IN THE CORONERS COURT
AT CAIRNS

IN THE MATTER OF AN INQUEST INTO THE CAUSE AND CIRCUMSTANCES SURROUNDING THE DEATH OF THOMAS CREEGAN

On the 5th, 6th and 7th October 2005, an inquest was held into the cause and circumstances surrounding the death of Thomas Creegan born 28th December 1955.

All proceedings before this Court are emotional proceedings and I express my sympathy and condolences, and those of the Court, to the family of Mr. Creegan in their sad loss due to his sudden and tragic death.

Pursuant to s. 24(1) of the Act, the purpose of an inquest is to establish, as far as practicable-

(a) the fact that a person has died
(b) the identity of the deceased person
(c) when, where, and how the death occurred
(d) whether any person should be charged with any of the offences referred to in s.24(1)(d) of the Act.

S. 43(5) of the Act provides that a Coroner, shall not express any opinion on any matter outside the scope of the inquest except in a rider which, in the opinion of the Coroner, is designed to prevent the recurrence of similar occurrences.

S. 43(6) of the Act provides that no finding of the Coroner may be framed in such a way as to appear to determine any question of civil liability or as to suggest that any particular person is found guilty of any indictable or simple offence.

I say at this stage that I am satisfied on the whole of the evidence before me that there is no evidence upon which any person should be committed for trial on any of the charges referred to in Section 24(1)(d) of the Act.

The evidence in the inquest was substantial, comprising 51 Exhibits, including two (2) Queensland Police Service (QPS) Reports which in themselves comprised numerous statements, photographs and other documents. The court also heard sworn testimony from sixteen (16) witnesses, including:-

- Scott Selby Cornish, Senior Constable, Police Diving Squad
- Sergeant Michelle Dodds, the Investigating Police Officer
- Vinodhan Adrian Wijenathan and Richard John Craig, both tourists on the subject resort dive giving rise to these proceedings
- David Frederick Roy Johnston, the diving instructor responsible for the supervision of Mr. Creegan and others on the subject resort dive giving rise to these proceedings (Mr. Johnston exercised his rights pursuant to s. 33(2) of the Act that he not be compelled to answer questions which may tend to incriminate him and on

that basis, he was excused from further attendance at the inquest).
- Janet Ann Murray, the second diving instructor and the instructor involved with Mr. Johnson in undertaking the initial briefing to the resort diving group
- Robert Bruce Fraser, vessel master of the Down Under Dive SuperCat as at 30th November 2003
- Adrian Gary House, Intensive Care Paramedic, Queensland Ambulance Service
- Peppi Iovanella, Managing Director, Down Under Dive, the company undertaking the subject resort dive
- Christopher Brian Coxon, Principal Inspector, Department of Industrial Relations Workplace Health and Safety, who undertook an investigation into the incident of the subject resort dive
- Daniel Dwyer, Regional Manager for PADI, Asia Pacific
- Colin George McKenzie, Executive Director, Association of Marine Park Tour Operations
- Dr. Mark Francis Jagusch, Forensic Pathologist, who undertook the post-mortem examination
- Dr. Christopher Stuart Butler, Senior Staff Specialist Anaesthetist, Townsville Hospital
- Dr. Catherine Meehan, General Practitioner and qualified diving medical examiner
- Julie Fitzgerald, Mr. Creegan's sister.

Subsequent to the close of the examination of witnesses, I received further documentation, in accordance with an undertaking given by Mr. Mellick, solicitor representing Down Under Dive, being the personal file, held by Down Under Dive, of the diving instructor David Johnston.

I would like to thank Sergeant Michelle Dodds, the investigating officer, for the thoroughness of her investigation; and Mr. John Tate, Counsel assisting me, who argued for the widest possible scope under which the enquiry was to be conducted.

Having done so, the issue of jurisdictional limitations was raised by Mr. Priestley, Counsel representing PADI, who argued the requirement of a causal connection between the matters that might be the subject of riders and the death. It has been held, however, in the recent Court of Appeal decision of *ATKINSON v. MORROW & ANOR (2005) QCA 353* that "the powers of a coroner with respect to the evidence to be admitted at an inquest are deliberately stated very widely indeed"; "it is clear that jurisdiction at an inquest is very wide"; and that it is the duty of the coroner to "inquire into all the circumstances attending that death or which might have caused it".

In reliance on that authority, I then ruled that all such circumstances would necessarily include issues relating to medical fitness to dive; including pre-dive medical testing, information gathering in relation to the current medical declaration form and identification of at-risk divers as well as issues relating to instructor competency and training of dive instructors in connection with dive briefings and in-water supervision of divers; the improvement of procedures for monitoring those competencies, the availability of programs to do so and expectations of regulating authorities in relation to competencies, supervision and training.

INCIDENT GIVING RISE TO PROCEEDINGS

On 30th November 2003, at approximately 8.30am, Mr. Creegan, a 47 year old male tourist from the United Kingdom, travelled with the tour company Down Under Dive on its MV Super Cat from Cairns to Hastings Reef. During the journey Mr. Creegan agreed to do a resort dive.

Resort diving is defined in the Department of Industrial Relations Workplace Health and Safety Compressed Air Recreational Diving and Recreational Snorkelling Code of Practice, (hereinafter referred to as "the relevant Code of Practice) as at November 2003, (Exhibit 1, Appendix 5) as "An introductory scuba experience or introductory educational diving program, conducted according to a recreational scuba training organisation's program…". There are two such organisations, being PADI (Professional Association of Dive Instructors) and SSI (Scuba Schools International). Down Under Dive were using the SSI program.

Mr. Creegan completed a medical declaration form (Exhibit 1, Appendix 1), consistent with that stipulated in the relevant Code of Practice. He ticked the "NO" box to all listed medical conditions (indicating effectively that he had not been subject to any of them), indicated that he was an average swimmer and a novice diver and also signed the Liability Release and Assumption of Risk on the reverse of that medical declaration form.

A briefing was then conducted with all of the prospective introductory/resort divers, including Mr. Creegan, by instructor Janet Murray, with assistance from David Johnston. The usual procedure in a Down Under Dive briefing, as at November 2003, involved the use by the instructor/s giving the briefing of a single A4 laminated sheet (Exhibit 25, document no.4) to prompt themselves as to the topics required to be covered. (This method differs to a PADI briefing which involves the use of a much larger and flip-chart (Exhibit 39, no.3) that is actually demonstrated to the prospective divers whilst also prompting the instructor of the topics to be covered in the briefing).

I accept the evidence of Richard Craig and Vinodhan Wijenathan that a number of topics were covered, including mask clearing, regulator recovery and clearing, breathing techniques, checking air gauges, swimming techniques, hand signals and equalisation techniques. There is differing evidence about the duration of the briefing, Mr. Wijenathan stating it took no longer than five (5) minutes but others saying it took ten(10)- fifteen (15) minutes.

Neither Richard Craig nor Vinodhan Wijenathan have any recollection that advice was given during the briefing as to how to use the buoyancy control device, including how to maintain buoyancy on the surface. Janet Murray's evidence was that it would have been covered in the briefing (although her statement as to her recollection of events was not given until February 2004) but that resort/introductory divers are not actually taught how to inflate their buoyancy control device as that is an action undertaken by the supervising trained dive instructors.

Mr. Wijenathan also had no recollection of being told about quick ascents or any risks associated with resort diving, but this must be considered in light of his evidence that he was so excited to be going on the dive and so determined to do so that he deliberately failed to indicate on the medical declaration form that he had suffered from asthma and that if he had had to undergo a medical examination prior to the dive, he would also have deliberately failed to disclose the asthma history.

There is no evidence that there was any additional or oral explanation provided to introductory resort divers as to how to complete the medical declaration form, the importance of the form, the use to which the form would be put or any consequences of failing to complete the form correctly.

Mr. Wijethenan also signed the liability release form without reading it, clearly stating that he did not think he was in any danger from diving. Janet Murray's evidence was that it is well known that a "potential problem for dive instructors is that the brief may not get through to the minds of the participants".

The MV Supercat arrived at Hastings Reef at about 11.15am and at about 11.20am, Mr. Creegan entered the water at the stern with the instructor David Johnston and 3 other divers, including Richard Craig. I accept that David Johnston undertook equalisation techniques, mask clearing and regulator clearing exercises with each of the four divers and they all then descended down the bars at the stern of the boat and swam towards the reef, with 2 divers on either side of David Johnston, with arms linked at the elbow. I accept the evidence of Richard Craig that as the group swam along, they began to spread out with Johnston in front regularly checking over his shoulder and signalling "ok".

After about 30 minutes, they all returned to the vessel MV Supercat and Mr. Creegan participated in snorkelling activities, had lunch and upon inquiry from crew members, indicated he would be interested in undertaking a second introductory/resort dive. By this time, the MV Supercat had moved to Saxon Reef.

There was no further briefing before Mr. Creegan's second introductory/resort dive which commenced at about 13.50pm and also included Richard Craig, Vinodhan Adrian Wijenathan, and Danny Edgard Tomasouw. Again, David Johnston was the instructor. I accept the evidence of Mr. Craig that, before entry to the water, the group was not told what formation to keep but that they could swim freely. I accept the evidence of Mr. Wijethanan that, in fact, Mr. Johnston said that the divers should keep an eye on him (Mr. Johnston) rather than the reverse.

The four divers, including Mr. Creegan, and David Johnston then entered the water by descending the bar at the stern of the MVSupercat as before and swimming towards the reef. By reference to the evidence of each of Mr. Craig, Mr. Wijenathan and Mr. Tomasouw, I accept that David Johnston at all times swam in front of the divers, facing away from them, looking back over his shoulder to check on them. Mr. Craig in fact took 2 photos of Mr. Johnston which clearly depict Mr. Johnston swimming some distance in front of, and facing away from, him (Craig) –(Exhibit 1, Appendix 7 and Exhibit 1, Appendix 8).

I accept by reference to the evidence of the three divers Mr. Craig, Mr. Tomosouw and Mr. Wijethanan that the group was in a formation, varying from time to time, one behind another with Mr. Creegan towards the end; that Mr. Craig was up to five metres behind Johnston; that Mr. Craig became concerned that Johnston wasn't looking around regularly enough; that Mr. Craig looked behind and saw Mr.Wijethanan and Tomosouw at his depth of about 5 or 6 metres and Mr. Creegan near the surface of the water about 10-15 metres behind him (Mr. Craig); that when Mr.Craig checked again he could only see Mr. Wijethanan and Mr. Tomosouw and had lost sight of Mr. Creegan; that Mr. Craig then swam to catch Mr. Johnston who was still in front of him (Craig) and signalled to Johnston that there were only 3 divers; that Mr. Tomosouw and Mr. Wijethanan swam to Mr. Johnston, a distance of up to 10 metres, to try to alert him that Mr. Creegan was missing and were very tired once they reached Johnston.

By this time, Mr. Craig had tapped on Johnston's leg and signalled "3" with his fingers to indicate that there were only three divers instead of 4 divers. Mr. Johnson then signalled "up" and swam ascending back the way the group had come. Mr. Craig, Mr. Wijenathan and Mr. Tomosouw followed. Each of Mr. Craig, Mr. Wijenathan and Mr. Tomosouw state, contrary to Mr. Johnston's statement to investigating police, that Mr. Johnston's ascent was not slowed or hindered by any of them or any tender vessel. In fact to the extent that Mr. Johnston's written statement contradicts the evidence of any of Mr. Craig, Mr. Wijethanan or Mr. Tomosouw, I reject Mr. Johnston's evidence.

I accept that, in the meantime, the master of the MV Supercat Robert Fraser heard a call for rescue, moved towards the rescue tender on the MV Supercat and saw Mr. Creegan on the surface of the water about sixty metres astern of the MV Supercat waving his arms in the air and shouting in a distressed fashion. Mr. Fraser, who was the only crew member licensed to drive the rescue tender, then drove the rescue tender directly to Mr. Creegan's position. Mr. Fraser had no previous rescue training but was the holder of a first aid certificate only.

A snorkeller, Javier Quiros, who was in the water approximately 20-25 metres from Mr. Creegan, also saw and heard Mr. Creegan screaming on the water surface. Mr. Quiros saw the rescue tender coming from the MV Supercat and swam to Mr. Creegan's position, arriving at the same time as Mr. Fraser and the lookout from the Atlantic Clipper, Jason Baker who had also swum to Mr. Creegan's position.

Mr. Fraser jumped from the tender into the water, having observed Mr. Creegan to lose consciousness and sink below the surface of the water. Mr. Quiros was required to assist Mr. Fraser in lifting Mr. Creegan in to the rescue tender after Mr. Baker (who had previous rescue training) had removed Mr. Creegan's scuba tank and regulator.

The rescue tender, with Mr. Fraser driving and Mr. Baker performing EAR then returned to the MV Supercat where resuscitation commenced, I find, at approximately 14.00 and not 14.07 as recorded. I do so having regard to the fact that Mr. Creegan's digital timing device records his dive as 5 metres for 4 minutes; the dive commenced at 13.50; I accept Mr. Fraser's evidence that he took approximately 4 minutes to travel

to and pull Mr. Creegan from the water and approximately 2 minutes to return to the MV Supercat.

Janet Murray (who had a senior first aid certificate only) cleared the back deck of passengers, observed the rescue tender return to the boat, pulled Mr. Creegan from the tender and commenced mouth to mouth while Ben Mair commenced CPR. Andrew Jacobs then took over from Janet Murray with mouth to mouth. The CPR and EAR continued for approximately 30 minutes. Oxygen, despite being available, was not used, Ms. Murray expressing the view that her training dictated the use of CPR and EAR. In the meantime, Mr. Fraser had called the Emergency Services and made a decision to move the MV Supercat to Norman Reef where there was a pontoon for the Emergency Services helicopter to land. No oxygen was ultimately used by the resuscitation team

The MV Supercat arrived at Norman Reef at approximately 14.25, the QES Rescue helicopter arrived at approximately 14.27, the paramedics arrived at 14.30 on the vessel and a decision was made to cease CPR at 14.33.

I am satisfied that everything that could have been done was done for Mr. Creegan under the circumstances which existed at the time and with the equipment that existed at the time. Whilst the MV Supercat had first aid kits and oxygen resuscitation equipment, there was no defribrillator on board.

THE INVESTIGATION

I have already referred to the thorough investigation of the Queensland Police Service and the extensive material comprising statements of witnesses and other numerous exhibits.

I accept the evidence of Senior Constable Scott Cornish that the diving equipment utilised by Mr. Creegan was of reasonable quality, cleanliness and functionality and that no life-threatening faults were found in the diving equipment.

By reference to witness statements and weather reports, I accept that Sunday the 30th November 2003 was quite an overcast day, the sea was quite choppy and visibility was not as good as it would have been on a clear, sunny day.

The Department of Industrial Relations Workplace Health and Safety (Mr. Chris Coxon) also conducted a thorough investigation. Mr. Coxon has prepared two(2) reports, the first dated 18th February 2004 (Exhibit 1, Appendix 13) and the second dated 7th September 2005 (Exhibit 22).

Perusal of the dive safety logs revealed that neither the dive sites nor Mr. Johnston's dives are recorded therein as required by regulation 86F of the Workplace Health and Safety Regulation 1997.

Furthermore, two improvement notices, being Notices No. 223614 and 223615 were issued by the Department to Down Under Dive on the 4th December 2003. The former notice relates to the requirement that the introductory/resort dive briefing conducted

by diving instructors prior to such a dive includes advice as to the use of the buoyancy control device, including positive buoyancy on the surface.

The latter improvement notice relates to the requirement that in-water supervision of introductory/resort divers by diving instructors be conducted in accordance with the Industry Code of Practice as applied at the time.

Charges have since been laid by the Department against Down Under Dive.

CAUSE OF DEATH

In Attachment 1 to his 2nd report, Mr. Coxon, in referring to the Queensland Workplace recreational diving and snorkelling deaths statistics between 1998-September 2005, stated, in Mr. Creegan's case, "Second dive of the day. Separation from instructor. Ascended alone and lost consciousness after calling for help on surface. History suggestive of cerebral arterial gas embolism".

In the Fact File of the Royal College of Pathologists of Australasia –Autopsy and the Investigation of Scuba Diving Fatalities- (Exhibit 12), it is stated that in divers using compressed gases, pulmonary barotrauma and cerebral air gas embolism (PBT/CAGE) represents 13-24% of fatalities. "Boyle's Law states that at a constant temperature the volume of a gas is inverse proportional to the pressure. Pulmonary barotrauma followed by cerebral air gas embolism (PBT/CAGE) occurs in a diver who makes an uncontrolled ascent without exhaling. The volume of the gas in the lungs expands during ascent as the ambient pressure falls, if the diver does not exhale, air is forced from the airspace into the pulmonary circulation, to the heart and hence into the cerebral circulation (CAGE). Pulmonary barotrauma has been reported in dives in as little as two metres of water. The history of the diver coming to the surface rapidly, crying out and then losing consciousness within minutes is characteristic of this condition".

X-Rays examined by Dr. Jagusch, who undertook the autopsy examination, showed no evidence that would suggest free gas in blood vessels, heart, or tissues of other sites such as the lungs, brain or abdomen as would normally be expected in a case of PBT/CAGE. This absence of gas was confirmed by a specialist Radiologist.

However, whilst features characteristic of barotrauma were not identified during the examination, Dr. Jagusch's evidence was that he could not positively exclude it.

What was evident, according to Dr. Jagusch's Post-Mortem Certificate (Exhibit 1, Appendix 41) and report (Exhibit 29) were features of significant natural diseases of the heart and blood vessels including a 70% stenosis of the Left Anterior Descending coronary artery; heart enlargement of mild to moderate degree; atherosclerosis of the remaining branches of the coronary arteries and in other vessels throughout the body; and thickening and abnormality within small blood vessels in a number of different organs.

I accept the evidence of Dr. Chris Butler in his report (Exhibit30), when referring to the autopsy findings of Dr. Jagusch, that a 70% stenosis of the Left Anterior Descending coronary artery in a novice diver undertaking relatively strenuous

exercise at depth in an unfamiliar environment could certainly have led to the development of myocardial ischaemia, chest pain, shortness of breath, cardiac arrhythmias and subsequently death.

Whilst accepting that there was no autopsy evidence of CAGE(Cerebral Arterial Gas Embolism), Dr. Butler stated that as volumes of less than 1ml of air in the cerebral circulation have been shown to cause neurological effects in animals, the inability to demonstrate the presence of air in the circulation at the time of autopsy does not totally exclude a diagnosis of CAGE. "The history of the event of a novice diver undertaking an uncontrolled ascent to the surface, then losing consciousness soon after is very suggestive. There is no definitive test to diagnose this condition and had Mr Creegan survived his initial resuscitation, urgent recompression would have been recommended in view of the probability of this condition".

I accept the evidence of Dr. Butler that the most likely cause of death was Myocardial Ischaemia as a result of undiagnosed coronary artery disease but that the possibility of CAGE as the precipitating event cannot be excluded.

OTHER ISSUES

As a result of the broad scope of the inquest, a number of other issues previously referred to were identified as relevant to the investigation of Mr. Creegan's death. Having regard to the cause of death as now found, it is important to refer to certain of such statistical information as is provided, not only in Mr. Coxon's second report (Exhibit 22) but in an article written by Mr. Coxon titled "Safety in the dive tourism industry of Australia" (Exhibit 21).

Exhibit 22 reveals the following:-

1. That there have been 35 recreational snorkelling and 23 recreational diving deaths in Queensland between 1998 and September 2005.

2. Mr. Coxon's analysis of these deaths has revealed the following risk and control factors:
- medical fitness, particularly cardiac fitness
- an increased risk for older persons
- the importance of appropriate levels of supervision, including accounting systems
- competence levels of participants relative to the activity being undertaken and environmental conditions
- provision of appropriate information, with due regard to the comprehension of the participants
- provision of appropriate rescue, first aid and evacuation facilities
- specialised risks associated with technical and breath hold diving.

3. Three (3) times as many men have died as women.

4. Persons over 61 years were the most common age category for diving and snorkelling deaths.

5. Most deaths occurred in North Queensland.

6. In relation to resort dives, there were 3 deaths. Two (2) incidents record cardiac causes of death (mean age of 45 years). Two occurred when the diver was separated from the instructor. One of those deaths was caused by cerebral arterial gas embolism and drowning following a panicked ascent and the other death is that of Mr. Creegan.

7. There were also 2 entry level certificate diver deaths, one being a cardiac cause of death within hours of a medical and the other involved separation from the instructor leading to an uncontrolled ascent and cerebral arterial gas embolism.

8. There were 16 deaths recorded for certificated divers, five (5) from cardiac events involving a mean age of 53.6 years. In fact, cardiac factors are the most common cause of death in certificated divers with the highest mean age.

11. Cerebral arterial gas embolism is the next most common cause of death, associated with a panicked or out of air ascent without adequate exhalation.

Dr. Fred Bove MD PhD in his article "Diving Medicine" (Exhibit 14) confirms "that the most likely reason for a diver over the age of 40 to die suddenly while diving is a heart attack with an accompanying fatal heart rhythm."

Defibrillators

The evidence of all of the medical witnesses and Mr. Coxon was that a defibrillator is the most effective tool in cardiac type situations and that, subject to any time delays; it is the most useful tool.

Unfortunately, the MVSupercat did not have a defibrillator on board in November 2003 and there is currently no requirement that dive companies undertaking introductory/resort dives carry such equipment.

There is sufficient evidence, however, that these machines are compact, lightweight (therefore portable), the training required for their use is minimal and the cost more than justifiable given their effectiveness.

Medical Issues

Other medical issues relevant to the circumstances of diving deaths incidents include those of medical fitness to dive, the usefulness of pre-dive medical assessments, the sufficiency of the current medical declaration form and the identification of at-risk divers.

Mr. Coxon states that in Queensland medical fitness to dive is the most crucial health and safety issue.

Medical Declaration Form

This form, according to the evidence, has already been the subject of consultation within the dive industry. There is no dispute that the medical declaration form completed by Mr. Creegan (Exhibit 1, Appendix 5) complied with the relevant Regulation 86C of Workplace Health and Safety Regulations 1997. Mr. Creegan's particular health issue, however, was unable to be identified as a result of the declaration as it would appear to have been unknown to him. This would not be an uncommon occurrence.

The Royal College of Pathologists of Australasia has, however, identified that such natural disease is one of a number of potential underlying causes of drownings which account for between 50-86% of diving fatalities. (Exhibit 12).

None of Drs.Butler, Jagusch or Meehan considered, however, that a full pre-dive medical is necessary for resort diving. Dr. Butler's opinion was that in the case of someone like Mr. Creegan, who had few or no symptoms from his condition; was close to normal body weight; was normal to examination and claimed to have reasonable exercise tolerance, they would probably have been declared by a pre-dive medical as fit to dive.

Dr. Meehan's evidence was that you would only carry out an ECG if there was a reason, on medical examination, to perform one. Dr. Jagusch's view was that requiring a resting ECG would not have assisted in his view as they are generally unreliable in detecting asymptomatic coronary artery disease. Therefore, mandating a medical may not have changed the outcome for Mr. Creegan.

The medical witnesses are in agreement, however, that there should be a comprehensive questionnaire and some sort of health assessment. Dr. Butler was concerned that the medical declaration form does not include any question relating to the occurrence of chest pain. A history of chest pain, according to Dr. Butler, especially associated with exercise, would be sufficient to disqualify that person from diving with out significant further investigation and an amendment to the medical declaration form would assist in identifying these high-risk divers.

Dr. Meehan agrees, stating also that the medical declaration form does not adequately address risk factors for cardiovascular disease given the number of deaths which have occurred while people have been participating in diving or snorkelling activities as attributed to cardiac cause. Her view was that the questionnaire should therefore be improved so that those at risk of cardiovascular incident are identified and some risk management measures implemented. In her evidence, Dr. Meehan referred to the Standards Australia document AS4005.1 2000 Appendix A (Document 3 as attached to Dr. Meehan's statement- Exhibit 28) which states that "any disorder which causes an increased risk of sudden death, impaired consciousness , impaired judgement, risk of disorientation, impaired mobility, risk of barotrauma or risk of decompression sickness may render a person unfit for SCUBA diving…Divers are exposed to pressures and related physiological changes which do not apply to persons involved in other activities. Ambient pressure at 10m depth in seawater is double that at the surface and pressure changes capable of causing tissue tearing in unvented lung regions can occur upon ascent from as little as 1m depth".

Mr. Coxon considers the medical declaration form to be a "soft/low-level control measure, merely "a crude screening tool to be quickly applied by people with a limited amount of knowledge" and that for that reason, divers should be given an honest appraisal and information about the risks that cannot be controlled, one of which is the issue of medical fitness.

In addition to medical causes of death, other potential and contributing underlying causes of diving deaths, relevant also to Mr. Creegan's circumstances, include inability to swim, fatigue, panic-inadequate training and trauma.

There is ample evidence that diving is a stressful activity. Sergeant Dodds, in her second report (Exhibit 2, page 7) refers to the increased ambient pressure, raised partial pressure of oxygen, increased resistance to movement, added weight and drag of diving equipment, cold stress and a higher breathing resistance - "Respiratory efficiency is impaired due to the scuba equipment, and this can give a sense of dyspnea at higher work loads which may induce panic, a potentially lethal state of mind while diving" (Scuba Diving – Physiology and Common Medical Conditions; Karen Carmichael).

The Industry Code of Practice applicable as at November 2003, Paragraph 2.4 specifically pinpoints Panic as a contributor to diving deaths. "As panic develops, anxiety increases and a diver reduces his or his capacity to think rationally and may focus on only one act or goal while forgetting about other important requirements. …Factors which can play a role in the development of panic include: equipment problems…environmental hazards…fatigue, medical or physical unfitness, …inexperience,…disorientation, inadequate instruction and training of divers." It is made plain that "Effective explanation and training in relation to all relevant aspects of diving can help minimise the likelihood of panic."

Interestingly, and for reasons which were not the subject of evidence in the inquest, the current Industry Code of Practice (Exhibit 11) is silent on the issue of Panic as a contributing factor to diving deaths.

Mr. Coxon's experience is that stress, anxiety and panic will all override advice, particularly in people with limited knowledge and experience and that they are at a higher degree of risk across a range of diving hazards, many of which pose an extreme risk.

All of the addition issues referred to above highlight the importance of pre-dive briefings, identification of at-risk divers and in-water supervision of all divers.

Paragraph 1.3.3B of the Industry Code of Practice as at November 2003 (Exhibit 1, Appendix 5) required that "each person doing resort diving be supervised in the water by a dive instructor, ….. A dive instructor must not supervise more than 4 resort divers at a time." It further states that "In relation to the ratios of diving workers to resort divers, the regulation gives the maximum number of resort divers who can be supervised by a dive instructor…In some instances, the number of resort divers being supervised may need to be lowered. For instance, if a risk assessment shows that the

abilities, fitness and confidence levels of divers, and the environmental conditions at the dive site put the health and safety of workers or resort divers at an unacceptable level of risk, then the ratios should be reviewed".

Dr. Butler opined that, because the activity of being an instructor on resort/introductory dives requires separate skills on the part of the dive instructor to those ordinarily required, and because the profile of a the resort diver differs significantly from the novice diver seeking an entry-level dive certificate (the latter group having undergone a formal dive medical and significantly more prior instruction to achieve a higher level of knowledge and skill), that consideration should be given to reducing this ratio (to, for example 1:2) unless the dive instructor has absolute confidence in the ability of the divers being supervised.

He expressed this view despite the level of supervision required by the Industry Code of Practice in relation to the level of in-water supervision, contained in 1.3.3B of the Code as at November 2003(Exhibit 1, Appendix 5) –"When divers are being supervised by a dive instructor only, then the divers should:

(a) swim closely on each side of the instructor, OR
(b) swim closely abreast with the instructor close in front of the students, facing them and swimming backwards….While in the water, the diver instructor…should always be positioned so they can make immediate physical contact with, and render assistance to, any resort diver. No course should be conducted with 1 instructor only, which allows the students to swim in single file behind or in front of the instructor. Indian file swimming with only 1 instructor at the beginning or end of the students has been the cause of divers being lost."

I have already referred to the evidence of the three other divers in the group with Mr. Creegan on his second dive in relation to the issue of the distances between each of them and the instructor Mr. Johnson.

I note the evidence of Janet Murray that her understanding of close supervision in-water was that the instructor should be able to get to the diver within two fin kicks. Whilst she then stated that "if you can reach out and grab their inflator or their arm, you have to be that close"; in response to questions about positioning of divers eg in Indian file, she simply stated that you had to be able to SEE your divers the whole time.

Perhaps this view of the Code of Practice is reflective of the fact that, upon her employment with Down Under Dive, she says she was given a copy of the Code of Practice and the Standard Operating Procedure Manual and after a four day probationary period, she was employed. As at November 2003, Mr. David Johnston was still in his probationary period with Down Under Dive. Mr. Iovanella's evidence was that, as at November 2003, once a person was employed as a diving instructor, having met all of the necessary criteria, they were not further examined by Down Under Dive.

These comments reflect clearly the importance of instructor competency and training, ongoing auditing of such competency and training**,** the availability of programs to do

so and clear indications from regulating authorities as to their expectations in relation to competencies, supervision and training.

It is clear, however, from Mr. Coxon's report (Exhibit 22-pages 11 to 17) that prior to Mr. Creegan's death, there had been;-

(a) a Diving Industry Task Force and Report (following the disappearance of two(2) divers off Port Douglas in 1998); recommendations by the Task Force in their final report in relation to dive supervision, resort divers, and changes to Codes of Practice among other recommendations affecting the dive industry;
(b) amendments to the Workplace Health and Safety Regulations 1997, covering issues of medical fitness, medical conditions of resort divers, supervision of resort divers, lookouts and rescuers and advice about medical conditions;
(c) the development of the Compressed air Recreational Diving and Recreational Snorkelling Industry Code of Practice 2000, to give practical advice about ways to manage exposure to risk identified as typical when conducting recreational diving and recreational snorkelling, including issues of medical fitness to dive, supervision of divers on open water, appropriate skills and knowledge of workers and divers, ascent diving and first aid and oxygen,
(d) the development of the Recreational Technical Diving Industry Code of Practice in September 2001
(e) 38 Workplace Recreational Diving Audits in the Northern Area in 2000
(f) a State-wide audit program of 59 workplaces in 2001-2002, the final report of which note that issues of concern included dive safety logs, emergency plans including rescue, provision of oxygen equipment and failure to have appropriate equipped and competent lookouts.
(g) Information and product development
(h) Workplace Health and Safety Queensland Safety links

Despite these developments, diving deaths continued to occur. (Exhibit 22-Attachment 1).

After Mr. Creegan's death, there were further developments in the dive industry, including

(i) Amendment to the Compressed Air Recreational Diving and Recreational Snorkelling Industry Code of Practice 2000 to provide specific advice to older snorkellers of the risks and recommended controls
(j) Replacement of (e) above with the Compressed Air Recreational Diving and Recreational Snorkelling Code of Practice 2005 to include sample questions to assess the current medical fitness of certificated divers and techniques to avoid separation of resort divers from instructors,
(k) A North Queensland Recreational Diving and Snorkelling Assessment program
(l) A Recreational Diving Resource Kit

Despite these developments, diving deaths continued to occur. (Exhibit 22-Attachment 1).

After Mr. Creegan's death, Down Under Dive also instituted changes to its dive program and training of instructors, including ;

(a) Changes to the introductory briefing sheet used by instructors to brief resort divers (Exhibit 40)
(b) The holding of instructor meetings (Exhibit 41)
(c) The distribution of a Risk Assessment notice (Exhibit 42)
(d) The holding of compulsory Risk Management Seminars for all master, dive instructors and dive masters
(e) The employment of specifically trained persons to conduct training sessions (Exhibit 44)
(f) Closer involvement in the day-to-day operations by directors

Whilst Sgt. Dodds, in her evidence was not able to identify any deficiencies in PADI or SSI training manuals tendered to the court, the particular circumstances surrounding Mr. Creegan's death are an indication of controlled and uncontrolled dangers associated with diving.

Whilst Mr. McKenzie's evidence was that the fatality rate for resort diving was 1: 1 million dives, one death is one too many. In any event, Mr. Coxon's evidence was that Queensland was poorly served in relation to studies of diving (including resort diving) mortality and morbidity rates and opined "If you can't measure it-you can't manage it" (Exhibit 21, page 4). This is a reference to the inadequacy of studies which have been undertaken in relation to diving deaths in Queensland.

In the Australian context Dr. Douglas Walker has detailed approximately 400 diving deaths (including resort diving deaths) between 1972 and 2002, there being an increasing average number of diving deaths over that period. Mr. Coxon states "Although it is not clear if the Australian increase is due to increased participation or reporting there is only cold comfort to be drawn from an examination of these case studies, leading Edmonds and Walker to conclude "the real tragedy of this survey was that it shows that the lessons and teachings of yesterday are still not sufficiently appreciated to-day"(Edmonds.* Walker. 1989)."

One wonders of what relevance are the facts that tourism within the Great Barrier Reef catchment, where the majority of diving occurs in Queensland, is valued at $5.8 billion dollars and employs 63 000 people, including dive instructors who are often partially paid on a commission basis according to their promotion and consequential sale of diving products, including resort dives.

FORMAL FINDINGS

It is now incumbent upon me, pursuant to the provisions of the Coroners Act 1958 to deliver requisite findings in open court.

I make the following formal findings:-

1. The deceased was Thomas Creegan, a male aged 47 years who was born on the 28th December 1955.

2. Mr. Creegan formerly resided at 12 Briarside BlackHill, Consett, County Durham, United Kingdom.

3. Mr. Creegan died at Norman Reef, Great Barrier Reef, North Queensland, Australia on Sunday 30th November 2003 at 14.33 hours.

4. At the time of his death, Mr. Creegan was holidaying in Australia and was undertaking the second of two introductory resort dives with three other introductory divers, He had never dived before. Mr. Creegan became separated from the other divers, all of whom were free swimming behind the instructor.

5. Mr. Creegan ascended unsupervised to the surface from a depth of 5 minutes after a period of 4 minutes, and after calling out for help, became unconscious.

6. The medical cause of his death was Myocardial Ischaemia as a result of undiagnosed coronary artery disease, although the possibility of CAGE (cerebral arterial gas embolism) as the precipitating event cannot be excluded.

7. No person will be committed for trial.

RIDERS OR RECOMMENDATIONS

Pursuant to s.43 of the Act, the following recommendations are made by way of rider to the formal findings:

1. (a) That persons undertaking recreational diving or snorkelling (to include employers, self-employed persons, employer organisations and recreational dive training agencies) shall ensure an automatic electronic defibrillator (AED) is immediately available at each dive and snorkelling site.

   (b) That a non-conducting mat is provided to allow the safe use of the AED.
   © That adequate numbers of workers who are immediately available at the site maintain current training in the use of the AED.
   (d) That the AED is checked daily to ensure it's proper functions and charge level .

2. That the Queensland recreational diving and snorkelling industry (to include employers, self-employed persons, employer organisations and recreational dive training agencies) consult and review the adequacy of training programs for its members, to address specific training needs for:

(a) dive instructors undertaking resort dives, to include but not be limited to;
   (i) Medical screening techniques
   (ii) Recognition and evaluation of diver anxiety levels
   (iii) Recognition and communication to divers, of factors which can create panic in a diver

(iv) Standardisation of the briefing, including the use of the equivalent of the PADI flip-chart
(v) Provision of a briefing before every dive
(vi) Delivering advice which includes advice as to the residual risks of the activity, particularly cardiac risk factors; advice regarding emergency procedures and skills required to maintain buoyancy on the surface
(vii) In-water supervision techniques
(viii) Identification of the specific coronary risk factors for both male and female recreational divers and snorkellers

(b) Rescue and resuscitation of divers and snorkellers (all relevant workers including lookouts, dive instructors, dive supervisors, rescuers), to include but not be limited to;

(i) Ensuring rescue techniques, rescue vehicles, suitably trained and qualified personnel and equipment are available and prepared in such a way that persons requiring assistance have this assistance provided in a timely manner
(ii) That resuscitation techniques, including airway management, EAR, CPR, oxygen resuscitation and use of AEDs are employed with the minimum of delays

3. That the consultation and review of the training programs referred to in Recommendation 2 above ensure;

(i) Adequate training materials (eg; documents, illustrations, videos) to allow their ready delivery by persons conducting the undertaking
(ii) An assessment program, including practical in-water assessments in the range of reasonable operating conditions, such program to be successfully undertaken before unsupervised work commences
(iii) Records to be kept as demonstrating assessment of the issues and successful completion of the assessment
(iv) A supervision program, comprising a skills checklist, a suggested frequency of recurrence of the program, specific action to be taken to address any deficiencies noted and records kept to demonstrate assessment of the issues and any actions taken
(v) A re-assessment program, mirroring the initial assessment, with a suggested frequency of recurrence off the program, action taken to address any deficiencies noted, record to be kept to demonstrate issues assessed and any action taken.

4. That in consulting, reviewing and further developing the programs outlined in Recommendations 2 and 3 above, that due regard be had to the relevant provisions of the Compressed air Recreational Diving and Recreational Snorkelling Industry Code of Practice and the Risk Management Advisory Standard –Supplement 1- Training.

5. That the Queensland recreational diving and snorkelling industry (to include employers, self-employed persons, employer organisations and recreational

dive training agencies) sponsor adequate research into the following matters to provide a sound basis for the consultation, review and possible further development of additional risk management strategies;

(a) Diver and Snorkeller mortality and morbidity
(b) Diver and snorkeller participation rates
(c) Diver and snorkeller demographics

6. That the Office of the State Coroner provide assistance to such projects by ensuring appropriate access to records of all diving and snorkelling matters reported to the Coroner.

In conclusion, I again express my sympathy and offer my condolences and those of the court to Mr. Creegan's family and friends.

The inquest is now closed.