MEDIA WATCH **Ben Goldacre**

Behold the Christmas miracle of antioxidants

Apparently chocolate is good for you and red wine is better. But should we believe it?

I'd like to make a sage prediction, seeing as it's early December. One of the joys of watching bad science coverage in the media—as I have done for four years now—is that you start to spot patterns: and this year, just like every Christmas, as regular as mince pies, I can confidently predict a specific rash of stories: they will explain solicitously that chocolate is good for you—“actually”—and red wine is even better.

It's not much of a prediction, since in the world of public relations, Christmas has started already. “Choxi+” is milk chocolate with “extra antioxidants,” and the newspapers are fawning over it already: “too good to be true,” says the *Daily Mirror*; “chocolate that is good for you, as well as seductive,” says the *Daily Telegraph*. The company is said to “recommend” two pieces of its chocolate a day. “Guilt free,” says the *Daily Mail*: it's “the chocolate bar that's ‘healthier’ than 5lb of apples.” Meanwhile, Sainsbury's is promoting Red Heart wine—with extra antioxidants—as if drinking the stuff was a duty to your grandchildren.

These products represent triumphs of over-extrapolation from observational data, and laboratory hunches. A huge amount has been made of the j shaped curve in the relationship between alcohol or wine consumption and good health. Moderate drinkers, the media gushingly tell us, are less likely to be obese than both teetotalers and heavy drinkers. Nobody wants to ruin Christmas with dreary talk of confounding variables, pointing out that teetotalers themselves are an unusual breed: recovering alcoholics, the chronically ill, devout religious abstainers from varying ethnic groups, and of course people who lie in surveys, among others.

Moderate red wine drinkers, we are specifically informed, come

out better on all kinds of health measures, and nobody wants to ruin Christmas by mentioning confounding variables again (like how moderate red wine drinkers hang out at home with their friends eating salad and talking about their posh jobs and stable social support). A fairytale science story must be simple, reductionist, and mechanistic. Red wine is good for you because it contains lifegiving molecules, like antioxidants.

And nobody wants to spoil Christmas—for the whole family—by mentioning that the antioxidants story is one of the great unspoken non-starters of 20th century medical research. People who eat fresh fruit and vegetables have lots of positive health outcomes, including reduced rates of heart disease and cancer; and fresh fruit and vegetables contain lots of antioxidants; and people who have high levels of antioxidants in their blood seem to be healthier.

There's even a charming fable from the metabolic flow charts in biochemistry textbooks about what antioxidants do in the body. Sainsbury's loves that story, along with the others: “Exposure to UV rays, pollution and smoking produces free radicals,” it says. “Free radicals are compounds that cause cell damage, which in the long term can damage health.” It's such a gloriously simple tale of right and wrong you can almost picture it, in animated form, on ITV after the Queen's speech. “Antioxidants help counteract the harmful effects of free radicals. Red Heart has an antioxidant level which is 32% higher than the average level of other leading red wines.”

Only a malevolent Scrooge-like figure, mumbling over his glass of tap water in the corner, would dare to point out that if you are going to pore over a biochemistry textbook, and pick pathways out at random,

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then you can prove anything you like. Phagocytic cells build a wall around invading pathogens and then use free radicals—among other things—to kill the bacteria off. Should we be selling free radical supplements to help people fight infections?

The antioxidant story took a bit of a blow, of course, when people started to do placebo controlled randomised trials with antioxidant vitamin supplements, to see what happened: because overall they seem to do nothing, or at worst, reduce life expectancy. And that's when you might start to think, well now, perhaps people who eat fresh fruit and vegetables are, just like the people who drink red wine in decorous moderation, living healthily in all kinds of ways. Much like the people who buy vitamin pills. Lusty walks around country mansions. Cycling to work. That kind of thing.

Of course there may yet be something valuable in the antioxidant story, although it's probably not going to be as simple as dishing them out by the spoonful. And of course observational studies aren't inherently evil or useless: they're frequently fascinating, as part of a puzzle. These are all interesting theoretical research findings, as we try to puzzle out the roots of cancer and heart disease.

But they make a pretty thin excuse for flogging chocolate and alcohol. And somewhere out there—right now—a researcher is rubbing their hands with glee, poring over a press release, picturing themselves in the *Today* programme studios, planning some choice quotes for the *Daily Telegraph*: something racy about mince pies cutting heart disease because of the raisins, perhaps, or red wine helping you run faster. Well, it's Christmas. Have another.

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MEDICINE AND THE MEDIA

Thalidomide—the drama continues

A controversial drama retelling the thalidomide tragedy has been broadcast in Germany, but not before a behind the scenes battle with the drug's manufacturer. **Annette Tuffs** reports

When a drug causes adverse effects, do the people affected need the help of media pressure to support their claims to compensation? This is certainly true in the case of thalidomide, Germany's worst ever pharmaceutical tragedy, which started in 1957. Its 2700 survivors in Germany were almost forgotten until a two part television drama named after the drug's German trade name, Contergan, was broadcast during prime time on 7 and 8 November, highlighting their fate and reaching millions of people. Several accompanying documentaries, interviews, and talk shows have provided additional information.

More than 50 years later, Sebastian Wirtz, chief executive officer of the pharmaceutical firm Grünenthal (the German manufacturer of thalidomide) and grandson of its founder, was the first member of his family prepared to meet people affected by thalidomide, which caused severe malformations in more than 12000 newborns worldwide. Wirtz admitted a "moral responsibility, but no moral fault of Grünenthal" in one of his rare newspaper interviews in the *Aachener Zeitung* and said that he would not be blackmailed into providing further compensation.

The original DM100m compensation fund was exhausted long ago and left those affected with severe complications with a maximum state sponsored compensation of about €500 (£360; \$740) a month. In the United Kingdom and Sweden, where thalidomide had been licensed by other firms, more substantial compensation is provided. Grünenthal is still a privately owned drug company, and has an annual turnover of €800m.

The image of Grünenthal has suffered

badly in the past weeks, and the firm's misguided communication policies have probably increased the damage. In the past two years Grünenthal has concentrated on trying to persuade the court to stop the broadcast of the original version of the film *Contergan*, or at least require the film's producers to alter several scenes which the firm said were fictional, therefore not true to historical reality, and showing the firm in a bad light (*BMJ* 2007;334:933). In summer 2007, the court decided that the film could be shown but with a disclaimer insisting that it is a work of art rather than a documentary of the Contergan scandal. Some scenes in the screenplay had to be changed according to the wishes of Grünenthal.

In the film, lawyer Paul Wegener and his wife Vera, living in the optimistic atmosphere of economically thriving postwar Germany, receive a shock when their daughter is born without arms and only one leg. "What's the matter? Show me the baby," says Vera after the birth. Hospital staff react by calling the deformed baby "horrible" and advising the parents to put the baby into care immediately.

But the couple take on the challenge and soon suspect a link with Contergan, a popular and allegedly harmless sleeping pill, of which Vera had taken just a single pill during her pregnancy. Together with a paediatrician who has found epidemiological evidence for Contergan's teratogenic effects, Paul Wegener forces the firm Grünenthal into a legal

case—after a long courtroom battle the case was settled when Grünenthal established a voluntary fund of DM100 million.

The film shows how difficult it is for a young couple to cope with the strain of bringing up a stigmatised, handicapped child. It has been widely praised for its detailed portrayal of Germany in the 1950s and 60s and its suspense and personal depth, as well as brilliant acting, especially by the young Denise Marko, who, due to a rare genetic disease, has malformations identical to those caused by Contergan.

Germany's most popular television award, the Bambi, will be given to *Contergan* at the end of the month, and several European countries have either bought the television rights or, like the UK, have shown strong interest in the film.

Grünenthal is continuing its legal battle to challenge historically incorrect scenes in the film in higher courts. Sebastian Wirtz said in the *Aachener Zeitung* that he stands by his decision to fight for historical truth because television audiences cannot decide between fiction and history. The company website (www.grunenthal.com) has a detailed summary of events. Wirtz continues to refuse to appear in TV talk shows like those accompanying the broadcasting of the film because he considers their atmosphere to be too emotional. A meeting with Contergan victims will take place only if there is no media attention.

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