The Clothesline Paradox

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A few years ago Peter Van Dresser mentioned the Clothesline Paradox.

Solar Energy advocates are continuously humiliated by being show "energy Pies". Slices are assigned to coal, gas, oil, hydroelectric and even nuclear, but solar energy is evidently too small to appear. I have a typical energy pie from the Ford Foundation whose source is the U.S. Bureau of Mines. The large pie is split into 5 pieces. Petroleum - 46%, coal - 18%, natural gas - 31%, hydro power - 4%, and nuclear - 15%. (An asterisk notes that wood has been omitted-why?) We are frequently reminded that the energy we advocate - solar energy - must, after the proper technical efforts, appear alongside coal, oil, natural gas and nuclear before it will make an "impact". ERDA in its different energy consumption predictions assigns only a thin wedge of the pie to solar energy and then only as a faint hope 15 to 25 years from now. The demoralized reader is then ripe to be persuaded of the necessity of nuclear power plants or offshore drilling. The accounting system shows that he has done absolutely nothing with solar energy. He lacks even a trace of a useful habit or activity that he could build on. As Peter and I discussed - if you examine these figures you find the cards are stacked against solar energy.

If you take down your clothesline and buy an electric clothes dryer the electric consumption of the nation rises slightly. If you go in the other direction and remove the electric clothes dryer and install a clothesline the consumption of electricity drops slightly, but there is no credit given anywhere on the charts and graphs to solar energy which is now drying the clothes.

The poor old sun is badly mistreated by such graphs. In the first place the obvious should be pointed out; that coal, oil and natural gas are all solar energy products stored ages ago by photosynthesis, and hydroelectric power is solar energy no older than the weather patterns which dropped the precipitation flowing through the turbines.

The graphs which demonstrate a huge dependence on fossil fuels are fine in one respect. They are alarming. But they are very bad in another respect. They are misleading. Misleading to such an extent that they blind people to obvious answers and prime them to a frenzy of effort in poor directions. Attention given to such graphs and charts trains people to attempt to deliver what is shown in these accounting systems rather than what is needed.

If you drive a motorcycle, the gasoline you consume appears in the nation's energy budget. If you get a horse to ride and graze the horse on range nearby, the horse's energy which you use does not appear in anyone's energy accounting.

If you install interior greenhouse lights the electricity you use is faithfully recorded. If you grow the plants outside no attempt is made at an accounting.

If you drive your car to the corner to buy a newspaper the gasoline consumption appears. If you walk - using food energy - the event has disappeared from sight, for the budget of solar energy consumed by people in food is seldom mentioned.

The Ford Foundation's energy study shows the U.S.'s energy consumption in 1968 at about 62 quadrillion Btu or, 310,000,000 Btu/person/year or, 310/365 = 850,000 Btu/day. If the average daily caloric intake is 2500 Kcal., this is approximately

10,000 Btu/day/person - about 1.2% of the total consumption listed by the Bureau of Mines. But this 1.2% doesn't appear anywhere on the graphs. Nuclear energy with 1% does appear. The food is obviously solar energy, why is it not included?

What about the question of the energy used in growing the food? Can't we treat this in the same way as the coal burned to generate electricity? If we use the figure of .5% efficiency (Ayres and Scarlott) this means we have consumed approximately 2,000,000 Btu/person/day of sunlight in producing the 10,000 Btu/person consumed. Solar energy then immediately fills over 2/3 of the new energy pie. If we aren't allowed to show the actual sunlight required for our 10,000 Btu/person, then what about power plants? Why is it that when they burn 4 Btu of fuel for every Btu delivered as electricity all the consumption appears in the energy accounts rather than the 1 Btu?