CALENDAR REFORMS AND METRIC REFORMS.

BY RUFUS P. WILLIAMS.

There are people even now who believe the earth to be a flat plain. Astronomers of the past generation recall an Englishman, Parallax, who, challenging proof of the sphericity of our globe, made a heavy bet on his contention. Though he lost he was not convinced. We once talked by the hour with a man who held this same view, though he had fair intelligence on most subjects. Such freaks are relics of bygone ages who would have been very much at home prior to Columbus and Galileo. But they seem not far behind living opponents of metric reform. Every progressive scientific reform has its laggards and opponents, who think the old order is best. The ways of their grandfathers are good enough for them. They prefer the horse car, or "hayburner," to the trolley or automobile.

Metric reform is no exception to the rule. One of the most notable instances in history is the change of the Julian calendar to the Gregorian. The adoption of this latter by one nation after another, after violent opposition, furnishes so complete a parallel to the metric reform movement that we give it at some length. The story of how Julius Caesar in 45 B. C., following the computations of Sosigenes, the Alexandrian astronomer, decreed that the year should have $365\frac{1}{4}$ days is familiar to all, as is the fact that Pope Gregory XIII in 1582 made Old Father Time move his clock ahead ten days. Two motives seem to have actuated Gregory. (1). The equinoxes were getting out of gear. Caesar's calendar made too many leap years, 407 in fact, since the great dictator issued his almanac, 12 more than the astronomers of Gregory figured ought to be, in order to have the vernal equinox fall on the same day as in 45 B. C. This made the equinox so much behind. It would continue to grow worse and in time the reckoning would be as bad as in Caesar's time when the spring kalens might fall in the autumnal period. Some date must be fixed and the leap years readjusted. (2). Being also a devout believer in Athenasianism whose tenets, as opposed to Arianism, had been forever fixed on the Christian world by the convention of Nicaea in 325 A. D., Gregory conceived of the idea of fastening the date of that great event upon posterity by making the vernal equinox fall on the exact day in which it fell in 325, viz., March 21. In this he was assisted by the Jesuite astronomer Clavius.

As the Nicaean convention was the second important religious act of Constantine the Great, the first and greater being the adoption, only 12 years before, of Christianity as the state religion of the Roman Empire, Gregory's calendar revision had a strong religious flavor, and, coming as it did, at the time when Protestantism was making headway, it met with violent opposition. There is here no intended parallelism to the case of the metric system and the English, except that one of the strong points of opposition to the metric formerly was its being the product of atheistic France in its revolutionary period. Such puerile criticism is little indulged in at present, for everybody knows the men employed to work out the metric reform were among the ablest mathematicians who ever lived. The parallel in the reform calendar and the reform measures consists in the slowness of adoption of each. The slogan of F. A. Halsey with which in one of his tirades against reform he closed every paragraph, was "In weights and measures we are irrevocably chained to the past." So said England and so said Germany about the calendar, and so it has been time without end by every opponent of every reform. Galileo, Columbus, Watt, Fulton, Morse, Field, and all reformers who have sought to benefit mankind join their eloquent testimony. Such opponents have been well characterized as only flies on the wheels of progress, whose insignificance will be seen when the reform has culminated.

It took Germany 118 years after the Papal Bull had been issued to break away from the old order. Denmark and Holland also waited the same number of years before requiring by law the revised calendar. For 170 years England clung to the Julian order, and Sweden a year longer. Caesar's almanac is still good enough for Russia and Greece, even after 325 years since the reform began. Yet does any one imagine that these countries will always go on at a variance with the rest of the world, making the double system of dating necessary for all correspondence? It may surprise most people that the Julian calendar is still in use in these United States; yet such is the case. The writer, taking a trip a few years ago through the Kentucky mountains, found it there among our "contemporary ancestors," who still continue to celebrate Christmas according to the English "old style," and this 150 years after the adoption of the "new style" by most of the English speaking people. To

be consistent Mesrs. Dale and Halsey should lose no time in declaring the Gregorian Calendar a failure, as well as a fallacy. But let those who think the progress of the metric system has been slow ponder well the adoption by the various states of Europe of our present calendar. By comparison, the International metric system has made very great speed. In little over a century its use is required in the custom houses of most of the civilized countries of the world, and is very largely used in every nation, while with the exception of England and our own country, the most progressive nations make its use compulsory. Again, let questioners recall that the Mohammedan nations are so far behind in their almanac that they have not even adopted the calendar that Julius Caesar promulgated forty-six years before Christ. The man who studies the history of any intellectual, moral or physical advance will find at every point these human obstructors who are either incapable or unwilling to see beyond their own immediate environment. But the opposition to the metric reform is mild indeed compared to that in England, for example, where riots accompanied the carrying into effect of the new dates where the feeling of the laboring class was the loss of thirteen days out of life, with attendant loss of wages. Now the opposition is a financial and an intellectual one. Yet who can believe that the calendar opponents were any more short-sighted than are the metric opponents of today? For less of a dictator than Caesar it would have been impossible to bring order out of the chaos into which the calendar had fallen. With a man less powerful than the Pope, the Gregorian reform would not have been, and we still might be in the same chaotic state in reckoning time, as we now are in weights and measures.

For an example of the persistence of custom one has but to consider the history of Christianity from its humble beginnings 2000 years ago. Let one study the evolution of constitutional governments, noting the slowness of progress. Take coinage and printing. The first coins are said to have been stamped about 700 B. C. One is surprised that stamping on paper, or printing, did not follow for nearly 2000 years. Dr. Mendenhall once said that a volume a foot thick could be written on the persistence of custom. The educated mind moves slow; vastly slower the untrained.

Measured by almost any standard the progress of the metric system has not been slow. It is now but little over a century since it was worked out and first introduced into France. But Napoleon went back to the old order, and France, the first nation to adopt it permanently has had it in operation only 67 years, or since 1840, when it was finally made compulsory. Since that time it has spread with varying rapidity over the civilized world. In Germany its compulsory use dates from 1872, 35 years ago.

The following statement from a textile manufacturer shows the rapidity of its growth:

"As a reply to those who persist in asserting that on the Continent, where the Metric System is compulsory, the old weights and measures are still to any appreciable extent in use. I may say that, on a recent visit to Germany, I had an opportunity of enquiring, in manufacturing circles, into the truth of these allegations. I was everywhere told that they were devoid of all foundation and that the present generation did not even understand the old weights and measures except in so far as they learnt such in any particular trade they engaged in and which custom had preserved just as it preserved old terms, which had no meaning for others outside that trade. Such instances one can find by the hundred in this country, alongside our own weights and measures.

The conversation turning on land, I made use of the old German measurement, 'Morgen,' almost the equivalent of our 'Acre.' I asked how much a 'Morgen' was and neither of my companions, both educated young Germans, aged about 29 and 31, could tell me. 'We do not talk about "Morgen,"' they replied. 'We say, "Quadratmeters."' Our business conversation was on textiles and no other German measurement was once used except meters and centimeters. To find any other weights and measures in shops or business houses but the metric, you would have to travel into some very outlandish places."

That in so short a time it should have superseded all other systems as *the system* of scientists, and in the main as the system for governments, as well as very largely in popular usage, illustrates in a striking manner the law of survival of the fittest. Its progress has been vastly more rapid than the march of Gregory's calendar. How can one contemplate these two reforms and not believe in the ultimate triumph of the metric system? If opponents will take a fair view they will see that the

utmost they can do is to hinder for a brief time the coming of this reform; to make young students waste a few more years of life over doggerel weights and measures; to try to block the course of American commerce with foreign nations; to attempt to hinder the inevitable law that the best will finally survive. At life's end they will look back on having accomplished the above brilliant achievements.

THE PHYSICS CLUB IN A NORMAL SCHOOL.

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The great need of normal school students, as indeed of all students, is constructive thinking. Whatever brings out the pupil's originality and exercises his real genius in what counts towards making him a power in the world. This power rightly directed, being the purpose of education, is of utmost importance in school work. This furnishes the reason for teachers being required to know so much more than the mere facts that they teach. Perhaps it is equally true in other vocations that men to make noted success must know much more than the facts with which they deal directly. Among other things it is recognized that a knowledge of elementary physics is fundamental to every educated person. This being true it is especially necessary in the education of the teacher. Then the question is, how shall the subject obtain its maximum value in the schools? We are not yet satisfied with our teaching of physics. And while the outlook in this direction is more promising than ever before, still the conglomeration of laboratory exercises, lecture table experiments, and class instruction that we teachers force upon our students, often simply mystify them without giving a clear conception of any one phenomenon in its entire relations. It is in the interest of wider and better thinking that we have organized the Physics Club.

The Physics Club of the Oregon State Normal School has been in operation over three years with a steady interest. The membership each year has been about 50, with an average attendance at the meetings of about 35. The meetings are held on Thursday evening of each week from 6:30 to 7:30. Part of the time the meetings are held only once in two weeks. The programs are