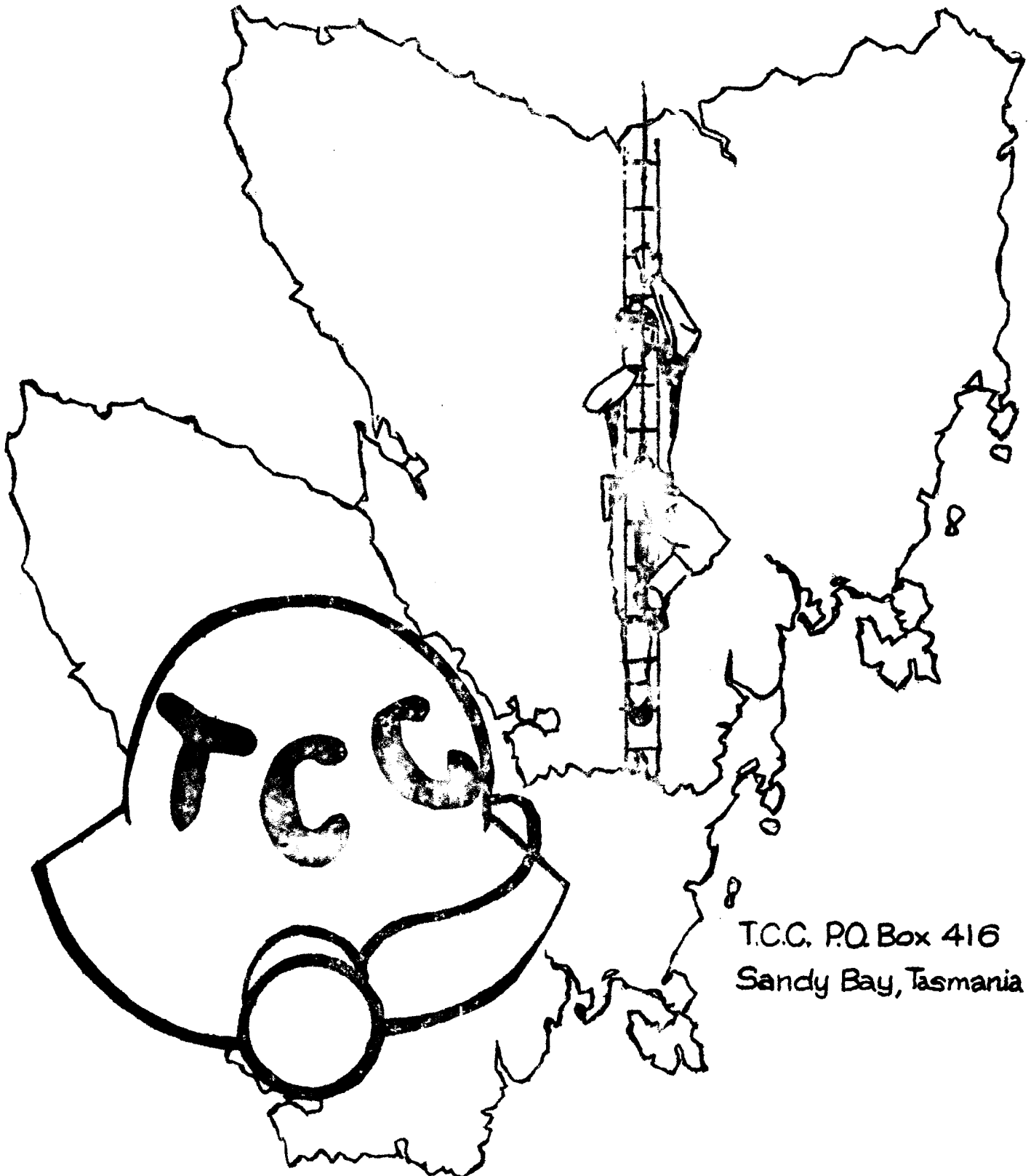


SPELEO SPIEL

Newsletter of the Tasmanian Caverneering Club

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Newsletter of the Tasmanian Caving Club
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FORWARD PROGRAMME

- July 15 & 16 - WEEKEND: Mole Creek Area. Exploratory trip.
- July 19 - WEDNESDAY: 8 p.m. Committee Meeting,
Wheatsheaf Hotel, meeting room, 314
Macquarie Street, Hobart.
- July 22 & 23 - WEEKEND: Mole Creek Area. Contact Bruce
McIntosh for further details.
Phone: 34 3166 (B) or 28 1282 (H) (If not
there, leave message)
- August 5 - SATURDAY: HMC trip. Wolf Hole. Contact
Bruce McIntosh for further details.
Phone: as above
- December 2 & 3 - WEEKEND: Kubla Khan. Photographic trip.
Expected in excess of 16hrs. Ladder &
abseil experience essential. Limited to
6 per party leader. Contact Bill Tomalin
for further details. Phone: 30 3752(B)

EDITORIAL

Caving seems to have come to a standstill. This is probably
due to the cold weather and snowed up roads.

If Liaison between all caving clubs in the state is improving
and we hope this will continue with combined trips. As SCS
and Northern Cavers would like to know of any future trips,
let's be of assistance. Happy caving!

NOTE FOR SPIEL

At the end of last month, Peter and Yvonne Shaw left Hobart
for an estimated fifteen months working holiday in Europe.
They intend to tour around in a camper van for a while,
working as and when necessary, participating in orienteering
competitions ("A sport for LIFE!") and generally having a
good time.

NOTE FOR SPIEL cont.

Some of our older members (same to you!) will remember Peter who, together with Phil Robinson, was the main force behind exploration of the Junee area in the early 70's. This included such infamous places as Khazad-dum, Cauldron Pot, Niagara Pot and all the other Sunday afternoon picnic areas in that region of the world.

Aside from being rather envious, I am sure all members of TCC will join with me in wishing them well for their trip.

Stuart Nicholas

THE STRESS OF FALLING (or) SOME APPLIED ALGEBRA!

The following discussion is aimed at providing some information concerning the forces experienced by carabiners and similar hardware when subject to sudden loads e.g. a falling climber. Elastic materials are assumed throughout (most metals are elastic under moderate loads).

If a member is subject to a sudden load, as opposed to a gradual load, it will tend to exhibit damped oscillations about the equilibrium position. This position corresponds to the average strain which is equal to the static strain caused by the same load applied gradually. The minimum instantaneous strain is zero, so therefore, the maximum instantaneous strain must be twice the average strain.

The maximum instantaneous stress is that occurring in the member at the maximum instantaneous strain and hence is twice the static stress set up by the gradual application of the same load.

In the case of a falling load, the work done on the member includes the kinetic energy of the load at the moment of impact. As a result, the maximum instantaneous stress may be several times the value of the equivalent static stress.

Given a mass "m", falling through a height "h", onto the lower end of a member of length "L", the maximum extension of the member is ΔL (Δ means a small change).

Let P = the static force which, when gradually applied, will cause the same extension ΔL .

Then the maximum instantaneous strain energy in the member is:

$$U_{\max} = \frac{1}{2}P\Delta L = \frac{P^2L}{2AE}$$

Neglecting the losses on impact, the total work done by the falling body is:

$$U = mg(h + \Delta L) = mg(h + \frac{PL}{AE})$$

Since the work done by the load = the strain energy stored

$$\frac{P^2 L}{2AE} = mgh + \frac{mgPL}{AE}$$

i.e. $P^2 - 2mgP - \frac{2mghAE}{L} = 0$

This quadratic equation may be solved, the positive root giving an expression for P.

∴ $P = mg + \sqrt{(mg)^2 + \frac{2mghAE}{L}}$

i.e. $P = mg(1 + \sqrt{1 + \frac{2hAE}{mgL}})$

What all this means may be a little unclear at first. However, basically it works out that a small load falling onto a member in such a way as to stress it in tension will cause a large stress in the member, far out of proportion to its static mass. Or, to put it the other way round, to stress the member to the same level by means of a static load requires a considerably greater load than that required to provide the stress by falling.

Putting a few figures into the hieroglyphics, reveals some rather startling facts.

A mass of 120kg falls 50mm onto a collar at the lower end of a vertical steel bar of given dimensions. The equivalent static load to stress the bar to the same extent is 6,600kg! Think about it.

Stuart Nicholas

REPORT ON CAVE RESCUE EXERCISE "OPERATION WOMGUANO" 27.5.78

The success of this exercise was due mainly I feel, to the quality of the planning. The aim was simple and relevant, being to give the various personnel involved, experience in moving casualties underground. The experience gained in other areas, i.e. control, leadership, was naturally a benefit.

As the session was an exercise, large numbers of people were given work in the cave, as distinct from the real situation, where smaller teams would be deployed. An attempt was made at the Base H.Q. to keep track of all personnel underground. The system used, was reasonably simple and, although not 100% effective during this exercise, I feel that with practice full effectiveness could be achieved.

This is an area in control which could be exercised in more comfortable surroundings. During the exercise, control was exchanged on various occasions relatively smoothly. The teams underground were also relieved by "fresh" parties, with apparently little bother. I feel that the latter was due mainly to the competency of the leaders. (Frank Brown)

REPORT ON CAVE RESCUE "OPERATION WOMGUANO" cont.

The request for Ambulance Board personnel was made by Mr Bill Nicholson of the Tasmanian Caverneering Club, following useful participation on previous exercises by staff members.

The aims of the exercise were as follows:-

- 1) To develop and test an efficient search procedure.
- 2) To develop and test more efficient evacuation techniques.
- 3) To give ambulance officers familiarisation of the cave environment.
- 4) Enable ambulance officers to have practical experience in medical treatment in the hostile environment of a cave with a long duration potential.
- 5) To enable Police and Cave Rescue personnel to evaluate the potential of individual ambulance officers for future involvement in actual rescues.

To achieve these aims, the following format of exercise was adopted.

The cave, known as "Beginner's Luck", was used because of its varying aspects requiring different techniques, enabling several parties to work independently. The cave basically consists of four hundred feet of confined horizontal passageways with one vertical shaft of ten metres.

Two weighted dummies were placed in the cave one week earlier, both in a chasm approximately 15 - 18" wide by twelve feet deep. One was to be evacuated by a very confined crawlway over one hundred feet long and the second via the vertical shaft. The first "patient" took over three hours to "treat" and move the hundred or so feet to the surface, the second "patient" requiring much less time (about one hour).

To give realism to the exercise and give the ambulance officers participating an idea of the difficulties likely to be encountered, simulated injuries were decided upon.

- 1) The search procedure in itself was for the benefit of Police and Cave Rescue personnel, however, by ambulance officers participating, they were able to get a better concept of the difficulties of a potential rescue.
- 2) Evacuation techniques were found to depend substantially on the medical condition and therefore each ambulance officer involved was able to contribute expertise in evacuation techniques.
- 3) The environment of a cave must be considered "hostile" because of the dark, a constant temperature of between 10 - 12°C, a humidity of 98%, usually a large amount of water flowing, and quite often very confined conditions, (e.g. crawlways less than 12" high up to 10 - 20 metres long).

REPORT ON CAVE RESCUE "OPERATION WOMGUANO" cont.

- 4) As brought out at a subsequent debrief, the medical problems of a cave rescue are quite extraordinary. In addition to the environment problems as mentioned, the duration of a rescue could, in Tasmania, be up to 40 - 50 hours and because of the confined conditions, only very basic equipment could be used.
- 5) Because of psychological and endurance problems encountered, the police, who are in charge of such an operation, will not even consider using personnell whose capabilities are an unknown quantity.

At the end of the exercise, Sgt. G. Galloway conducted a debrief, the following points being discussed and decisions made. I will only relate those pertaining to ambulance officer involvement.

Firstly, it was unquestionably agreed by all present that an ambulance officer of the standard of those present, who had sufficient underground experience, would be of far more value than a doctor or nurse, whose capabilities were unknown to the rescuers and themselves.

The need for specialised medical equipment was also mentioned, with special emphasis on equipment for the treatment of hypothermia, pain relief and fracture immobilisation.

As a follow up to this, I have made enquiries with Protector Safety Products as to the feasibility of using the Komesaroff Oxy Resuscitator closed circuit system as a means of giving internal warmth. (C. A. Ransley)

Attendance from the four organisations concerned, the Police S & R Squad, A.B.S.T., S.C.S. & T.C.C. was impressive and I would like any member who attended, who has any comments or ideas on equipment modification to please pass them onto me so that I can put together a more detailed report.

A few comments I would like to make through my own observation are these: The danger of falling rocks, of which there were many from the top of ladder pitch JF79 can be greatly minimised by covering the loose areas with a canvac tarp and a drag mat to ease the stretcher over lip; Ropes need to be coded and also the drag mats and Paraguard G.Q. stretcher needs further modifications for cave rescue work.

Did you know that both dummies snuffed it in the initial handling stages through carelessness?

T.C.C. members who participated were: Bill Nicholson, Frank Brown, Steve Smillie, Dave Barry, Jon Walton, Ian Gothard, Paul Ruzicka, Mark Forward, Strato Anagnostis, Peter Watts, Max Jeffries, Steve Annan, Julie Marsh, Lindy Dew & Anita Truchanus. Also 10 personnel from the Police S & R Squad, 7 A.B.S.T. men, 6 S.C.S. members and one C.C.T. representative. A total of 39 persons. Many thanks to all concerned.

Bill Nicholson, Search & Rescue Officer.