IN THE CORONERS COURT HELD AT WELLINGTON
Decision No. 8 Z /2004 IN THE MATTER of the Coroners Act 1988 AND IN THE MATTER of an inquest into the death of NATHAN REGINALD CHAPMAN
Before:Mr G L Evans
Date of Hearing: 4 December 2003 Date of Receipt of
Final Report: 22 July 2004
Date of Decision: 31 October 2004
Appearances: Constable M A Kelly for Police
Family members
RESERVED FINDINGS OF THE CORONER
[1] The deposition of Constable Kelly reads that at about 2.30 pm on 23 April 2003 Police were informed by Wellington Free Ambulance control room and others that Nathan Reginald Chapman, then aged 34 years, had died following a dive off Mana Island. Police went to Paremata Harbour and commenced to make enquiries into Mr Chapman's death. Those enquiries showed that he had been one of seven people taking part that day in a chartered dive off Mana Island. The group left the boat ramp at Paremata at 1.15 pm and group members were briefed by the dive charter skipper concerning the forthcoming dive. Mr Chapman and his diving buddy, Mr R Jessep, entered the water at about 2.00 pm and dived to a depth of 14 metres. They made their way along the seabed and checked on each other from time to time. They were wearing self-contained underwater breathing apparatus ("Scuba" equipment). Some ten minutes later Mr Chapman indicated to Mr Jessep that his face mask was filling with water. The pair tried unsuccessfully to clear the mask and Mr Jessep then indicated to his companion that they should return to the surface. They began their ascent and when they were about 7-8 metres below the surface Mr Jessep lost sight of Mr Chapman but found him already at the surface when he got there. The pair signalled to the skipper who was moored about 50 metres away. Mr Jessep told the skipper that Mr Chapman was having trouble with his mask. Mr Chapman got onto the boat and Mr Jessep went back into the water. The dive boat skipper (Mr P McAllister) subsequently informed Police that he thought Mr Chapman was "off colour". He observed that Mr Chapman looked uncomfortable, short of breath and was somewhat panicky. When Mr Chapman coughed Mr McAllister noticed that he was coughing up blood and the alarm was raised. The other divers returned to the boat. CPR was commenced. Emergency services were contacted from the boat at 2.17 pm and a paramedic ambulance team met the boat at Paremata boat ramp. It was found that Mr Chapman had died.

[2] Before the Court lies a report from Dr K J Thomson, the pathologist who carried out post-mortem examination of Mr Chapman's body. Dr Thomson reports that the cause of Mr Chapman's death was acute left ventricular failure, secondary to severe coronary artery disease, with an underlying air embolism. Dr Thomson also notes that contributing to Mr Chapman's death, but not relating to the disease or condition causing it, was rapid decompression. Dr Thomson goes on in his report to say:

"At the request of the Police, Dr Lorraine Smith kindly supplied some further information in relation to Mr Chapman's medical history. Dr Smith referred Mr Chapman to Cardiology Outpatients in April 2001 because of his elevated cholesterol, mild hypertension, and bad family history (brother had myocardial infarction at 35 years).

Mr Chapman was seen in June 2001 and mild left ventricular hypertrophy was noted. He was reviewed in October at Outpatients and started on antihypertensive therapy but did not qualify for subsidised supply of anticholesterol medication. He was not asked to do a treadmill test as he was asymptomatic and had no symptoms suggestive of angina.

The finding of a significant old posterior myocardial infarction at postmortem in addition to the generalised ischaemic damage does not mean that Mr Chapman may have been symptomatic; posterior infarcts in my experience are very often 'silent' or may present in an atypical way. In a young man, myocardial infarction would not necessarily be an obvious diagnosis under these circumstances.

The Police summary of events indicates that the reason for Mr Chapman's return to the surface was the presence of water in his facemask, rather than any apparent illness or distress while diving. The presence of air embolism is beyond doubt; even though the amount of air present was relatively small, the very seriously constricted nature of the coronary arterial circulation made the presence of even small air bubbles particularly dangerous, and I believe that the terminal left ventricular failure was the result of myocardial ischaemia resulting from air emboli within the coronary arteries."

[3] A report from ESR dated 28 May 2003 records that post-mortem blood samples revealed no evidence of the majority of medicinal drugs which affect the mind, alter mood or cause sleep. The urine was screened for evidence of the use of Amphetamine, Benzodiazepine and opiate-type drugs and Cannabis. No such evidence was found. No alcohol was detected in blood or urine.

[4] A written statement was made to Police on 23 April 2003 by Mr Jessep. He describes the boat taking the group of divers out to Mana Island as a 20 foot "tinny". He says he has his own gear, as have most divers. Group members 'suited up' before going on board the boat. There were six male divers and one female. Before group members got into the water the skipper, Mr McAllister, checked that each had all his/her gear. Each person then made a personal check. The boat left Mana between 1.05 and 1.10 pm, arriving at the dive point at about 1.30-1.40 pm. Mr McAllister checked the depth sounder and told members that the dive depth would be about 14-15 metres. The boat was about 70 metres from the southern shore of Mana Island. Sea conditions were good. The members "got partnered up". Mr Jessep was partnered up with Mr Chapman. Mr Jessep says he introduced himself to Mr Chapman and asked him how much diving he had done. Mr Chapman replied, "Yeah, yeah". Mr Jessep said he told Mr Chapman, "The visibility is pretty crap down there, only about 3 metres. What do you want to do if we get separated?" Mr Chapman said nothing. Mr Jessep asked Mr Chapman if he wanted to meet at the surface after a minute of looking round, or whether he just wanted to keep going. He says Mr Chapman didn't really answer. He said he just wanted to "cruise." He said, "I don't really want to catch any crays." Mr Jessep says he assumed Mr Chapman was going to follow him if he wasn't interested in getting crays. Mr Chapman looked as though he had good gear so Mr Jessep assumed it was his own gear. He had the same make of buoyancy control device as Mr Jessep. He also had a really good wetsuit. When the two entered the water Mr Jessep signalled to Mr Chapman thumbs down, meaning "Let's go to the bottom." Mr Chapman responded accordingly. Mr Jessep "flipped up" and went down. He looked back after 5 metres. Mr Chapman was right beside him going down head first. Mr Jessep checked Mr Chapman a couple of times on the way down. He "seemed sweet". Mr Jessep says he takes things slowly as he is "pretty paranoid" when it comes to other people's safety. His computer showed a depth of 12-14 metres

when he and Mr Chapman had reached the bottom. Each gave the other the "OK" sign. He checked his compass to get his bearings and then signalled to Mr Chapman that he was intending to go north-west. Mr Chapman signalled in return. Both men went 5-10 metres and reached a reef. Each then gave a further "OK" signal. They then moved on another 10 metres. As Mr Jessep was moving on he felt a tap on his side and back. He looked around. Mr Chapman was right above him. Mr Chapman gestured towards his mask. He was pointing to his eyes. Mr Jessep could see water in the mask just below the bottom of his eyes. He motioned to Mr Chapman to clear his mask of the water. He says you do this by lifting the bottom of the mask and blowing out your nose. You seal it at the same time as you stop breathing out your nose. Mr Chapman did this well. The two men gave the "OK" sign again. They moved on another 5 metres. Mr Chapman was about 2 metres behind Mr Jessep on his left. Mr Chapman pointed at his goggles again. Mr Jessep directed him to a sandy bottom. Mr Chapman's mask had more water in it this time. He again cleared his mask. Mr Jessep examined the seal about the goggles. The seal looked OK. He gave Mr Chapman the "OK" but he responded "by pointing to his mask indicating that there was something wrong. He kept pointing towards his mask." Mr Jessep then gave Mr Chapman the thumbs up "indicating to surface". When the two men left the bottom each had his computer in one hand and the air release valve in the other hand. At about the 8 metre mark Mr Chapman took off towards the surface. The depth was such that this did not cause Mr Jessep any concern. He says Mr Chapman "didn't seem to rocket off as if his BCD wasn't empty." It did surprise him a little that he took off towards the surface. He lost sight of Mr Chapman in the last 8 metres. His ascent was faster as he ascended that distance. When Mr Jessep surfaced Mr Chapman was up there. Mr McAllister was 30-40 metres away in the boat. Mr Chapman was using his alarm to let Mr McAllister know where the two men were. Mr Jessep says he asked Mr Chapman whether he had used the goggles he was wearing before, and Mr Chapman said he had worn them a couple of times. The surface was pretty choppy and Mr Chapman went to use his snorkel. He took that out and used his regulator. , He pushed on his whistle. Mr Jessep was waving to get Mr McAllister's attention. Mr Chapman looked slightly uncomfortable in the chop. The chop was breaking over the heads of the two men. Mr Chapman did not say anything to cause alarm. He looked OK, breathing in his regulator. Mr McAllister heard the whistle and came over. Mr Jessep was first to the boat, followed by Mr Chapman, who was 2 metres behind him. Mr Chapman swam over to the boat without any problems. Mr McAllister told the latter to lie back in the water. He then undid Mr Chapman's BCD and weights, placing them on the boat. Mr Jessep watched Mr Chapman climb into the boat. He did not need any help. He then told Mr McAllister he was going to go down again and asked whether that was OK. Mr Jessep then dived again. About three minutes later a thunder flash went off, indicating an emergency. Mr Jessep surfaced within a minute. Mr McAllister came over to Mr Jessep and told him that Mr Chapman was in trouble, and that he should get in the boat immediately. Mr Chapman was lying on his back in the boat. He looked pale and sick. Mr Jessep began CPR. There was blood and saliva coming from his mouth. He was not breathing. His lips were white and his eyes were not moving. Mr Chapman's stomach and chest "seemed to be getting bigger and full of air." He spat up "pink stuff" which Mr Jessep thought "was lung". Mr Jessep says after Mr Chapman "took off' upwards at about the 8 metres depth point it took him another 20-30 seconds to surface. He says that he and his fellows did everything possible to save Mr Chapman's life.

[5] In a statement made to Police on 24 April 2003 Mr McAllister says he knew Mr Chapman as a previous customer of Splash Gordon Limited ("SLG"). Mr McAllister was employed by that company as charter skipper. He says Mr Chapman was an advanced diver. He did an advanced diving course with Splash Gordon. Mr McAllister says that he had designed "the dive buddies, that

was based on experience level." He tries to put people of similar dive experience together. Mr McAllister says he thought, when he saw Mr Jessep and Mr Chapman surface, that they must have some problem because they had only been down for about ten minutes. At that time he did not know it was anything serious. He immediately went over to see what was wrong and that was he was told Mr Chapman's mask kept flooding. Mr Chapman had his mask on his forehead. Wearing a mask on the forehead is a sign of distress, but a lot of divers do it out of habit. Mr McAllister goes on in his statement to say:

"[Mr Chapman] looked uncomfortable and short of breath. A bit panicky. He was trying to grab hold of the rope quite vigorously as opposed to just holding it with his hand. I took that to be that he was uncomfortable with the water in his eyes. I quickly took his mask off his forehead because at that stage I didn't realise there was much wrong with him and I didn't want him to lose his mask. ... He kept closing his eyes and I thought it was because he had got water in his eyes from his flooded mask.

I then helped [Mr Chapman] take first his weight belt off and then his scuba gear. It is unusual to do this for an experienced diver unless they are in some kind of discomfort. At this stage I thought it was due to his eyes. His buddy was hanging onto the rope at the same time. I can't remember if he said anything at this stage. He then swam to the boarding platform at the back of the boat and then climbed into the boat. He didn't seem to have any problems doing this.

When he got on the boat he looked a bit distressed, a bit white, pale, like he was seasick. He didn't appear to be panicky at that stage, but he did look off colour. I asked him if he was all right. Initially he said yeah and then he changed his mind and said no."

Mr McAllister says that at that stage Mr Chapman coughed and he observed blood coming from his mouth. Mr Chapman looked sick; "he said bloody hell". Mr McAllister said he then threw a thunder flash into the water to recall the other divers because Mr Chapman appeared to be deteriorating and he was pretty worried.

[6] Before the Court lie two reports. These reports were received on 27 February 2004. The first report summarises the investigations and enquiries carried out by the Occupational Safety and Health Service of the Department of Labour. The second report is from Sergeant Bruce Adams, officer in charge of the Police National Dive Squad.

[7] The report from OSH states that Mr Chapman had completed 91 open water dives as at 21 April 2003 and would be classed as an experienced diver. It states that he was medically cleared to dive in November 2001. A medical statement is attached to the OSH report as Appendix 4. That statement has been signed by Mr Chapman. The medical history contained in such statement shows that Mr Chapman's brother had suffered a myocardial infarction at age 38 years. A history of heart disease, angina or high blood pressure is denied by Mr Chapman. There is a note "borderline BP await clinic". The medical statement contains room for the recording of what is described as the "Physician's Impression". The physician signing the statement is Dr M C Field, locum tenens for Dr Lorraine Smith. Dr Field's "impression" , recorded on 21 September 2001 is that she could find no medical conditions that she considered incompatible with diving. However, that impression is qualified. The qualification entered by Dr Field reads:

"To Whom it May Concern: This is to certify that I have examined this man today. He has untreated hypertension and is awaiting cardiologist assessment at Wellington Hospital which is

scheduled for 10/11/01. I feel he is fit to do the basic PADI course in a pool but should defer sea-diving until clearance by his cardiologist has been obtained."
An addendum dated 16 November 2001 shows, "Results of heart tests now available. Fit for recreational diving."
[8] Mr Chapman was seen on two occasions by the Department of Cardiology, Capital Coast Health, for evaluation at the request of Dr Smith. Copies of two Departmental letters to Dr Smith were sent to the Coroner on 1 February 2004 by Dr Mark Simmonds, Clinical Leader, Cardiology, Capital Coast Health. The first letter relates to Mr Chapman's attendance on 25 June 2001. Problem list is shown as:

* Raised cholesterol.
* Strong family history of myocardial ischaemia.
* Hypertension.
* Left ventricular hypertrophy (LVH) per ECG.
* Soft ejection systolic murmur.

Relevant history is shown as being Mr Chapman's brother's myocardial infarction at age 35 years. Brother was a heavy smoker. Mr Chapman did not smoke. Not diabetic. Absence of exertional symptoms in relation to playing soccer, in which sport Mr Chapman engaged. Upon examination blood pressure was 150/90, all pulses were present; no bruits in abdomen. Respiratory examination was clear. Abdomen normal. ECG showed normal sinus rhythm with no acute changes. Definite presence of left ventricular hypertrophy. Only significant risk factor was positive family history. Also has LVH. To be brought back for echocardiogram. Mr Chapman was seen again on 23 October 2001. Echocardiogram showed no significant evidence of LVH, with left ventricle being at upper limit of normal, good systolic and diastolic function and no evidence of valvular disease. Regular checking of blood pressure showed on each occasion slight elevation. Hypertensive management recommended. Mr Chapman commenced on Accupril 2.5 mg daily for two weeks, increasing to 5 mg daily should renal function remain normal and he have good blood pressure control. Decision left to Dr Smith in relation to management of raised cholesterol. Treadmill testing not carried out as Mr Chapman clinically asymptomatic and no symptoms suggestive of angina.
[9] The second letter sent by Dr Simmonds relates to Mr Chapman's further attendance on 23 October 2001. It reads:
"This gentlemen, as you know, was referred for evaluation of risk factors for ischaemic heart disease given that his brother recently had a myocardial infarction. An echocardiogram has been performed which shows no significant evidence of LVH with the LV being at the upper limit of normal, good systolic and diastolic function and no evidence of any valvular disease. He tells me he has had his blood pressure checked on numerous occasions since last seen and on each occasion this has been slightly elevated.
I've discussed his case with Dr Matsis and we feel that this patient clearly is at higher risk than average for ischaemic heart disease in the future given his family history. However, the big factor in his favour is that he is a non-smoker and his brother unfortunately was a smoker. To help reduce his risk in the future, we feel we should initiate hypertensive management and I've commenced Accupril 2.5 mg daily for two weeks with a view to increasing to 5 mg daily should his renal function remain normal and he have good blood pressure control. Secondly, even though a Statin would be superior to Bezafibrate for this patient, he would not qualify for a special authority. If he is prepared to pay for the medication himself, we would clearly recommend a Statin in place of

Bezafibrate. It is important that both these drugs are not prescribed together as this increases the risk of myocytis substantially. We've left the decision with him to make and discuss with yourself ...
We've not elected to do a treadmill as he remains asymptomatic and has no symptoms at all suggestive of angina. Should he develop any chest tightness or heaviness or anything at all suggestive of angina, at that point a treadmill would clearly be warranted.
He will be discharged from our care. However, should you require help at any time ... please do not hesitate to contact us."

letter is signed by Dr E B Petzer, Cardiology Registrar to Dr P P Matsis.

[10] OSH concluded that SGL was a professional and well-run dive company and re were no breaches of any sections of the Health and Safety in Employment Act a2 or of the Health and Safety in Employment Regulations 1995. It concluded 11 the interviews conducted and the reports made available to it, that SGL "is a 11-run company with all its safety procedures in place and [that] they were adhered
It satisfied itself that all procedural and safety documentation was in place. It icluded that on the day of the accident Mr Chapman had recurring problems with a king dive mask; that such problems caused him to abort his dive from a depth of 14 metres and to make a rapid ascent; that during the final part of his ascent Mr Chapman failed to carry out a safety stop at 5 metres; and that during the ascent he might also have held his breath as he ascended to the surface. It notes, however, that as it is unaware of the actual cause of death its conclusions as immediately set out remain speculative.
[11] The Court is indebted to sergeant Bruce Adams for the careful report prepared by him. A summary of the Sergeant's investigations is contained at pp.21-23 of that report. It is convenient to set out that summary in full:

"Summary
The incident is detailed in the attached OSH report and I agree with the OSH findings.
Nathan Reginald CHAPMAN was a qualified diver who has recorded 91 dives since completing his training in January 2002.
Mr CHAPMAN had dived in the general area where the fatal dive took place and with the charter operator. He had not previously dived with his dive partner on the day, Mr JESSEP but there is nothing to indicate that this was a contributing factor in the death, rather it was the actions of Mr JESSEP that ensured the Deceased got to the surface through his assistance on the seabed.
Examination of the equipment, including test dives, found that it was in new condition and functioning correctly.
There have been no depth and time violations made during this fatal dive. The total dive time involved was only 8 minutes to 16.7 metres, no limits have been exceeded and no decompression or safety stops were required.
The dive computer and personal logbook show that the Deceased has completed dives to similar depths in the past, and 91 dives in total since December 2001.
The dive computer shows that the Deceased made a fast ascent from 13 metres, this places the diver at risk of suffering a diving injury such as Pulmonary Barotrauma, Pneumothorax, Tension Pneumothorax and Arterial Gas Embolism.
Evidence of Arterial Gas Embolism was found during the Postmortem.
Control of ascent rates is managed and is the responsibility of the diver himself or herself.

The dive partner reported the Deceased's mask being flooded as the reason for the planned 30-minute dive to end early and the Deceased to ascend to the surface. It is possible that the mask has flooded during the ascent. This may have caused the Deceased to lose sight of his dive computer, which shows correct ascent rates, or cause him to panic.
The dive partner reported the Deceased's mask being flooded as the reason for the planned 30-minute dive to end early and the Deceased to ascend to the surface. It is possible that the mask has flooded during the ascent. This may have caused the Deceased to lose sight of his dive computer, which shows correct ascent rates, or cause him to panic.

The exact reason for the mask to flood is not known and is subject to speculation. The mask was checked prior to the dive by the Deceased and Mr McAllister and during the dive by Mr Jessep, but the mask continued to flood.
Examination of the mask used by the Deceased found it to be in new condition and functional but showed evidence of dust-like debris in sealing grooves indicating that the sealing skirt had pulled away at some stage from its frame and repeated correctly. It is not known if this took place or the mask was just a poor fit to the Deceased.
Medical
Mr CHAPMAN completed a medical on the 14th September 2001 but was referred to a cardiologist at Wellington Hospital for further tests. Following those tests being completed he was cleared for diving on the 16th November 2001 and his basic training (PADI Open Water Certification) commenced, this was completed on the 17th December 2001.
Further regular medical examinations are not mandatory for recreational divers.
On the 5-6th January 2002 Mr CHAPMAN has completed further training (PADI Advanced Open Water Certification). The Deceased again completed a medical questionnaire but he recorded different answers to those recorded in the medical completed on the 14th September 2001. Specifically that he did not take prescription medicines or that his family had a history of heart attacks or strokes, when he did in the original medical questionnaire. He did not undergo another medical examination.
Training institutions rely on customer honesty when conducting courses, it is not known if the medical declaration - if made in full as in September 2001 - would have alerted the training instructors to any issues or caused another referral for examination.
In comparison, commercial divers (including recreational instructors) must undergo an initial comprehensive medical examination that is repeated at least every five years. Every intervening year on an annual basis the diver completes a detailed medical questionnaire.
All commercial medicals must be completed by a Designated Diving Doctor and all medicals and questionnaires are screened by the Naval Health Service who issue all medical clearances.
The postmortem identified not only that the Deceased suffered an Arterial Gas Embolism but that he had pre-existing medical conditions. I believe that these conditions should have precluded him from diving but expert advice should be sought to confirm this.

It is not known that if the medical testing completed should have identified the existing medical conditions, further expert advice should be sought in regards to these issues."

PADI is the acronym for Professional Association of Dive Instructors. The Association Asia-Pacific office is in Sydney.

[12] Following receipt of the reports from OSH and Sergeant Adams, advice was sought by the Coroner from Dr A Hochberg, a Wellington registered medical practitioner with a specialist interest in diving and occupational medicine. By report dated 22 July 2004 Dr Hochberg says he has reviewed all relevant documentation, including post-mortem and toxicology reports, OSH report, report from Sergeant Adams, reports from Dr Lorraine Smith and cardiology reports from Wellington hospital.

[13] Dr Hochberg says he has identified some significant factual errors in the OSH report. He says OSH incorrectly records that a cardiologist medically cleared Mr Chapman for recreational diving on 16 November 2001. He records, correctly, that it was Dr Lorraine Smith, Mr Chapman's GP, who cleared him for diving on that date. He records, again correctly, that the reviewing cardiology registrar, Dr Petzer was never asked to review Mr Chapman's fitness for diving. However, OSH correctly states that there is no expiry date for the medical clearance for diving issued by Dr Smith. Dr Hochberg notes that Mr Chapman was referred to Dr Matsis at Wellington Public Hospital for review of his multiple cardiovascular risk factors, including high blood pressure and a brother aged 35 who had had a heart attack. He notes that Dr Smith suggests, in her referral letter of 18 April 2001, that a stress exercise test would be appropriate. He records that there is no mention of SCUBA diving evaluation in the referral letter or in subsequent correspondence from Wellington Hospital Cardiology. As recorded, a screening stress exercise test was not undertaken as Mr Chapman presented no symptoms of heart disease. Dr Hochberg records that at the time Dr Smith signed the diving medical certificate on 16 November 2001 she increased Mr Chapman's Accupril medication for raised blood pressure from 2.5 mg daily to 5 mg daily. He also records that the_PA 1 Medical Statement signed by Dr Field and, subsequently, by Dr Smith states in the preamble:
"To scuba dive safely you must not be extremely overweight or out of condition. Diving can be strenuous under certain conditions. Your respiratory and circulatory systems must be in good health. A person with heart trouble, a current cold or congestion, epilepsy, asthma, a severe medical problem, or who is under the influence of alcohol or drugs should not dive. If taking medical consult your doctor and the instructor before participation in this program."
[14] Dr Hochberg concludes, and the Court accepts his evidence, that Mr Chapman was not medically fit to dive. He was hypertensive and was receiving antihypertensive medication. He had several cardiovascular risk factors and ha4. been inadequately screened (no stress exercise test had been carried out) prior to commencing scuba diving. The risk factors referred to are: high blood pressure, on treatment; a high cholesterol (6.30; HDL 0.79; cholesterol/HDL ratio 8) suggestive of familial hypoalphalipoproteinemia. There was also a family history of early coronary disease in a brother aged a few years older at 35. Dr Hochberg says the influence of anti-hypertensive medication in a hyperbaric (diving) environment is not known and potentially adds to the risk analysis. He comments that postmortem results show Mr Chapman had advanced coronary artery disease and had suffered a myocardial infarction in the time between the date of the echocardiogram carried out on 12 October 2001 and his death on 23 April 2003.
[15] Dr Hochberg says, and the Court accepts:
"It is entirely possible that Mr Chapman experienced an angina attack under water which made him rapidly ascend to the surface from 8 metres. It would appear unlikely that an experienced diver would adopt such a diving profile, which fits more to panic due to inexperience, than [with] a medical emergency as I have suggested.
The harshness of the underwater environment could possibly have hastened his cardiovascular death. Exercising in a cold seawater environment or against sea currents requires considerable

cardiac reserve. Mr Chapman had severe' coronary disease and a previous heart attack, [found] at postmortem. It is likely the difficulties he had with his face mask diving that day, in combination with the cold and exertion during the dive, contributed to an angina attack."

[16] Dr Hochberg notes that the further PADI medical questionnaire completed by Mr Chapman on 5 January 2002 showed different answers to those recorded in the medical form completed on 14 September 2001. Specifically, that Mr Chapman did not take prescription medicine or that his family had a history of heart attacks or strokes. Dr Hochberg goes on to comment:
"The value of screening questionnaires is suspect and currently the topic of some debate in the diving medical field. It is unclear how the alteration in the questionnaire would have impacted on Mr Chapman's medical fitness as it is unclear how SGL or PADI reacts in this situation e.g. do they have an independent medical expert review the reports - to the best of my knowledge they do not. If Mr Chapman had been referred to a diving medical doctor who had the benefit of the GP record, it is possible that his death may have been prevented at the second medical screening point on 5 January 2002."
The Court accepts what Dr Hochberg says in his report.
[17] Dr Hochberg records that SGL determined that the charter boat skipper, Mr McAllister, was employed by SGL for gain or reward and that the group of divers, of which Mr Chapman was a member, paid for the charter. It concluded that the boat was at the time of the accident a place of work. Accordingly, SGL had duties under the Health & Safety in Employment Act 1992 and the Health & Safety in Employment Regulations 1995.
[18] In para [8.2] of its report OSH expresses the view that SGL's safety procedures were in place and were adhered to. Dr Hochberg advances good reason for saying that this was not so. In para [6.8] of its report OSH says that the emergency procedures carried out on 23 April were appropriate. Again, and for good reason, Dr Hochberg says this is not so.

[19] The reasons advanced by Dr Hochberg for his disagreement with the findings by OSH in the respects stated may be summarised as follows:
* After Mr Jessep (dive "buddy" of Mr Chapman) had surfaced with Mr Chapman he indicated to the charter boat skipper that he wished to continue diving alone. OSH says that this is done at a diver's own personal risk, but the SGL safety-briefing (p 16 of OSH report) states "all dives are with dive buddies". Shortly after Mr Jessep went diving on his own Mr Chapman became unwell and collapsed, leaving resusitation to Mr Allister alone, who then had to summon support by firing off a thunderflash.

* Mr McAllister found Mr Chapman to be pale and coughing blood, yet administration of oxygen and placement in recovery position were delayed for a period of time. The need for oxygen therapy and placement of Mr Chapman in head-down position were not recognised by OSH as being appropriate medical management. Dr Hochberg says:
"This is critical for emergency medical management and may have altered the outcome for this diver."
* OSH failed to identify or recommend what constitutes safe diving practice. There is no consideration or discussion of appropriate ascent rates, use of dive computers, what is involved in dive training, dive medical conditions and their emergency treatments, the appropriateness of DAN oxygen training or CPR qualifications of staff.

* It was inappropriate for Mr McAllister to pick up the other divers whilst Mr Jessep was administering CPR. Both men should have been involved in resuscitation. The other divers could have made their own way back to the boat and, once on board, could have assisted in CPR, allowing Mr Allister to collect any remaining divers on the water. Dr Hochberg says:
"The lack of coordinated resuscitation may have impaired the deceased's prospects for survival."
* Wellington Marine Radio was not contacted for some time. Dr Hochberg asks why were not ambulance services contacted directly? He says the OSH report makes no reference to the timing of the call to Marine Radio. Nor has OSH reviewed the audio tapes or transcripts relating to the emergency call-out. It would have been more appropriate to have had the Westpac rescue helicopter at the scene, potentially within minutes, with a paramedic winched down to the vessel. Dr Hochberg adds:
"The delay of 50 minutes to reach a waiting ambulance was totally unacceptable. "
* OSH does not comment on the independence of the Adventure Sport Institute Audit and the appropriateness of audit by an agency that is part of PADI, which latter body is responsible for diver training. Nor does OSH identify the relevance of the limitations of the Adventure Sport Institute Audit and the impact such limitations may have on dive safety. OSH does not give consideration to the effects of the lack of diving medicine expertise in the examination and certification by doctors for SGL. Diving medicine issues are minimised. In para [6.10] of its report OSH indicates that the latest ASI audit was comprehensive and thorough but notes, in para [6.12], that such audits are limited to dive training programs and not to dive charters. Dr Hochberg says a review of ASI site audit document (appendix 1 of OSH report) shows that staff performance and management performance appraisals were conducted by the same four staff members on each other and not independently or externally. The ASI audit shows staff development plans were not met for three out of four of the staff. Understandably, Dr Hochberg asks what are the implications? Dr Hochberg says the OSH report relies on 14 previous customers in order to confirm that health and safety systems were in place. He says this is insufficient and limited by the skills and occupations of those interviewed. Again, and understandably, he asks would the 14 customers know how a good and safe dive operation should be run? What are the qualifications and experience of those customers that enables them to make informed judgements on the adequacy of SGL operations?

[20] The questions raised and comments made by Dr Hochberg, whose expertise and experience in diving medicine are recognised and well known, are deserving of the most careful consideration. His questions and comments take the somewhat neglected area of diving safety to a new level. It is important that diving deaths of the kind that occurred in this case be subject to rigorous examination and report at the hands of an expert in diving medicine. It is important also that OSH take expert advice in future cases of this tragic kind and the Court recommends that it does so.

[21] Dr Hochberg says that Mr Chapman, along with other divers, was subjected to the hazards of compressed air diving, exposure to a hyperbaric environment and seawater-diving. He says SGL does not appear to have reviewed the first or second dive medical questionnaires which would have alerted it to the existence of significant cardiac problems and also to discrepancies in the medical history between the two questionnaires. If SGL did not have the expertise to review the questionnaires it should have arranged for a suitably trained diving doctor to review them. The Court recommends that SGL do so in the future. The Court makes no critical comment in relation to SGL or OSH, recognising that through the intervention of expert advice each has only now come under notice of the need to do what Dr Hochberg recommends.

[22] This decision follows the delivery by this Court of its Findings following inquest into the death of Lance Baker (decision 81/2004, delivered 21 October 2004). It is important that these two decisions be read together. An earlier decision of this Court, delivered following inquest into the death of Andrew Robert De Thierry (decision 101/03, delivered 15 December 2003) also requires to be read with these two decisions. As with Mr Chapman, Mr De Thierry was engaged in scuba diving. Mr Baker was engaged in free-diving. The recommendations made by this Court in view of both public and the achievement of minimum safety standards in the area of recreational diving.

[23] Dr Hochberg says there are approximately 10 scuba diving deaths in New Zealand each year. He says this figure has remained constant over the last 15 years. There has been no improvement in such mortality figures. He says the OSH report refers to the French Pass tragedy, with three diving deaths and two cases of the bends. He says there were three diving deaths on the Mikhail Lermontov in the Malborough Sounds, including the death of an 18 years old Lower Hutt girl, who was only just out of her dive-training course. He' says there is a move now to teach scuba to children as young as eight or nine years of age. He asks is this appropriate and, if so, who carries responsibility for their lives and continuing good health? Should a 12 year old be scuba diving? Because recreational diving is unregulated there is no minimum age standard, such as there is with private pilot training (15 years). Dr Hochberg says the lack of on-going medical surveillance of recreational divers is in contrast to recreational pilots who are required to have periodic medical examinations annually over the age of 50; biennially from 40-50, and 5-yearly under age 40. Such examinations are carried out by aviation medical examiners. The competencies of such examiners are assessed by the Civil Aviation Authority, which undertakes audits to ensure standards are complied with and are consistent. Dr Hochberg says that in his view scuba diving is riskier for a young adult in terms of potential for serious harm than flying. He notes that skippers of boats require maritime medical clearances every two years. He says the situation in the recreational dive industry has largely been one of self-regulation. He says:
"With no improvement in scuba dive deaths over 15 years, a number of bends cases every year - between 50-100 treated in Hyperbaric Units in New Zealand, and a lack of public awareness on the risks, it is time for review of safe diving practice.
In line with aviation and maritime regulation, independent regulation is advised:'

[24] Dr Hochberg says dive medicals should always be performed by a doctor who is training and experienced in diving medicine, with a copy or summary of the GP record at hand. He says the subsequent emergency management of Mr Chapman shows significant flaws in emergency procedures. He says it appears from the emergency management initiated in respect of Mr Chapman that safety and emergency procedures of all bodies concerned with diving need reviewing. He says:
The dive industry should not be allowed to self-regulate to an ad hoc standard. Appropriate amendments to the Maritime Safety Act could see an independent organisation administer safety standards consistently across the dive industry in much the same way that private pilots or skippers of boats are monitored at the current time. This is long overdue."
Again, the Court is in complete agreement with what is said by Dr Hochberg and recommends to those bodies/persons listed in para [30] hereof that steps be taken immediately to standardise emergency resuscitation and rescue procedures.

[25] Dr Hochberg refers to the Findings of the South Australian Coroner in respect of five scuba diving-related deaths each of which was delivered on 6 April 2004. The deceased persons, in respect of whom inquests were held were:
Robert Anthony Walker
Neville Arthur Kinnear
Rex Alexander John Humberstone Debra Christine Campbell Jennifer Lee Barrington
In each case the following recommendations were made by the State Coroner:

1. All persons engaged in recreational underwater diving should undergo an examination by a registered general medical practitioner trained in hyperbaric medicine on a regular basis, preferably annually but not less frequently than every two years.

2. Medical practitioners should decline to conduct such examinations unless they are appropriately qualified to do so.

3. Medical practitioners conducting such examinations should, if they are not the subject's regular medical practitioner, require the subject to produce a referral letter detailing the subject's medical history as far as is known.

4. Medical practitioners conducting such examinations should warn the subject that diving is a potentially lethal activity if undertaken by a person with certain medical conditions, and that absolute honesty in providing background history is called for.

5. If there is any doubt about the subject's health, the medical practitioner should arrange such follow-up tests as x-rays, hypertonic saline tests, or whatever else may be indicated, before passing the subject as fit to dive. Any doubts should be resolved against passing the subject as fit, until such follow-up tests demonstrate fitness to dive.

6. The recreational diving industry should conduct an awareness campaign under its member organisations and the diving public about the dangers of diving with certain medical conditions, the need for regular medical examinations at least every two years, the need for absolute honesty during such examinations, and the responsibility a diver has both personally and to his or her diving colleagues to ensure that he or she is fit to dive."

[26] Each of the deaths that were the subject of inquest at the hands of the South Australian State Coroner occurred between 24 February 2001 and 21 April 2002. The State Coroner said a startling number of similarities existed in these five cases. In three such cases there was evidence of cerebral arterial gas embolism. In four cases a lack of cardio-vascular fitness was evident. Four of the deceased were obese. All of the deceased had medical conditions relevant to the cause of death which (could have been detected in a properly conducted medical examination", namely:
* Cardiomegaly (enlarged heart)
* Other lung disease (Myocarditis)
* Lung disease
* Back problems
* Oesophageal reflux
* Ear problems

In four cases the deceased wore a wet suit that was too tight, interfering with breathing and possibly causing reflux. In, two cases the deceased wore a weight belt that was too heavy, causing excessive fatigue. In one case the BCD was faulty, also causing excessive fatigue. In only one case did the 'buddy' system break down. In two cases poor diving technique may have contributed to the deaths. Two of the deceased had recent diving training but were inexperienced; and the other three were experienced but had not had recent training. The evidence shows that each of these deaths were preventable. So, also, was Mr Chapman's death.
[27] As discussed in the State Coroner's Findings, three options are available to address the issues arising from his Findings:

* Conduct an educational or public awareness campaign about the dangers of diving with a medical condition and recommending regular checkups
* Make periodical medical examinations compulsory.

The difficulties in relation to the making of medical examinations compulsory are said to be resentment from recreational divers; expense; the lack of sufficiently trained medical practitioners; and unenforceability. Occupational divers are required to undergo periodical medical examinations by medical practitioners trained in hyperbaric medicine. The option preferred by the State Coroner was to recommend that the recreational diving industry take steps to promote safe diving practices by the development of an education program specifically aimed at the need for divers to maintain a good level of fitness.

[28] At the time this Court delivered its Findings and recommendations in Baker, it did not have before it the six decisions of the South Australian State coroner. The recommendations made by the court in Baker reflect the adoption by it of an approach similar to that taken by the State coroner.

Recommendations:

[29] It is unnecessary for the court to replicate the recommendations made at pp14-15 of its findings in Baker. It endourses and commends the recommendations made by the State coroner for south Australia, set out in para [25] hereof, to those bodies/persons named in para [30] below. The recommendations contained in paras [20], [21], and [24] addressed to OSH, SGL and to all those involved in recreational diving in New Zealand should also be the subject of careful considerations and action by those bodies/persons named in para [30].

[30] It is directed that a copy of these findings be sent to:
The Chief Executive Officer
New Zealand Underwater Association
PO Box 875
AUCKLAND

The Chief Executive Officer
Water Safety New Zealand
WELLINGTON

The Chief Executive

Maritime Safety Authority
WELLINGTON

The Chief Executive Officer
New Zealand Recreational Association
WELLINGTON

The Chief Executive Officer
Accident Compensation Corporation
WELLINGTON

Mr G Cooper
National Diving Coordinator
Department of Labour - OSH
Private Bag MBE 433
HAMILTON

The Chief Executive Officer
Dive New Zealand

The Editor
Viva Aqua
New Zealand Underwater
PO Box 875
AUCKLAND

Managing Director
Splash Gordon Ltd
432 The Esplanade
ISLAND BAY

The Chief Executive Officer
OSH Department of Labour
WELLINGTON

Sgt Bruce Adams
National Dive Squad
New Zealand Police

[31] The Court extends to all members of Mr Chapman's family its sincere sympathy on their loss. It thanks Constable Kelly and Detective Bruce Adams for their assistance. It regrets the delay that has been occasioned in the delivery of these Findings, which delay has largely been beyond the control of the coroner.

Verdict

[32] Nathan Reginald Chapman late of 234A Adelaide Rd, Newtown, Wellington Analyst died on 24 April 2003 on a boat returning from Mana Island to Paremata Harbour, Wellington, the cause of his death being acute left ventricular failure secondary to severe coronary artery disease with underlying air embolism, which latter condition is likely to have been causally related to rapid decompression following ascent from a dive off Mana Island that day.

G L Evans
Wellington District Coroner