

DETECTIVE SENIOR CONSTABLE GRAY

Q1 This is an electronically recorded interview between Detective Senior Constable Stuart Gray and Mr Lance Leslie at the Bureau of Meteorology in Sydney, on Thursday, the 28th of January, 1999. The time on my watch is now 1.33pm. Also present, seated to my right, is Senior Constable David Upston, from New South Wales Water Police.

Q2 As I've explained to you, Lance, we're making inquiries in relation to the Sydney to Hobart Yacht Race of 1998, and we've been asked to speak to a number of people in relation to that race and the input that they had. For the record, could you please state your full name?

A Yeah, Lance Maxwell Leslie.

Q3 And your date of birth?

A 24th of December, 1945.

Q4 And your current address?

A 34 Anglo Street, Chatswood.

Q5 O.K. Now, could you give me some qualifications in regards to yourself, so far as as weather is and -?

A O.K. I've got a doctorate in mathematics but the thesis was in, in meteorology. I've, I've worked with the Weather Bureau as a cadet, starting at the age of 16, had 32 years with the Bureau, working with the Bureau of Meteorology - - -

Q6 All right.

A - - - and the CSIRO working as a meteorologist and the past five years as Professor Mathematics at the

University of New South Wales, but specialising in
..... meteorology.

Q7 O.K.

A So that's 30, a lot of years.

Q8 All right.

A Thirty seven years.

Q9 All right. So, what's your actual role so far as the
weather's concerned, like?

A At the moment I teach courses in meteorology.

Q10 All right.

A And I do research and I supervise post graduates,
including, at the moment, four people from the Bureau
of Meteorology, so they are working towards high
degrees in meteorology, but my main function is in the
running of computer weather prediction models, both at
the university and here at the Bureau of Meteorology.

Q11 All right. Can you just give me some background in
relation to the different types of models used to
predict weather, or the ones that you commonly use
.....?

A The ones that I use, I guess there are two, two main
kinds. There's the very simple ones that are based on
statistics and they're not every effective in extreme
events, like the one we're talking about now.

Q12 All right.

A But the main model that I use solves the basic set of
governing equations for the atmosphere, the equations
that govern the behaviour of, of the, of the air in

motion.

Q13 O.K.

A And that's, that's just a big set of equations that need very high powered computers and the output, the data comes from the head office in Melbourne and we march forward in time events in the, the state of the weather.

Q14 All right.

A And for this particular event the weather forecast was over quite a large area of south eastern Australia, southern Queensland, across into South Australia, down below Tasmania, out into the Tasman sea, to capture that entire area.

Q15 All right. Now is that an Australian model as such or -?

A Yes.

Q16 It is.

A It's one, I, I built over the years.

Q17 You've developed that yourself have you - - -

A Yes.

Q17 - - - basically?

A Yes, yes.

Q18 Have you heard of the Manchester University model?

A No, I haven't.

Q19 Never heard of that?

A No.

Q20 O.K. Now, as I said to you before the interview, I received a phone call from a Miss Philippa Walsh from

the Daily Telegraph, I believe it was last Monday. She informed me that she'd received a phone call, stating that you had spoken to the CYCA prior to the race and indicated that there were wind predictions higher than that were provided earlier by the, the Bureau and that, she's further stated that the CYCA disregarded figures that you predicted and presented to them. Can you, would you have any recollection of that or any conversation with a Philippa Walsh or -?

A No, well, O.K. Point by point. I don't know who she is.

Q21 All right.

A I certainly haven't spoken to her. I, I didn't, didn't ring the Telegraph.

Q22 All right.

A And I have no recollection of, of speaking to anybody from the CYCA.

Q23 O.K.

A All, all the conversations I had that morning were with the Bureau officers here on duty.

Q24 O.K.

A I didn't actually go down to the CYCA, it's the first year I hadn't gone down because the briefing was earlier and my model was still running - - -

Q25 All right.

A - - - at the time, so what I gave them, instead of the usual sets of charts, I gave them point values as the model was still running, and they took that into

account while they were here.

Q26 All right.

A And with them.

Q27 O.K.

A In a, in terms of changed forecast.

Q28 O.K. So on the 26th, can you, sort of, take me through the, what procedure you adopted that day and -?

A Yeah. Well, it was pretty much business as usual when I came in around about 6.00am, to run the model it takes two to three hours to run, and then we go off to the briefing, well, it's not really a briefing, it's a stand - - -

Q29 Yeah.

A - - - set up by the Bureau of Meteorology and they display a whole bunch of products and also available if they want, are the forecasts that I do.

Q30 All right.

A This time the briefing, or the stand, or whatever, was set up a bit earlier than usual and I didn't realise that until I got in there, so there was no chance of my making it, however, I initiated the forecast and I noticed, and I'm just holding up a sheet now that shows Eden, I noticed the winds getting up into gale force and then into storm force during the course of the forecast and I alerted the duty forecaster and the two bureau officers who were going down to the CYC - - -

Q31 M'mm.

A - - - with the stand that, gauge about the

values that were coming up here.

Q32 All right.

A Now this model's been used very extensively by the Bureau, including in the recent Olympic Games trials

- - -

Q33 M'mm.

A - - - where they were fairly happy with its performance and the fact that it had been run every other year as well that meant that they gave it credibility - - -

Q34 Mm.

A - - - despite the fact that other models weren't quite as strong as this.

Q35 All right.

A So this, the numbers that I gave them, they took into account and, and upgraded their forecast and this is, I'm pretty certain of this, but it can easily be corrected, from strong winds to gale force, which is a significant upgrading.

Q36 All right.

A And by that I mean winds in excess of 34 knots - - -

Q37 All right.

A - - - is regarded as gale force.

Q38 O.K.

A And that, and that includes gusts of around 50.

Q39 All right.

A But sustained 34.

Q40 Did you or, or were you aware of what and, and his offsider took down to the stands, so far as their

prediction?

A Yeah, they took gale force winds down.

Q41 All right. O.K.

A And that was subsequently verified in that I saw the actual - - -

Q42 All right.

A - - - pieces of paper that had the predictions on there.

Q43 All right. So where did they get their predictions from, the same model as yours or their own model?

A They got it from a blend, information from many sources, from Bureau models, from overseas models and from this model.

Q44 All right.

A And they weren't all saying the same thing.

Q45 All right. O.K.

A So there's a gradation from strong winds up to, in my case, just touching storm force - - -

Q46 All right.

A - - - so they went, not from middle ground, well, sort of middle ground.

Q47 Yeah.

A They didn't go all the way to storm force.

Q48 O.K.

A Because this was, my model was just into storm force, so they went for gale - - -

Q49 O.K.

A - - - at that point. Subsequently they returned after

the briefing and the other models had had their morning run and were coming up with storm force winds, that's when they issued another forecast, this time with the storm force warnings - - -

Q50 All right.

A - - - but by then, this was just after 2 o'clock, 2.14, I think, was the time on the, on the piece of paper, by then the race had been underway for about an hour.

Q51 M'mm.

A But it was a long time before the actual basically struck that, that kind of weather.

Q52 All right. O.K. You might like to define gale force?

A O.K.

Q53 And storm force?

A O.K. Gale force is sustaining winds of 34 knots to 47 knots, and storm force is above 48 knots, there's probably another level above that - - -

Q54 Mm.

A - - - which escapes me at the moment but it would be something like hurricane forces, something like 64, 64 knots.

Q55 O.K. Have you received any information or hard data so far as winds, winds that were actually experienced in the race?

A Yeah, I mean, naturally I followed up the observations and, and I've looked at the chart since and we intend doing a, a case study to see, we, we want to take this particular case apart - - -

Q56 All right.

A - - - because if there, if there's any chance of avoid this happening again - - -

Q57 Yeah.

A - - - to take it.

Q58 Yeah.

A Yes, so what I've, I saw some, some pretty big winds.

Q59 Do you recall what the highest speed was off, offhand?

A I saw, well, I can recall very clearly what the strongest ones are, whether they're, they're true or not it's, it's another matter, but I saw, saw reports of winds, gusts this is - - -

Q60 All right.

A - - - above 80, 80 knots and sustained winds above 55.

Q61 O.K. So in that case if we've got winds in excess of 64, we are looking at sort of a hurricane type situation. Is that correct or -?

A Yeah, yeah.

Q62 O.K.

A And the kinds of seas and the kinds of winds, and conditions that were experienced and we've all seen on the film footage is well suggestive of that kind of condition.

Q63 All right.

A And totally confused seas and the big problem, the, the biggest problem of all, namely, very large waves, actually breaking.

Q64 Yes.

A So there were significant waves, were around six, five, say five to seven or five to eight metres - - -

Q65 Yeah.

A - - - but every so often you'd get a bigger wave, a rogue wave or a freak wave, and they started coming in about one in every four.

Q66 Yeah.

A Some of them, the reports I got, were 10 to 12 metres - - -

Q67 Yeah.

A - - - and then breaking on top of that - - -

Q68 Yeah.

A - - - and from different directions.

Q69 Yeah.

A So there's, under those conditions, I mean it's, you know, about as bad as it gets.

Q70 So that's indicative, those waves are indicative of, of a hurricane type situation, at sea so to speak?

A Yes, storm force to hurricane force.

Q71 All right.

A Yeah.

Q72 O.K. Now, was there any way of predicting those winds from your point of view?

A As high as that?

Q73 Yeah.

A Well they did, actually predict them.

Q74 They did, did you say?

A Yeah, in, in the later runs.

Q75 Yeah, right.

A My model didn't quite get as high as that but it, it got very close.

Q76 O.K. So what model was that predicted that in the later part of the race?

A Well, all of them, just about.

Q77 O.K.

A 'Cause they, these models, my model and the others were run from the 9.00pm data.

Q78 All right.

A That's the first run.

Q79 All right.

A The runs that all went with much stronger winds were run off the 9.00am data.

Q80 M'mm.

A And they were run around about, they were in around about 1 o'clock.

Q81 O.K. How, how do you actually predict winds, I mean, how, how do you actually do, like -?

A O.K. You, you - - -

Q82 In layman terms?

A O.K.

Q83 If you can.

A O.K. Data comes in from all sources - - -

Q84 Yes.

A - - - it's gathered centrally at the Bureau of Meteorology in Melbourne.

Q85 Yeah.

A They do what's known as an analysis, they produce a field of the various winds.

Q86 Yeah.

A We take those initial values, which are for 9 o'clock
- - -

Q87 Mm.

A - - - now they're, they're within a few minutes of either side but basically they're 9 o'clock at night, in this case - - -

Q88 Yeah.

A - - - 9.00pm winds, and you, you march them forward in time, and here's the, the tough bit. If you know, if you've heard of Newton's law, F equals mass times, force equals mass times acceleration.

Q89 I'll say, yes.

A O.K. That's F equals M times A . If you turn that around the other way, acceleration is rate of change of, of wind.

Q90 All right.

A O.K.

Q91 Yeah.

A So you get rate of change of wind is force divided by mass.

Q92 All right.

A So there's your predicted equation.

Q93 All right.

A All you need then is the forcing on the right-hand side.

Q94 All right.

A So the, Newton's law, for example, can be turned into a predictive equation.

Q95 All right.

A If you know the state now, you can march ahead in time because you know the rate of change - - -

Q96 All right.

A - - - you know the acceleration, which is the rate of change of velocity - - -

Q97 Yeah.

A - - - or wind.

Q98 Yeah.

A That's as simple as I can, I think I can put it.

Q99 And it's a fairly accurate science, it's -?

A It's, yeah, it certainly is now.

Q100 All right.

A It's way ahead of anything that can be done manually and - - -

Q101 Yeah.

A - - - every major centre in the, in every sizeable country in the world uses this kind of approach.

Q102 Yeah. Now you mentioned earlier that there is some problem with the terminology so far as these briefings that you consider was important. Could you explain that to us?

A Yes, I can. I didn't, I wasn't aware at the time because I thought these were as much nautical terms as, as anything, but clearly a lot of, a lot of people who

sail aren't necessarily traditional sailors from a long time ago.

Q103 Yeah.

A So what I've heard in speaking with people people who sail is that for some of them, gales sound worse than storm, they think of, you know, a storm that's, as being something that's quick and over and gone - - -

Q104 Yeah.

A - - - like a, a thunderstorm, whereas a gale is something really horrendous, whereas the terminology used in, in meteorology, gale is, is lower, considerably lower than a storm.

Q105 All right.

A And I'm so used to it, that wouldn't have occurred to me but when it was pointed out by a number of people that it does sound worse and the reasons I just mentioned - - -

Q106 Yeah.

A - - - you know, it's sort of, yeah, I, I agree with that.

Q107 Yeah.

A So I think there's a, a big issue here that needs to be settled that the terminology being used needs to be explained - - -

Q108 Mm.

A - - - just like with all the drownings we're getting
- - -

Q109 Mm.

A - - - off the beach - - -

Q110 Mm.

A - - - you know, the beaches off Sydney.

Q111 Mm.

A Misunderstanding of the flags, you know some countries, two flags means, keep out, this is a restricted area owned by somebody - - -

Q112 Mm.

A - - - for us this is the area you swim in.

Q113 Mm.

A So, it's, again, these kinds of - - -

Q114 Mm.

A - - - kinds of problems arising out of terminology.

Q115 So quite simply do you think that if people were briefed, so far as the weather is concerned on the day of, on, on race day, and they were informed that it was gale, if I'm getting my terminology correct here.

A Yeah.

Q116 And they knew that, the true meaning of gale, they may consider their position so far as going ahead?

A Well that's, I guess you pointed out a contradiction. They did get a gale force warning - - -

Q117 All right.

A - - - and they still went ahead anyway, so, you know, it's sort of counteracting a little bit what, what I thought, but -

Q118 Well, what's your views on that so far as, what would,

well, what do you think a definition of a gale storm, gusting, whatever, would be sufficient for people to be warned that it's going to be horrendous out there, have a think about your position?

A I think horrendous is a better term.

Q119 All right.

A I think, yeah, probably gale and storm would not be sufficient to have, to have stopped the people.

Q120 All right.

A If they'd known, yeah, if they'd seen a video of the conditions - - -

Q121 Yeah.

A - - - and been told this is what you're going to get.

Q122 Yeah.

A That's, that's the kind of thing you need - - -

Q123 All right.

A - - - rather than just a word.

Q124 So as far as you're concerned, from your expertise, there is no way that that you, well, there's no information that suggests that anybody knew that winds would be in excess of 60 knots prior to the race?

A Prior to the race starting, no.

Q125 All right. O.K. If 80 knot winds were predicted, do you know if these predictions were passed onto the CYC for broadcast?

A At what time?

Q126 During the race, because that's the only time you would have known about them.

A Yeah, I, I've seen the amended forecast - - -

Q127 All right.

A - - - issued in the afternoon - - -

Q128 Yeah.

A - - - about an hour or so after the race started, and
I know for sure that was issued.

Q129 Issued, yeah.

A That was issued with storm, storm force. Storm force
is 50, 48 plus.

Q130 Yeah.

A And you've got to add on top of that at least another
third or maybe more.

Q131 O.K, so - - -

A 'Cause that's - - -

Q132 Does - - -

A - - - sustained winds, not gusts.

Q133 O.K. O.K. So, when you - - -

A So you're really getting up there.

Q134 Yeah. And that's an hour after the race started?

A Mm.

Q135 So if you were to, now, you've got experience in
sailing, have you not?

A Yes.

Q136 And, what, you've sailed a couple of Hobarts?

A Yes, back, a long time ago.

Q137 A long time ago.

A Yes, yes.

Q138 So if you were heading out the Heads and, or an hour,

an hour down the track and you received information that, that the winds in excess of 68 you're going to be run into, what would be your considerations?

A Well, two things. Being a meteorologist I know what it means - - -

Q139 Yeah.

A - - - 'cause I've been out chasing hurricanes and all those kinds of things. A, a storm, severe weather is one of the things I specialise in.

Q140 Yeah.

A I would have turned around and gone back.

Q141 All right.

A But that's partly because I've got extra knowledge.

Q142 That's right. So do you think that, do you think there's room for improvement in sort of briefing the yachts people so far as, you know, you must consider this and, that these things will, can progressively get worse and you should consider this and consider that, and

A Given, given, given the, the absolute tragedy of what's happened, I think, well, as you know, these are only personal opinions.

Q143 Mm.

A Every race for the, for the time being should have a video, not of the deaths but of the, the kinds of conditions - - -

Q144 Mm.

A - - - associated with, if there's any, any thought at

all of, of severe weather - - -

Q145 Mm.

A - - - and if they were issuing forecasts they know, they were already thinking severe weather - - -

Q146 Mm.

A - - - and gales, severe weather.

Q147 Mm.

A So you've got allow for the possibility that it might go above that.

Q148 Mm.

A So I'd consider part of the briefing, just showing footage of, making very clear the, the terminology - - -

Q149 Mm.

A - - - and showing what, what a storm sea looks like.

Q150 Mm.

A Yeah, it might stop an awful lot of people, particularly if they've got some of those, some of the kids that were going down there were - - -

Q151 Mm.

A - - - not even teenagers or, some were just teenagers.

Q152 Mm.

A And that, there's this idea that the captain makes the decision but, I don't think captains should be making decisions for, for 12 year olds.

Q153 No.

A That's just a personal feeling.

Q154 Yeah. That's fine. Now just on the back of your

diagram here, you've, when you've, figures there, you've just got your predictions. Can you just read those predictions over for the record?

A Yeah, while I was taking down the hourlies, hourlies are not representative in between those hours, you might get stronger winds, so the highest wind I got from the hourly data, at 5.00am, was from the south-west at 43 knots, which is closer to storm than gale, but still in the gale force area.

Q155 So you can add a third onto these predictions?

A Yeah, that's the sort of, like, rule of the thumb.

Q156 Rule of thumb.

A Can be even more in a, in a, if it's in a channelled area or whatever.

Q157 All right.

A And what I've got extra, I took down when I saw something that was above the, the 43 that occurred at 5 o'clock, and at 4.45, it got 45 knots, 5.25, 46, 5.30 was the, the highest wind I, I recorded at Eden, this is one specific point, 48 knots. At 5.40, 47 knots, 6.30 it was starting to abate a bit, but that's a term here, 41 knots, and at 6.45, 40 knots.

Q158 All right.

A But I guess also significant is that at 9.00pm, which is more than 12 hours after, well, 15 hours after those numbers I mentioned, it was still above gale force

- - -

Q159 Mm.

A - - - according to this model run, and that was, what was observed.

Q160 Mm.

A And that's the thing that really worried me a lot, because you're looking at a day and a half here - - -

Q161 Mm.

A - - - of gale to storm force winds.

Q162 Mm.

A Which is really scary stuff.

Q163 Can you tell me what the figure is for the?

A Yeah, that's the direction.

Q164 O.K.

A So that's the direction that's been - - -

Q165 All right.

A So, it's 2.25, well, in the 5.00am case 2.25 is basically south-west - - -

Q166 All right.

A - - - and 43 knots.

Q167 O.K. O.K.

A And knots are bigger than miles an hour, as you realise.

Q168 Yeah, what is the -?

A It's about 1.1, or something, so, another 10 per cent on that, getting up in miles per hour - - -

Q169 Mm.

A - - - and kilometres per hour, that sounds even worse.

Q170 We were informed by a, a yachtsman that he received something over the internet, he found something in the

internet from the Manchester University, which I mentioned to you earlier, which predicted winds of 75 knots, and it was fairly spot on.

A O.K. Do you know when that was?

Q171 No, we've, we've got to chase that up but that's why I asked if you knew about that model, it would be interesting to

A My PhD supervisor was from there but - - -

Q172 Yeah.

A - - - I visited the place but I, I hadn't heard of any model from there, no.

Q173 Yeah. It may be America too, we don't know.

A I have heard rumours of models of models, there are claims that models have predicted it spot on so
- - -

Q174 Mm.

A - - - but I haven't seen any information about when they were run - - -

Q175 Mm.

A - - - and what kinds of models they were.

Q176 O.K.

A Whether that was a gust, if it was a sustained wind, I'd find it, it wouldn't be correct anyway, it's too strong - - -

Q177 All right.

A - - - 'cause you'd be looking at 100 knot gusts or more.

Q178 Mm.

A So that, that'd be over the top in the other direction,
 which mightn't have been a bad thing in this case.

Q179 O.K, Dave?

SENIOR CONSTABLE UPSTON

Q180 Just keeping in mind that the predictions were from
 only, a number of hours before the race, and then the
 briefing was given at a certain rate of knots was
 predicted and then going right back up to 9.00pm, some
 many hours later - - -

A M'mm.

Q180 - - - the predictions in fact increased up to 35 knots
 was, was the, from 9.00pm on the, what date could you
 tell me that is, please?

A No, I'm sorry, maybe I misled you. The, on 10.00pm the
 26th, was when the wind changed from northerly to
 southerly, according to the model, or south-westerly.

Q181 All right.

A Then the winds rapidly increased to gale force just
 after midnight, so the early morning of the 27th.

Q182 Yeah.

A They continued to increase through the early hours and
 into the morning - - -

Q183 All right.

A - - - of the 27th - - -

Q184 Yeah.

A - - - and just very slowly dropped off, but were still
 above gale force at 9.00pm, on the 27th, so it was a
 rise and a, a very slow drop off. So the period of, of

gale force winds, if, if we count this as close enough, here was from at least 1.00am, on the 27th, to 9.00pm, on the 27th, which is the best part of a day.

Q185 Yeah. Do you, do you feel and have you got data to suggest that from that 9.00pm where the, where the winds eased slightly to 35 knots, do you have further data to say that in fact it was going to increase and if you do, do you think that more emphasis should have been placed on perhaps increasing the, the weather warnings?

A The first part of the question, no, because this is the early morning run, so, at this time, it, the, the wind continued to drop slowly, after 9.00pm, on the 27th, according to this model run. So that's, that's the answer to that part. The second part of your question, I think was answered by the fact that the forecasters did increase their forecast from strong winds to gale force winds, very much as a result of, of seeing this, because they were coming around to the computers this was running on and looking at it.

Q186 All right. But you did, you did mention earlier that the, that predictions were, were on the day of where most of the mishaps occurred, were in fact predicted to reach extremely high rates.

A Yeah, that was in the later.

Q187 In the later part of the day?

A Yes, yes. Yeah, that's right, not, not at 6.00am when
- - -

Q188 No.

A - - - yes.

Q189 No.

A In the middle of the day.

Q190 Yes.

A Just as the race was starting, just after is when the information came in from the other models.

Q191 All right. To say that they in fact would reach the whole - - -

A Storm force.

Q192 Storm force?

A Yes.

Q193 All right.

A And then they rapidly amended, the Bureau, 'cause I was here, I saw it - - -

Q194 Yeah.

A - - - they rapidly amended the, the forecast and sent it out.

Q195 O.K. I've no further questions.

DETECTIVE SENIOR CONSTABLE GRAY

Q196 Is there anything further you'd like to add, any ideas or views you have?

A No, not that I can think of, other than the, the ground we've covered.

Q197 Yeah. Now you have some, some data in the computer you mentioned before?

A Yeah.

Q198 What's that in relation to?

A That's just, these are only three station, Sydney,
Batemans Bay and Eden - - -

Q199 O.K.

A - - - what I have, what I can produce is maps that show
the whole area - - -

Q200 O.K.

A - - - so not just three isolated points.

Q201 Can you make that available to us at some stage or -?

A Yeah, it'll take me a day or two, that's all.

Q202 Yeah. Now, you're working for the, the Bureau here,
but are you independent to - - -

A Yeah, I don't work for the Bureau - - -

Q203 You don't.

A - - - I work with them.

Q204 O.K.

A Yeah.

Q205 O.K. That's fine.

SENIOR CONSTABLE UPSTON

Q206 So you're not employed at all by the Bureau - - -

A No.

Q206 - - - of Meteorology?

A No, not, not a cent, no.

Q207 All right.

A It's, it's, we do, they have lots of data and people
who want to do high degrees - - -

Q208 Mm.

A - - - and a common interest in, in severe weather
events.

Q209 Mm.

A And trying to avoid tragedies like this not - - -

Q210 Mm.

A - - - not sadly going over them after it's happened.

DETECTIVE SENIOR CONSTABLE GRAY

Q211 Yeah. O.K. The time is now 2.02pm. This interview is
now concluded.

INTERVIEW CONCLUDED