MISCELLANEOUS.

Written for this Paper.

THE METRIC SYSTEM.

Utah is soon to start upon a new life. In a short time the people of the Territory will be called upon to assume the exclusive management of their public business, and it will then be their privilege to devise and prescribe within certain limits the methods for the regulation of their affairs. The most important instrument in all business, public and private, is the system upon which the qualities of matter described as distance, volume, weight and value are defined. This fact has become thoroughly appreciated by modern civilization. Within fifty years practically every enlightened nation in existence has joined in some degree a general investigation of the subject, with a view to the final adoption of a perfect international system of moneys, weights and measures. The United States was among the first to fully recognize the barbarous crudities of the ancient standards and to look to modern invention for something better. It was indeed the founders of the Republic who inaugurated the work of reform in this direction. An emphatic testimony of that fact appears in the messages of President Washington to Congress. Following is one of his utterances on this subject:

"A uniformity in the weights and measures of the country is among the important objects submitted to you by the Constitution, and if it can be derived from a standard, at once invariable and universal, must be no less honorable to the public councils than conducive to the public convenience."

Again, in 1821, Mr. Adams said:

"Uniformity of weights and measures, permanent, universal uniformity, adapted to the nature of things, to the physical organization and moral improvement of man, would be a blessing of such transcendant magnitude that if there existed upon earth a combination of power and will adequate to accomplish the result by the energy of a single act, the being who should exercise it would be among the greatest benefactors to the human race."

The same statesman is author of the following eloquent eulogy upon the Metric system:

"The system approaches to the ideal perfection of uniformity applied to weights and measures, and whether destined to succeed, or doomed to fail, will shed unfading glory upon the age in which it was conceived, and upon the nation by which its execution was attempted, and has been in part achieved. In the progress of its establishment there, it has often been brought in conflict with the laws of physical and moral nature, with the impenetrability of matter, and with the habits, passions, prejudices and necessities of man. It has undergone various important modifications. It must undoubtedly submit to others before it can look for universal adoption. But if man upon the earth be an improvable being, if that universal peace which was the object of a Savior's mission, which is the desire of the philosopher, the longing of the philanthropist, the trembling hope of the Christian, is a blessing to which the futurity of mortal man has a claim of more than mortal promise, if the spirit of evil is, before the final consummation of things, to be cast down from his dominion over men and bound in the chains of a thousand years, the foretaste here of man's felicity, then this system of instruments, to accomplish all the changes of social and friendly commerce, will furnish the links of sympathy between the inhabitants of the most distant regions; the meter will surround the globe in use as well as in multiplied extension, and one language of weights and measures will be spoken from the equator to the poles."

Many methods and devices were proposed by our revolutionary leaders with a view to a reformation, but none prevailed at that time in this country except the system of decimal money. Our table of mills, cents, dimes and dollars, with its uniform ratio of ten, was then determined and established by law, and as will be seen later, became a model for the international, or metric system, formulated some years after by the French republic.

A brief comparison of this decimal money system with the heterogeneous coinage of Great Britain will serve appropriately to illustrate the inestimable blessing which this one reform brought to our country. Here are the two tables:

English Money.	*U. S. Money.*
4 farthings=1 penny.	10 mills=1 cent.
12 pennies=1 shilling.	10 cents=1 dime.
20 shillings=1 pound.	10 dimes=1 dollar.

Suppose one wishes to know how many farthings are contained in nine pounds, on the one hand and how many mills are contained in nine dollars on the other. In the first case he must reduce his pounds to shillings, his shillings to pence and finally his pence to farthings, requiring three processes of multiplication, with all the attendant mental calculations, thus:

9 pounds.
20
180
12
2160
4
=8640 farthings.

To reduce $9 to the denomination of mills, it is simply necessary to write down the 9 and add three ciphers, which is equivalent to multiplying by ten three times, thus:

$9=9.000 mills.

The English method requires, therefore, in this case, the equivalent of twenty figures (including lines) and the mental process of eight multiplications. Whereas, the same reduction is performed in United States money by the writing of four figures and with no mental exertion whatever. In proportion as the amounts to be thus handled are larger than the example chosen the more enormous become the advantages of the decimal system, and this is but one of the simplest of an infinite variety of examples that might be drawn from ordinary business transactions. This simple comparison of the English money with the money of the United States is in some respects the most forcible illustration which science affords of the contrast between the semi-barbarous contrivances of the middle ages and the enlightened methods of modern civilization.

With the invention of the decimal money system the reform energies of our leaders of that period seem to have taken a temporary relapse, for it was left to the more volatile spirit of France to take up the work so splendidly begun and carry it on to perfection. The great difficulty experienced by the first agitators of a reform in weights and measures was in securing a unit of measurement which might be reproduced from nature, in the event of losing the artificial standard. The difficulty was finally overcome by the French, who for the purpose of a standard calculated as they supposed the exact length of a quadrant of the earth's meridian, of which they took the $\frac{1}{10000000}$ part for a unit of measure; the fraction thus derived is equal to 39.37 English inches, and is known as the meter in the international metric table formulated upon it.

The reform made little progress among other nations for nearly half a century, the rest of the world being disposed rather to criticize while France did the work. In 1870, however, the general interest became so great that an international convention was arranged to meet at Paris for the purpose of settling all doubts as to the stability of the metric system, and to make any adjustment that might seem necessary to secure a harmonious approval.

Practically every civilized nation was represented at this convention, and its deliberations finally resulted in the establishment of the International Bureau of Weights and Measures, which held its meetings at Paris and was supported by pro rata contributions from the powers participating. The labors of the convention closed in 1875 with a formal approval of the metric table as it now stands.

The system became at once the standard of France, and many of the other powers, who emphasized their acceptance by declaring all other weights and measures illegal. Other nations have one by one imitated this example until the United States and England remain practically the only nations in Europe and America that recognize the old standards. This fact has been quoted as evidence that the people of England and the United States do not want the metric system. Let us see how much truth there is in such a conclusion. As early as 1865 the House of Commons, which is peculiarly the mouthpiece of the English people, passed an act making the metric system the exclusive standard of Great Britain; the House of Lords with which the people hold virtually nothing in common, promptly vetoed the bill. Another measure immediately took its place, and became a law, which legalized the metric table, but permitted a continuance of the old standards. This puerile measure was imitated by the United States Congress in the following act:

"It shall be lawful through out the United States of America to employ the weights and measures of the metric system, and no contract or dealing or pleading in any came shall be deemed invalid or liable to objection because the weights or measures expressly referred to therein are weights or measures of the metric system."