

sciences, which are not true sciences at all; they are arts. Why are they arts? Because, gentlemen, we cannot truly measure their manifestations. As Lord Kelvin said, in one of the most perceptive statements, I think, ever made, "It isn't scientific if you cannot measure it." It is as simple as that. So remember now that the scientist deals with accurate, quantitative data within the limit of quantitative measurements, and hence science has progressed only as fast as its ability to measure accurately.

Once in the early days of atomic energy on this platform I used an example to give an understanding of this concept. Thus, if you had a 5-ton iron ball here and you heated it up from the room temperature until it was ready to melt, at, say, 2300 degrees Fahrenheit, or thereabout, you would put a tremendous amount of thermal energy into that iron ball. Sure, it weighed five tons when we started, and if Einstein was right, that E equals mc -squared the ball should be heavier when hot. How much heavier does the ball actually become? Twenty milligrams, twenty thousandths of a gram, and a gram is roughly one-five hundredths of a pound. Is it any wonder, then, that no one discovered atomic energy? There were no weighing instruments for measuring a five ton mass that accurately. You could not really develop an understanding of atomic energy until you had a means of measuring it.

This is what determines a true science. In the social sciences one seldom if ever, can measure phenomena in this sense. So we are compelled to assert our conclusions! Thus it has been said that social scientists can seldom find universal agreement from their colleagues. They suffer from the lack of a rigorous and inexorable mathematical proof for their conclusions and furthermore have likewise denied to them the experimental verifications so essential to all new scientific hypotheses. Scientists cannot quarrel about who is right and who is wrong. They have to run an experiment, and the experiment tells them who is right and who is wrong. This separates true sciences from the quasi-sciences, the pseudo-sciences.

It was popular 20 years ago to put the label, "science," on any academic area or discipline. This sort of lent it a new dignity. Gentlemen, it did not change it any. Do not confuse social science with true science. It is an art, a very difficult art, an art that has far more problems connected with it, because of its inability to measure what it does. You cannot prove the law of supply and demand. Why, an American president even suspended that law.