Metric Update

by *Harold Don Allen*
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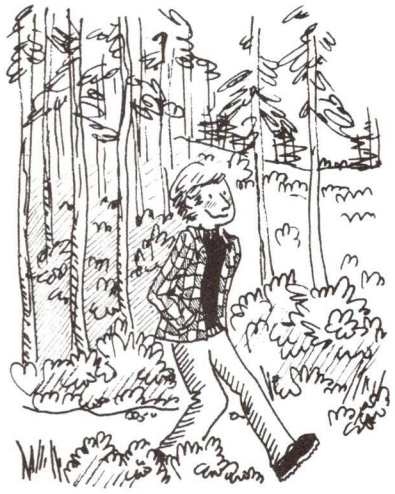
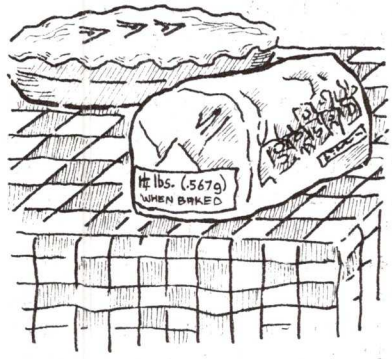


"Metric" may have been the furthest thing from my mind this summer as I roamed the Laurentian foothills of Quebec, following paths I'd known since boyhood. A leisurely hour would take me three miles or more, experience had taught. Three miles is five kilometres, more or less. So, for me, a kilometre along a country byway is roughly a ten-minute stroll. That kind of informal, intuitive relationship--as opposed to formal unit conversion--can have an important place in metric re-education. One hundred kilometres becomes equated to one hour of expressway driving, so many litres to a dollar's worth of gasoline, and so many kilograms' mass to a commonly experienced "weight." Or, in my Laurentian setting, where memorable thunderstorms punctuate every summer, count three seconds and think "a kilometre" (rather than five seconds and a mile) while awaiting the thunder and estimating the distance of the flash. Only when we identify metric measures with real occurrences rather than with old units does "metric" really become a part of our lives.

Professor Allen has written a number of these brief chronicles on metrication. They have been published in various newsletters in Canada and the United States.

"Metric means bigger numbers," one teacher claims. He expresses concern about public acceptance of this aspect of Canada's measurement change-over. Yet, *does* metric, as such, necessarily imply larger numerical values? A "Miss Canada" figure of 36-24-36 (inches) undeniably becomes, with sensible rounding, 90-60-90 (centimetres)--somewhat larger values. But let's look further. If Miss Canada "weighs in" at 106 pounds, the metric counterpart is a mass of 47 kilograms. Should her fever ever reach 102.4 on a Fahrenheit thermometer, that's 39.1 degrees Celsius. Also choosing somewhat randomly, 39 miles is 61 kilometres, 14 ounces is 4 hectograms (0.4 kilograms) and Canada's quart approximates the litre, the yard is a little less than the metre, and the hectare (for land measure) is a somewhat larger unit than either the acre or the arpent.

"Big numbers" arise artificially and needlessly when the range of metric prefixes is curtailed. Thus, if milli- and kilo- are used, omitting centi-, deci-, and deca-, and hecto-, the decigram becomes 100 milligrams (to uncertain precision) and eight decilitres is 800 millilitres or 0.8 litres. This kind of stress on the milli- and kilo- prefixes is being officially encouraged in Canada--except for body measurements (and hence clothing sizes), which are to be in centimetres. Educators could, and perhaps should, put forward good arguments for fuller use of the intermediate units.

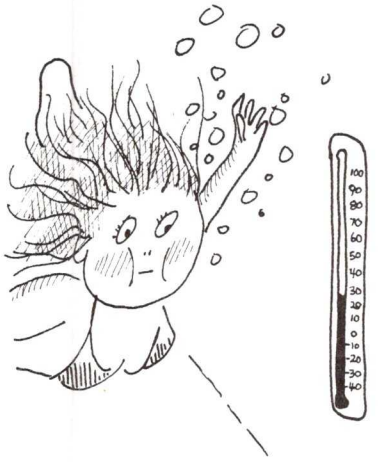


A study of dual labelling as encountered on Canadian packaging can come up with, among other things, some startling conversions. One recently encountered in a Quebec general store was a Farm House brand frozen rhubarb-strawberry pie--a net weight of 24 ounces was converted as 680.385 grams, to the milligram, while a single drop of moisture could mean a difference of 20 mg either way! More seriously, a Nova Scotia supermarket currently sells an Eastern Bakeries Limited product, Butter-nut Thin Sliced Dark Rye Bread, strikingly mislabelled, "1-1/4 lbs. (.567g) when baked." There's food here for classroom discussion--including the important areas of accuracy and precision. Incidentally, quart milk cartons (Imperial measure) are near-universally relabelled 1.14 litres, yet I am told that automatic filling machines operate with a tolerance of roughly three percent. Surely the saddest addition to Canada's metric scene, pedagogically speaking, is the new, larger bottle of Schweppes Ginger Ale. "NEW 35.2 FL. OZ." declares the new label, in bold red numerals 17 mm high. Far below, for those who read smaller print, is "1 LITRE."

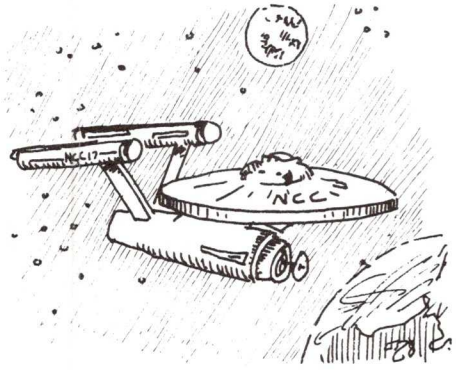
"Metric" bathroom scales have begun to make their appearance on the Canadian consumer market. The first models seem to be "dual," reading both kilograms and pounds. This arrangement may have initial consumer appeal, but adults are less likely to develop a true sense of metric measure with the "pounds" reading to fall back on. "Kilograms only" scales currently available are British imports from science supply houses. All metric calibrations seem to suggest a need to subdivide the kilogram (why, really?), and proceed to do it nondecimally (I shudder at ½ kg!) You "weigh in" to determine your mass, and a force (in newtons) is read as the corresponding kilograms mass. This may sound confusing to our generation. My metric faith was restored, however, when our Grade I daughter arrived home from school the other day and proudly -- and impeccably -- announced, "My mass is twenty kilograms."

Letterhead that is a bit longer and a bit narrower than the usual North American size is being seen increasingly in Canada. Certain federal and provincial departments and forward-looking industries are the prime users to date, and the recipient is right if he guesses that the paper somehow is metric. The A4 international letterhead size is 210 mm by 297 mm, and the dimensions themselves are interestingly derived. A0 (A-zero), the basic metric sheet, has an area of one square metre and dimensions in the ratio one to square root two. Canadians know it as the double page of Toronto's *Globe and Mail* -- and, more often than they realize, as a poster size. As a challenge, calculate its dimensions to the nearer millimetre. Halved to A1 size, its proportions remain unaltered, one to square foot two. Four such halvings give A4 letterhead size, and eight yield A8, the new calling card size for the metrically alert. Australian paper manufacturers changed completely to metric paper last year. Canada has yet to formulate official policy, but metric school supplies, including A4-size four-ring binders, currently are available.

"All the difficulties in the metric system are in translating from one system to the other, but the moment you are in the metric system alone there is no difficulty." A United States congressional committee was so informed by a scientist and inventor who had found it necessary to impose metric standards on carpenters and mechanics in his employ. "I do not anticipate any difficulty in the use of the metric system by itself; and if the government will lead the way, the change must and will come, and we will be brought into line with the progressive nations of the world, instead of lagging behind." The year was 1906, and the scientist, Alexander Graham Bell. Twelve pages of Bell's metric observations were published in the March 1906 *National Geographic* as "Our Heterogeneous System of Weights and measures." Metric Update recommends the presentation as still-timely background reading and suggests that an educational library should be able to retrieve a photocopy.



Dual markings on packages have no educational value. So reports Australia's Metric Conversion Board, and, to an educator, this should make sense. New concepts are internalized by experiencing, by immersion--not by repeated reference to old ideas. There's a lesson here for those about to buy a new thermometer. Make absolutely certain that all thermometers in your life read "Celsius only" for rapid, efficient learning . . . assuming, of course, that Ottawa has done its job of preliminary coordination and that suitable thermometers are generally available in the stores.



The rapidly emerging metric world has been, in a sense, such a blind-spot for North Americans that the urgent need for change-over has caught many by surprise. Ironically, among those most conspicuously caught have been those prophets of possible tomorrows, the science fiction writers. As a particularly horrendous example, our well-metricated youngsters have found unintended high humor in "Star Trek," the televised space opera. A pointedly cosmopolitan "starship" crew has come up with startling mouthsful of those all-but-antiquated units that at this point only Uncle Sam seems determined to preserve . . . and in the long run, of course, can't and won't. Warp factor six, Mr. Sulu!