A New and Improved System of Numeration and Measurement.

(Concluded from page 134.)

After having contrived a system of numerating which would be, certainly, without defect, let us fix upon a system of weighing and measuring which will dispense with all useless irregularities, one which will be applicable to all materials, and meet all requirements, both ordinary and scientific. Philosophers have been much puzzled to fix a standard of weight and measure, and no natural standard is at present made use of; none has been found sufficiently perfect. Barleycorns, feet, grains, &c., vary too much. But there is in nature a very good standard for both weights and measures, a standard always at hand and easily employed. Such a standard is a drop of water—of distilled water—or rather a certain number of drops dripped from a small-mouthed phial. Upon this base we can form a table of liquid measures applicable to all liquid materials. Thus (10 stands for 8):

10 milistiles (from the Latin *stilla*, a drop)		1 centistile.
10 centistiles		1 decistile, or destile.
10 destiles		1 stile—the unit.
10 stiles	make	1 dekstile.
10 dekstiles	"	1 hekstile, (one teaspoon full.)
10 hekstiles	"	1 kilistile, or kil.
10 kils	"	1 Prote, (equal to four-fifths of a pint.)

The above table is rather for minute measurements. For ordinary requirements a decimal division seems to be too large. Prote is a Greek word signifying *first*, and would denote the most common liquid measurement, about an ordinary tumbler full. For ordinary use we could form a table of larger measurements, thus: (4 is half a double number here)

2 moits	make	1 prote.
4 protes	"	1 tesser.
4 tessers	"	1 urn (3 1-5 pints.)
4 urns (1000 protes,)	make	1 cask, (about 6 2-5 gallons.)

UNIVERSAL WEIGHTS.

10 millines	make	1 centine.
10 centines	"	1 decine.
10 decines	"	1 stil, (the weight of a drop.)
10 stils	"	1 decade.
10 decades	"	1 hectade.
10 hectades	"	1 kiliade, (1 1-2 ounces.)
10 kiliades	"	1 litre, or weight, (full 12 ounces.)
1000 litres	make	1 quarter.
4 quarters	"	1 pas, (about 2,000 pounds.)

These tables are all framed upon the hypothesis that 8 and 9 are abolished, and 64 written 100, and 512 written 1,000.

Dry measure might be the same as liquid measure. There does not seem to be any reason for a special table. We have now given the measures for all solids and liquids, there remains then only to give them length and superficies. We can apply even here the base of one drop of water, but indirectly. The liquid measure is already framed upon it. We will take one prote of water in a cubic measure, and the quarter of one side will be the unit of measurement. This will be about 83-100 or 7-8 of one inch. In hydrostatic measurements it will be very convenient to have the relation between long measure and solid or liquid measure precise and well-known.

LONG MEASURE.

10 milimiters (milets)	1 unit, (about 7-8 of an inch.)
10 units	1 palm, (7 inches.)
4 palms	1 rule, (28 inches.)
10 palms or 2 rules	1 meter, (5 feet.)
10 meters	1 chain, (nearly 40 feet.)
100 chains	1 cast, (106 yards.)
1000 meters	1 kilometer or kile, (half a mile.)

By this table mechanics, surveyors, and engineers would make use of the same measurements—measurements much more convenient than our present ones.

SQUARE OR SUPERFICIAL MEASURE.

100 square units	make	1 square palm.
100 " palms	"	1 " meter.
100 " meters	"	1 " chain, (about 1,600 square feet.)
10 square chains	make	1 hortus, or hort, (about 1-0 of an acre.)
4 horts	make	1 area, (about 1 1-5 acres.)

These make up the sum total of measurements, except that of time, and, upon examination will be found suited to all requirements. In the measurements of time we need a thorough change and simplification. In the first place, it would be a great convenience, if, knowing the day of the week, we could, from that, know the day of the month at any time. At present it is some labor to keep the run of the days of the month, as few commence on the same week-day, and some have 30 days and some 31, and February only 28, except leap-year intrude an extra day to still further confuse matters. There exists a widely-recognized authority for forming the week of 7 days—let us keep it so. The year consists of 365 days (written, new style, 555 days) and a fraction. We could form 13 months of 28 days each—4 weeks—leaving only one extra day to be brought in at the end of the year, thus making all the corresponding days of all months fall on the same day of the week. Leap year would occur twice in every *decade*, adding another day at the end of the year. An equinox or a solstice would be a proper time to commence the year; and as Christmas day is very near a solstice, and also very near the present beginning of the year, it would be fitting for a Christian people to usher in the new year on that day. It would be well, too, to make a new division of the day, making 64 seconds (pulsations) to the minute, 64 minutes to the hour, and 16 hours to the day. The table would then be:

(64)	100 seconds	make	1 minute, (1 1-4 minutes long.)
(64)	100 minutes	"	1 hour, (1 1-2 hours long.)
(16)	20 hours	"	1 day.
	7 days	"	1 week.
	4 weeks	"	1 month.
(13)	15 months	"	1 year.

The hours thus being longer would seem to divide the day more perceptibly—they would be more distinguishable. The quarters would consist of 16 minutes (a decade) and be divisible by divisible numbers in *series*. The dial of a clock would consist of 2 decades; no returning to 1 o'clock, and no more confusing A. M. and P. M. It is not meant that clocks and watches should have 16 figures, perhaps 8 would be a more convenient number, but this would not prevent us counting to 16 hours without returning. The Romans, until lately, counted to 24 o'clock, yet had only 6 figures on their clocks. This made no confusion, every one learning to read the figure 1 for 7, 13, or 19, as these hours arrived. It would, probably be better to have only 8 figures—a decade—as a mere glance at a watch would be less mistakable. It is hard to refrain from further developments of this system as so many advantages from it crowd upon the mind; but it is to be hoped that these will suggest themselves to all thinking minds. At a first glance much that now exists would have to be changed, which seems discouraging, but a further glance will show the change would consist chiefly in destroying much that is useless. The new matter to learn would be little, and that little simple. J. M. Willcox.

Pennsylvania, 1855.

California.—Her Works and Ways.

Our California exchanges are neither few in number nor mediocre in taste and intellectual power. They are generally edited with great ability, and are well printed on good paper; they always contain much that is new to us on the eastern part of our continent. The following articles are abbreviated and collated from our exchanges—more especially from the San Francisco *Chronicle*.

Fortifications on Alcatraz, or Bird Island—This island lies about a mile out in the harbor of San Francisco. It is 140 feet high, one-quarter of a mile long, and 525 feet wide. It is a natural guard-house for the harbor, and is occupied by the U S. Government for that purpose, for it has high steep sides, accessible only in a few places.

The work of fortification was commenced in March, 1854; the amount of $466,000 was appropriated by Congress for the purpose.—There are to be three batteries on the northern, western, and southern sides of the island, to contain, in all, 43 guns, most of which will be 68-pounders. There will be a few 128-pounders and some 42-pounders. The largest-sized guns will throw a ball nearly a foot in diameter. Their range is said to be five miles. All the batteries are in *barbette;* that is, there is but one tier of guns, and they are uncovered—the carriages being protected by walls. The walls of the northern and western batteries are of brick; that of the southern battery is of stone. The last-named battery commands the city, and in the possession of an enemy might be used with terrible effect. It is guarded by a bomb-proof, case-mated battery—a very strong stone building, with walls and roof of solid masonry, many feet in thickness. This battery will have four very large guns looking down along and raking the barbette battery. Before the latter could be used by an enemy, the former would have to be taken. There is already erected on the island a light-house, in which a Fresnel light was placed on the 1st of June, 1854. The light is 160 feet above the ocean level, and may be seen at a distance of seventeen miles.

Tunnel Borer—The *Chronicle* gives the following description of a machine now being built in San Francisco for boring tunnels, and from the description we perceive that it is "Wilson's Stone Cutting Machine," which has been illustrated on pages 105 and 106, Vol. 7, Scientific American:

Gordon & Steen ave at their foundry the model of a late invention for boring tunnels. No description would convey a clear idea of the machine, but we may say that the cutting is done by round plates of steel, about eleven inches wide by an inch in thickness, with a sharp edge. There are four of these plates which revolve upon a center, and are carried round and round in the tunnel, touching the rock at a low angle. The machine has been tried in the hardest New England granite. An engine of sixteen-horse power will be needed to bore a five and a half feet tunnel. At present the purpose is not to sell the machines, but to form a company for boring tunnels, and bore them at a certain price per foot.

Geology and Scriptures.—Dr. W. O. Ayres recently delivered a lecture on the above subject before the San Francisco Young Men's Christian Association, in which he gave the following interpretation, (as reported by the *Chronicle*) of the first chapter of Genesis:

"The Bible had been formerly interpreted to mean that the earth was only six thousand years old, but the science of geology proved beyond a doubt that the world had existed for many millions of years. This fact was proved by the structure of the rocks, to be found beneath the surface of the soil. To account for the apparent discrepancy between the Bible and geology in regard to the age of the world, it has been advocated that where Genesis said the earth was created in six days, the meaning was in six periods, each of which might have been thousands or even millions of years long. This theory has long been received as the correct one, but the lecturer was satisfied that it was incorrect.

"Genesis speaks of only three days wherein organic beings were created upon earth, the vegetable kingdom being called into life first and then the animal kingdom. Now geology showed plainly that a portion of the animal kingdom, residing in the water, had been created long before the vegetable, and these animals were numerous beyond conception and singular in species, there being many tribes of lizards and kindred animals which grew to be one hundred and fifty feet long. After these animals had been destroyed, as their remains still existing in the rocks testify; the first traces of vegetable life appear in the coal. These facts contradict the theory that the word day, as used in regard to the periods of creation, means a long series of years. The true interpretation of the phrase in Genesis, 'In the beginning God created the heavens and the earth,' was that millions of years ago God created the world, and formed the ancient animals. The second verse of Genesis says, 'And the earth was without form and void.' This, says Dr. Ayres, means that the Almighty, after having allowed the earth to exist for many ages with its fishy inhabitants, suddenly killed off all animal life, and then created light and the planets, and the animal and vegetable kingdom, as they now exist, within the six days as recorded in the first chapter of Genesis. The phrase that 'the earth was without form and void,' means that the earth was rendered empty and desolate, and only afterwards was the world rendered fit to become the residence of man."

This is the theory first clearly taught by Dr. Chalmers, but is now rejected by Hugh Miller and other eminent geologists. Dr. Ayres is a distinguished naturalist, and the lecture room was crowded to hear his lecture.

Recent Foreign Inventions.

Harris's Patent Steam Purifier.—The principle and operation of these steam purifiers consists in arresting a considerable amount of water and mud, usually proceeding with the steam from boilers, and particularly when driven hard, forming deposits which are detrimental to the effective working of steam engines, by causing a large and unnecessary amount of friction, as is well known to engineers. Now, by preventing this useless and destructive friction in the cylinders of engines, less steam would be required for accomplishing any given amount of engine work; and, of course, less fuel would be consumed, less burning of boilers, and less wear and tear of apparatus generally. When purified steam is used, 1 lb. of tallow will be much more effective in abating friction than 10 lbs. where water and mud are driven over with the steam, for the elements of mud, particularly should there be much alumina or magnesia in it, will form a sort of soap, ore mulsion, with the tallow, thereby causing it to be readily washed away at the temperature of steam engines, when in proper work. —[London Mining Journal.

A New Water Motor—G. A. Hubbart, Esq., of Brynkir, England, has recently obtained a patent for the following method of applying the power of water. It is described as follows by the patentee:—"By the discharge of an overshot stream of water into the endless chain of buckets greater power will be maintained than if the water were caused to act upon an ordinary bucket water wheel, and this power I propose to employ in order to rotate a bucket wheel, and by that means lift the water that has been discharged by the endless chain of buckets."

[This water motor is equal to any perpetual motion ever invented. The water is first applied to a series of buckets which rotate a wheel that pumps back all the water, so that the same quantity of water can do an infinite amount of work. Good for the year 1855.

New Stove—E. Myers and J. W. Potter, of Rotherham, England, have obtained a patent for a stove which has two chambers, a combustion chamber, which may be heated by gas or other means, and a heat chamber, which is placed immediately above it. Within the latter is fitted a conical reflector, having its apex downwards, by means of which a portion of the heat from the chamber below will be thrown down on to the floor.

New Use of Spent Tan Bark—Thomas Horton, of Birmingham, England, has obtained a patent for submitting spent tan bark to destructive distillation in a retort, from which he obtains pyroligneous acid as one of the volatile products, and charcoal as the remainder in the retort.

India Rubber Propellers—John Trotman, of London, has obtained a patent for making screw or submerged propellers of gutta percha, or vulcanised india rubber!

Our Patent Office generally refuses to grant patents for the application of a well known substance or substances to a new purpose, but it is very different with the English Patent Office. The application of well-known substances to new purposes, to produce useful results, is a patent in principle, and has been sustained at law again and again. It would materially redound to the credit of our Patent Office if more liberality were exhibited with regard to this class of inventors.

Draining of a Sea.

The Chairman of the Commission on the Draining of the Haarlem Sea in Holland has published a final report on this work, which is to be finished this year.