



It has been said that good prose is achieved when words do not draw the reader's attention: An author should aim to "make the writing disappear" so that the reader can focus on the meaning. In general, the language should not get in the way of clear communication. Just as somebody engaged in a conversation or committed to reading an article should not struggle with obscure words or errors in punctuation, a person engaged in any activity involving the use of tangible materials should not focus on the substances that constitute the objects, but rather on their functions.

When a person looks through a window to see what is happening in the garden, she won't normally notice the glass, only the squirrel running and climbing the tree. Because the glass transmits electromagnetic radiation in the visible range, it is perfectly transparent. The same person grabs her camera and shoots a picture of the squirrel that is now searching for acorns. The immediacy of the photo doesn't stand out as incredible in this era, because old polymeric film has been replaced with a semiconductor sensor. This sensor captures the light and transforms it into an electric signal that is converted into a digital image. And while she holds the camera, she doesn't stop to think that the camera is lightweight because many parts have been made out of plastic, whose density is lower than that of metal used in the past.

These are a couple of examples of materials that are consistent with their applications. We may notice the materials we are handling either for good or bad reasons. Often materials draw our attention because some trouble has occurred: a component that is supposed to bear a certain load but breaks is like a misspelled or misused word that diverts our attention from the meaning to the inconsistency. Last year, one-third of the steel bolts used in the Bay Bridge between San Francisco and Oakland failed upon installation, delaying the opening of the bridge and increasing its cost; steel, with its treatments and problems, gained notoriety. Most people, with the exception of metallurgists and materials engineers, must have been surprised upon hearing of all the things that can go wrong after the heat treatment of a high strength piece of steel. Good design cannot disregard materials knowledge.

Keeping with the analogy between materials and words, materials science could be compared to grammar in the tangible world. We select a material for a specific application after studying its behavior and assessing that its properties match the requirements. Similarly, we select the right words to convey a message after analyzing their meaning and making sure the relationship between each other is correct.

Words as well as materials can draw our attention for fascinating reasons:

glass in the form of a fiber is something poetic when you think that light can travel along it, carrying information in a fast and effective way. One experiences similar awe when reading a verse and finding that a single word has the power of revealing more about human nature than hundreds of pages.

Even though there are different levels of proficiency, we all communicate using words. Some strive to be sensitive to the beauty and power that words can carry, knowing that the use of one word in the place of another can change the entire meaning. Similarly, I wish more people were as familiar with materials science. Not because everybody has to be a materials engineer, but because a little knowledge of materials could help everybody to be more aware of the tangible world—to understand how things work and how they could work better. This also means seeing beyond the tangible, as we often read between the lines, and learning what innovative uses of materials and related technologies can tell us about civilization as they capture or trigger changes in our lives and our society.

This is the kind of materialism I advocate: an attitude toward the tangible world, the acknowledgment that materials hide many stories and history, knowledge and ability, and so much beauty and poetry.

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