



# Inventory



# Stories and Jokes



Edited by

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Published by ISIR

August 2002  
Budapest, Hungary



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Published by the International Society for Inventory Research at its 20<sup>th</sup> anniversary  
August 2002, Budapest, Hungary

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## **Inventories are the most serious things on earth...**

*Have you ever been to a major warehouse? If you were, you can confirm the above statement.*

*Have you ever talked with a member of the Board (almost any board) about conflicts between manufacturing and sales? Again, if you did, you can confirm: inventories are the most serious things on earth...*

*Have you ever overheard the coffee break discussion of two OR guys at a conference? Once again, you can confirm...*

*Nevertheless....*

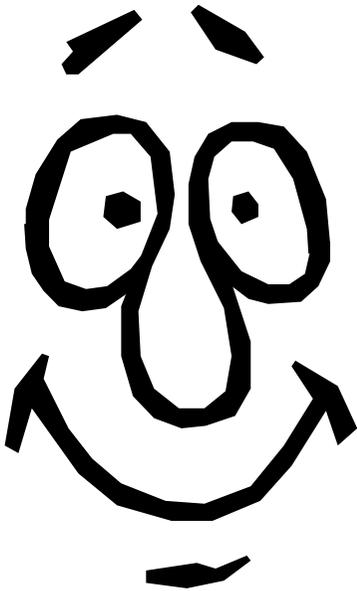
*There are people and situations which do not respect even the most serious things on earth... And they allow themselves to laugh at those things. Or, they feel so much love for those things that they dare to smile at them.*

*Inventories, the most serious things on earth are the subject of this small volume. The items were collected from ISIR members, their friends and relations, at the occasion of the 20th anniversary of the society. We would like to thank all the contributors that they helped us to provide an opportunity of a few minutes of laughter to our members, in order to refresh them before they return to their work with the most serious things on earth: inventories.*

*The Editors*



# Stories





## **A Couple of Inventory Stories**

**From D. Clay Whybark**

*University of North Carolina*

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Several years ago, Benito Flores and I were doing some research on inventory classification, variations on the ABC method that is in every textbook. We were both at Indiana University at the time and our work took us to the local General Electric plant and into the university warehouses as well. At the GE plant we discovered that they already had a system of classification, A, B, C and D. When we asked how the classifications were determined, they replied that the A items were their fast movers, the B items next and their C items were the slow movers. Of course we said, "And what are the D items?" Their reply, "D stands for dead. These are the items that don't move at all and are still on our books." Interestingly, roughly 50 percent of our sample of their inventory was made up of D items.

It was a different story at the University. They also had an inventory classification system that had an A+ category. When we asked what that meant, the answer was, "Those are the spare parts for the air conditioner in the President's office."

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One of my first teaching jobs was in an executive development program at Ethiopian Airlines in Addis Ababa. During the time of the program, all of the instructors were involved in various projects at the airline. On one of my projects I was with the Director of Purchasing discussing his plans for building an addition onto the warehouse where much of the inventory was stored. He was looking for ways to make his justification of the expense as strong as possible. I went around the warehouse with him and had to agree that it was quite full and jumbled. He complained about losing parts and finding them after ordering replacements. He argued that the new space would enable him to reorganize the warehouse for better efficiency and effectiveness.

As we walked through the tight isles and around boxes I began to ask him what some of the items were and he described them to me. Many of them were spare parts required for the jet aircraft the airline was purchasing to replace their older airplanes. At one point we came across four very large reciprocating engines with a large number of boxes of parts taking up a large corner of the warehouse. They were packed together so

tightly that it took a great deal of effort to get into the area to retrieve anything. I asked the Director of Purchasing what they engines were for and he said that they were for the Lockheed Constellation. I knew that they had retired the “Connies” a number of years before, so I asked why he still had the engines and parts around. His answer was, “Just in case, besides they are not worth much on the market and it doesn’t cost me anything to keep them here.” You can guess that the subject of our next few classes had to do with opportunity costs!

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This is a story told to me several years ago by a manager at a firm in Chicago that makes spare parts for army equipment. They had just installed a software package to help manage their inventory. The package had the capability of forecasting demand using time series of projection models (like weighted moving averages and exponential smoothing). Moreover, the forecasts were combined with the lot sizing and safety stock calculations to make dynamic revisions to their reorder points, production quantities and purchase orders.

The firm received a very large order for replacement parts from the Israeli army. The shipment was intercepted and blown up before reaching the Israeli warehouses. Of course, the Israeli army reordered the parts. In the meantime the inventory software was dutifully increasing the forecast for these parts and increasing the order quantities and reorder points. The second shipment was also intercepted and blown up. The Israelis again reordered the parts.

By the time the third shipment was on its way, the plant was working overtime and the warehouse was filled with spare parts. The third shipment got through. The forecast plummeted, order quantities dropped and reorder points fell. It didn’t make any difference, however, the company now had several years of these spare parts on hand. They also rewrote the software to put in some reasonableness checks and manual overrides.

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We used to teach a short case on a coffee company that had a very creative warehouse manager. His objective, of course, was to minimize costs. The creative solution that he developed was to use what he called his “rolling warehouse.” These were railroad boxcars filled with coffee. The idea was to fill the boxcars with production as it came off the production line. When the railroad siding was full of full boxcars, the railroad would be asked to come and move them. The shipments were dispatched to various locations around the United States. This would

reduce warehouse costs by reducing inventory and any increased costs would be on the transportation budget.

The theory was that, as orders came in, the closest boxcars would be diverted to the company placing the order. This is great theory, **but!** The boxcars were loaded right off the production line, so often contained a single SKU (e.g., one pound, dark roast, vacuum packed, filter grind in 12 container boxes). The boxcar (or even train) closest to the customer might contain some of what the customer ordered but never everything. By the time that the senior managers were getting phone calls about customer service and threats to take their business else where, the United States was covered with rolling warehouses of the wrong inventory at various customer locations.

The management stopped all production (after firing the warehouse manager), sent the management team to visit their top customers and plead for patience. They had the workers identify, as best they could, what products were left in what boxcars and begin to do some rerouting. They had great sales of product that didn't warrant shipping back and forth around the country. When they knew what they had a picture of what could be used from the boxcars, they authorized overtime and inefficient production sequences to produce what else was needed.

## **Goddamninventory!**

**Dr. Linda G. Sprague, FDSI, FIOM**

*China Europe International Business School, Shanghai*

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Inventory in the granite business is hard to miss: we make tombstones - a custom product if there ever was one - and when quarry blocks, slabs, bases, and finished stones are hanging around, they're quite visible. It's also pretty dangerous when they pile up (literally) because stones have been known to topple over and fall on people.

It may not be immediately obvious, but tombstone manufacture is a seasonal business; in New England you can't "plant" anything in the winter, so there is a huge demand peak just before Memorial Day (the last Monday in May). Since quarrying can't be done in the winter either, quarry blocks have to be purchased in the fall. Put this together with the fact that our dealers insist on consolidated shipments to various parts of the country given the weight of the finished product, and you've got the makings of a whopping inventory position during the run-up to the end of May. Add the need for lots of overtime for highly skilled craftsmen, and an annual cash flow crisis is going to be part of your life.

My grandmother was President of J.O. Bilodeau & Company, manufacturers of Paragon Memorials, in the Granite Center of the World - Barre, Vermont. My uncle and my mother were vice presidents (Sales and Office Administration, respectively), my step-grandfather was General Foreman, and my other uncle was Plant Superintendent. (Our motto: If there's money to be made, for God's sake keep it in the family!) Lunch every day was a working meeting where children knew enough to be quiet: keeping one's mouth shut was a lot better than tangling with Grandma Pinard, so I was in high school before I figured out the "goddamninventory" was actually three separate words.

When I went off to MIT, Grandma decided I should help pay back my tuition by reporting anything I found out that could help the family business. After hearing about some of system theorist Jay Forrester's early work, I decided that Grandma should know (and I was just the one to tell her!) that she didn't really have an inventory problem. It was just a matter of buying less raw stock so early, insisting that our customers place their Memorial Day orders before Christmas so we could do work in the slack periods and avoid overtime, and telling our dealers that they would just have to pay for more convenient (fewer consolidated) shipments. Fortunately for me, Grandma spoke French-Canadian and hadn't permitted any of my generation to learn it very well, so I didn't fully understand her

response. I did, however, grasp its general nature and so got away as soon as possible.

My mother, of course, took Grandma's side, and there was great hilarity about the wisdom being imparted at the great MIT. Grandma consoled herself with the thought that, in spite of its naïve understanding of suppliers, customers, and dealers, MIT was probably giving me enough basic training in engineering that I would "learn a trade" - which would supplement the courses in sewing and tailoring she and my mother had put me through as backup in case MIT wasn't as great as its reputation.

Meanwhile, every year between early April and late May we had a Goddaminventory problem, and for another month or so beyond that a cash crisis of epic proportion - as did every other manufacturer in town, to the considerable delight of the local banks. Until the day she died, my grandmother found great humor in what MIT had to say about the Goddaminventory problem.

*Source: Operations Management for Competitive Advantage (ninth edition) by R.B. Chase, N.J. Aquilano and F.R. Jacobs, McGraw-Hill/Irwin, 2001, pages 481-482*

## **Stories from Edward A. Silver of the University of Calgary**

*To understand these stories from Ed Silver, you need to know that it is written that even the hairs on your head are numbered. Ed has two more (hairs) than I do. In both our cases, the hairs are not only numbered, they are named. D. Clay Whybark*

- 1.** I found the following to be an effective way to convince students that there is variability in processing (lead) time that depends on work in process. I pick out a student in the class with a big mop of hair and state that the time for a haircut for that individual would be very different than for me. (Incidentally, that is a good one for Clay to use as well!)
- 2.** There is the analogy on pages 237 & 238 of Ed Silver's book regarding the necessity to take account of inventory on order when deciding on whether or not to initiate another replenishment. Specifically, consider a person who takes aspirin to relieve a headache. Suppose that a review interval of 5 minutes is used, and the headache is still present after 5 minutes. The individual had better not take 2 more aspirin. He/she should take account of the 2 aspirin already taken. The relief is "on order" - aspirin operates with a delay.
- 3.** This one is due to Jaydeep Balakrishnan. He probably used it at the mini-conference for Ed Silver's 60th birthday in Banff. If Ed Silver were to go out on a trail in the Rocky Mountains eating honey and a grizzly bear came along, the bear would have a silver meal.

## In vino veritas?

### Differences and similarities between logistics and enologistics

Leonard Fortuin

TU/e, Eindhoven (The Netherlands)

*One of the most important problems a modern manager has to face, at least the successful one, regards layout, management and usage of his personal wine cellar. Several years ago, while working as a consultant, I was asked to advise in such a problem. But The Netherlands is not a wine growing country and enological expertise is scarce. So outside help was needed. Fortunately, we live in a global village; contact with professor Alessandro Buffone was easily established. An interview with a world-famous enologist<sup>1,2</sup>.*

Italian	English
Enologi'a	Science of wine preparation
Eno'logo	Enologist, wine expert
Enologis'tica	Logistics of wine

**Professor Buffone, what are the characteristics of a good wine cellar?**

A wine cellar is not a stocking point but a factory. The basic operation is simple but time-consuming: it merely is the ripening of wine. For certain products, the operation time is long. These are the so-called "slow movers". Others, the "fast movers", require less time. Layout of the cellar is depending on the product assortment: Only red wine? Only white? Dessert wine too? From which country or region do I take bottles in my collection? That is the first question to be answered.

**Let us assume that we want to have a purely European cellar...**

Now we touch a strategic question: Only Italian? Some bottles of that horrible French stuff as well? Spain and Portugal are entering the market. Are you sympathising with countries in East-Europe? Then also Hungarian, Rumanian and Bulgarian wine should be bought. For me, as an Italian, this is a non-issue. We, Italians, are the inventors of wine. Bacchus was an Italian deity. In Italy there was wine before Rome even existed!

<sup>1</sup> A. Buffone, "Sulla gestione di cantine private, ieri, oggi e domani," *Rivista Italiana della Enologia*, 89, 3, 23-48 (1990).

<sup>2</sup> A. Buffone, "Su l'importanza di metodi e modelli quantitativi nel mondo enologico, nel passato, presente e futuro," *L'Assaggiatore di vino*, 7, 11, 1-35 (1992).

***But the ancient Greek...***

Don't mention the Greek. Greek are swindlers; they put resin into their wine. I have no words for such barbaric conduct. My country is cultivating wine since the beginning of time. Here we have an incredible variety: from Barolo and Bardolino in the North to Moscato and Frappato di Vittoria in the South. And in between, too many to name: Chianti, the real one, and also the wrongly discarded Chianti Colline Pisane. And the Bianco della Val d'Elsa, Soave, Trebbiano, the Vin Santo delle Marche, Vernaccia di San Gimignano, Orvieto, Malvasia di Grottaferrata. Mammamia. What beautiful names and what a wealth. Who was it, saying that wine is something divine in a bottle?

***Which scientific methods are available to build a good collection?***

On the basis of strategic and political considerations, one chooses countries or regions. Suppose we select Tuscany, Veneto and the Abbruzzi. There are excellent algorithms for *portfolio selection*. If that is settled, one looks at the budget available, an economic issue. After that we have a simple *Knapsack problem*. Any personal computer can solve that in a few seconds.

***How do we achieve optimal management of a wine cellar?***

In principle, there are three basic questions: 1. How often do we conduct an inventory inspection? 2. When do we re-order? 3. How many units do we re-order? Here we do not see any difference between enologistics and the classical logistics. As for Question 1, a genuine wine lover never leaves his cellar. So: continuous inspection! And I really do mean con-tin-u-ous. Not inspection after each transaction, no, inspection night and day. The true wine lover sleeps in his cellar!

***But if he has to earn a living for wife and children?***

Tasting is very important indeed; it has to be done very often, also almost continuously. The reason is easy to understand: quality control has to be carried out during the manufacturing process, not afterwards. By the way, we did not learn this elementary fact of life from the Japanese: in Italy we never did otherwise.

***What about question 2, professor? When do we re-order?***

Stock replenishment, re-ordering, has to be done as soon as the re-order level has been reached.

***Yes, that is well known. But how do we establish the re-order level?***

As any book about logistics is telling us, the answer depends on the demand process. Here we touch upon a nice characteristic of a wine cellar: the wine lover can determine the demand process all by himself. Hence demand is completely deterministic, because only the own consumption is decisive. *Ergo*, we do not need a safety stock.

I beg your pardon, professore, but a safety stock is also depending on the delivery time. And if the supplier faces us with stochastic delivery times, and moreover not delivers what we have ordered..

I do no business with thieves, crooks and unreliable suppliers. So your remark is fully beside the point. By the way, very beautiful and worthwhile obtaining is *co-makership*. That means a relationship with the wine producers so pleasant and prolonged that one is being invited to the *Vendemmia*, and is allowed to trample in the wine press. One of my best friends is *il Barone de Ricasoli*. Shortly the time will come. Barefoot and in the company of lovely girls... Gorgeous!

***We also have to determine the re-order quantity, question 3***

Oh yes. Well, once more we meet the *Knapsack*. It has to remain full. So the policy of *order up to* follows automatically.

***You said a wine cellar is a factory. How do you take care of product identification in that factory?***

The time of poorly readable labels is over. Also a Kardex is out of fashion. Here in Italy enologists label their precious bottles with a bar code. The light pen is coupled to the personal computer and any desired query from the database can be made: age of the wines present, which wine will be ready for consumption as of a certain year, which has to be consumed before a certain date, etcetera, etcetera. Do you want to know which wines of the top year 1980 I possess? No problem. After a few instructions the answer will appear on my screen.

***What advices do you have about the layout of a wine cellar, and about storage and transport of bottles?***

Edgar Allan Poe described the far nicest arrangement, in his gothic story "The barrel of Amontillado"<sup>3</sup>. Sure, not everybody can afford such a mouldy vault, full of skulls and bones, with sulphur dripping along the walls. But one should aim at it, if necessary with artificial means. Possessing a wine cellar is no children's play. As for the transport of wine, this should never be done mechanically, but always with loving and caring human hands.

***Which role can performance indicators play in wine cellar management?***

Most owners are proud of their enologic treasures. So they also look at the monetary value of their collection of bottles and how that value increases over the years. Stocking wine is not only a joy, it is also an investment. Then we have the consumption, the yearly turnover, again as a function of time. Wine is the drink of lust, of voluptuousness. More elegantly put: the potion of love. Consequently, the graphical representation of wine consumption includes an indication of the owner's love life.

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<sup>3</sup> E.A. Poe, *Fantastic Stories/Fantastische vertellingen* (Het Spectrum, Utrecht/Antwerpen, -1953), pp. 167-173.

***But it happens that people try to drink away their unhappiness in love, with wine for instance.***

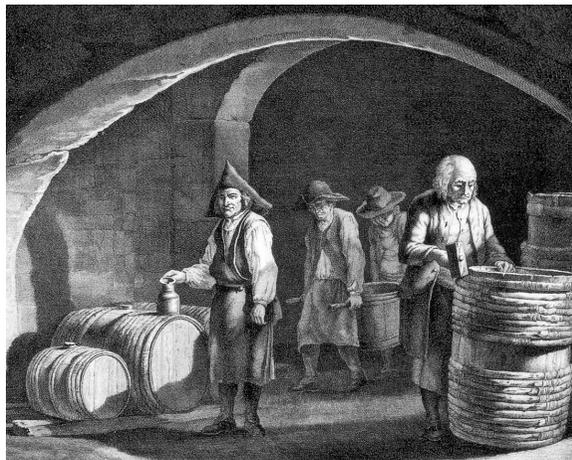
Sure, one should read such graphs carefully. That means with reason and sentiment.

***How do you like the custom in some countries, like The Netherlands, to use wine as a present?***

Horrible! Disgusting! The probability that the ‘present’ fits into the recipient’s collection is approximately zero. Wine should not be presented as a gift. It should be drunk! Hahaha.

***Which role do you see for quantitative models and methods in the enology and the enologicals, in the past, now and in the future?***

Pythagoras already said that things are numbers. Leonardo, the genius of Vinci, has also shown that, somewhat later. About the present I have instructed you sufficiently, I daresay. Remains the future. Then the role of quantitative methods and models will become ever more important. Nothing is new under the sun. Don’t you believe that “the future is past”, as Ackoff pretended<sup>4</sup>. Listen to your own fellow-countryman, Alessandro Rinnooy Kan, who claimed that “the future of OR is bright!”<sup>5</sup>. They spoke about Operational Research, *va bene*. But it holds *a fortiori* for some of the most exciting human operations: grape growing, grape cultivation, wine making, and wine drinking! *Salute*.



*Professor Buffone and his enological logisticians in his wine cellar*

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<sup>4</sup> R.L. Ackoff, “The future of OR is past”, *Journal of the Operational Society*, 30, 93-104 (1979).

<sup>5</sup> A.H.G. Rinnooy Kan, “The future of OR is bright”, *European Journal of Operational Research*, 38, 282-285 (1989).

## Pet Inventory Sale

W. Bruce Cameron

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**For Sale:** All Cameron pets, including two rabbits - - oops, make that six rabbits. These rabbits consume several pounds of pellets a week in order to produce several pounds of different pellets a week. The bunnies came to live with me because at the end of the school year my son's science class had to give away its inventory of animals and, as he explained it, it was them or the guppies. "You can't teach guppies any tricks, Dad," he advised seriously. I'm not sure what tricks he's taught the rabbits unless it is peeing out of the cage.

With the rabbits comes a stupid dog. The dog often spends hours in front of the bunny cage, barking with an unpleasant edge of hysteria in its voice. Initially the rabbits were very exercised over this and put their pellet production into overdrive every time it happened, but now they just stare at my canine, amazed that there is anything dumber on the planet than a rabbit.

The dog believes it is starving and blames me for this. At every meal I eat, it sits alertly at my side, tracking the movement of every bite from my plate to my mouth with frantic eyes. When I glance at her, she presents me with a "you're not sharing? I'd give up my life for you!" expression. This is complete nonsense; the dog won't even give up her NAP for me.

The dog's dinner consists of what appears to be compressed cardboard pellets, the ingredients listed on the bag making frequent use of the words "crude" and "by-products." As in: Crude Fiber: 25%; Crude Animal By-Products: 30%; Crude Recycled Machine Parts By-Products: 15%. When I serve this inedible stuff to my canine, she swallows it so forcefully you can almost see it slamming into her intestines.

When the dog is not barking at the rabbits, it is sitting at the window, barking at the neighbors. "If it weren't for this glass separating us," she seems to be snarling, "I'd tear you to pieces."

I will sell the dog to anyone who will also take the cat - - not because the two of them are inseparable, but because I know how much this would irritate the cat, who regards the canine as a waste of fur. The cat holds the same opinion of me.

When I serve the cat's dinner, I get a look in return which clearly communicates, "What? Lobster again? I had this last week! You're going to be in big trouble when your wife finds out about THIS!" To enforce her point, the feline will spend the rest of the day walking around the room

with her nose in the air, pretending I don't exist. If I don't look appropriately hurt by this lack of attention, she curls into a sullen ball in the corner.

The cat was my low-tech answer to the family of mice which discovered that our dryer vent led to a wonderful world of fluffy warm clothes to sleep in. The first time she hunted down one of the little rodents she proudly brought the squirming thing back to our bed, which resulted in a fair amount of screaming and hysterical raving. My wife was unhappy as well.

Take the cat and I'll throw in my son's gerbil, who is the hardest-working animal on the planet. For two years it has been attempting to dig its way out of its cage, its little paws a blur. The cat hopes it succeeds soon. I don't really have anything against this tiny rodent, except that its ambition makes me feel completely worthless. At any given moment it has half a dozen gerbil projects going, all of which involve chewing up cardboard boxes or trying to sweat off a few grams of fat on the exercise wheel. The gerbil feeds on pellets manufactured out of the only stuff in the world that my dog won't eat.

Supposedly, I don't own any of these animals. I didn't buy them, and each was named by another member of the family. But ultimately, I'm the one who takes care of them, who cleans up cages and cat boxes and messes in the yard, which is why I feel I can legitimately sell them. So give me a call, I'll make you a deal on my whole inventory.

*Copyright 2001 W. Bruce Cameron*

## **80 Billion Tons of Jar Jar Merchandise Now 70 Percent Off New York**

**Sent by Denis Rondelli**

*From Onion 2002*

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An estimated 80 billion tons of Jar Jar Binks-related merchandise-manufactured in bulk this spring in anticipation of the summer's blockbuster Star Wars prequel-is now available at as much as 70 percent off the regular retail price and could plummet even lower by week's end, according to a report issued Monday by the National Association of Toy & Novelty Retailers.

"Come on down, one and all, and get your special, ultra-rare collectibles featuring everybody's favorite bumbling orange space-frog, the incomparable Jar Jar Binks, surely one of the most enduring and beloved characters in the entire Star Wars pantheon," NATNR spokesman Jonathan

Oglivie said. "All across America, Jar Jar action figures, plush dolls, push-up pops, bedspreads, nightlights, play make-up heads, keychains, toothbrushes, mugs, mouse pads, bicycle helmets, TV-dinner trays, T-shirts, pajamas, coloring books, paint-by-number sets, jigsaw puzzles, glow-in-the-dark stickers, videogames, interactive read-along CD-ROM adventures, and pretty much anything else you can possibly imagine are available at low, low prices that anyone in the universe can afford."

Oglivie said the savings are part of a "very special, limited-time offer" available "only until we can somehow clear all this stuff off the shelves." He also noted that the estimated 850 billion cubic feet of cardboard-backed, plastic-wrapped Jar Jar merchandise is available "wherever virtually anything is sold."

Monday's report comes in response to what industry insiders are calling "a shelf-space crisis of unimaginable proportions" that has resulted in "giant piles of Jar Jar detritus as much as several stories high" in parking lots across the nation. Toy stores, gas stations and supermarkets everywhere are choked with items bearing the image of the omnipresent, mischief-making Gungan amphibian. To deal with the massive overflow of goods, many retailers are offering a "bucket of Jar Jar" deal, in which customers who bring their own trashbag can take away "as much Jar Jar crap as they can carry" for a nominal fee, often one dollar or less.

"Not only is this clearance sale a chance to buy some terrific Star Wars merchandise at a great price," said Ames, IA, ShopKo manager Benjamin Reuss, "but it will also help fulfill the legal requirement that I clear a reasonable pathway to the fire exits before the fire inspector returns next Thursday."

"Let's face it: America is in the grip of a Jar Jar glut that has virtually paralyzed the nation," said sales-industry analyst Richard Januszcz. "Almost anywhere you go in this country, there is a life-size stand-up cardboard cutout of Jar Jar Binks staring at you, extending a helpful hand toward the soft-drink dispenser, his grinning face seeming to say, 'Wah-nah so-dah?' He is inescapable. Something must be done immediately."

A spokesman for Lucasfilm said the enormous discounts represent "a fantastic opportunity" for Star Wars fans, noting that Jar Jar is a fun, adorable character who is loved by children of all ages.

"Who doesn't love Jar Jar, with his clumsy, side-splitting antics, adorable pidgin-English speech patterns, and hilarious Muppetty voice?" asked Lucasfilm vice-president of licensing Joseph Gaer. "As George Lucas himself has repeatedly stated, the creation of Jar Jar Binks is his single greatest accomplishment in *The Phantom Menace*, the aspect of the film he's most proud of, because Jar Jar is the first completely digital character ever to appear in a major motion picture. Right?"

"Right?" added Gaer, wiping his brow. "Is anybody with me on this one? Hello?"

With the Jar Jar crisis mounting, the federal government has stepped in, urging citizens to "do their part" by purchasing at least one Jar Jar item. Citizens are also encouraged to stay indoors and use major business-district thoroughfares only if absolutely necessary.

Should the Jar Jar surplus reach disaster levels, the National Guard is poised to begin transporting the accumulated products to special "Emergency Jar Jar Storage Silos" in northern Nevada, where they will be kept until buyers can be found. If significant tonnage remains after these measures have been taken, the Jar Jar items will likely be recycled for use as building materials by Third World nations or, if necessary, as solid fuel.

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## **A Story from Ana Poratelli of Argentina**

*It happened about 12 years ago, but is very appropriate today with all the accounting scandals.*

This story happened about 12 years ago, when I was working at Price Waterhouse (PW) for the Auditing department. One of our teams was doing a year end inventory audit at a very large manufacturer. It was a time when accounting had to adjust the inventory value for a very high inflation rate (it reached 2500% in 1989). The inventory account for this company was very large, so PW had to be very careful with the valuation. The team noticed that the managers were a little uneasy as the audit went on, so they worked very hard, doing more counts than usual, checking every single corner of the warehouse. They worked a very long day on December 31st., and found nothing wrong. Exhausted, but happy that the job was finally over and the count was pretty much accurate, a senior associate leaned against one of the warehouse walls...only to fall on his bottom when a secret door opened and uncovered a huge room full of hidden goods!!! So much for a happy new year celebration!!

## **A story from Scott Young**

### **The Morgue Gown Stockout**

Before I was an academic, I was a materials manager in a hospital in rural Georgia. One morning, I arrived at my office to discover the sturdily-built Director of Nursing entrenched in front of my desk. "Good Morning, Miss Beauchamp, what can I help you with?" She got right to the point. "You are out of large morgue gowns. A patient died last night. He is 6-7 and we had to use a medium morgue gown and his feet are sticking out and the family is all upset."

"Why didn't you just put 2 small gowns taped together over him?" She did not think that was funny. "Mr. Young. In nursing, we pride ourself on patient care. And if you can't provide the materials we need to do our jobs, then I think you better find another line of work."

"You're right," I said, diplomatically. "I'll make sure we get them today." What I was thinking was, "That patient really CARED that his feet were showing!" Before this incident, I had not even been aware morgue gowns came in sizes, but I had some shipped by special courier before anyone tall died. And I did go on to another line of work!

## **A story from Jim Pope of the University of Toledo.**

I was visiting the Harmon Stove facility near Harrisburg, Pennsylvania, with the local American Production and Control Society (APICS) Chapter. As they led us through the production line, there were partially completed stoves everywhere. They were piled in corners, on shelves and in the aisles. I asked, somewhat innocently, "How much work-in-process inventory do you have?"

Our guide replied, "Almost none." Pointing to the piles of partially completed stoves, I asked, "What are those?" He replied, "Oh, we're not working on them."

## Stories from Greg White

*The first two (and maybe the third) were heard at an APICS meeting*

### The costs of carrying inventory

Everyone knows that retail stores have problems with "inventory shrinkage," which often results from shoplifting, but manufacturers can also face the same problem, as indicated by the following stories.

A major tire manufacturer has a large warehouse next to the plant. They kept finding that the physical counts of tires in their warehouse were below what the inventory records showed was supposed to be there. Everyone thought that some inventory transactions just were not being recorded, but efforts to improve record accuracy did no good. Finally, one of the plant managers decided to "stake out" the warehouse late at night. It wasn't long before he found out that an enterprising employee was running his own business -- selling tires at cut-rate prices over the warehouse back fence -- the source of the "unrecorded transactions."

Another company kept encountering problems with shortages of a particular part. The only answer was that an employee had to be taking the parts out of the plant, but no one could understand why because this particular part was unique only to the product the company made and could not really be used for anything else. However, one of the employees finally got caught sneaking the parts out in his lunch box. As it turned out, this particular part was made of copper, which had a pretty good price as scrap metal at the time. The employee was supplementing his income by selling the parts for scrap.

The tire manufacturer mentioned in a previous story illustrates the real "hidden" cost of inventory. Once, when the plant was shut down for several weeks due to a strike, management decided to tour areas of the plant they had never visited, such as the warehouse. The warehouse was full of stacks of tires, but in one corner way in the back they found a veritable wall of tires that appeared to fill the entire corner. However, someone realized there was actually just enough room for someone to slip between the last stack of tires and the back wall of the warehouse. Instead of more tires, what they found inside was actually an empty space that had been comfortably furnished with a couch, several chairs -- and even a TV! No wonder no one could ever find a warehouseman when they needed one.

## **These two are from Greg's own experience**

**Again, the most important person in the company is -- the forklift driver!**

I was visited one day by a group of students from the College of Education. These students were enrolled in a graduate education class that required them to do a consulting project. Heaven only knows how they happened to end up with a project that involved a small local manufacturer who was considering implementing JIT, but the students were smart enough to realize they needed help. They came to me to find out whether I thought JIT was a good choice for the company. As I asked questions to learn more about this company, I came to realize the company had absolutely no formal systems for doing anything. Finally, somewhat incredulous, I asked the students how the company managed to get anything done. They responded that things actually seemed to run pretty well, except when the forklift driver was out sick. More than slightly surprised I asked them why that was. They said there was no formal inventory storage system, so the forklift driver just put things wherever he wanted. The only problem was that whenever he was out sick, no one else knew where anything was; so on those days they spent most of their time looking for stuff. As might be expected, I told those students that JIT was definitely not a good fit for that company.

**The relationship between production scheduling, WIP inventory, and cash flow.**

One of our College alumni is a very successful businessman who owns several small manufacturing companies. One of those companies was purchased when the heirs of the company founder tried to run the business after the founder's death -- even though none of those heirs had any manufacturing experience, nor even any business experience. Our alum tells what the company was like just before he purchased it:

The original founder was a very autocratic person who had worked his way up as a machinist. He did not believe in sharing authority, and kept most of the company information in his head. When he died suddenly there were very few formal records -- not even ones for customer orders.

Although the founder's heirs had no record of previous orders, they could see any new orders that came in, so they decided to stop all work on past orders and to start working only on new orders, leaving WIP inventory from the past orders in the aisles. Unfortunately, customers who had orders that had been in process when the founder died began calling up to inquire about the status of their orders, which were now past due. The new owners, feeling pressure from these customers to get the orders done, decided to stop work on the new orders and to begin work on the old orders. WIP from the new orders, which had not yet been completed, joined the previous WIP from the old orders, which was already in the aisles.

Customers started realizing that the company's new management was responding to whichever customer contacted them most recently, so those customers began resubmitting previous orders that had never been completed. Because the heirs had not installed a formal system for recording orders, they did not realize that these "new" orders were actually old orders being resubmitted. In any case, whenever a new order came in, work was stopped on existing orders and begun on the new order. This continued until the aisles became so clogged with WIP that nothing could move. Furthermore, nothing was getting shipped out, so no revenue was coming in. At the same time, significant amounts of raw materials had to be purchased for each new order, so the company owed huge amounts of money to its suppliers, which had now begun demanding payment up-front before they would ship materials.

At this point, the heirs decided to sell the company, and our alum got a very good company (with lots of WIP) for a very low price.

### **This one is from one of Greg's students that did an internship at the company.**

#### **When counting inventory, it depends who does the counting.**

A company near the University manufactures the bumper fascia for several different auto makers. The bumper fascia, made of plastic, is pre-painted by the parts maker to match the colors of the cars on which they are scheduled to be assembled. Because the auto makers use JIT deliveries, it is extremely important that exactly the right number of bumper fascia in each color be ready for shipment each day. In fact, the company had even started a program of having inventory physically counted, either by the forklift drivers or by other plant personnel if the forklift drivers were all busy. However, there were still some problems with inaccuracies -- especially involving the darker colors. After studying the problem, the only pattern that emerged was that inventory counts seemed to be more accurate when the forklift drivers did the counting than when someone else did it. Finally, someone realized that the bumper fascia are loaded onto long, narrow racks that are placed in the not-too-well-lit warehouse. Bumper fascia at the back of a rack is very hard to see, and it's often difficult to differentiate between dark colors. Because of this, the forklift drivers were in the habit of using their trucks to pull the racks out so they could see at the back. However, other employees did not have that option, and had to "guesstimate" as best they could, often leading to inaccurate results.

## With This Sign, Optimize

Gene Woolsey

*(From The Performance Advantage, January 1992)*

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Some time ago in a far city, there was a manufacturing firm that was in a most happy state. Demand for their most profitable product far outstripped the supply. However, it was quickly noticed that the finishing department was posting service rates to outside customers that maxed out at a very poor 37 percent of ordered product. What made this doubly strange was that the foundry was posting rates of 99.995 percent of desired tonnage to the finishing department. The foundry was clearly a winner and the finishing department was a problem.

The industrial engineering group was quickly handed the problem and told to "fix it now!" In the finishing shop they quickly discovered that machines were usually idle for lack of work. But, how could this be, if the foundry was making 99.995 percent of desired tonnage to finishing each month? Now this product usually came in sets of 100. The foundry produced the castings for finishing to machine. Unfortunately the finishing shop often didn't get enough good castings from the foundry to make up a complete set. Also, they often had a "hot" job following closely on the heels of the incomplete job. The foundry put partial sets in an inventory holding warehouse until such time as they would get around to completing the set. Unfortunately, this warehouse that was down the street and "out of sight" rapidly became "out of mind." An examination of the "holding" warehouse revealed racks of inventory of incomplete sets stretching away into the darkness.

We see at once why the foundry looked so good. They were measured on tons delivered to finishing, and deliver tons they did, very well. The fact that the tonnage produced was incomplete and useless to finishing was no problem of theirs.

The solution was clear: require the finishing shop director to take partial sets. The finishing shop director was adamant about not accepting partial sets because of the following logic. Say, he sets up and starts running a partial set. If the rest of the set arrives before he is through running what he has, fine and dandy. If not, then the fun begins. He now has the following no-win situation:

**Case 1:** He may set up for another kind of casting and start running. He now faces the five to ten hours of machine setup again to machine the remaining parts of the original set (an additional cost to him as a profit center). The other alternative is equally unfortunate.

**Case 2:** He may choose to idle the machine in hopes that the remaining parts, like St. Nicholas, soon will be there. As he is not a believer in Santa, and as idle machines tend to attract the eye of bean counters, he will (almost) always choose Case 1. The real hidden agenda in all this is simply that his customers will not accept partial shipments.

A first proposal from the industrial engineering group was that the foundry should be measured in service rate to the finishing shop. The resulting outrage of the foundry manager went all the way up to the president. Treating their second degree burns, the industrial engineering group tried again. They suggested that both the foundry and the finishing shop be measured in tonnage and service rate for the same period. The foundry manager could live with this as his high tonnage and poor service rate to finishing would contrast with the poor tonnage and poor service rate of the finishing shop. The finishing shop director could live with it because the measures were now consistent and he knew that the simultaneous presentation could do nothing but help him. Both sides could give a little and feel justified. But the real problem remained. Four alternatives were considered:

**1.** Require that no partial sets could leave the foundry floor.

**Result:** The foundry would soon be up to their backside in partial sets and be unable to do more work until the partial sets were completed.

**Bad news:** If the following order is a "hot," high-profit job, it might be delayed to get a low-profit, low-priority job out of the way.

**2.** Move the holding warehouse next to the foundry so everyone can see the level of partial inventory. Put a sign four meters high where the foundrymen (and the director) can see it. This sign would state the percentage of partial sets stored there relative to total sets produced. The plant manager would come and (visibly) look at it every day.

**Result:** The partial sets would no longer be out of sight, the sign would be hard to miss.

**Bad news:** Moving the warehouse would cost a bundle.

**3.** Just post the sign as in #2 above. The plant manager would have a similar one, the same size, in his office. Both signs would be posted as above, by the corporate auditor. The plant manager would still look at it every day.

**Result:** Sign and top management interest would be hard to miss.

**Bad news:** Doesn't have impact of # 1 or #2 above.

**4.** Do nothing.

**Results:** Maybe things will get better.

**Bad news:** Maybe they won't!

Now, when you give a manager a spread of alternatives, few can argue that the work is insufficient. Further, the chance that management will choose one of your suggestions is increased, helping your batting average and credibility.

In the above case, alternative #3 was chosen with a twist provided by the plant manager. He moved the foundry manager out of his air-conditioned office and set him up on the foundry floor, facing the sign! He suggested that he could move back into air conditioning when the partial set warehouse was consistently empty. It didn't take long!

## The Strange Case of the Disappearing Inventory

Gene Woolsey

*(From: The Performance Advantage February 1992)*

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The new production manager of Smortzcrumpf Tool & Die had a queasy feeling that all was not well with their latest product. The product had only five components and was simple indeed. The final form was made by shaping and forming a raw material after the addition of, at most, four other materials. The entire process, from unloading boxcars of the raw material to shipping the final product, went through at most seven steps. However, the most casual observer would note that the number of raw material boxcars in was massively greater than the number of final product boxcars out.

Without further ado, the IE/OR grüpe was assigned the problem. After some weeks had passed, the IEs had many new pads of time-and-motion studies. The OR people then simulated the process on their CDC 6600. They then presented some suggestions for a new machine layout in the shop. This was implemented at once with the expected result: an immediate drop in production. Once more the empirically proven People-System Theorem had its effect. Let us restate it here:

**The People-System Theorem:** *Any system requiring actions not consistent with human nature will never operate up to expectations (if at all).*

However, after a time, the learning curve came up enough that production was only slightly worse than before the change. Unfortunately, the number of boxcars of final product was now noticeably *less* than the miserable level heretofore achieved. At this point panic set in on all sides. Somehow, inventory was disappearing. Clearly, extreme measures were going to be necessary.

The production manager held a brainstorming session in which *any* suggestions were encouraged. At this point, entering right, we meet our heroine. She was a graduate chemical engineer who had somehow fallen into OR. As an aside, I must say that chemical engineers make some of the best OR analysts. The reason is simple. Chemical engineers have two basic concepts beaten into them: (1) What you put in, got to come out (somewhere, eventually)<sup>6</sup>; and (2) Left-hand side units must equal right-

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<sup>6</sup> Peters, M.S. and K.D. Timmerhaus. *Plant Design and Economics for Chemical Engineers*, First Ed., McGraw-Hill Book Co., New York, New York. 1958.

hand side units<sup>7</sup>! In short, chemical engineers instinctively believe basic inventory laws and disbelieve any system that does not exhibit mass and energy balances.

It was clear to her that, at least, the mass balance of the system was the point of interest. She therefore took a hard look at the scrap rate in each stage of the process. She went into the shop and observed that the scrap from each stage was around 10 percent. One stage did have a scrap rate of 20 percent, but as this was rework, it did not seem unreasonable. At the brain- storming session she suggested that the problem had to be in excess scrap rate. She suggested that all outgoing scrap be weighed at the end of each shift. The foremen argued that this was unnecessary. They pointed out that for scrap to account for the lost product, each machine would have to be surrounded by full scrap barrels. As it was impossible to find, at any time, more than a half barrel of scrap in the shop, clearly she was on the wrong track. With that, the meeting adjourned.

Undaunted, she returned to the shop floor to look some more. She noticed that, indeed, you couldn't find a full barrel of scrap on the shop floor, even if you looked for days. She was almost convinced that the foremen were right, when she realized that if *you never* found a full barrel that wasn't likely either. If you never found a full barrel you naturally concluded that not much scrap was being produced. But there was another possibility. Her first clue came when she noticed all the scrap barrels had a hand-painted red strip centered half-way down the barrel. Her second clue came when she asked the forklift driver who picked up the barrels for permission to have a look at the barrels they were taking away. They were half full. She hied herself off to the office of the plant's materials manager. She asked him why the scrap barrels were being removed when only half full. He told her, at length, about his first day at work as a new materials manager many years before. When he had come on board, he told her, "You couldn't see the machines for the full scrap barrels." He had quickly passed the word to his men that if he found a barrel of scrap more than half full anywhere in the shop at anytime, that by sunset the company would have one less forklift driver. He proudly told her that he had only had to fire one driver. And that firing was on the first effective day of his new order.

She now knew why there was so little visible scrap. The reasons were because the company had: (1) centralized scrap management, and (2) one jolly efficient scrap manager. Her next statement was obvious: "Does your profit and loss statement reflect sales of this scrap?"

"Whaddaya mean, *reflect?* Lady, it's *most* of it. I sell it back, for recycle, to the people who sell it to us! *We ship a hopper car full every day.*"

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<sup>7</sup> Levenspiel. Octave. Chemical Reaction Engineering. Wiley & Sons, New York. New York. 1962.

## Further Adventures in Inventory Control Education

Gene Woolsey

*(From: The Performance Advantage, July 1992)*

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In a previous article in this series, I outlined how, in my humble opinion, inventory control education *ought* to be done. In essence, it just requires that the student work his or her way through the plant "dock to dock" before being allowed to make any smart-ass suggestions as to how things might be improved. I recall (with considerable amusement) an application of this approach at a nameless local porcelain plant attached to a nameless local brewery. The production manager gave me a call and said that they were having a little problem with one of their coated substrate lines - they were rejecting an unconscionable percentage of their final product on quality grounds. He asked if I might have a student to work with them on the problem.

Shortly thereafter, I and the student appeared. Now, this student was extremely bright and also a rather attractive young lady. The middle manager inquired politely if this was the student I had proposed for the project. I quickly assured him that she was. His response was, "But, she's a *girl!*" I applauded (literally) his perception, realizing that I now was sure that I was dealing with *middle* management, and suggested that we get on with it.

He proposed that she be given a clipboard and stopwatch and take some time and motion studies of the workers to get data for her "model" of the situation. I proposed that she start that day's midnight shift, unloading 44-gallon barrels of alumina from box cars and do this for a couple of weeks. I then proposed that she make ceramic tape for a couple of weeks, work in the tape curing room for a couple of weeks, work the punch press punching out substrates for a couple of weeks, load kilns with substrates for a couple of weeks, unload kilns for a couple of weeks, work inspection for a couple of weeks, and package and ship for a couple of weeks. After this, I said, "*Then she'll be ready to help you.*"

He said, "I certainly don't propose to pay her an engineer's salary to work the line. I told him that I didn't want him to pay her *at all!* I suggested that she be paid a dollar so she was covered by insurance, but that she shouldn't be paid until she *knew enough to help them.*

He said he had never heard of such a concept. I told him that it was called **Honesty** - a completely new concept in higher education.

He turned to her and said, "Honey, you don't want to work the *line*?" She said, "Yes darling. I think I do! (I *like* feisty women.)

He (still fighting) said, "Yes, but can't you learn as much by *watching*?" At this point she leaned over, put a hand on his knee, looked soulfully into his eyes and said, "You're kind of old to be a virgin, aren't you fella?" He changed color and choked out that. "Perhaps the young lady had made her point." She started that day.

While running the punch press, a young industrial engineer appeared and informed her that he was going to do a time and motion study on her. She turned her machine off and asked him if he, perhaps, knew how to turn it back on. He told her that he didn't. She then coolly asked him if he thought that he could show her how to do her job better. He replied that he thought so. She (still coolly) asked him why he might think so. He answered that he could because he was an *industrial engineer*! She then told him (we have nine co-workers as witnesses) to go and perform a *physical impossibility*! He fled the scene. (Men do not deal well with that sort of reply from women in this country.)

He went immediately to the production manager and said, "You won't *believe* what one of those women on the punch press just said to me!" The production manager, visibly amused said, "I'll bet I know which one it was."

He called them both into his office and asked her if she had, indeed, made the suggestion mentioned above. She answered, "Big Time!" He (trying to control his mirth) asked her the reason for this outburst. She said, "Look here, I have to work my way through this plant for 14 weeks on the midnight shift to satisfy my flaming a\*\*\*\*\*e of an advisor that I might have some business trying to improve this process, and this clown - who doesn't even know how to turn my machine on - tries to tell me how to do my job better. I just told him what he could do with his suggestion. I suggest that he work *his* way through this plant for 14 weeks on the night shift. *Then* when he comes around telling us girls how to do it better, we just *might* listen to him."

The production manager said, "Sounds like a good idea to me, how about it?" The industrial engineer, visibly shocked by the idea, said, "I'm not going to work the *line*. I'm a salaried employee *and* an industrial engineer." The production manger said, "No, you're wrong on both counts. You're *fired*!" In a sudden moment of career-saving reflection, the IE quickly replied that he was "willing to give it a shot."

**Moral: Isn't it touching how we can inspire people in hard economic times!**

## **An Essay in the Management of Inventory or por Razon si Possible, por Fuerza si Necesario<sup>8</sup>!**

### **Gene Woolsey and El Zopilote Sabio**

*(From Interfaces, June 1982)*

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There was once a tool crib in a company in South America that contained about \$300,000 worth of tools, dies, and jigs. Presiding over this small, caged empire was one Octaviano Huerta, who was within two years of retirement. He had been with the company when it was but a small machine shop; now it covered many hectares of land, and, indeed, he felt that the present tool crib was probably larger than the original shed where he had started 30 years ago as a helper. In that time he had worked as a helper, machinist, foreman, and finally, with advancing years, had been given the tool crib as his domain.

This tool crib was much like all other such repositories around the world; there was a half-door before which workmen appeared seeking tools, dies, and jigs. Octaviano saw his job as giving them what they wanted, if he had it. Further, he must watch carefully the usage rates and order enough so that no one went away empty-handed.

Naturally there was, hanging on a nail next to the half-door, a pad of pull tickets which should be filled out for the delivery of something from the crib. Precariously perched on top of the pad was a pencil, and on top of the pencil, in geologic depth, was dust.

When Octaviano had first taken over the tool crib many years before, he had been assiduous in making sure that the forms were properly filled out and all in order. But as time went on, the crib grew larger, and the line before the half-door grew apace. It was much harder to get the people to fill out the forms properly when you had two or more people in line behind them with a machine waiting for a tool. After a while, Octaviano relied on memory to fill out the Friday totals to the accounting department and, therefore, ever so slowly, things (the tool count in particular) began to deteriorate.

In the course of time this firm reached sufficient success to acquire a OR/MS/IE grüppe reporting to the head bean counter. Naturally, such a group must cast about for opportunities for advancement in the eyes of corporate management. As luck would have it the small domain of Octaviano caught their eye. Studies were run, and soon bids were to be let

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<sup>8</sup> With reason if possible, with force if necessary.

for a computerized system that would keep track of all that came in and went out, with an anticipated considerable reduction in operating cost. There was one among them, however, who said: "I seem to recall reading about a situation like this. Before we go out for bids let me seek the reference in my library."

He was not long in finding it. After reflection, he met with the head man of his group and proposed another way: "El Zopilote says that computerization of a failing manual system often results in an abortive computerized system *for more money*. Let us think again before we move on the bids."

A deal was soon struck with the plant manager that any system that cost less than their present shrinkage of tools was acceptable to management. At this point the idea man went to Octaviano and asked: "Octaviano, what is the value of the material in this crib?" Octaviano guessed quickly and came up with the \$328,000, a figure only about 2% high. The idea man then told him that the company was most concerned that the forms were not filled out by the workmen. This situation made it most difficult to keep a record of the cost of operating the crib, Octaviano agreed at once, in principle, but pointed out that he had been trying for years to get the men to do it with no success. In fact just the other day there had been an upsetting incident when he had tried. He had politely asked Venustusiano Oso, one of the biggest workmen there, to fill out the form. Venustusiano rudely refused. At that point Octaviano simply told him that, if he didn't get the form, Venustusiano wouldn't get the tool. Stories differed among the workmen as to what happened next, but the most reliable one seemed to be as follows: El Oso reached through the half-door, pulled Octaviano across it, and offered to do him grievous bodily harm if he didn't get his tool. The tool was shortly forthcoming. Octaviano was still shaken over the incident. He was willing to try to get the system to work but somewhere short of suicide.

At this point a new deal was offered to Octaviano. First, that night, a full physical inventory would be run in the crib. And Octaviano was told that for every end-of-month reached with a *perfect* match between inventory and pull tickets, he would be given *one-half of one percent of the value of his crib*. Needless to say, this proposal had to be put in writing before Octaviano would believe it. He realized that 'he had the near anticipation of a munificent retirement bonus. There was some concern on the group leader's part, as they left the plant floor, as to how little Octaviano would enforce the new rule. The idea man consoled him: "He'll find a way by morning, don't worry."

Indeed, by the time the OR grüppe arrived at work the system had resolved itself. As usual, stories differed, but there was general agreement that the incident took place roughly as follows: Unfortunately for Octaviano, the first workman that approached the crib that morning with a broken tool to be replaced was (you guessed it) Venustusiano Oso. The script apparently was:

Oso: "Give me one of these!"

Huerta: "Certainly, but first we have a new system in force, you must fill out the form."

Oso: "I have never done it before and I won't do it now, give me the tool."

Huerta: "Not until you fill out the form."

Oso: "Perhaps, old man, your memory has failed you as to the result of our last conversation on this subject. GIVE ME THE TOOL!"

Huerta: "Fill out the *form!*"

Oso: (leaning over the half-door) "If you don't give me the tool *right now* I am going to tear off this door and make you *eat it.*"

(At this point reliable witnesses agree that, shaking visibly, Huerta reached under the half-door and produced, holding it with both hands, a cocked single-action .44, shoved it into Oso's gut and said softly, but firmly:)

Huerta: "Fill out the form?"

To which Oso replied: "Si, comprendo."

He then filled out the form, received his tool, and was politely thanked by Huerta. Needless to say, at the end of every month, until his retirement, Octaviano received his bonus. His replacement had no further problems either. Apparently, at his retirement luncheon, Octaviano solemnly presented his replacement with his gun. No further action was necessary.

Some arithmetic quickly showed that for a cost of about \$36,000 for two years that average shrinkage of \$62,000 a year was avoided plus a considerable reduction in total inventory costs. But the most important lesson, for productivity buffs, is as follows:

**With the old system, Octaviano was an *employee*.**

**With the new system he was an *owner*.**

## The Inventory that Couldn't Be Zero

Gene Woolsey

*(From: The Performance Advantage, September 1991)*

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A few years ago, I was called in to evaluate a production and inventory control operation in a large manufacturing firm in a nameless South American country. After installation of appropriate computerization, it was one of the most up-to-date systems in the country. Indeed, every ten days they did a complete inventory of the warehouse, which contained some 15,000 different items. A listing was then produced for the production and inventory control supervisor to work with in dealing with the marketing forecasts.

There was just one problem with this otherwise relatively efficient unit-record card system - the number in inventory was *always* wrong, relative to the listing. The P&IC manager witch-hunted every possible avenue where things could be going wrong but found nothing. In desperation, it was decided that a *Norteamnericano* should be called in and, shortly thereafter, my phone rang. As this looked like an interesting opportunity to educate one of my students, I took one along.

As we were winging our way south, I explained in detail to my student, that he was to look, listen and take notes. I further told him that if he volunteered any words while we were on the job, I would hit him with the nearest blunt instrument. His duty there was to watch me carefully and note when I did good things, and note even more carefully the occasions when I messed up. Now I know that telling students of your triumphs is a sure ticket to put them to sleep. The reason for this is clear; they are sure that, given the same situation, they could have done as well or better than your success stories. On the other hand, if you tell them of your screw-ups, they not only take notes but bring along tape recorders, as well. They pay much closer attention to your disasters, as they sincerely wish to avoid repeating history.

On our arrival, we were given a guided tour of the plant and a detailed look at the data collection system. We noted almost immediately that it took quite a while for the data to be punched up, verified and listed on the tab equipment. Of course, the time lag could account for the error, as parts were removed from the warehouse between the time that the count was taken and the listing produced. But the removals could easily be verified in the withdrawal records kept in the warehouse.

Hours had now passed and we were getting dizzy looking at yet another page of part numbers. The really strange cases were the ones in which there had been no withdrawals for several cycles for a given part.

Yet, each time it was counted, we noted a different number on the listing. Finally, we went to the warehouse and counted for ourselves. The result: we, too, would get a different number than was listed in the inventory.

At this point, a suspicion was beginning to form in my mind. I requested the forms for past counts that were filled out by the warehouse people who actually did the counting. We had these for only the last three counts, but we noted immediately that the transmission through the key-punching, sorting and listing process was virtually error-free. This indicated that the only remaining source of error was either in the withdrawals from the warehouse or in the original count. We chose some high-value and low-value items at random for checking the withdrawal process. There were some errors, to be sure, but not enough to generate the kind of consistent errors we were witnessing. This left only the original counting procedure as a possible source of error. I then carefully asked the head warehouseman if he thought that he had enough people to do the constant cycle counting that was required by the system. He didn't hold back. Indeed, he lamented for a good half hour about how it was a miracle that he and his present crew could complete the count before they had to start all over again. In fact, upon checking with his supervisor, I discovered that they had to threaten to *fire* him before he would agree to try to complete the original count required by the system every ten days.

Returning to the listing; which was some three inches thick, I started looking for something, I knew not what. Suddenly, my student and I noticed simultaneously that no count of a part ever ended in zero. We checked hundreds of pages of the present and past listings with the same result.

We immediately returned to the warehouse for a discussion, sans management, with the head warehouseman. He admitted that the first count had been pretty rough and ready. In fact, to save time, he had told his people to simply estimate the counts of the less valuable items as close as they could. The result was the well-known human tendency to round to the nearest ten or, in some cases, hundred.

Immediately after the first count was turned in, he *really* caught hell when the bean counter section, disbelieving all the zeros, came and counted the warehouse for themselves. The chewing-out he got was forever etched in his memory. It was clear that he had been called on the carpet because the bean-counters didn't like to see the counts ending in zeros. The result was, naturally, that he told his people to estimate as before, in order to complete the count on time. However, as the message he had received was that the bean-counters didn't want to see zeros, *he had seen to it that they never saw another.*

# Jokes



## Two from New Yorker Cartoons

Sent by Harvey Wagner

Two guests at a very crowded party were backed into a corner by the crush of people. One turns to the other and says, "Does the host really know all of these people?" "No," replied the other, "they're just inventory."

The boss looks into the office of one of his employees. The office is crammed full of boxes that are stacked to the ceiling. There is barely enough of a path to get to the employee's desk and even less room on the desk for any work. The boss says, "We all appreciate your efforts to help us draw down our inventory, Svensen, but isn't it too crowded to work in here?"

## How Inventory Gets out of Control

*Below is some correspondence that actually occurred between a London hotel's staff and one of its guests. The London hotel involved submitted this to the Sunday Times. No hotel name was mentioned.*

**Dear Maid,**

Please do not leave any more of those little bars of soap in my bathroom since I have brought my own bath-sized Dial. Please remove the six unopened little bars from the shelf under the medicine chest and another three in the shower soap dish. They are in my way. Thank you, S. Berman

**Dear Room 635,**

I am not your regular maid. She will be back tomorrow, Thursday, from her day off. I took the 3 hotel soaps out of the shower soap dish as you requested. The 6 bars on your shelf I took out of your way and put on top of your Kleenex dispenser in case you should change your mind. This leaves only the 3 bars I left today which my instructions from the management is to leave 3 soaps daily. I hope this is satisfactory. Kathy, Relief Maid

**Dear Maid,**

I hope you are my regular maid. Apparently Kathy did not tell you about my note to her concerning the little bars of soap. When I got back to my room this evening I found you had added 3 little Camays to the shelf under my medicine cabinet. I am going to be here in the hotel for two weeks and have brought my own bath-size Dial so I won't need those 6 little Camays

which are on the shelf. They are in my way when shaving, brushing teeth, etc. Please remove them. S. Berman

**Dear Mr. Berman,**

My day off was last Wed. so the relief maid left 3 hotel soaps which we are instructed by the management. I took the 6 soaps which were in your way on the shelf and put them in the soap dish where your Dial was. I put the Dial in the medicine cabinet for your convenience. I didn't remove the 3 complimentary soaps which are always placed inside the medicine cabinet for all new check-ins and which you did not object to when you checked in last Monday. Please let me know if I can be of further assistance. Your regular maid, Dotty

**Dear Mr. Berman,**

The assistant manager, Mr. Kensedder, informed me this A.M. that you called him last evening and said you were unhappy with your maid service. I have assigned a new girl to your room. I hope you will accept my apologies for any past inconvenience. If you have any future complaints please contact me so I can give it my personal attention. Call extension 1108 between 8AM and 5PM. Thank you. Elaine Carmen Housekeeper

**Dear Miss Carmen,**

It is impossible to contact you by phone since I leave the hotel for business at 745 AM and don't get back before 530 or 6PM. That's the reason I called Mr. Kensedder last night. You were already off duty. I only asked Mr. Kensedder if he could do anything about those little bars of soap. The new maid you assigned me must have thought I was a new check-in today, since she left another 3 bars of hotel soap in my medicine cabinet along with her regular delivery of 3 bars on the bathroom shelf. In just 5 days here I have accumulated 24 little bars of soap. Why are you doing this to me? S. Berman

**Dear Mr. Berman,**

Your maid, Kathy, has been instructed to stop delivering soap to your room and remove the extra soaps. If I can be of further assistance, please call extension 1108 between 8AM and 5PM. Thank you, Elaine Carmen, Housekeeper

**Dear Mr. Kensedder,**

My bath-size Dial is missing. Every bar of soap was taken from my room including my own bath-size Dial. I came in late last night and had to call the bellhop to bring me 4 little Cashmere Bouquets. S. Berman

**Dear Mr. Berman,**

I have informed our housekeeper, Elaine Carmen, of your soap problem. I cannot understand why there was no soap in your room since our maids are

instructed to leave 3 bars of soap each time they service a room. The situation will be rectified immediately. Please accept my apologies for the inconvenience. Martin L. Kensedder, Assistant Manager

**Dear Mrs. Carmen,**

Who the hell left 54 little bars of Camay in my room? I came in last night and found 54 little bars of soap. I don't want 54 little bars of Camay. I want my one damn bar of bath-size Dial. Do you realize I have 54 bars of soap in here? All I want is my bath size Dial. Please give me back my bath-size Dial. S. Berman

**Dear Mr. Berman,**

You complained of too much soap in your room so I had them removed. Then you complained to Mr. Kensedder that all your soap was missing so I personally returned them. The 24 Camays which had been taken and the 3 Camays you are supposed to receive daily (sic). I don't know anything about the 4 Cashmere Bouquets. Obviously your maid, Kathy, did not know I had returned your soaps so she also brought 24 Camays plus the 3 daily Camays. I don't know where you got the idea this hotel issues bath-size Dial. I was able to locate some bath-size Ivory which I left in your room. Elaine Carmen Housekeeper

**Dear Mrs. Carmen,**

Just a short note to bring you up-to-date on my latest soap inventory. As of today I possess:

- On shelf under medicine cabinet - 18 Camay in 4 stacks of 4 and 1 stack of 2.
- On Kleenex dispenser - 11 Camay in 2 stacks of 4 and 1 stack of 3.
- On bedroom dresser - 1 stack of 3 Cashmere Bouquet, 1 stack of 4 hotel-size Ivory, and 8 Camay in 2 stacks of 4.
- Inside medicine cabinet - 14 Camay in 3 stacks of 4 and 1 stack of 2.
- In shower soap dish - 6 Camay, very moist.
- On northeast corner of tub - 1 Cashmere Bouquet, slightly used.
- On northwest corner of tub - 6 Camays in 2 stacks of 3.

Please ask Kathy when she services my room to make sure the stacks are neatly piled and dusted. Also, please advise her that stacks of more than 4 have a tendency to tip. May I suggest that my bedroom window sill is not in use and will make an excellent spot for future soap deliveries. One more item, I have purchased another bar of bath-sized Dial which I am keeping in the hotel vault in order to avoid further misunderstandings. S. Berman

## Inventory Rain

A friend had an old Datsun that she simply couldn't part with. Eventually, time and mileage caught up with her and she was stranded in a small town in the middle of the United States. The local mechanic looked over the car and said, "I think I can fix it, but it will take a part for the transmission. It's a special cog that I haven't had in stock for years, but let me call the Datsun dealer up in the city."

After a bit the mechanic came back and said, "They don't keep the cogs in inventory either, but suggested I call the distributor. Well, I did, and the distributor has them. The problem is they only sell the cogs in case lots. I won't be able to use them, but if you'll pay for them, I'll get a case so I can fix your car. The distributor can send them by overnight express and we'll have them tomorrow."

After thinking it over, my friend said okay and the mechanic ordered the parts. As luck would have, the airplane bringing the cogs for the Datsun had an accident in the air and the case with the cogs flew out the door and hit the tail of the airplane. Nothing happened to anyone in the airplane, but the case was broken open and the cogs started to fall to the ground. On hearing the noise in the air, several people ran out of their houses to see what was happening. One old timer looked up and said, "My God! It's raining Datsun cogs."

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## You can count on me

It was time to take inventory in the jewelry store. The manager was new to the job and it would be his first time. He knew that each jewelry case would have to be opened, the trays of jewelry brought out and each piece of jewelry counted. He was quite concerned about the risk of having trays of jewelry out in sight while the counting was going on.

When the day finally came, the manager asked the entire staff to leave early and said that he would take inventory. Two of the employees went to the local bar to celebrate their extra time off. On their way back, they passed the store and saw the store manager's wife sanding next to the counter with her hands in the air. The store manager would point one of her hands and she would lift a finger, then he would point again and she would lift another finger and so on. After a bit, he would stop, look at her hands, write something down and she would close her fingers. Then the process would start again.

Eventually the two employees went on their way, deciding it would be best if the manager didn't see them in their current condition. The next day, however, they asked the manager what his wife was doing in the store. He replied, "She was helping me take inventory." They asked, "What do you mean?" He answered, "She was the only one I could count on."

## Planning Ahead

On a Friday afternoon one winter a traveling salesman was preparing to leave Amsterdam to return to Singapore, when a huge storm closed the airport. The forecast was for the airport to remain closed until at least Sunday afternoon. Disappointed at not being able to get home, the salesman went to the bar for a drink. When the drink came he sighed, lifted the glass and, just as he was about to take a drink, looked across the bar. There was one of the most beautiful women he had ever seen. He lifted his glass to her and she responded. He took a sip, not really believing what was going on, and looked to see her toasting him.

Deciding that it must be for real, he went over to her and introduced himself. He ordered another round of drinks and suggested that she join him at a secluded table in the back. She readily agreed. As they sat talking, they were each surprised to learn how much they had in common. They liked the same music, food, cinema, artists and so forth. After a while he suggested that they have dinner and go dancing. Again she agreed.

After a great meal and some time dancing, she suggested that they go to her apartment for a nightcap, to which the salesman quickly agreed. The next morning, after a wonderfully satisfying night together, the airport was still closed and they spent the day enjoying Amsterdam's museums, wonderful food and city sights. After dinner and dancing, they spent another wonderful night together.

The next morning the storm had passed and the salesman learned that he could get on a flight too Singapore that evening. They had a leisurely breakfast and walked around a bit before returning to her apartment for one more romp in the bedroom. When the salesman finally had to leave, he said how much he had enjoyed the weekend together and asked if there was anything that he could do for her. She protested no, that she had enjoyed the time together as well. He said he really would like to get something for her and she relented.

"If you would really like to get me something, get me a gold-plated, switch-bladed, Boy Scout knife," she said. "What is that and where would I get it on a Sunday?" he replied. "Well, it turns out that there is a store nearby that has them," she answered, and gave him the directions.

Well the salesman did find a gold-plated, switch-bladed, Boy Scout knife, exactly as she had said. When he returned to the apartment, he was asked her where she would like the knife. She said, "Just put it in the drawer in the table near the door." He opened the drawer and it was filled with gold-plated, switch-bladed, Boy Scout knives. "What is this inventory of knives for?" he asked. "Well, she replied, remember when we first met at the bar." "Yes!" "You saw someone that you thought was attractive, right?" "Yes!" "In time, you know, some of the glamour will go. The wrinkles will come to my skin, the shine in my eyes will dim, my body will begin to sag and I will be less attractive." He interrupted, "So why the knives?" She replied, "When I can no longer attract men, do you have any idea what a Boy Scout will do to get one of those knives?"

## On shrinkage

Every afternoon at quitting time, old Fred would come to the gate at the construction site with a wheelbarrow full of dirt. The guard at the gate suspected that Fred was stealing tools or other valuable material from inventory. Every night the guard went through the dirt and never found anything. After several weeks had passed and the job was just about over, the guard finally told old Fred, "Look, you're driving me crazy. If you tell me what you're stealing, I won't report you to management and I'll look the other way if we're ever on another job together." Old Fred pondered this and finally said, "OK. I'm stealing wheelbarrows."

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## Inventory Control

While in the checkout lane of my local grocery store I observed a young man as he was leaving the store. As the man passed through the exit there was a loud announcement over the public address system, "You have activated our inventory control system. Please step back and an associate will assist you." The man kept walking, oblivious to the announcement and none of the store employees made any effort to approach him. I thought the entire situation was rather odd.

First, let's take a brief look at the meaning of the announcement. "You have activated our inventory control system. Please step back and an associate will assist you." basically means, "We think you have stolen something from the store. Stop so security can search you." Why don't they just say what they mean? Everyone knows what the announcement means but the wording is so fluffy that a thief wouldn't possibly stop for such an announcement. I think they should have something that says, "STOP! THIEF!" or "FREEZE SUCKER!" A big iron grate that drops from the ceiling to block the exit and some flashing lights with sirens would be a nice touch as well.

Of course, the store doesn't want to offend anyone and that is why the announcement is so politically correct. However, it is so non-offensive that even the store employees don't pay attention to it. Not one employee even looked up as the young man left the store.

"Aren't you going to check that guy out?" I asked the manager.

"What for?" was his reply.

I can just see some guy walking out the door of the store managers house with his television in hand. I can picture the manager saying, "You have left the premises with my TV. Please step back so I may assist you in returning it to my home." The manager would then sit down and start reading the newspaper as the thief shut the door and walked away.

## Only in the United States

*Secretary of Agriculture  
Washington DC*

Dear Mr Secretary,

My friend, Ed Peterson, over at Wells, Iowa, received a thousand dollar government check for not raising hogs. So, I want to go into the "not raising hogs" business. What I want to know is, in your opinion, what is the best kind of farm not to raise hogs on and what is the best breed of hogs not to raise? I want to be sure that I approach this endeavor in keeping with all governmental policies. I would prefer not to raise razorbacks but if this is not a good breed not to raise, then I would just as gladly not raise Yorkshires or Durocs. As I see it, the hardest part of this program will be keeping an accurate inventory of how many hogs I haven't raised.

My friend, Peterson, is very pleased about the future of the business. He has been raising hogs for twenty years and the best he ever made on them was four hundred and fifty dollars in 1968 until this when he got your check for not raising any.

If I get one thousand dollars for not raising fifty hogs, will I get two thousand dollars for not raising one hundred hogs? I plan to operate on a small scale at first, holding myself down to about four thousand hogs not raised which will mean about eighty thousand dollars the first year. Now, later on, I could diversify into not raising grain or hogs. Please advise me soon on the kinds of hogs I am not going to raise. I want to get started as soon as possible as this seems like a good time of the year not to raise hogs or grain. Another thing: These hogs I will not raise will not eat ten thousand dollars bushels of corn. Will I qualify for payments for not raising corn to feed the four thousand hogs?

Also, I am considering the "not milking the cows" business so please send me information on that, too. In view of these circumstances, I will soon be totally unemployed and plan to file for unemployment benefits and food stamps.

Patriotically Yours,

M. D. Hartt

## Supplies

Sent by Ruud Teunter

A man inherits a gold mine from an unknown uncle in South Africa. He decides to grasp the opportunity and go there. On arrival, however, it turns out that the mine has not been used for several years and hence no workers are available. So he put up an ad in a local newspaper, asking for mineworkers. The next day, he sits in the main office building waiting for applicant. In the morning and the beginning of the afternoon, no one comes in, and he is already starting to feel desperate. But then this huge "Mike Tyson" type- of guy walks in. Of course, this seems like a perfect mineworker, and so he is hired. Later in the afternoon, another huge guy walks in. This "Arnold Swarchzenegger" look-alike is also hired. After hiring these two workers, the man decides that it has been a fine recruiting day, and decides to go home. The moment he walks out the door of his office, a small Chinese man enters, also looking for work in the mine.

Well, thinks the man, this is not your typical gold-digger, but perhaps he can handle the "supplies". So he hires the Chinese man, and tells him that he has to handle the supplies.

The next day, after spending a few hours in his main office, the man decides to check out how his new workers are doing and enters the mine. After a while he finds Mike and Arnold, and the sight of those two at work makes him instantly happy. Mike is hitting at a mine-wall with his bare hands, and huge parts of rock break off. Arnold lifts those pieces as if he was standing on the moon and carries them off. After enjoying this scene for a while, the man leaves and looks for the Chinese worker. But, though he looks everywhere, he is not able to spot the man. Well, guesses the man, probably he decided that mining wasn't his thing after all. So, he decides to leave the mine again and go to his main office. And then, just when he has left the mine, the Chinese man almost gives him a heart attack when he jumps from behind a tree shouting "surprise" (say: supplies).

## Bumper Stickers

“A bartender is just a pharmacist with a limited inventory.”

## The Modern Tool Box Inventory

*You only need two items in your toolbox:*  
WD-40 and duct tape.  
If it isn't moving and it should, use the WD-40.  
If it moves and it shouldn't, use the duct tape.

## Sure-Fire Signs There's Trouble on the Job

The Security guard takes a complete inventory of your work area.

## Bad One

Q. Where does a rancher record his inventory?  
A. In a cattle-log.

## If Microsoft Were Based Out of Alabama

Their Excel software would include examples to inventory dead cars in your front yard

## How to Clear Your Inventory



## Another Bad One

Q: What to the British call a Conservative production manager who uses the "push material starts into the line" approach?  
A: An invenTory

## **From Goldratt?**

When your throughput 's down  
Inventory is high,  
And OE is out-a-sight Who ya gonna call ?  
**CONSTRAINT BUSTERS!**

When compromise is deemed wise  
And the consequences  
Bring tears to your eyes  
Who ya gonna call ?  
**CONSTRAINT BUSTERS!**

When cash flow is a memory  
And your very close to bankruptcy  
Who ya gonna call ?  
**CONSTRAINT BUSTERS!**

## **Low Inventory**

A woman walks into a convenience store. She walks straight to the manager and asks, "Do you have any small notebooks?"

"Sorry," says the manager. "We're all out."

The woman shrugs, and asks, "Well, do you have any mechanical pencils?"

"Nope, don't have that either," says the manager.

The woman feels her stomach rumbling and asks, "Do you have Doritos? Nachos?"

The manager shrugs, "Sorry."

"Hmmp. How about Chapstick?" says the woman.

"Nope. Don't have that."

"My God!" the woman shouts, "If you don't have anything, you should close the damn store!"

The manager shrugs, "Don't have the key."

## **About Negative and Hypothetical Inventories From Robert W. Grubbström**

A gentleman came into a Coffee parlour and said: " I would like to have a cup of coffee, but without a Danish pastry."

The waitress replied: "I am very sorry, sir. Today, we don't have any Danish pastries, we only have doughnuts. Would it be alright to have a cup of coffee without a doughnut?"

## From Teaching Practice

### From Andre' Everett in New Zealand

These "mistakes" by students show their thinking about inventory from getting basic resources to satisfying the customer:

access to scared resources --- scarce  
row material --- raw  
inventory can butter capacity problems --- buffer  
patrol storage tanks --- petrol  
fished goods --- finished  
butter inventory --- better  
a quantum lip in customer satisfaction --- leap

### From Linda G. Sprague

From an MBA Final Exam: "Inventory is cash that is not flowing."

### From Stephen Disney in the UK

#### **Reasons for not doing your inventory assignment**

1. I accidentally divided by zero and my paper burst into flames.
2. I could only get arbitrarily close to my textbook. I couldn't actually reach it.
3. I have the proof, but there isn't room to write it in this margin.
4. I was watching the World Series and got tied up trying to prove that it converged.
5. I have a solar powered calculator and it was cloudy.

#### **Ways to prove your inventory theorem:**

1. Proof by intimidation
2. Proof by gesticulation (handwaving)
3. Proof by overwhelming evidence
4. Proof by blatant assertion
5. Proof by definition
6. Proof by constipation (I was just sitting there and...)
7. Proof by mutual consent
8. Proof by changing all the 2's to n's
9. Proof by lack of a counterexample
10. Proof by elliptical reasoning
11. Bullet proof
12. 86% proof
13. It stands to reason
14. Try it; it works
15. Proof by linear combination of the above

16.