A Good Idea? Coal, Oil, and Admiral Fisher

Halstead Harrison,  
1991 ["Gulf I"]: revised slightly in 2003 ["Gulf II"]

I've been musing recently .. I don't know what set me off on it .. over a sensible seeming technology that never really contributed much, and wondering why that was so. Perhaps it wasn't really all that good? Or perhaps it failed for some social reasons that I don't quite grasp. And I've been wondering, too, about how many sensible-seeming innovations just don't happen .. lots of them I imagine, and why not?

My story begins with Admiral Fisher, Britain's First Sea Lord between .. roughly .. 1906 and 1910, and then again called back from retirement by Churchill between .. roughly .. 1913 and 1915. Fisher was a strong personality, hyperactive, and a driving force on England's side of the dreadnaught arms race preceding World War I. [Tirpitz played similarly in Germany. Sims in the US.] Fisher decided early and emphatically that the new ships should burn oil, despite the obvious and glaring counter argument that England didn't have any.

With the technology of that day oil permitted smaller bunkers and crew, longer range between refueling, higher speeds, and weight savings that could be allocated to longer cruising range, or bigger guns, or stronger armor. Oil made less smoke [with then-current technology; we can do it better now], which was tactically important, and re-coaling was a dirty job that all sailors hated. The advantages of oil were obvious.

But England, rich in coal, had no oil at all.

What to do about this? England .. actually, it was Balfour, I think, then Chancellor of the Exchequer .. did an apparently sensible thing: they bought foreign oil, imported it, and set up an emergency reserve. [Sound familiar?] Most of that oil came from Mexico, after the Diaz revolution of 1902. A "lavish" reserve was set up to run the fleet for an inconceivably long war of two whole years. The British Admiralty further assumed that control of the sea would permit importing more oil, as needed. It neglected submarines, a still-nascent technology when the decisions were being made.
Sometime during the early Fisher years someone suggested that the oil reserves could be extended by mixing in powdered coal. Fisher reacted furiously to this, judging it a diversionary, tactical argument brought by his fiscal and personal enemies solely to delay his dreadnaught program. He wanted his ships, and he wanted them RIGHT NOW.

A test was made anyway, and a freighter was outfitted to burn coal-oil slurries. It steamed around for a few winter weeks in the north Atlantic, with ambiguous results: the oil-coal slurries indeed worked, but there were problems with sedimentation, burner-nozzle erosion and carbonization, and pump wear. All of these problems, I judge, were "ordinary", to have been expected, and none so serious as to govern so important a decision. Competent engineers could have addressed them all, and they did.

Fisher, nevertheless, vigorously [indeed, explosively] emphasized all the problems, brushed aside all the benefits, and forced the dreadnaught build-up with conventional oil combustion, only.

Interestingly, coal-oil slurries have higher energy densities than oil alone; they would have permitted further reduction in bunker volumes and further increments to trade-off for firepower, armor, and speed. Had Fisher considered this, he might plausibly have decided otherwise. Or he might not: Better is always the enemy of Good Enough, and I cannot argue firmly that Fisher was wrong.

But a fearful price was paid for his decision in the two wars that followed. In both, submarine attacks upon oil supply lines were nearly fatal. The world might be very different.

Now, today, both England and the US are similarly oil-intensive and both are economically and militarily vulnerable to oil supply, while sitting on large coal reserves. Both countries import oil and close mines. The US imports about half its oil and maintains reserves sufficient to last a few months, only. [In a pinch we could ramp up domestic production markedly, for some moderate period.] England depends heavily on the North Sea natural gas fields, which are now depleting rapidly. We depend heavily on the Prudhoe Bay oil fields, which are also depleting rapidly.
Coal-oil slurries are presently used in niche markets, only. Coal-water slurries are used here and there for transporting coal through pipelines over relatively short distances into settling ponds, from which the water is then recirculated. I know of no significant use of coal-oil slurries for electric power production. Neglecting very large, but externalized costs of the Gulf Wars and their likely sequelae, the short-term economics seem clear: the price difference between oil and coal is too small to support the extra costs of pulverizing the coal, and the extra costs of pollution abatement. As we worry about global CO2 burdens, coal is worse than oil. And deep-mining coal is a not job we should ask of good people.

Yet ...

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