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WEIGHTS, MEASURES, AND NUMBERS

The friction between the English system of weights and measures and our number system is a cause of much wasted time. The English system is based on two, three, and their multiples, especially twelve: the foot contains twelve inches, the pound and the pint each contain sixteen ounces, there are 640 acres in a square mile, etc. When we want to convert one unit of measurement into another, in order to add quantities of inches and of feet, for example, we must multiply or divide by such numbers as twelve and sixteen, and in our decimal number system such operations are tedious. If only there were ten inches in a foot, we could rattle off the fact that two feet plus thirteen inches were equal to three point three feet, and similar simplicity would characterize all other calculations in weights and measures.

The large majority of the world now uses a system of measures that is based on ten: units of length in the metric system progress by ten from the Angstrøm to the myriameter, and units of area, volume, and weight progress in the same way. Furthermore, the metric units of weight are equal to the weights of the metric volumes of the most common substance in the world, water, so that

anvone can use water to convert a meter stick to a scale and a scale to a measuring cup. Intelligent persons who are willing to spend a few hours initially to save much more time in the future and who see the obvious superiority of the metric system to the English one are advocating that the United States stop worrying about the difficulties of learning a new system and make the change now that it will eventually be forced to make, the adoption of the metric system.

This is rather abrupt. It would be better to use some adversative conjunction like "However," "Yet," or "Nevertheless."

I disagree. The English system of weights and measures is based on multiples of two and three for an excellent reason: it is these numbers by which we most often divide the measurements which we make. A foot can be divided into two, three, four, or six parts of integral numbers of inches, but a foot of ten inches could be split only into two or five such parts. We could have divided inches into tenths, but it was more convenient to divide them into halves, fourths, etc. Even where the metric system is used the units of time and of angles progress by sixties, making division by two, three, four, five, and six very easy. A change to the present metric system would remove one cause of tediousness, but would substitute another.

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The solution of this dilemma is simple. Before we alter our system of weights and measures, we must change our number system from a decimal to a duodecimal basis: we must have twelve, instead of ten, digits. Consider the advantages of this change. We now regard numbers like five, ten, one hundred, and one thousand as round numbers, and, for convenience in calculation, we often choose quantities that correspond to these numbers: the dynamics of demography are expressed in units per thousand, and goods, from stationery to sand, are sold in quantities of one hundred pieces or pounds. As a result the number of ways in which we can divide the principal quantities of goods that are sold is small: we can not even divide a ream of paper into three equal parts. In spite of our decimal number system, however, we sometimes choose duodecimal quantities, such as the dozen. The ream is often 480 sheets instead of five hundred. The proposed change of our number system would remove the only obstacle to the selection of duodecimal quantities, that of cumbersome calculation, and decimal quantities would disappear. Moreover, pure mathematical calculations would become easier: in a random sample of numbers, we must laboriously divide two-fifths of them by every prime

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number up to their square roots, except two and five, to find whether they themselves are prime numbers; in a random sample of numbers written in the duodecimal system, however, only one-third of the numbers would require such a treatment.

As soon as we had adopted the duodecimal system, we could adapt the present metric system to it, perhaps keeping the meter and altering the other units (the kilometer, for example, would become 1728 meters, but this number would be expressed with figures corresponding to the present one thousand). Then we would enjoy the advantage of the English system, manipulability, and the beauty of the metric system, conformity to the number system, as well as the advantage of a more versatile number system for general use. I admit that the con conversion of all the decimal numbers so far printed to duodecimal ones would be a large task, but the longer we wait, the more printed numbers there will be, and the greater the effort that will be needed. If we look at the amount of time we can save for posterity in the indefinite future, the time required for this change will seem tiny indeed.

A- An excellent essay, full of controlled good humor, precise information, and accurate statement. Your tone is consistent and consistently right. Only one objection to your proposal occurs to me, that we would have to find new names for all our numbers, since the present names of all numbers above 10 imply a decimal system.