
POSTERMINARIES

Hallmarked Materials

Scientists and engineers have a reputation for social ineptitude and lack of romanticism that is hard to shake. So long as you can cope with mathematical abstractions, you are bound to be regarded as a nerd by those who cannot. And this is only the mildest criticism of the social skills of the scientific elite. The state of Indiana (and probably most others) requires that candidates for certification as Professional Engineers should be “natural living persons,” which seems to imply some doubt; and possibly raises the bar out of reach of many of our colleagues who are otherwise technically qualified. Many are those who have pointed out the common, caricature portrayal of scientists in the movies, and I will not go into that here. Having served as a university administrator, though, I should probably own up to the observed fact that the phys-

ical sciences and engineering departments do not produce their fair share of faculty romantic scuttlebut, which is almost the exclusive domain of the arts, humanities, and social science departments.

When the “love bug” computer virus spread e-mail messages entitled “I LOVE YOU” all over the Internet in May of 2000, not one computer or e-mail address in my own department was affected. Among our archetypally nerdy e-respondents, I suppose, such a message was simply considered ridiculous and deleted rather than opened and allowed to spread among their address-book entries. It is a terrible thing, though, to be so stereotyped by the very technology that identifies you with such purported failings as a lack of romanticism.

Despite all this stereotyping, I find it interesting that the gifts that are supposed

to be exchanged at wedding anniversaries are nearly all identified by their materials. Surely there is some romance in this and an opportunity for the materials profession to establish its amorous credentials. Although graduations, weddings, birthdays, and religious holidays are opportunities to give gifts, or at least exchange cards, wedding anniversaries, in particular, have a long list of associated gifts, only a few of which are particularly honored. These even pre-date the massive commercialization of every conceivable occasion by the greetings card manufacturers.

The anniversaries associated with the precious metals—silver at 25 years and gold at 50—are the most significant and best known, but there are other materials in play, too. Generally, the materials are precious, or at least desirable, and it is easy to surmise that the list might have

pre-dated the Hall-Hérout process. Invented in 1886, this innovation instantly dropped the price of the 10th year gift, aluminum, from above that of gold to less than that of a serving of carbonated beverage. Somehow a gift of aluminum doesn't quite say what you really mean any more. Or maybe it does.

You can't find the complete list of anniversary gifts in any CRC handbook, and I doubt that it is accepted as any kind of an ISO standard, so there may be some variants. One list of approved materials appears in the Sidebar. My source for this one is the web site www.weddingtips.com, which contains much other information that can be used if you wish.

There are approved anniversary gift materials for every year up to the 15th. At this point romance apparently fades abruptly, and gifts are thereafter expected only at every fifth anniversary. Let us not be churlishly pedantic about the 15th anniversary gift which may be called crystal although it isn't. Leaving this aside, the list still needs some work to make it socially and technologically acceptable in the 21st century, and here is an opportunity for you to make contributions. It is no longer appropriate to give ivory on the 14th anniversary, since international trade in that material has been banned in the interest of biodiversity. As the coral reefs of the world wither and die, the 35th anniversary needs rethinking, too. Materials substitution has long been a staple of our work, so let's consider what we might substitute for these two cases, and what gifts might be considered for those unassigned years beyond the 15th year.

The age of the list is also evident in its serious deficiency of "modern" materials. We can begin to rectify this and meet the environmental needs just described by replacing ivory (#14) with surface micro-textured polymers that have been patented by Steinway and the Rensselaer Polytechnic Institute as ivory substitutes for use in piano-keys. (OK, "tickling the acrylics" doesn't have quite the appeal of "tickling the ivories" as a metaphor for playing the piano, but we must move with the times). Such a direct substitute for coral (#35) is not so easy to find: Perhaps some bio-inspired material can be adopted here. Apatites might provide a few candidates; and the zeolites and mesoporous silica (a candidate low- κ dielectric) have coral-like microstructures, but none of these materials have been incorporated in objects suitable for gift-giving, to the best of my knowledge. Well, entrepreneurship is the mantra of the age, so you might want to consider starting up a small company to produce gifts of these materials.

We'll do our best to get the list modified to create a demand for your products.

Even with these important corrections, the list still has 36 unassigned years (if we still choose to stop at 60 in these times of expanding life expectancy). What gifts can we assign to these years, in the interest of those of us with longer-lived admiration for our spouses? Consider this an opportunity to fill a serious social need, and possibly to boost the demand for your favorite material. It will not hurt the romantic reputation of our profession, either, if we can gain some official recognition for the new selections. Let's begin with a modest goal of filling in the vacant years between 15 and 25. Here are a few suggestions:

For the sixteenth – Silicon: the material of the age. Not so romantic perhaps, and usually not visible to the eye in most of the products that it enables, but surely a huge range of silicon-based gifts is available. According to David Eaglesham (Bell Laboratories/Lucent Technologies), only one subject (and that not unrelated to marriage) commands more of the scientific literature than silicon, so it is high time that it received this kind of recognition.

Seventeenth – Nickel-titanium: the "shape memory" alloy. Anything with a memory has to be a good idea for an anniversary gift.

Eighteenth – Carbon fiber. Maybe some composite sporting equipment? After

around 18 years of marriage with regular meals, many of us begin to notice the need for exercise.

Nineteenth – Quartz. Nowadays it is used for precision oscillators, and at the heart of many bejewelled gifts. You need to be careful not to imply that you feel a need to check on time's passage, as it relates to your marriage, though.

Twenty-First – Superalloys. There must be some way to make a statement about a beloved spouse with such a material. Caution is necessary, however: Who knows how a gift of "Renée 95" might be taken?

Twenty-Second – Lead-zinc titanate, a piezo-electric, making the statement that "squeezing you still gives me a charge."

Twenty-Third – Stainless steel. By this point, it is clear that the marriage is going to last, so why not a material with similar properties?

Twenty-Fourth – Teflon. This is for those who prefer to give gifts of a practical kind. Show your appreciation of a lifetime of great cooking, as noted in the 18th anniversary. Many of the silver gifts offered at the 25th are going to be household items (of a very upmarket sort), so why not make an early start? At least it will not tarnish, and it will make for plenty of comments about things not sticking.

Perhaps platinum should be reserved for the 75th year. It's a little surprising not to find it on the list at all, yet. If it's good enough for multi-million-selling record albums featuring pimply artists too young to know the true meaning of romance, then it is surely good enough for a marriage of such longevity. Those descendants of the union who make such gifts to the happy couple can be reasonably assured that they will shortly re-inherit them.

There is still plenty of space for additional suggestions. Feel free to send in some of your own. If we get enough and with suitable consensus from at least, say, three MRS members, we will lobby for acceptance of our proposed revisions with the highest authorities of the advertising business.

Now you'll have to look up your own wedding anniversary, but remember that Valentine's day is February 14, in case you have not already been adequately reminded of this by the advertising media. I hope that you are suitably inspired for the occasion and ready to dispel the myth of the unromantic researcher, having read these thoughts.

ALEX KING

**Traditional Wedding Gifts
(www.weddingtips.com)**

- First* – Paper
- Second* – Cotton
- Third* – Leather
- Fourth* – Fruit/Flowers
- Fifth* – Wood
- Sixth* – Candy/Iron
- Seventh* – Wool/Copper
- Eighth* – Bronze/Pottery
- Ninth* – Pottery/Willow
- Tenth* – Tin/Aluminum
- Eleventh* – Steel
- Twelfth* – Silk/Linen
- Thirteenth* – Lace
- Fourteenth* – Ivory
- Fifteenth* – Crystal
- Twentieth* – China
- Twenty-Fifth* – Silver
- Thirtieth* – Pearl
- Thirty-Fifth* – Coral
- Fortieth* – Ruby
- Forty-Fifth* – Sapphire
- Fiftieth* – Gold
- Fifty-Fifth* – Emerald
- Sixtieth* – Diamond