

and without engineering applications and which are instruments for employing national power.

That is obvious, you say. All right, let us speculate. Why was it that Greece never became a viable, major, powerful country, except in the extension of its culture? Not in its power. It was very ephemeral. Why? Why was Rome the leading power of the world for 960 years, and it never pretended to have the culture of ancient Greece? It merely borrowed from it. Why? Why was it that Germany, in World War I, quite a small nation in terms of European population, or of Western civilization if you like, was on the verge of winning a war against most of the great powers? Why did that small population, with very few natural resources other than coal and iron and forests, dare to challenge the great power history of industrial England, Pax Britannica, for 100 years, and the sleeping might of the United States, and then the power of France and the allies? How could this be done?

All right. Let us pass to another. How could Japan set out to dominate Asia? A nation that was relatively uncivilized in the modern sense as late as in the year 1,000, while the mainland of China had developed the greatest culture of the world before even the Mediterranean Basin, from which our culture stems? This great culture of China, with its enormous population--how was it that a small island kingdom, with only 10 percent of its land arable, with no suitable supply of raw materials, was able to not merely subjugate this teeming mass in spite of its ancient culture, but in addition very nearly all the rest of that hemisphere and raise hob with the kind of weapons that we, the Western world, initially sent over there?

Many of you who fought in that campaign will understand what I mean. How? The answer, gentlemen, was not politics, it was not economics in the ordinary sense. In my thesis economics tries to explain the results from applied science and technology. Science and technology provides the products and services with which economics tries to deal. It is the application of scientific knowledge to the useful purposes of men that provides the national standard of living.

In earlier lectures in this College I have shown data taken from the United Nations which showed, strangely enough, that the standard of living in the civilized countries and many of the advanced Asiatic countries was quantitatively proportional to the amount of kilowatt hours of energy per unit of population in those countries.