in turn, over time, let clean waters percolate down into the ground and slowly seep into the Monongahela River. Then Braddock becomes a unique place with a beauty special to itself. Then land values rise and neighborhoods become more interesting, and the new early settlers benefit economically, socially, and culturally.

For instance, if Braddock, North Braddock, and the hills above are seen as one place, perhaps 1,000 acres all told, and approximately 1" were to fall in one day (for last year's rainfall, 1" or more fell on 12 days; 1/2" or more fell on 35 days; and on the worst day, almost 6" of rain fell on September 17), then we would be looking at about 83 acre feet of water spreading over these lands.

In addition, if we assume that the sewer system itself will take 8 acre ft., or 10%, of the water, and the open lands, without any diversion to them, will take approximately 10%, which is 16.6 acre ft., then the diversion of waters required for the whole would need land available sufficient to percolate about 63.4 acre ft. of water for about 1" of rainfall, or about 32 ft. for 1/2" rainfall, which is more likely.

For instance, 63 acre ft. would require about 6.5% of the land in a 1,000-acre site to percolate one acre foot of water. Or, in the event of a 1/2" rainfall, which is more likely, that same 6.5% of land would need to percolate 1/2 an acre ft.

Even in these interesting geophysical circumstances where excess waters can be percolated into the ground, there is still the probability of overload. For instance, if test studies show that more than 1/2" or 3/4" of rain would constitute overflow, then a tank or reservoir to capture the overflow waters with dilute effluent would need to be constructed as is now proposed for elsewhere in the city. It appears to us that there is a remarkable opportunity here to test the concept of sewage system decentralization wherein waters are purified in situ rather than gathered and sent long distances to a central facility. Toward this end, we would propose a system that can purify large amounts of waters that have dilute effluent in them. The system is called the Pirana. According to their inventor:

> The essence of the ABG technology is to condense as many of the critical components of microbial treatment into the smallest possible configuration so that a given amount of treatment capacity can be mobilized in an instantaneous fashion wherever and whenever it is needed.
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> The unit is thus a transportable, fixed-film treatment unit applicable to almost any strength effluent. Treatment is based on passage through the unit over the bacterial matrix. With concentrated effluent more passes over the aerated bio-film are necessary.
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> Thus, for a given mass of organic waste, the concentration will depend on the volume of water it is in. Low water volumes will exhibit higher concentrations. A Pirana will cycle some measureable volume depending on the size of the unit. For instance, a P-40 circulates 30,000-50,000 gallons per day through it. For 1,000 gallons of concentrated waste we get 30-50 treatment passes per day. That same mass of waste in 10,000 gallons will experience only 3-5 passages through, however, since its concentration is only 10% of the more concentrated effluent, fewer treatment passes are necessary.
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> In effect the treatment capacity is independent of concentration, being similar at high or low dilution because of the self-correcting iterative nature of the process.
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> Further the portability of the units allows use in almost any feasible containment. Again treatment is a function of the internal characteristics of the unit and not the configuration of the containment surrounding it.

It is for these reasons that we find this situation in the Braddock area extremely interesting both socially, ecologically, and economically. Moreover, it is for these reasons that we are seeking monies to first bring together a group competent to more precisely conceive how this project would work and thereafter to locate a test site, and then to seek further funds to test the idea directly on the ground.

However, from both driving the city, looking at maps, and taking a boat trip, it appears to us that the parts of Pittsburgh that have had both population loss and building loss are open to the separation of groundwater and effluent that we propose here. If the system we propose lives up to its potential, we believe the savings will be considerable, to say the least.

Thinking About Pittsburgh as a Whole

However, where the population is dense, and open space rare, then the idea of the creation of large catchment areas perhaps in the form of large concrete holding tanks may well be the least expensive solution to these very intractable problems, and intractable they are.

Fundamentally, we are arguing that the Braddock experiment offers the possibility of generating a model for decentralization to replace, or at the very least enhance, an over-centralized, apparently increasingly inefficient sewer system that exists in Pittsburgh.

The meeting we would like to call would have as participants:

1) An ecologist and soil scientist that could determine how much and how long and how expensive it would be to make the present open lots friable.

2) An engineering group who could design methodology for channeling surface waters into open lots.

3) Sewage engineers who understood the system and the problems particular to the Braddock area.

4) Ourselves, the artist team; Dan Wickham, the Pirana System designer; and Richard Jennings, the water harvester.

We request that a meeting be funded and held with these and other interested parties to begin the design of a working model for Braddock using the principles discussed earlier.

The initial cost would be $4,600 exclusive of pulling together local people. The $4,600 would cover the costs of bringing the water harvester and the Pirana leadership (at $2,000 each), and he travel expenses of the artists (at $600).

Respectfully submitted,

Helen Mayer Harrison and Newton Harrison