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Survival Technology

Arnold Pacey's book, *Technology in World Civilization: A Thousand Year History* argues that survival technology, the technology of production of food and other basic necessities, is dependent on the local environment and requires local solutions rather than solutions dictated by "technologically superior" scientists from other areas. Every culture has had a long experience with the environment they live in and have developed ways to make food and other basic necessities. When outsiders with advanced technology interfere without taking input from the natives they can cause more damage than they solve.

One of the most basic principles of survival technology is that the most advanced solution is not necessarily the best solution. An example of this principle occurred in the 1940s in India and China. Both countries took different approaches to solve their malaria problems. India which was more open to western ideas decided to spray the walls of every dwelling in India with DDT to kill the malaria carrying mosquitoes. On the other hand China, which was not able to afford DDT, decided to inform the populace on how to avoid malaria, redesign the water courses and improve housing all in an attempt to reduce malaria. India had a more drastic drop in malaria cases, but China's drop was more permanent. By the 1970s malaria cases began to rise in India, because of mosquitoes with immunity to DDT.(1) The quick technologically advanced solution was inferior to the steps the Chinese took to reduce the amount of malaria.

Forcing advanced technology onto areas without that technology is usually not a good idea without proper thought put into it. A tractor would be less than useful to the average farmer in a technologically poor area. Without the training in the use of the tractor it would likely break down and then become a worthless waste of money. Also tractors are more expensive than standard farm tools and would become a major drain of resources of the standard farmer. Also in Africa the type of farming performed would become impossible

with tractors.

In certain areas of Africa multistory farming is performed where crops are intermixed with trees that were not cut and fruit trees that were planted with the crops. Another method of African farming is intercropping where a mixture of complementary crops are grown in a field.(2) In situations like these tractors would prove less than useful as there are no single large areas where one crop is grown. Anybody trying to solve the problems of survival in Africa by using the advanced technology of tractors is going to accomplish less than if they went about it in a different way.

African farmers also came into trouble when Europeans tried to force the farmers to move from multistory intercropping to monocropping that the Europeans used where they filled a large area with just one crop. The technique of monocropping served the Europeans well in Europe and North America and they assumed that it would work equally well in Africa. The problem with European monocropping is that for large periods of time during ploughing and sowing the ground has no vegetable cover and erosion and leaching result.(3) This is more of a problem in areas without the best soil to begin with, like Africa, though even in America in the thirties the destruction of the soil from monocropping created the dust bowl. The African method protected the soil from erosion with tree cover and fertilized the soil with leaves. Switching from the African method to the European method caused a lot of damage to the soil in some areas of Africa. This leads to another principle of survival technology which is that not all techniques are universally applicable.

In survival technology "scientific knowledge of such things as photosynthesis and genetics has universal validity," while "methods of planting crops and providing them with water...depend on the ecological particulars of local environments."(4) Too often scientists seem to forget that certain techniques are local not general. Techniques from one side of the world will not necessarily work on the other side of the world. Scientific principles may

translate from area to area but applications of those principles may need to be tailored to the local area.

Another principle of survival technology is that simple solutions are usually better than complicated ones. Europeans often make this mistake when they only think about technology in its aspect of engineering. When the Europeans looked at farming in Africa they assumed that the farmers did not have much knowledge of irrigation, because there were no big engineered canals and dams for irrigation. What they failed to notice is that African farmers used water runoff from hills and natural floodplains to supply water to their crops without having to waste time and effort building irrigation canals and pumps. African farmers farmed their land to take advantage of natural irrigation which is more efficient than building irrigation structures.(5)

Gradual simple solutions generally work better than large complicated methods that try to solve all problems with food supply in a decade. Gradual simple solutions can usually take into account the techniques that the farmers are already using and make small improvements that they can handle to increase food supply. As the gradual improvements increase over time the food supply does also. On the other hand big complicated solutions totally overhaul the agriculture of an area, cost a lot of money and are hard for farmers to get used to. Because the new huge change is hard to get used to in a short amount of time the farmers are less than expert in the new technique or technological item. In the first couple of years after the big change production might go down because the farmers are not able to be as efficient as they were with their old techniques. In many cases they just abandon the new change all together and go back to the way it was before.

The last and possibly most important principle of survival technology and one that has been hinted at throughout this paper is that scientists must depend and take into account the existing techniques, environment and input of

the farmers when they make attempts to improve survival technology. An example of this principle occurred in India when Indian plant breeders at agricultural research stations tried to improve crops to improve the yield of farmers. The problem with the Indian plant breeders were that they did their experimentation and research on good soil while the average Indian farmer had to farm on poor soil. The ordinary farmers had to do their own experimentation and research with new crops on poor soil before the new crops proved to be a success. In fact in some cases the farmers picked crop varieties that had been rejected as useless by the official plant breeders rather than the approved plant varieties. In one case the farmers chose rice variety IR 24 and experimented with it and created rice that was more resistant to local pests than any of the official rice varieties created by scientists.(6) The problem with the scientists is that they did not consider the local conditions of the farmers and instead created crop varieties that would function best in ideal situations where the soil was good and pests were not a problem. This was so far from the reality of the average farmer that the work of the scientists accomplished much less than it would have if they had considered local conditions.

Another example of this in India came when scientists were trying to develop a method to control a local weed. The local farmers could not afford chemical herbicides, so they developed a way to control the weed. The weed was most vulnerable a month after the crop was sown. At that time the weed could be harrowed, but the rice was at a stage where it would not be harmed. When the scientists heard of this and confirmed it through experimentation, two of them called it "a turning point in making us realize that local practices are not altogether irrelevant."(7) The problem with a lot of attempts to improve survival technology is that techniques already developed by local farmers is not given enough weight by the scientists trying to improve the technology.

In conclusion the scientists who try and improve survival technology make many mistakes that make their efforts less than successful. The scientists

often do not have enough respect for the farmers who make their living at survival technology and instead tend to ignore the techniques that the farmers have already developed. This is unique to survival technology as there is no other technology division where the researchers would totally ignore the contributions and suggestions of those using the technology. These problems are only exacerbated when the scientists come from different areas and cultures than the farmers there supposed to be helping. In those cases the scientists not only ignore the contributions and suggestions of the farmers they generally are ignorant of the environment as well. It would probably be best if the scientists would talk to the farmers they are trying to help.

Works Cited

1. Arnold Pacey, *Technology in World Civilization: A Thousand Year History*, Basil Blackwood, 1990, pg 189
2. Ibid, pg 199
3. Ibid, pg 199
4. Ibid, pg 199-200
5. Ibid, pg 199
6. Ibid, pg 192-193
7. Ibid, pg 193