

## EVALUATION OF CAVES AND KARST

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### Abstract

*The development of the Australian National Estate legislation is outlined. The dependence of this legislation upon a concept of "place" rather than upon an ecosystem approach is criticised. Practical issues to be considered in making recommendations for registration of caves or other karst features as part of the National Estate are then outlined. These include:*

*significance vis-as-vis representation*

*the problems in assessment of significance,  
particularly in respect to essentially subjective  
aspects*

*the benefits and potential dis-benefits of  
registration*

*the definition and delimitation of a place  
for purposes of registration;*

### Introduction

In 1973, the Australian Government appointed a Committee of Inquiry to examine and report upon the "National Estate" and the ways in which its preservation might be fostered. The Committee presented its report in 1974<sup>1</sup> and by the date of its tabling in Parliament, an Interim Committee had already been established to continue the work of the Inquiry and to lay the foundation for further action<sup>2</sup>.

In 1975, legislation establishing a permanent Australian Heritage Commission and empowering this Commission to act upon matters relative to the National Estate was passed<sup>3</sup>. This act is now being amended<sup>4</sup>, and the Commission was appointed in 1976, holding its first meeting on 26th July, 1976.<sup>5</sup>

The concept of a register of the National Estate has become increasingly significant during this process. The original Report, in listing recommended functions of a National Estate Commission, included:

*"To organize and commission any studies, research work and investigations it considers necessary . . . . . To prepare formal registers of National Estate property based on these studies."*<sup>6</sup>

The report of the Interim Committee suggested a considerable simplification and their total list of functions reads:

- "\* to advise the Ministers on all matters related to the National Estate*
- \* to prepare and maintain national registers of the National Estate*
- \* to arrange for or commission such research as the Commission thinks necessary for the identification, classification, protection, enhancement, preservation, or management of the National Estate."*<sup>7</sup>

You will note that the register now appears above the research clause.

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The 1975 act spelt out the functions of the Commission in seven sub-sections, of which one dealt with registration.<sup>8</sup> These functions are now being amended only by deleting the Commission's functions in relation to recommendations upon expenditure or grants by the Australian Government.<sup>9</sup> However, a recent statement by the Chairman says:

*"The Commission has two general roles. The first is to provide general policy advice on all issues affecting the National Estate – research, professional training, information and publicity, environmental education, and so forth. The second is to establish a Register of the National Estate. The National Estate, for those to whom the term is new or unclear, includes all sites of significance to Australia, whether prehistoric, historic or natural, related to Aboriginal or white culture or to cultural history or natural history".<sup>10</sup>*

He then continues to point out the urgency and importance of the register, and it is now clearly seen as the Commission's primary task, at least for the time being.

One might interpret all of this process as a gradual castration of the visionary principles expressed in the first report, or alternatively, as a matter of woolly idealism being replaced by sound administrative common sense. I am not arguing for either viewpoint, but merely making the point that the register has now become a central element in the Australian Government's program for the National Estate, and that the first report, probably the best-known of the documents to which I have referred, does not reflect the present situation.

At the commencement of 1976, the Australian Speleological Federation received a grant (paid via the Australian Conservation Foundation) from the Interim Committee on the National Estate to carry out a study of the criteria and principles to use in deciding which caves and other karst features should be placed upon the register of the National Estate.

The Federation's approach to this study has been described in its newsletter<sup>11</sup>, and has been pursued largely by mail at this stage in order to try and involve members throughout Australia. Questionnaires have been circulated, completed and returned. Discussion papers, of various degrees of intelligibility, have been circulated, discussed and comments returned to the study committee. All this process will continue into 1977, and will be fully reported upon at the conclusion of the study.

This paper has been prepared to outline a number of issues arising from the study, and hopefully to generate further discussion and feedback.

## The Concept of Place

A perusal of the various official documents dealing with the National Estate makes it clear that one basic assumption underlying virtually all thinking is that the National Estate consists of a series of discrete "places". Admittedly, the legislation defines a "place" as "a site, area, or region....", but other than in some sections of the first report (particularly 'the captions to plates') there is little evidence of understanding natural ecosystems and their complex inter-relationships.

Of course, this is no new problem. We are all familiar with legislation which prevents one from killing or capturing an individual native animal yet remains utterly silent about wholesale destruction of the environment which is vital to the survival of that same animal species. Regrettably, we now have, in the National Estate legislation, laws which can recognise the significance of a cave, but which could all too easily ignore the dependence of that cave upon a large watershed area and the stability of water table levels.

Perhaps it is too difficult to write legislation so that it does effectively come to grips with ecosystem concepts – or perhaps our legislators could not or did not wish to face the implications of an ecosystem approach.

Whatever the cause of the situation, it seems to me that the position of bodies such as the Federation is clear. We do have to understand the implications of an ecosystem approach, and we do have to frame our own recommendations in the light of that approach.

The practicality of doing this is another question. For instance, it is clear to any who have seen Easter Cave, Western Australia, that the integrity of that uniquely beautiful and fragile cave is very much dependent upon the stability of local groundwater levels and the chemical composition of that groundwater. However, none of us could confidently predict the long-term impact (or lack of it) of any activities on the ground surface within the surrounding country – we just do not know enough – yet it is quite possible forestry activities many miles away might ultimately lead to destruction of that cave.

Nevada's Devil's Hole is only one of the many examples of caves which have been disastrously

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affected by other activities at a considerable distance, even though Devil's Hole itself is a National Monument and hence a protected "place".<sup>1 2</sup> It should serve as a warning to us.

Before proceeding to further discuss the issue of how we might best define and delimit a "place" for purposes of our own recommendations, there are some other matters which also bear upon this problem.

### Outstanding or Representative?

The approach to defining the National Estate seems to assume that it should consist of particularly "significant" places. Thus, the legislation states:

*"For purposes of this Act, the national estate consists of those places, being components of the natural environment of Australia or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community".<sup>1 3</sup>*

However, the first report certainly implied that some attention should be given to recognising the range of environmental features which exist and the need to ensure preservation of a sample of all elements.<sup>1 4</sup> Current practice in land conservation planning virtually throughout the world certainly emphasises the need to ensure preservation of representative sample of all land systems, and not just those which happen to seem "significant" at some particular point in time. Although analysis of questionnaires returned by our own members is not complete, a preliminary count indicates that Australian speleologists have a strong preference for the representative approach.

This starts a whole new game. So far, our study has concentrated upon the notion of "significance" and we have made a great deal of progress in this direction. However, if we are to consider representation instead of or in addition to, significance, then we need a taxonomy (systematic classification) of caves and karst features, establishing the various classes, genera and species of caves from which a sample might be drawn.

Grimes<sup>1 5</sup> has suggested on taxonomy, which I take the liberty of reproducing here. (Fig. 1).

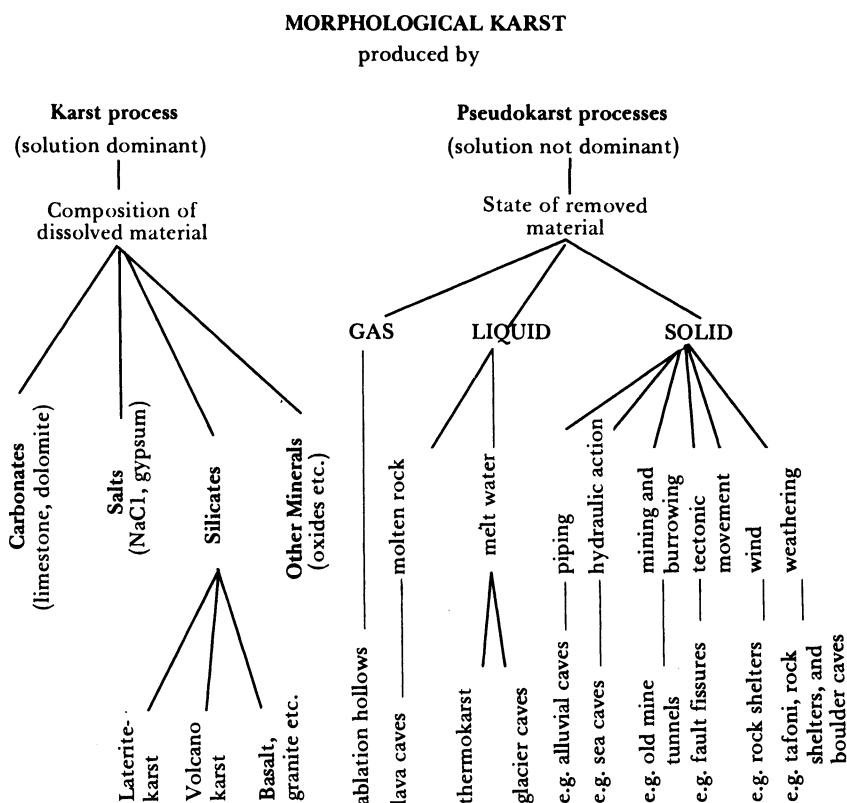


Fig. 1. : Classification of Karst and Pseudokarst (after Grimes 1975).

Now this immediately raises some very interesting questions for us. Let me list two of them:—

1. Obviously the class named 'carbonates' within the phylum 'Karst' includes most of Australia's recorded and described caves. How can this be divided into useful sub-classifications?
2. The taxa of piping caves is one of several which raises some extremely interesting problems. We have an immense number of such caves in Australian Laterites, but very few have been described.<sup>1 5</sup> At present, such caves are not generally seen as "significant", but if the National Estate is to be representative, then they certainly have a place on the register; the remarkable paucity of data on such caves in other countries suggests that we may well have a responsibility on world scale! Similarly, what about the remarkable tafoni of some caves in the Hawkesbury Sandstone of New South Wales? So, you see the importance of this new game — it draws our attention to previously neglected fields of spelcological study, and hence poses a considerable information problem to us.

It is perhaps also important to raise the historical context of "significance". Places which were once seen as "significant" enough to be enshrined in state reserves may now be seen as of little or no importance. For instance, Dickson's Caves, Buchan, Victoria, are the subject of a reservation, yet on any comparative scale would today rate very low vis-a-vis almost any other caves in the region. Perhaps some of the caves which we now perceive as most significant will similarly fade into obscurity in the eyes of a future generation, or others which we now see as unimportant (even Dickson's Caves) will assume a new significance in future.

To follow the above example, perhaps our laterite caves will one day be accorded a major significance. A little closer to our present perception, I believe it can be argued that the lava caves of Western Victoria and the Einasleigh region of Queensland are greatly under-valued by virtually all Australian spelcologists.

This leads me to the position that the representation framework is perhaps more valid than the significance framework. In practice we may end up trying to combine both considerations, but this is obviously a question of real substance.

A further issue is that any one cave may not only be significant for a number of reasons, but it may also be representative on a number of dimensions. Leaving aside the spectacular examples such as Exit Cave, Tasmania, let me just example Cloggs Cave, East Buchan, Victoria. This insignificant little hole of some thirty metres length is an interesting example of a cave contained within an anticlinal fold; it has proved an extremely valuable archeological and palaeontological site; <sup>1 7</sup> it was (but regrettably is no longer) a maternity site for the relatively rare (in Victoria) bat *Myotis australis*<sup>1 8</sup> and houses an interesting population of living invertebrates.<sup>1 9</sup>

Cases like this are probably relatively easy to place within a significance framework, although there are some practical questions about the relative weighting assigned to particular aspects. However, the determination of its place within a representation framework does pose some nice problems in sampling design!

## Assessment of Significance

Reference has already been made to the progress of the Federation's study on assessment of significance. However, one immense gap can be identified in our work to date, namely, ways in which we might quantify such subjective characteristics as beauty.

It is relatively easy to establish some kind of framework within which to assess the significance of, for instance, the occurrence of rare animal species or rare minerals within a cave, and to give that framework a reasonable appearance of objectivity. Certainly, this apparent objectivity may well be nothing more than a high level of agreement amongst recognised "experts" within a discipline, and according to the criteria of that discipline. Inevitably, these criteria are to some extent arbitrary, but they are generally accepted.

When we come to beauty, or the subjective experience of a good "sporting" cave, then we find it very difficult to specify criteria, and even difficult to conceptualize a framework within which beauty and excitement can be assessed. These are highly personalized judgements, and subject to immense variation.

Obviously, one approach would be to take an opinion poll and abide by the majority view. Regrettably, all this means is that some of the most visited and best-known caves will rank most highly, while little-known caves will be neglected.

There also seems to be an odd anomaly here, in that the concept of beauty generally evokes a response in terms of the quality (and sometimes the quantity) of cave decorations. Basic form seems to be overlooked, and such features as the geometric perfection of the arch in Anticline Cave, Murr-

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indal, Victoria; the white walls and clear lake of Weebubbie Cave, Nullarbor Plain, the remarkable fretwork roof of Aiyennu Cave, Stockyard Gully, Western Australia; the majesty of the Gunbarrel, Wyanbene Cave, New South Wales; the massive rockfall at the entrance of Koonalda Cave, Nullarbor Plain; or the sculptured passageways of Mammoth Cave, Jenolan, New South Wales, rarely rate a mention.

Unfortunately, these subjective aspects are perhaps some of the most important ones. The very notion of some overall significance is in itself seeking a subjective judgement. Moreover, it is the beautiful and exciting places which will capture public imagination, and hence, support for the preservation of the national estate — a very important political reality.

### Implications of Registration

There are three relatively obvious and quite direct benefits of registration. The first is that any place which is registered is protected from thoughtless action by Federal government authorities or departments.

In the words of the Chairman:

*"Protection for a site on the Register (which applies equally to sites on the Interim List) is related to Federal actions and authorities only. All Ministers and heads of Federal departments or authorities must take no action which would damage that site unless there is no feasible or prudent alternative; if there is deemed to be no such alternative, they must only take such action as would minimise damage. They must not act at all without first informing the Commission. An action is defined to include the granting of moneys, the issuing of licences, and the taking of a decision".<sup>20</sup>*

Secondly, the registration of any place will confer an identification and recognition of its significance which surpasses any parochial considerations. Thirdly, it seems clear that future financial assistance in respect to the National Estate is likely to primarily flow in respect to those places which are registered. Registration therefore opens an avenue to potential financial resources to assist in conservation and management.

Obviously registration does not of itself confer any direct protection other than from Federal government action as outlined above. It does not necessarily mean protection from action by State governments, private land owners or lessees, such as mining companies.

However, the Federal government has expressed its hope that State governments will establish equivalent commissions with comparable functions at the State level. At least one State has announced its intention of doing so,<sup>21</sup> and consideration is being given to this matter in at least some other States.

Where such State bodies are established, it seems likely that they will accept registration on the National Register as a basis for their own program.

Finally, the very existence of registration may certainly act as some deterrent to private land owners and lessees who might otherwise destroy a site. Moreover, registration will provide valuable evidence to support conservation action in any area of conflict.

At the same time, there are doubtless some disbenefits of registration. The first of these is that the public attention attendant upon registration may well attract visitors in excess of the available management capacity. Fraser Island provides an interesting example of this situation. The publicity of recent years has greatly increased visitor traffic to the Island and the resultant environmental damage is considerable. It again highlights an inherent problem of the National Estate legislation in that registration is not integrated with provision for management.

Almost by converse, registration may well increase pressure upon un-registered sites. This may happen in either of two ways. Where registration results in more adequate and more tightly controlled management, visitor pressure may well be diverted to other sites in the same way as caver pressure in New South Wales has been diverted to Bungonia and Wee Jasper, much to the detriment of the latter site in particular. The other is that developmental interests such as mining companies might well be deterred from destroying one area and turn their attention to another.

The implication of this is obvious from our point of view. Every effort must be made to ensure registrations of all sites of importance rather than a limited selection.

Although perhaps an extreme possibility, there is always the likelihood that initial steps towards registration might well result in a vindictive land owner taking action to destroy the site concerned.

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Again, the implication is relatively clear and any intention to seek registration of a site on private property should be carried out in conjunction and, if possible, with the full co-operation of the owner.

### Defining a Place

It is now possible to return briefly to the issue raised earlier of the way in which a place might be defined and delimited.

From an ecological point of view, it is highly desirable that boundaries should be natural ones relating to total ecosystems rather than arbitrary ones. In some cases this will also mean the incorporation of a buffer zone area which protects the ecosystem. Obviously this can pose some considerable practical problems. In the example of Easter Cave, Western Australia, referred to above, we do not really know the scope of the functional ecosystem involved. In some other cases we may know this but it may be extremely difficult to argue and justify for registration purposes. As a simple example, the watershed which influences the Buchan/Murrindal Karst of Eastern Victoria, is the total watershed of the two rivers concerned encompassing many thousands of hectares.

A further practical question is the extent to which a place as defined for purposes of registration provides a viable land unit from a management perspective. It is obviously desirable that any registered place should be under a single ownership or management and not fragmented into a variety of holdings. In practice, this will not always be possible but it clearly is a factor to be considered when arguing for registration.

Finally, one important argument for registration of relatively large areas rather than single features is that it may help to off-set at least one of the potential disbenefits of registration, namely, the extent to which visitor pressure may increase. Thus, if Kubla Khan Cave, Mole Creek, Tasmania, were registered as a single cave it is virtually certain that visitor pressure upon the cave would increase. However, if a large section or all of the Mole Creek limestone area were registered, it would not necessarily increase visitor pressure upon any one feature within the area.

### Conclusion

I trust this paper and the issues raised in it will be discussed at length, both during this conference and subsequently. The extent to which the Federation can move towards a better solution to the problems posed here is important for the future of Australia's caves.

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