

This December 16th, 2005 Issue:

*****SNS*** SPECIAL LETTER: PANDEMIC BIRD FLU PREPAREDNESS**

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Publisher's Note: As one of the doctors responsible for eradicating smallpox worldwide, and now as Chair of the Seva Foundation (working to eradicate preventable juvenile blindness worldwide), Larry Brilliant is exactly the kind of person you would want to turn to for pragmatic answers to current concerns regarding a potential avian flu pandemic. Future in Review attendees already know how special Larry is; now the rest of our membership will get a chance to meet him, if indirectly. Through Larry, I have recently become involved in working with others to understand what international preparedness would mean, and how it might be implemented, in order to minimize human loss. When SNS members started writing in asking about this issue, I realized there was no one better qualified to provide you with those answers than Dr. Brilliant. At a time when there is a great deal of hype and misinformation floating around, I think you will find this issue useful, pragmatic and sensible.

As is true each year, we will take the next two weeks off in honor of the holidays. The next SNS will be on January 4th. – mra.

PANDEMIC BIRD FLU PREPAREDNESS

By Larry Brilliant, M.D., M.P.H.

Through the fog of misinformation and fear surrounding the H5N1 bird flu virus, a few things are becoming clearer¹, and they may serve as an outline to approach a serious SNS conversation about this complex, difficult, and constantly changing topic:

1. *No one* knows **if, when, or where** an H5N1 pandemic might start.
2. *If* a pandemic begins soon, it will lead to unprecedented catastrophe.

3. The U.S. federal government is unlikely to provide enough help.
4. Ditto re: other countries, the UN, and the World Health Organization (WHO).
5. Ditto re: the invisible hand of the market.
6. Ditto re: the media.
7. Therefore, each of us will want to know a lot about this in real time, because *the odds change often*, and we may face important decisions for ourselves, our families, our communities, and our businesses.

Let's explore each of these concerns and hope they shed some light on how we should prepare for an uncertain future.

1. *No one* knows if, when, or where an H5N1² pandemic might start³.

No one – no matter what the talking stethoscopes say on CNN – *no one* knows if or when the H5N1 virus, which has caused the death of about 70 humans and more than 100 million birds and domestic fowl, will achieve “escape velocity” and mutate to become a highly contagious, human-to-human “monster at the door”⁴ before there is sufficient quantity of vaccine and/or anti-viral medications to protect us.

H5N1 is already a devastating epizootic⁵ that's wreaking havoc in the poultry industry. Will it become a devastating pandemic? My latest poll of a dozen epidemiologists puts the odds somewhere between 1 in 10 to 1 in 50 that a pandemic will start within the next three years. Whether that seems a low or high risk depends on your tolerance for uncertainty. And it is probably wrong, anyway – besides which, odds-making on a pandemic is an unfortunate game. Perhaps we have been ruined by blithely quoting lottery odds or football pools. Indeed: one website, Intrade, is taking bets on a 65% chance that by 2006 there will be pandemic bird flu⁶. I am sure that will be wrong, too.

2. *If a pandemic begins soon, it will lead to unprecedented catastrophe.*

How bad could it get? Bad. Very bad. There are dozens of guesstimates also of how many might die if the virus becomes an efficient human transmitter – I've seen three conflicting⁷ estimates of 7.4 million, 100 million, and 150 million human deaths from WHO⁸ alone, and some, by extrapolation to the 1918 pandemic, have predicted up to 300 million⁹. *National Geographic*, in an otherwise excellent article on pandemic bird flu, suggests that as many as 1 billion might die¹⁰. *None of them knows*. But all agree that the death toll from pandemic flu will be very high.

Here is my math exercise to come close to orders of magnitude. First, assume that over the three-year period that pandemics usually run their course, one-third of humanity contracted the disease (about the same proportion as the 1918 flu and the same order of magnitude as other flu pandemics). Then, assume that the death rate from H5N1 drops from the currently reported 50% human fatality rate (it is almost 100% fatal in chickens) reported today.

Assume that as a result of both better surveillance (so that we find more mild cases, reducing the denominator of the case fatality rate, which is number of deaths divided by number of cases) and the virus becoming less virulent over time – as do most viruses as they pass through the human population – the case fatality rate drops by nine-tenths. That would reduce the case fatality from H5N1 to 5%. Even then, we face a disaster of unimaginable

proportions: if 33% of the 6.5 billion people in the world get infected, and 5% of them die, we are looking at over 100 million deaths from the disease.

Sadly, and most poignantly, perhaps many more will die, become sick, or experience other horrors from the aftermath of a possible global depression and severe economic disorder. The Congressional Budget Office (CBO) estimates that pandemic bird flu could cost the U.S. 5% of GDP – \$675 billion in just a few weeks¹¹. Many economic analyses (see, for example, the well-written reports by BMO Nesbitt Burns¹²) suggest that the global economic order will break completely in a pandemic, that months may pass with no commercial airplanes in the sky, and the losses from unemployment-related calamities could rival those from the virus.

Medical care will become more and more difficult to get. Unprotected doctors and health workers (and firefighters, police officers, postal workers, etc.) will face difficult choices each day about whether to expose themselves to illness and the risk of death. The frantic quest of CFOs of HMOs and hospitals to fill every bed every day have taken away any “surge capacity” from our own healthcare system, so that in a pandemic, if you need your diabetes medicine or have a heart attack or deliver a baby, you may be on your own more than ever before. It will not be pretty.

3. The U.S. federal government is unlikely to provide enough help.

Who will help us? You are probably reading this newsletter because you attend the Future in Review (FiRe) Conference or are interested in the SNS newsletter’s usual accurate predictions of future trends. As individuals, we try to predict the future not just for the fun of it, but to prepare for it. However, society – our society – as a whole (as opposed to individual investors) does not prepare well for future catastrophes that have low or unknowable probabilities of catastrophic impact.

The federal government has a plan (www.pandemicflu.gov), the basics of which consist of:

- \$1.2 billion for the government to buy enough doses of the vaccine against the current strain of bird flu to protect 20 million Americans; the administration wants to have sufficient vaccine for front-line emergency personnel and at-risk populations, including military personnel.
- \$1 billion to stockpile more anti-viral drugs that lessen the severity of the flu symptoms.
- \$2.8 billion to speed the development of vaccines as new strains emerge, a process that now takes months; the goal is to have the manufacturing capability by 2010 to brew enough vaccine for every American within six months of a pandemic’s start.
- \$583 million for states and local governments to prepare emergency plans to respond to an outbreak.

(Source: <http://msnbc.msn.com/id/9883713>)

We can be grateful that there is a plan, and that the Bush administration appears to be taking pandemic bird flu more seriously than it did Hurricane Katrina. And HHS Secretary Mike Leavitt, by all accounts, is also a breath of fresh (and competent) air – so for the moment, I’ll spare you my rant on the incompetence of this administration. And we should be very happy that more than one-third of the president’s plan is allocated to addressing the market failure which disincentivizes investment in making vaccines.

But there is much to worry about in the president's plan. *Pandemic* starts with "pan," as in "everywhere" – but the president's plan calls for two-thirds of the money for pandemic response to come from the states instead of from the federal budget. This is absurd. The entire nation is put at risk when any community is unable to mount its own pandemic response. Instead of building on the strength of states which have solid plans in place, the president's plan puts the lives of New Yorkers and Californians and Texans more at risk because Louisiana and Alabama and Mississippi may be less able to prevent or contain a raging pandemic. If there were ever a case for a federal government – as opposed to a loose collection of state governments – a disaster whose first name is "pan" should make that case pretty clearly.

Likewise, the president's plan (see next paragraph) fails entirely to be on the offense against emerging outbreaks that start in Viet Nam or Thailand but will inevitably move here. The way to try to prevent or mitigate a pandemic is to adequately fund and resource the campaign at the point where the disease is most likely to originate: South Asia.

Between the dependence on the weakest states and the "America the Island" approach to pandemic defense, the president's \$7.1 billion looks like it has overlooked and underfunded the most important vulnerabilities in pandemic defense: the plan misses a chance to go on the offense in the South Asian birthing zone for a mutated virus and misses the chance to play strong defense by shoring up the weakest links in the American healthcare system – our poorest states.

And like the diner who complained that not only was the food inedible, but the portions were too small, it is not even clear that Bush will get his money at all. Congress is screwing around with the funding appropriations by writing a story that even Jon Stewart would not invent. Earlier this week, conferees agreed to the new Labor, Health & Human Services Conference Report. But they moved around some major money. About \$100 million was taken away from bird flu and re-allocated to retain government coverage of Viagra and other erectile-dysfunction drugs, and more was moved to appease moderate Republicans with rural health dollars. \$120 million total was taken out of the president's request for avian flu funding.

Take money from pandemic preparedness for bedroom preparedness. Now *that's* a policy to campaign on.

And as of mid-December, it looks as if Congress will give the president only half of the \$7.1 billion it is being legislated piecemeal, with \$3.3 billion included in the Defense spending bill, the same bill that Bush has threatened to veto if it includes the McCain provisions against torture.

Even more disconcerting than the amount or source or timing of the money is the basic question of competence. The politicization of FEMA caused an incompetent federal response to Katrina. It should not be a surprise if the FEMA-ization of CDC, NIH, and FDA renders those once-stellar agencies less competent to deal with a pandemic.

4. Nor are the UN and the World Health Organization likely to provide enough help.

Whether the H5N1 virus will achieve "escape velocity" could turn on viral shift, or drift, or even on a single lone point mutation on one virus in the blood of one chicken or one pig or

one farmer in a remote corner of Cambodia – a single mutation that makes the hemagglutinin (the “H” in *H5N1*) more likely to bond with receptors on a human cell and thus gain easier entry into the host body, and thereafter spread human-to-human. No one knows where this might happen, but the most likely places are where there are unsafe poultry practices and lots of chicken-to-human contact. The most likely places for a pandemic to begin are in Asia.

China now produces 12 to 15 *billion* chickens a year – a thousandfold more than the 12 *million* of a decade or two ago. Pigs, chickens, and children coexist in often very tight quarters. Peasants and farmers in Thailand and Viet Nam and Cambodia are faced with an impossible choice: “Is my family’s need for the protein and income from my flock of six or eight chickens – or the income from my fighting cocks – more important to me than some vague obligation to report any chickens that show signs of illness?” And who to report to? In Cambodia and Indonesia, national health services lack rudimentary surveillance systems. You might think that the World Health Organization is represented in every village, but that, too, is impossible.

WHO, like CDC, is composed of some very dedicated health workers doing magic with such limited resources in the midst of a dysfunctional global health network. But unless there are some major changes, the old magic will not be enough. The total WHO two-year regular budget is less than that of a very small U.S. city: in 2003 it was \$900 million¹³. By comparison, San Francisco’s annual city budget for 2004 was \$5 billion¹⁴, of which the Health Department budget was just over \$1 billion¹⁵.

In other words, San Francisco (and every other similar-sized American city) spends more on health care for city residents than the annual general WHO budget has to spend on the whole world. And less money means less staff. There are 12 fulltime pandemic flu doctors working for WHO, covering – at last count – nearly 200 countries. Bush’s Pandemic Preparedness Plan has allocated less than 5% of its \$7.1 billion for international pandemic relief, hardly any of which would go to WHO because of policy favoring bilateral aid over multilateral action. I thought this was a president who wanted to “fight over there, so we won’t have to fight here.” Finding the first cases of human-to-human transmission in Cambodia or elsewhere in South Asia and containing them with sufficient anti-virals, chicken exchange programs, mass culling, and other early-response techniques is our last best chance to prevent a global disaster.

5. Nor is the invisible hand of the market likely to provide enough help.

The marketplace is unlikely to be of as much help as you might like – or expect. The invisible hand of the market works to create innovation, more efficient production of goods and services, and personal wealth. But it fails often in creating public goods. In health, there are many clear-cut examples of the market failing to create precisely the very things that we most need to combat public health risks – for example, prevention of environmental diseases, creation and manufacture of vaccines, rapid diagnostic tests, and international early warning systems.

The president’s plan does include \$2.8 billion to resurrect the vaccine industry, to remove litigation and taxation hurdles so that the vaccine industry can attract capital and have a reasonable opportunity for return on investment. Today this is not the case: ask anyone in Big Pharma. They would rather spend their R & D dollars on the third male-potency drug than on

the first HIV/AIDS vaccine; they lobbied hard to shift \$120 million from the proposed pandemic bird flu spending to government payment plans to cover Viagra.

And the rest of the private sector needs a lot of help in planning for a pandemic; most companies do not have their own pandemic preparedness plans in place.

6. Nor is the media likely to provide enough help.

The media is for the birds. We have a problem with birds on TV, in the press, and on the radio. The problem is with two species of birds in particular: Ostriches and Chicken Littles. Ostriches irrationally belittle any risk of impending peril from pandemic bird flu, and Chicken Littles flap around on television screaming that the sky is falling and that pandemic bird flu will kill us all before we can do our Christmas shopping.

These birds are part of the reason the public is so confused. Pandemic bird flu is one of the new millennium's most poignant challenges, not only to the way we "do" public health and epidemiology, but also the black-and-white all-or-nothing spewed out by our superficial, and to a simplistic, media. Low-probability but highly consequential events, such as a pandemic, are complex stuff, but the media would prefer to show extreme views and not work the issues through.

But both of these extreme media birds have something going for their points of view. The Ostriches say that H5N1 has been around since 1997, and that since it has not yet mutated to a form of the virus that can easily pass from human to human, it is unlikely to do so now. Besides, the argument goes, if it did, today we have antibiotics to treat the complications of pneumonia, which is the cause of one-third of flu deaths. We also have modern intensive-care units and in general have much better health care than we did in 1918; and, they say, unlike during WWI, there is no world war with millions of young soldiers passing the virus back and forth like cigarettes in their wartime trenches, accelerating viral transmission.

The Ostriches remind us that pundits overhyped Y2K and that CDC overreacted to Swine Flu in 1976. Their position tends to be that the media is igniting/overhyping the question of pandemic flu by bringing us a daily progress report of migratory birds carrying H5N1 ever closer to the heartland of America. In other words, the media needs a scary story more than the story warrants daily coverage.

The mirror image of the Ostriches – the Chicken Littles – claim that the sky is really falling this time, and predict that infected fowl will become long-range bombers, flying from Qinghai Lake in China, dropping infected guano bomblets into European and African chicken coops, turning poultry farms into deadly H5N1 transmission facilities. Then, they say, any new virus will ping pong back and forth among the tens of billions of chickens in the world until humans are caught up in its lethal cycle, just a single point mutation away. With odds like this, they say, it is just a matter of time before the clever H5N1 figures out how to move from human to human and a pandemic is virtually 100% certain. And when (not "if") it occurs, 300 million humans will die, all commercial aircraft will be grounded, and international commerce will grind to a halt.

There is some truth to the views of both sides. This is why no one knows with any certainty if, when, and where it might all begin.

7. Therefore, each of us will want to know a lot about this in real time, because *the odds change often*, and we may face important decisions.

So now we come to the most difficult part of all: personal decisions for you and your family. Should you stockpile Tamiflu or Relenza, move any of your family to a “secure, undisclosed location,” cancel travel plans? What should we do?

I was asked on a national radio show if I would recommend stockpiling Tamiflu at home, and I said I thought it was a gross overreaction, that it might even be unethical, and that I had done it for my family. So have most of the epidemiologists that I know, even though most of us feel that there is a 90% or 95% chance that we will never need it – that it really is an overreaction to the unknown risk of the nightmare scenario that H5N1 might achieve escape velocity before there are sufficient quantities of an effective vaccine and before there are enough effective anti-virals.

But each of us makes many decisions each day based on probabilities much lower than that, don't we? If I told you there was a 1 in 20 chance that you would get cancer from your artificial sweetener, you would quit using it. How many bet on lotteries with 1-to-a-million odds or worse? Odds of 1 in 10, or 1 in 20, that hundreds of millions might die look like pretty scary odds to me. So we need to do something about this. Not crazy-worried, not in a frenzy, but just as a measure of good citizenship. At every level.

Now is the time to learn more about this low-probability but highly consequential possible disaster. Now is the time to think locally, get involved politically, and work with your local community's disaster-preparedness committee. Now is the time to rationally and soberly prepare contingency plans for distance learning and tele-learning and emergency medical backup; to think about your community's quarantine and isolation facilities and other social distancing laws and plans; to start stockpiling anti-viral hand wipes (frequent hand washing or cleansing being the single best preventive measure against influenza, more so than face masks); to be aware of how to access anti-viral medicines; to aggressively prepare your company for telecommuting, data backup and recovery plans, web-based home video and audio conferencing, and other local steps, many of which are well-covered on CDC's “what to do” website¹⁶.

There are many questions each of us must ask, at the level of our family, our community, our state and federal government, and as part of the global community. I suspect we will still be asking them at FiRe in May 2006.

¹ They're becoming clearer to me, at least. And I'm almost certainly wrong, as most of us are, in predicting the future. But these are my personal opinions, and only I am responsible for any errors – don't blame SNS or any of the institutions I am affiliated with if that turns out to be the case.

² The name *H5N1* refers to the subtypes of surface antigens (<http://en.wikipedia.org/wiki/Antigen>) present on the virus hemagglutinin (<http://en.wikipedia.org/wiki/Hemagglutinin>) type 5 and neuraminidase (<http://en.wikipedia.org/wiki/Neuraminidase>) type 1.

³ There are many excellent sources for reading more about pandemic bird flu. Certainly, Alfred W. Crosby's classic *America's Forgotten Pandemic* (Cambridge University, 1989 and 2005), John Barry's absorbing book *The Great Influenza* (Penguin, 2004), and Gina Kola's great read *Flu* (Simon and Schuster, 1999) are excellent background reading on the 1918 influenza pandemic. Wikipedia has a very readable overview of pandemic bird flu at <http://en.wikipedia.org/wiki/H5N1>. And it might be useful to read about the time "we got it wrong" or *The Swine Flu Affair: Decision Making on a Slippery Disease*, by Richard Neustadt and Harvey Fineberg (University Press of the Pacific, 2005).

For more scientific details, I recommend following CDC's journal, "Emerging Infectious Diseases" (www.cdc.gov/ncidod/eid/vol5no4/contents.htm). (Disclosure: I am one of many reviewers.) For daily comprehensive updates on the world of pandemic flu, www.flu.wikie.com is an all-volunteer labor of love from some very well motivated citizens who have put nearly everything about bird flu in a single place.

⁴ A book by that title, *Monster at the Door*, by MacArthur fellow Mike Davis, is one of the best-written but most frightening scenarios around. Here is an excellent review in the *British Journal of Medicine*: <<http://bmj.bmjournals.com/cgi/content/full/331/7527/1275?rss>>.

⁵ *Epi* means "upon," as in "a pox upon your people," while *pan* is from the Greek for "all." *Demos* is "people," and *zoo* is "animals" – hence "epidemic" outbreak of disease in people, "epizootic" in animals, and "pandemic" an epidemic everywhere, usually – by convention, if not in reality – thought of as a worldwide influenza epidemic.

HIV/AIDS is certainly pandemic. So is resurgent malaria, but we don't usually use these words to describe them. And every year, the "annual" or "seasonal" or "winter" influenza (this year possibly H3N2) kills 300,000 to 600,000 people worldwide, but we don't call that a pandemic, for reasons hard for me to defend.

⁶ www.salon.com/ent/feature/2005/12/13/birdflu/index.html

⁷ www.cnn.com/2005/WORLD/asiapcf/09/30/birdflu.un

⁸ WHO now has a very good website and good FAQs: www.who.int/csr/disease/avian_influenza/avian_faqs/en/#present

⁹ <www.foreignaffairs.org/20050701faessay84402/michael-t-osterholm/preparing-for-the-next-pandemic.html?mode=print>

¹⁰ www7.nationalgeographic.com/ngm/0510/feature1

¹¹ See this UPI report: <www.upi.com/HealthBusiness/view.php?StoryID=20051208-042554-3749r>

¹² <www.bmonesbittburns.com/economics/reports/20050812/avian_flu.pdf> and <www.bmonesbittburns.com/economics/reports/20051011/dont_fear_fear.pdf>

¹³ <www.nationsencyclopedia.com/United-Nations-Related-Agencies/The-World-Health-Organization-WHO-BUDGET.html>

¹⁴ <www.sfgate.com/cgi-bin/article.cgi?f=/chronicle/archive/2004/06/02/BAGHA6VBR51.DTL&type=news>

¹⁵ www.dph.sf.ca.us/budget

¹⁶ www.cdc.gov/flu/pandemic

About the Author

Larry Brilliant is an M.D., M.P.H. board-certified in preventive medicine and public health, and a former associate professor of Epidemiology and International Health Planning at the University of Michigan. After studying religion in a Himalayan monastery, he joined WHO in 1973 as a medical officer and helped manage the WHO smallpox eradication program in South Asia. He was a staff member of the WHO Global Commission to Certify Smallpox Eradicated and served as the last WHO medical officer to visit Iran in search of hidden smallpox.

More recently, Larry was a “first responder” for the Centers for Disease Control’s (CDC) smallpox bioterrorism response effort, volunteered in Sri Lanka for tsunami relief, worked in India with the WHO polio eradication program, and established Pandefense, an interdisciplinary consultancy to prepare for possible pandemic influenza.

The author of two books and dozens of articles on infectious diseases, blindness, and international health policy, Larry has worked at city, county, state, federal, and international levels. He is a founder and longtime director of the Seva Foundation, which has raised nearly \$100 million to fund sustainable global health projects in India, Nepal, Tibet, China, Cambodia, Bangladesh, Tanzania, Mexico, and Guatemala. Over the past 25 years, Seva-funded or -managed eye health projects have given back sight to more than 2 million blind through free or very low cost sight-restoring eye operations.

Larry also has a technology side as a patent holder, co-founder of the legendary online service The Well, and CEO of two public technology corporations. He was recently CEO of an IBM/Intel/AT&T joint venture.

Larry is on the dean’s advisory board of the Berkeley School of Public Health, on the boards of the Seva Foundation and Wavy Gravy’s Camp Winnarainbow, and on the advisory boards of the Grateful Dead–created Rex Foundation and the Presidio World College MBA Program in sustainable business. He is a GBN network member and is on the advisory board of Future in Review (FiRe).

Larry has received many awards from WHO and the Government of India for his work in smallpox eradication. More recently, he received an honorary doctorate of science from Knox College, the 2004 “International Public Health Hero” award from University of California (Berkeley) School of Public Health, the 2005 Peacemaker Prize from the Center for Peace and Conflict Resolution at Wayne State University in Detroit, and the 2006 Ted Prize, which awards him “a wish to change the world.”

As with most of our Special Letter authors, Larry doesn't presently have a great deal of free time to take in creating a Special Letter. I would like to thank him for taking that time, knowing the good it will do to share this information with the kind of folks who make up the SNS Membership. As always, I would also like to thank Sally Anderson for doing a fantastic, under-the-gun editing job.

Being prepared for a low-probability, high-risk event is not an "easy sell" to the general public, but thanks to Larry, and perhaps now to you as well, an increasing number of communities are taking matters into their own hands, creating meetings among first responders, charting out what to do if something does have to be done, and making sure the necessary supplies are identified and available. This preparation has numerous side-benefits, applicable to all manner of natural disasters, and offers the additional one of knowing you did what you could for those who depend most upon you.

Your comments are always welcome.

Sincerely,

Mark R. Anderson

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About the Publisher

Mark Anderson is president of Technology Alliance Partners, and of the Strategic News Service(tm) LLC. TAP was founded in 1989, and provides trends and marketing alliance assistance to firms leading the convergence of telecom and computing. Mark is a Seybold Fellow. He is the founder of two software companies and of the Washington Software Alliance Investors' Forum, Washington's premier software investment conference; and has participated in the launch of many software startups.

A past director of the WSA, Mark chairs the WSA Presidents' Group. He regularly appears on the Wall Street Review/KSDO, CNN, and National Public Radio/KPLU programs. Mark is a member of the Merrill Lynch Technology Advisory Board, and is an advisor and/or investor in Authora, Ignition Partners, Mohr Davidow Ventures, Chameleon Technology, and others. Mark serves as Chair of the Future in Review Conferences, of Project Inkwel, and of The Foresight Foundation. He is also President of Orca Relief Citizens' Alliance.

Disclosure: Mark Anderson is a portfolio manager of a hedge fund. His fund often buys and sells securities that are the subject of his columns, both before and after the columns are published, and the position that his fund takes may change at any time. Under no circumstances does the information in this newsletter represent a recommendation to buy or sell stocks.

On January 20th he will present the Washington Software Alliance/TAG group in Bellingham with his predictions for 2006. From February 27th to March 5th he will be in China, as a guest of the U.S. Embassy. On March 16th he will host the Third Annual SNS London Dinner. And on May 14th - 17th he will host the Fourth Annual Future in Review Conference at the Hotel del Coronado, in San Diego; see <http://www.futureinreview.com> for details.

In between times he will be once again wandering in the smaller, hidden meadows around the farm, looking for soldier firs who have left the margin by just enough to be round, and not so long ago as to be tall. This simple operation should take at least an hour, be accompanied by a good deal of bartering, barking, laughter and disagreement, and conclude with a general head-nod as the Christmas tree of this year becomes suddenly obvious, despite that hole in the back left side.

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