

Jargon: Second Cousin Twice Removed

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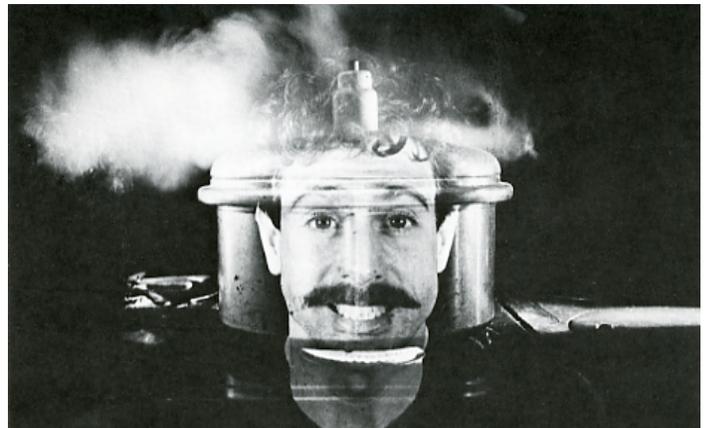
When a language first develops, there is often a word for every shade of meaning and a specific meaning for every word. Over a long period of time, however, most words become ambiguous and their meaning can be extracted with precision only from the context of the conversation or the shared experiences of those who are talking to each other. Jargon differs from the general language in that each word has a specific meaning that cannot be changed by the context or the experience of the talker or listener; as a result, jargon cannot be used to communicate anything that is totally new to them.



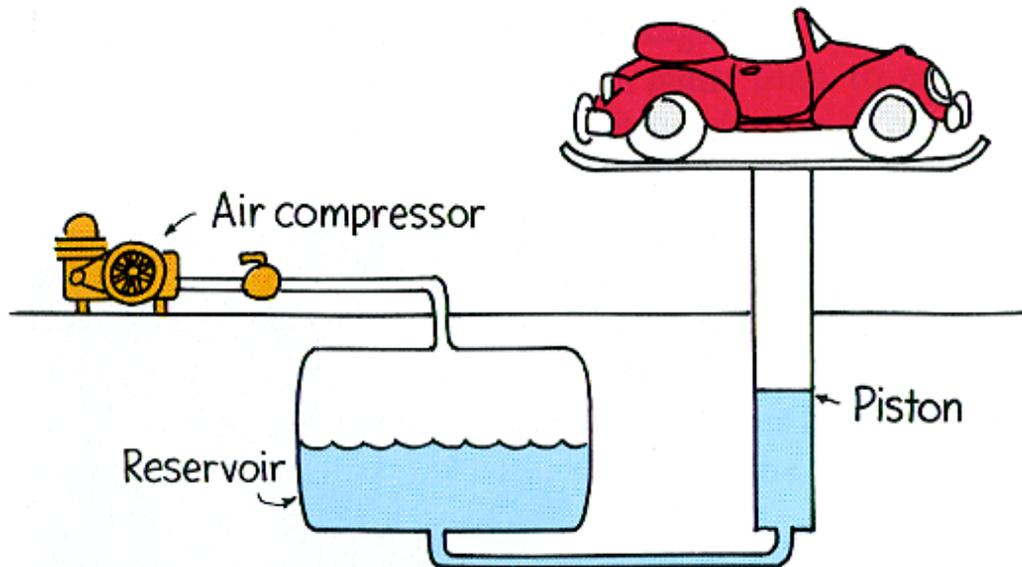
Jargon has many uses. For example, it can speed up communication. This is certainly an advantage when sailing a small craft since so many crises occur that must be dealt with speedily. When a rock suddenly looms ahead, one can cry, "Man the jib, I'm coming about." "About" can mean many things in English, but not in the jargon of sailing. In sailing jargon, every part of the boat - even the scuppers, which are merely holes in the gunwhales - has

a specific name, and every action whether "luffing" or "falling off" means a specific procedure that would take minutes rather than seconds to describe in English.

A less obvious virtue of jargon is that it can help one think. This attribute is especially important in physics and in mathematics. I still remember being delighted and astonished during my high school physics course at how much thinking mileage one got out of restricting the use of the word "pressure" to mean force on one unit of area. The pressure of the atmosphere, for example, is about fifteen pounds on a one-inch square whether that square is on your body or on the wall, on the ceiling or on the floor.



In ordinary language, "pressure" and "force" can be used very loosely. One can talk about the force of habit or the pressure of work. But in physics jargon "pressure" always means a force on a unit of area and "force" means something that will cause a change in the velocity of an object. Once having learned this jargon, it is very easy to think through, and therefore to understand, how a liquid can be used to multiply a force with a hydraulic jack or car lift. If I push on the liquid by pushing on a piston whose area is one square inch with a force of fifteen pounds (that is 15 pounds per



From "Conceptual Physics" by Paul Hewitt

square inch) then this pressure of fifteen pounds per square inch will be communicated to every square inch of the area with which the liquid is in contact. If part of this area is another piston with an area of one square foot (12" x 12" or 144 square inches) the total force on this big piston will be 15 pounds per square inch times 144 square inches or a little over a ton. My push of fifteen pounds can thereby lift a ton.

In physics (and in other sciences) the use of jargon which precisely and restrictively defines the words does more than simplify the communication between physicists; it helps each of us in private to move, with the aid of mathematics, from what we knew to what we didn't know.

Actually jargon has many functions. In the law, it insures that others in the profession know exactly what is meant so that basic disagreements are not further confounded by semantic misunderstandings. But as in other jargon used in fields such as medicine and finance, legal jargon can be used to exclude the uninitiated or to make it appear that the initiated know what they are talking about when, in fact, they are not really saying anything.

In the Exploratorium, as in most forms of teaching, the problem is quite the reverse. Our

problem is how to include the uninitiated in jargon without making the subject incomprehensible because our discussion is too long winded.

The jargon of the family can illustrate this difficulty. *Frieda is my son Mike's second cousin twice removed.* I personally consider any language involving removed cousins to be jargon. I forget its meaning immediately after I have learned it. My friends, of course, run into the same problem when I try to tell them that a hologram is an "interference pattern."

The problem involves unraveling the jargon without making the unraveling impossible to follow. In this example, I could avoid jargon by telling you that Mike is the son of the son of the son of Opah, and that Frieda is the daughter of the son of the daughter of the son of the daughter of Opah. A reader could probably construct a diagram from this information and from it understand the relationship between Mike and Frieda, but I doubt that anyone listening to that amount of daughters and sons would learn much. One choice might be to say, simply and accurately, that Mike is Opah's great-great-grandson and Frieda is Opah's great-great-great-great granddaughter. But this description would not help much to describe the relationship because it includes the possibility that Frieda is Mike's granddaughter. Perhaps the most comprehensible way to



adequately describe second cousin twice removed would be to say that Mike is the grandson of Opah's son and Frieda is the great-great granddaughter of Opah's daughter. There are other choices as well. Perhaps you are not interested in Opah. You may just want to know that Mike is my son and Frieda is the granddaughter of my cousin. Of course, you could not understand this statement if the word "cousin" was not part of your knowledge of family jargon.

The discussions that take place amongst the staff of the Exploratorium in figuring out how to write the "What's Going On" labels for our exhibits are even more involuted and often more ridiculous than the above deliberations on second cousin twice removed, but are nevertheless required.

Ingenuity is always required in order to communicate without a familiar language. I remember needing horseshoeing tools when my horse lost a shoe in a Spanish-speaking

section of New Mexico. I needed a rasp, claw hammer and hoof nippers. I did not know the jargon in Spanish. I did not even know the Spanish word for "horseshoeing tools." After several futile attempts at talking and gesturing with a farmer, I went around behind him, backed up to him and picked up his leg and clamped it between my thighs just above the knees, as one does with the back foot of a horse. I then hammered the sole of his shoe with my fist. It worked. I had explained what I wanted to the uninitiated.

The precision of jargon does not exceed the extraordinary potential for precision that is inherent in all language. Yet in too many instances jargon is now substituted for our more versatile English when there is no particular advantage in doing so. It is then used for reasons of laziness or ignorance, and this excessive use therefore degrades the respect for and the dignity of our language.