



Photograph: Getty Images

ice crystals in high cirrus clouds. "In a sense, this is probably the first comprehensive compilation of the rules for ordinary storms," he says. "Because basically they have been handed down over the centuries from father to son."

The key to it all, according to Ellis, is pressure. To be precise, it's the rate of change of pressure. Ellis believes his storm formula will give people more warning of when they will be hit.

Currently, despite all the technology, the satellites and the radars, warning times can be short. Ellis says his method will lengthen the alert time for a tornadic supercell thunderstorm from 13 minutes to three hours. Hurricanes can be forecast 24 hours out.

"Over the years, the world's craving for technology, they have sought to use a sledgehammer to drive a nail," he says. "Satellite, radar, they produce pretty pictures, but they are not always as reliable."

Ellis says all it takes to reliably predict a storm is a barometer. Barometers measure air pressure. Wind occurs when air moves between locations where air pressure is different. Wind will flow to the lower pressure area.

By Ellis's formula, if the barometric pressure has fallen 4 millibars or more to below 1009mb in the previous three hours then a storm is approaching. That is the basic rule. The type of the storm may be unclear – it could be a thunderstorm, it could be a cyclone or a tornado.

Lightning is produced when the updraft generated by the initial evaporation is high enough into the atmosphere to create ice crystals. Water droplets and crystals then collide and fall, producing the lightning.

In the case of predicting a tornadic supercell thunderstorm, Ellis says in the previous three hours there must be a drop of at least 4mb to below 1005mb, with a straight line drop in the pressure curve that lasts at least three hours.

For a hurricane, Ellis says what to watch for is a steady pressure for at least six hours.

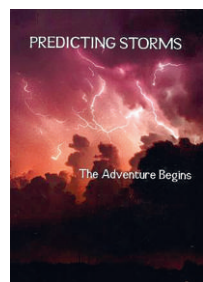
After the steady period, the barometer must be at 990mb or less and there will be a fall of 8mb over the last eight hours.

Ellis says around 500,000 people a year die from storms, and he expects that number to increase, so he hopes by teaching people how to predict storms he will save lives.

He has also created two apps which people can also use.

"My aim is to show ordinary people how to predict a storm long before it is even visible to radar or satellite," he says.

"We can expect that the storms of our grandchildren will need the early warning that this will provide."



To buy *Predicting Storms* or download the apps go to worldstormcentral.co

OPINION



Bring on the robots to do my shopping

Susie O'Brien

Don't order your online groceries under the influence. It's hard enough sober. All those pesky details, all those prices, all those different items.

Watch out and you'll end up with three kilos of tomatoes, half a chicken leg and one olive. One nice old lady in the UK ended up with 73 litres of milk after pressing the wrong button.

Substitutions can also be an issue. One guy received sanitary towels instead of protein powder. I don't care what the system says, but "Maxi nutrition promax chocolate" is not the same as "Always infinity night 10".

Others tell of getting the wrong size batteries, having Easter eggs replaced by daffodils and even ending up with fresh, naked wild rocket instead of extra peppery Italian rocket. I've got more sympathy for the person trying to bulk up for the gym by snacking on adult nappies.

It's no wonder online grocery shopping isn't catching on in this country, and accounts for only 2 per cent of all supermarket purchases made. Many say they don't trust the process, don't think it's convenient and don't think the food will be fresh enough.

Enter Codey from West Ryde. Codey, a personal packer, is featured in Woolies ads in a bid to convince shoppers their online haul is lovingly selected by people just like them. At Woolworths "only the pickiest pick your shopping".

But online shopping is set for the biggest shake-up in years with the arrival of Ocado on the scene. Coles has just signed a deal with the automation multinational to set up two warehouses in Melbourne and Sydney. Just as we're struggling to come to terms with machines scanning our groceries and randomly telling us that "an item was not detected in the bagging area", machines are taking over the online duties as well.

Ocado will build two "fulfilment centres", which are, in fact, vast factories full of battery-operated robots zipping around directed by air traffic controllers. A "hive" of robots sort thousands of grocery items into carts. They are so co-ordinated they help each other, huddle and then split up to pack an order in minutes. They're much more efficient than humans at a checkout and don't want to chat about how the cold weather's affecting their bunions.

Similarly, Woolworths is working on a range of AI and ML (artificial intelligence and machine learning) projects that will be used to create "future shopping" experiences.

Sorry, Codey, no longer will we need you to spend five minutes fondling our avocados with a satisfied look on your face.

Of course, some shoppers will never make the switch to online because – according to one survey – they "enjoy going to the supermarket" and would "miss the social contact".

No way, not me. In fact, I'd prefer to crawl through compost than pop into my local supermarket for a social outing.

The other day I was forced the indignity of getting a price check for Lynx Excite male body spray. This caused a stampede of teenage girls to the aisle hoping to find a cute teen boy, only to see a middle-aged woman with bed hair spraying Lynx Dark Temptation up her jumper.

After 15 years of parenthood, I am sick of the weekly trawl around the aisles looking for specials to keep the family fed. We pop in for milk and emerge an hour later with two trolleys full of things the kids remembered they HAVE TO HAVE like lollies for swimming carnival and air-popped popcorn (but not the cheddar cheese one because it tastes like vomit).

And all that choice ... do we need Quilton toilet paper three-ply eight pack or is it eight-ply three pack? I often give up and run out with microwave meals just as they're turning the lights off.

That's why I love the idea of easier, cheaper, fast online shopping.

But there's one thing the robots are having problems with. They don't know how to handle bags of oranges.

They just can't deal with them. The bag moves in too many weird ways, there are no obvious bits to grab hold of, and they often squeeze them too hard.

It's nice to think the robots aren't smarter than us just yet.

Codey, perhaps you won't be out of a job as a personal picker for awhile.

BLOG WITH SUSIE

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