

String Games in Australia

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This chapter discusses the occurrence of string games in Australia, and traces the history of string figures from first century Greece, through nineteenth century Aboriginal cultures and into twenty-first century Australian playgrounds. Along the way, attitudes and adaptations to the game, ethnographic and folklore research and the skills involved in making string figures are explored. Currently regarded as a children's pastime, the game has a rich history showing connections between people, place and time, and has the potential to be of interest and value to researchers and practitioners working in several disciplines.

Definitions

String games are usually played by tying a length of string into a loop, taking the loop on the hands and using the fingers to weave intricate shapes and patterns in the string. Often the term 'cat's cradles' is used as a generic name for the game, but broadly speaking, there are two different types of string games, which require their own terminology to avoid confusion.

When two people play the 'old-fashioned' game of taking the string off each other's hands to make a consecutive series of shapes – *Cradle, Soldier's Bed, Candles, Manger, Diamonds, Cat's Eye, Fish in a Dish, Hand Drum* and back to *Diamonds* – this game is usually known as Cat's Cradle.¹

There is also another form of string game, where one person weaves her fingers in and out of the strings on her own hands to make a shape or pattern. These patterns are collectively called string figures, although each usually has its own identifying name – for instance *Cup and Saucer, Parachute, Cat's Whiskers*. The term 'string figures' can also include the various tricks, traps and catches, like the *Cutting the Hand* trick and the *Mouse* or *Yam Thief*.²

In this chapter, the two different forms of string games will be referred to as Cat's Cradle and string figures.

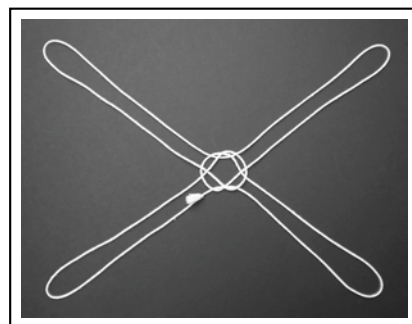
History of the game

No-one knows when humans began playing with a loop of string, for the game itself lives in the minds of the players and leaves no trace. The first strings used – probably made from natural materials like plant fibre, animal sinews or human hair – have been lost over time. The game may have originated in prehistoric times:

The practice of making a loop out of string-like material can be dated to the Upper Palaeolithic (late Old Stone Age, 40-10,000 BC) for the beads of necklaces (if not the loop itself) have survived in graves of the period.³

The earliest documented string figure was not used for amusement, but as a surgical aid. It was recorded in the first century by the Greek physician Heraklas, in his monograph on the surgical use of knots and slings⁴. Called the *Tetrakyklos Plinthios Brokhos*, it was described as a sling to set and bind a broken jaw. The chin was placed in the centre of the figure and the loops tied at the top of the head for support.

This ancient string figure was preserved through its republication, in the 4th century, by the Greek physician and medical writer Oribasius. Oribasius compiled a medical encyclopaedia containing excerpts from many of the earlier medical writers whose work would otherwise have been lost.⁵



The earliest known string figure, *Tetrakyklos Plinthios Brokhos*

Traditionally, playing games with a loop of string has been a common pastime in cultures throughout the world, particularly among Indigenous peoples, who created many intricate shapes representing objects and events from their daily lives. In this context, string figures can be seen as part of a relationship between people, place and time. Renowned anthropologist Kathleen Haddon theorised that string figures arose out of familiarity with, and use of, string in the everyday life of peoples.⁶

Not only objects of physical nature and animals are portrayed, but objects of human construction (houses, canoes, weapons), or of cultivation (plants), and even human beings themselves are portrayed. And not only these but social customs (hunting, dancing, etc.) come in for notice, and also, as we have seen, religious beliefs and observances.⁷

It is thought that the game itself arose independently in widely dispersed countries and cultures, but there is also evidence for it having travelled the world along the trade routes, being shaped and adapted through the meeting of different cultures and the movement of people from place to place. However they came to be, the making of string figures was a significant activity in the lives of Indigenous peoples across the globe:

... we know that many are closely connected with racial history and mythology, with traditional tales and fortune-telling; some are accompanied by muttered chants or songs; in others a consecutive story follows from movement to movement, or perhaps a touch or word is associated with a certain turn or twist of the string.⁸

Australia was the first continent for which string figures were reported.⁹ Edward John Eyre, one of the early explorers of southern Australia, who was later given the dubious title Protector of Aborigines, was amazed by what he described as the “varied and singular figures”¹⁰ he saw being made by Aboriginal people. He wrote “our juvenile attempts in this way are very meagre and uninteresting compared to them”.¹¹

The game of Cat’s Cradle

At the time of Eyre’s writing, the definitive string game in Western societies was Cat’s Cradle, a game for two people where each player takes the strings off the other’s hands in a certain way, in order to produce a repeating series of shapes. The game was played in Asia – a Japanese woodblock print from 1770 depicts two women in traditional Japanese dress playing the game¹² – and it is thought that Cat’s Cradle was most likely introduced into Europe by way of the trade routes:

Cat’s cradles (sic) were brought from China and Japan to England by sailors engaged in the 17th and 18th century tea trade. They are the form of string figure best known to Westerners, and are limited in distribution. The other string figures, less well known in the West, have a literally world-wide distribution.¹³

This comment highlights the difference between the spread of the Cat’s Cradle game, which was familiar to Western society, and the world-wide occurrence of string figures, the number and diversity of which was staggering.

In Europe, children were quick to take up this new game and include it in their play, and in the 1890s Cat’s Cradle was included in Lady Alice Bertha Gomme’s publication, *The Traditional Games of England, Ireland and Scotland*,¹⁴ an extensive two-volume inventory of children’s games.

Aboriginal String Games

South of the Equator, an Indigenous Australian version of Cat’s Cradle was recorded in Victoria by Daniel Bunce, around 1840. In the diary of his travels he described the daily activities of the Aboriginal people of Western Port:

This morning we observed that they practised some little amusements among themselves, and some were playing with a puzzle made of string – ‘cudgi, cudgick’ – made from the fibre of a tree (*Sida pulchella*)¹⁵

common on the banks of the mountain streams, as well as occasionally on the banks of the Yarra. This puzzle was played between two individuals, and required two pairs of hands, in the same manner as the juvenile game of “cat’s cradle”, common to our own country.¹⁶

Because there is no further description, we do not really know how it was played or if it was, indeed, the game familiar to people in Europe and Asia. Other explorers, including Captain William Bligh, also mentioned seeing a similar game during their travels, and called it by the familiar term ‘cat’s cradle’:

It is delightful to see the swarms of little children...taking a peice [sic] of line in a variety of shapes off one the others hands (in some places of England called a Cat’s cradle)...¹⁷

In 1941, Daniel Sutherland Davidson of the University of Pennsylvania published a comprehensive study analysing and describing the string figures he collected in three states – Western Australia, South Australia and Victoria, between 1930 and 1939. He separated the string games into three classes: string tricks and catches, cat’s cradle and string figures. At the end of the expedition he had collected one hundred and forty-five string figures and tricks, and noted that “Catches and cat’s cradles [sic] were not noticed anywhere”.¹⁸

While there is no evidence that Australian Aboriginal people knew the European version of Cat’s Cradle, it is possible that they played a similar form of the game. Today, in Western Arnhem Land, women play a string game which has been handed down through generations by oral transmission. It needs two people and an extra long loop of string, and the strings are transferred from one person’s hands to the other’s as they are in Cat’s Cradle. Although the form of the game is similar, the method of transfer and the shapes made by the string are completely different, and it seems to be played as a dynamic game of strategy rather than the making of a series of patterns.¹⁹

Another anthropologist, Frederick McCarthy, during a 1948 expedition to Yirrkala, Arnhem Land in Northern Australia, collected over two hundred string figures – the largest collection ever assembled from a single community, and around one-fifth of all known string figures at the time.²⁰ As well as an amusing pastime, McCarthy noted that there were some socio-magical relations governing the making of the figures²¹ and related a myth about the origin of string-figure-making in north-eastern Arnhem Land.²² He mounted 193 figures on cardboard, to be preserved in the collections of the Australian Museum, but his detailed instructions were found to be incorrect and less than ten per cent of the figures could be reproduced. They were later extensively revised by the late Honor Maude, renowned expert on string figures in the Pacific region and Mark Sherman, Director of the International String Figures Association.²³

Some of the earliest and most comprehensive records were made in the early 1900s by Dr. Walter E. Roth, another Protector of Aborigines in Northern Australia, who published a number of Bulletins based on his reports to the Home Secretary on the “ethnography and anthropology of the North Queensland aboriginal” [sic].²⁴ In one Bulletin, Roth described in meticulous detail the process of making string from different sources, including human hair and bark fibre, and made beautiful, delicate illustrations of the various processes. His documentation of the types of materials used to make the string provides valuable contextual information.²⁵

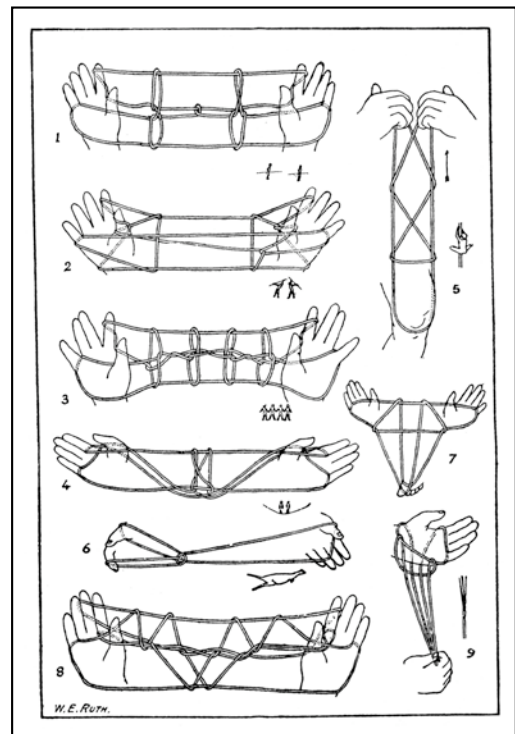
In another Bulletin, he described the making of string figures, and observed: “With any fair length of twine, adult women and young children, of both sexes, will often amuse themselves for hours at a time. It is thus used in the form of an endless string to play the game known to us Europeans as ‘*cratch-cradle*’”²⁶ He observed that some adult men also ‘indulged’ in the game.²⁷

Roth produced ten plates of illustrations, showing the finished patterns of seventy-four string figures, in which it is possible to identify the way individual strings are threaded though the pattern – behind or in front of the other strings – an invaluable aid for anyone trying to reproduce them. Unfortunately he did not collect the method of making the figures, but he observed the skill required and the complexity of the process involved:

Some of the figures are extremely complicated ... passing through at least 8 or 9 stages before completion: the diagrams of course only attempt to make a record of the finished article. During the process of manufacture such an [sic] one requires not only the hands, but even the mouth, knees, etc. to make the different loops, twists and turns. In addition to variations in complexity, certain of the figures may be made with two endless strings ... while to complete others again it may be necessary to have one or even two assistants... Occasionally the endless string may be arranged on the flat ...[or] on the ear.²⁸

Roth's beautifully detailed drawings were the first ever published of Australian string figures, and the number and diversity of shapes representing familiar animals, objects and scenes from everyday life are evidence of the game's significance in the relationship between people, place and time.

One of the Aboriginal string figures, called 'The Sun Clouded Over', is identical to the *Tetrakyklos Plinthios Brokhos*, the surgical sling described by Heraklas in first century Greece.



Roth's Plate III

Australian Children's String Games

String games are part of the folklore and play traditions of childhood, picked up by watching and learning and passed on in turn to the next generation of players. This type of activity and the process of transmission are elementary childhood experiences. As eminent Australian writer and folklorist June Factor states, 'Children's folklore is as integral to childhood as milk teeth and unlined skin'.²⁹

String games are more passive and individual than most playground games, although they are usually played in a social situation. They require very little space and are usually played quietly, so they are not as obvious in the playground as more active games like Chasey.

String games are part of children's traditional play, along with Hide-and-seek, Skippy, Poison Ball and other enduring playground games. These games, although largely unchanged for generations, often reflect children's own experiences and views of their community, the wider society and the adult world:

The verbal and kinetic play modes adopted and adapted by children in a specific community are necessarily shaped by that community's history, material circumstances and social values, but conventions of folkloric play appear to be universal. Wherever there are children there is child lore.³⁰

Historical literature and oral tradition tell us that string games have been played by adults and children throughout the world for generations. In contemporary Australia, the game is mostly associated with childhood, and forms part of the play traditions and culture of Australian primary school-aged children of around seven to eleven years. Adults sometimes regard it as one of a number of 'old-fashioned' games, usually meaning the games they remember from childhood. Along with games like Hopscotch, Jacks and Marbles, string games are often seen as 'games of the past', and there is a mistaken perception that children do not play them anymore.

Research in school playgrounds and elsewhere indicates that both Cat's Cradle and string figures are known to Australian children, but the extent of the game, and its place in contemporary children's playlore, has not been widely researched. Certainly, Aboriginal children played string games, and from the wealth of string figures that were collected they were probably very skilled at it. It is possible that Cat's Cradle may have been played by non-Aboriginal children and brought into the colony at the time of European settlement: "Colonial children played string

games (some possibly learned from Aborigines)”,³¹ but there has been a lack of research in this area, and little understanding of how the game has been influenced by changes in Australian society and culture. The contents of string games books for children draw on the early ethnographic collections and are *for* children, not *from* children.

Australian research

There have been two published Australian research projects about children’s string games. The first was carried out by Dr. Dorothy Howard, an American Fulbright Scholar, in the mid-1950s and the second by Associate Professor Barbara Poston-Anderson and Kristina Bathgate of the University of Sydney in the mid-1990s.

Howard collected the string figures as part of her pioneering research into the play traditions of Australian children. Her self-described “hasty hit-or-miss survey”³² in 1954-55 discovered ten names for string figures, some of them different names for the same figure. She documented five of the shapes by photographing the completed patterns. There are no instructions on how to make the figures, but they are all fairly simple shapes, still made by children half a century later, so the knowledge still exists. Dorothy Howard’s Australian research material is part of the Australian Children’s Folklore Collection, which is held in the collections of Museum Victoria.

In her monograph, *String Games of Australian Children*, Howard observed that the European name Cat’s Cradle was largely unknown to her Australian informants.³³ Howard referred to the earlier ethnographic research, and identified the lack of knowledge about the transference of string games between Aboriginal and non-Aboriginal children as a gap in the research. She wrote:

Nobody has yet made any attempt to find out whether or not Australian white children have learned any string games from the Aborigines. The assumption is that they have not; that the current string games have been transmitted via British tradition.³⁴

In an article describing their research, Poston-Anderson and Bathgate wrote about their study of string games in a north-western Sydney public primary school. The key questions were about transmission of the knowledge and the inherent meaning in the activity for the participants.³⁵ The study began as an adult oral history project. Children were added to the sample when the researchers found that all the adult informants ‘associated string figures with childhood experiences’.³⁶

The Sydney study revealed that the children knew 31 different string figures, 13 of them also known by adults in the study. The researchers noted the ‘magical’ and ‘ritualistic’ significance of the string figures for some informants, and were surprised to find that the children invented their own shapes.³⁷ The researchers also found that the string figures prompted the adults to recall childhood memories, and that there was an added element of ‘tactile memory’ in the experience of making the shapes for the first time in many years: ‘the fingers seem to do it automatically’.³⁸

The study led the researchers to classify the making of string figures as “a ‘folk game’ rather than as an essential part of the cultural myth-making process as it once was”.³⁹

Attitudes to string games

One of the problems identified in both the historical literature and the most recent research into string games is what Sutton-Smith calls ‘the triviality barrier’,⁴⁰ one of the highest hurdles children’s folklore researchers must jump. Sutton-Smith highlighted a common perception that folklore is ‘nonserious’⁴¹:

The historical roots of this bias have to do with the character of this civilisation, including its respect for work, rationality and science and its disrespect for play, irrationality, and aesthetics...⁴²

The Sydney researchers found that adults were not interested in participating because they thought string games was “a ‘childish’ activity not worthy of research”.⁴³ Similar attitudes, and the accompanying cultural blindness, were recorded by earlier researchers, including Kathleen Haddon:

Where travellers know nothing of string figures – or despise them as the pastimes of women and children – they are hardly likely to find them. Thus figures have actually been found in places where Europeans, long resident in the area, have averred that none existed...⁴⁴

There is additional evidence of an ambivalent attitude by researchers to the two different types of string games – the making of string figures, mainly known to Indigenous peoples, and the game of Cat's Cradle, mainly played by Europeans:

In remarkable contrast to the monotonous and strictly limited cat's cradle, which everywhere is performed perfunctorily and equally well by the stupid and clever, string figures are featured by such a variety of opening arrangements, types of manipulation and methods of extension that strict attention to detail is necessary throughout the procedure and careful memorisation of the proper continuity required.⁴⁵

In a 1959 article entitled 'Games in Culture', Roberts, Arth and Bush defined games as organised, competitive play with agreed rules and two or more sides. They saw other recreational activities, such as "noncompetitive swimming, top-spinning and string-figure making" as "amusements".⁴⁶ It is interesting to note that, conversely, Poston-Anderson and Bathgate classified the making of string figures as a "folk game" with the "gaming characteristics" of competition, challenge and skill.⁴⁷

In contrast to the 'trivial' view, Haddon presented a detailed case for regarding string figures as art, while at the same time exploring their possible significance as "valid evidence for movements and changes in the habits of peoples".⁴⁸ Haddon's unique hypothesis argued that string figures are a form of art, consciously created to imitate familiar objects. She described the way string figures are used to tell stories, outlined the development of moving string figures and posed the question, "Have we then, here the first embodiment of the cinema – the original moving pictures?"⁴⁹ Haddon's view was later supported by Davidson, who regarded string figures as both art and entertainment: "...for the artist, an opportunity for keen personal satisfaction in the meticulous execution of difficult figures; for the skilled entertainer, an extensive repertoire with which to delight an audience".⁵⁰

Adaptations and influences

Adaptation is a well-recognised element of string games and of folklore in general. Writing about children's folklore, June Factor observed: "The tenacity with which children maintain old traditions is matched by their readiness to invent, adapt – and forget...Nothing is so sacred in children's lore that it cannot be changed, parodied, or dropped and forgotten".⁵¹

Children are masters of invention and adaptation, and in Australia one of the ways this is demonstrated is through the changes in their string games. As well as the 'old-fashioned' game of Cat's Cradle, and the traditional string figures their parents and grandparents made – *Cup and Saucer*, the *Eiffel Tower*, *Parachute*, *Cat's Whiskers* and *London Bridge* (or, if you live in Sydney, the *Harbour Bridge*) – children are creating new shapes that reflect their contemporary world: *Picnic Basket*, *Telephone*, *T.V.*, *Baby's Cot*, *Birthday Cake with Candle*, letters of the alphabet, *Cream Cake*, *Star*, *Egg Timer*, *Apron* and, of course, the *ABC Symbol* – the logo of the Australian Broadcasting Commission, or, as the children call it, *ABC Kids*. These are just some of the ways the traditional string game has been adapted by these children to represent their connection with their own time and their own place.

There is a further adaptation, which may have come about through changes in the availability of 'found' materials for play. Children in Australia and other countries have for some time been making shapes on their fingers using rubber bands. Like string figures, the shapes represent objects the children are familiar with – shapes like a *Soccer Field*, a *House*, a *Jet Plane*, letters of the alphabet, a *Butterfly* and *The Phantom's Underpants*.⁵² There is also a series of rubber band figures that transform from one shape to another – a box, which turns into a cross, which turns into a star, to an army tank, to a gun, to a knife. More reflections of contemporary society?

There is evidence that this stretchy version of string figures is widespread and may, in some places, be more popular. At a primary school in Bulolo, Papua New Guinea, many of the children knew how to make figures with rubber bands, but only one child could make string figures.⁵³

Changes in the making of string figures by Indigenous peoples were recorded by anthropologists as early as the first half of the 20th Century. Many of these changes reflected the influence of western culture on the way of life of the local population. James Hornell, researching string figures in Fiji in 1925 wrote:

Whatever the custom in former times, string games in Fiji are played nowadays solely for pastime; even this custom is dying out before the spread of hymn singing, the attendance at football matches, and the general and rapid deterioration of the native culture.⁵⁴

Hornell's observation was supported a decade later by Honor Maude, one of the luminaries in the field, who observed:

While the impact of western culture has apparently in no way lessened the popularity of string-figures, except on Banaba, where the art is almost lost, it is fast becoming merely a pastime, and is being rapidly shorn, by the influence of Christianity, of the magico-religious significance which it at one time possessed. The game is probably still as popular as ever, but with the widening of their horizon the Gilbertese are re-naming many of their old figures and seeing in them fancied resemblances to objects previously unknown to their culture.⁵⁵

While Haddon recognised by 1930 that string games were losing their importance among Indigenous peoples, she was also mindful of the role of children's play and its relationship to the wider culture:

Although in most countries in which string figures are found they now survive mostly as games with which women amuse their children or which the little ones play amongst themselves, this is no criterion of their erstwhile importance. It is a commonplace that in the traditional children's games we see the last vestiges of old customs ...⁵⁶

Skills involved in making string figures

One of the most interesting aspects of string games is the mental and physical skill associated with the activity. Jayne, in the first universal publication on string figures, observed: "The figures offer an excellent means for developing manual dexterity and coordination between brain and hand, and present a challenge to personal inventiveness, too, since they are capable of infinite variations".⁵⁷

The link between mental agility, manual dexterity and the ability to make string figures is well documented. McCarthy described the extraordinary number of string figures and techniques known to one Yirkala woman as "a remarkable example of skill and knowledge of the exact sequences of such a large number of complex finger movements. Her mastery of this pastime demonstrates that she possesses high powers of mental and manual coordination".⁵⁸

Davidson, reviewing a particularly intricate string figure, observed: "Such a complicated procedure can be the outcome of only a long experience with string figures and presumably requires an intelligence better than average for successful completion".⁵⁹

Haddon, on the other hand, did not regard the making of intricate string figures as extraordinary:

The more developed figures are so complicated and their construction so lengthy that at first sight it seems marvellous that they could ever have been invented, and still more marvellous that once done they could ever be recaptured. But memory after all is always marvellous. We have only to think of the long verse recitals in the days before writing was common...to see that the power to remember intricate string constructions is quite a normal possibility.⁶⁰

There also seems to be a connection between mathematical aptitude and string figures in particular. Dorothy Howard reported being told about a 10-year-old Melbourne girl “with a special aptitude in mathematics, who knew several dozen string figures”,⁶¹ and there are several publications on the subject.⁶² Innovative maths teachers have also introduced string figures to their classes as a way of inspiring and motivating their students.⁶³

The role of memory in string games

Poston-Anderson and Bathgate reported that their informants experienced a kind of ‘tactile memory’ in their fingers when making the string figures, and that they often remembered patterns they thought they had forgotten... “the fingers seem to do it automatically. There seems to be a habit” ... “I like the satisfaction of feeling your fingers doing things without being controlled by your mind”.⁶⁴ Similar experiences can be found in both the historical literature and current developmental psychology references. Haddon, commenting on the length of time taken to learn a new string figure, wrote:

... the memorising – the permanent fixing – takes much longer, and the figure has to be repeated from day to day until it becomes mechanical. It is the writer’s impression, indeed, that when the figures have become quite familiar they are repeated by a kind of “muscular memory” that is partly unconscious.⁶⁵

Nelson Cowan of the University of Missouri, who conducts research into “working memory” – the ideas that come to mind “just when they are needed” for mental problem-solving – states that the amount of memory that can be brought to mind “all at once” is limited and can be retained only for brief periods of time “unless the person devotes intense effort to the task of retaining the information”.⁶⁶ He also comments that “there is memory ‘in the muscles’ and other memory in the mind...”⁶⁷

There is no doubt that when a loop of string is placed on the hands of an adult who played string games intensely in childhood, it is common for the fingers to automatically begin to find their way into the strings and begin a long-forgotten sequence of moves which will eventually, perhaps with some gentle prompting, lead to a completed string figure.

Cowan confirms, in psychological terms, the impressions of Haddon in 1930 and the experience of the informants in the more recent Sydney study. These findings highlight the value of using string figures as a means of retaining memory and passing on oral cultural traditions.

String games as therapy

One area that has not yet been explored is the therapeutic value of string figures. Jayne wrote: “The games are certainly fascinating, appealing as they do to young and to old, and to those debarred from all pastimes demanding physical exertion”.⁶⁸

In 1990, *Tops, Tales and Granny’s False Teeth*, an experimental month-long play program, was undertaken at the Royal Children’s Hospital, Melbourne. The program introduced traditional games into the hospital as “a bridge between the lives of the children inside and outside the hospital, and a link between children, their parents and the hospital staff”.⁶⁹ The play program consisted of an interactive exhibition, with baskets of traditional games on each Ward. String games were included, and volunteers taught string figures and tricks to the patients, family members and other visitors to the hospital. It was observed that the games



String games as therapy

“encouraged interaction in a way that is not normally found in a hospital ... [and] provided a way of reaching

children who were withdrawn or traumatised by their hospital experience”.⁷⁰ The value of string games in establishing communication between people was noted by early researchers,⁷¹ and they are an ideal activity for children who are bedridden, provided they have the use of their hands. This is an area which needs further exploration.

Conclusion

Although string games are still played among Aboriginal and non-Aboriginal people in Australia, the game is primarily seen as a children’s game and it will change as society changes. There are large gaps in both the historical and contemporary knowledge, and more research is needed into the way the tradition has survived into the twenty-first century.

Bibliography

- Abraham, Alexander Johnston. *String Figures*. Algonac: Reference Publications Inc., 1988.
- Averkiewa, Julia and Mark Sherman. *Kwakiutl String Figures*. New York: American Museum of Natural History, 1992.
- Ball, Walter William Rouse. *String Figures: An Amusement for Everybody*. Cambridge: Heffer and Sons, 1925.
- Bligh, William. “The Log of the Bounty”, quoted in Alexander Johnston Abraham. *String Figures*. Algonac: Reference Publications Inc, 1988.
- Bunce, Daniel. *Australasiatic Reminiscences of Twenty-Three Years’ Wanderings in Tasmania and the Australias; including Travels with Dr. Leichhardt in North or Tropical Australia*. Melbourne: J. T. Hendy, 1857.
- Cowan, Nelson. “The development of working memory.” In *The Development of Memory in Childhood*, edited by Nelson Cowan. Sussex: Psychology Press, 1997.
- Davidson, Daniel Sutherland. “Aboriginal Australian String Figures.” *Proceedings of the American Philosophical Society* 84, no. 6 (1941): 763-889.
- Day, Cyrus Lawrence. *Quipus and Witches’ Knots: the Role of the Knot in Primitive and Ancient Cultures, with a Translation and Analysis of ‘Oribasius de Laqueis’*. Lawrence: University of Kansas Press, 1967.
- Elffers, Joost and Michael Schuyt. *Cat’s Cradles and Other String Figures*. Middlesex: Penguin, 1979. Originally published as *Das Hexenspiel*. Cologne: Du Mont Buckverlag GmbH & Co, 1978.
- Emory, Kenneth and Honor Maude. *String Figures of the Tuamotus*. Canberra: The Homa Press, 1979.
- Eyre, Edward John. *Journals of Expeditions of Discovery into Central Australia*. London, 1845, quoted in Alfred Cort Haddon 1905, introduction to Caroline Furness Jayne. *String Figures and How to Make Them: A Study of Cat’s-Cradle in Many Lands*. New York: Dover, 1962. Originally published in Jayne, Caroline Furness. *String Figures*. New York: Charles Scribner and Sons, 1906
- Factor, June. *Captain Cook Chased a Chook: Children’s Folklore in Australia*. Ringwood: Penguin Books, 1988.
- Gomme, Alice Bertha. *The Traditional Games of England, Scotland and Ireland*, Vol. I. New York: Dover Publications, 1964. Originally published in Gomme, Alice Bertha, *The Traditional Games of England, Scotland and Ireland*, Vol. I. London: Nutt, 1894.
- Gryski, Camilla. *Cat’s Cradle, Owl’s Eyes: A Book of String Games*. Toronto: Kids Can Press, 1983
- Gryski, Camilla. *Many Stars & More String Games*. New York: William Morrow and Company, 1985
- Haddon, Kathleen. *Artists in String: String Figures: their regional distribution and social significance*. London: Methuen, 1930.
- Hage, J. Joris. “Heraklas on Knots: Sixteen Surgical Nooses and Knots from the First Century A.D.” *World Journal of Surgery* 32, no. 4 (2008): 648-655.
- Hornell, James. *String Figures from Fiji and Western Polynesia*, Bulletin 39. Honolulu: Bernice P. Bishop Museum, 1927.

- Howard, Dorothy. "String Games of Australian Children," in *Child's Play: Dorothy Howard and the Folklore of Australian Children*, edited by June Factor and Kate Darian-Smith. Melbourne: Museum Victoria, 2005. Originally published as an offshoot to *Folklore*, vol 72, June 1961.
- International String Figure Association. "Plinthios Brokhos (Greece)." *String Figure Magazine* 6 no.2 (June 2001).
- Jayne, Caroline Furness. *String Figures and How to Make Them: A Study of Cat's-Cradle in Many Lands*. New York: Dover, 1962. Originally published as *String Figures*. New York: Charles Scribner and Sons, 1906.
- Lee, Eric. *Kid's Guide to Easy String Figures*, accessed December 28, 2009.
<http://www.alysion.org/figures/introkids.htm>
- McCarthy, Frederick. "The String Figures of Yirrkalla." *Records of the American-Australian Scientific Expedition to Arnhem Land: Vol 2. Anthropology and Nutrition*. (1960): 415-511.
- McKinty, Judy. "Play in Papua New Guinea." *Play and Folklore* 37 (December 1999): 1-4.
- McKinty, Judy. "Papua New Guinea Children's Games." Unpublished video recording, 1999.
- McKinty, Judy. "Some string figures of Kunwinjku-speaking women from Western Arnhem Land". Unpublished video recording, 2005.
- McKinty, Judy and Dorothy Rickards. "Tops, Tales and Granny's False Teeth: Children's Traditional Play in a Paediatric Hospital." *Australian Children's Folklore Newsletter (now Play and Folklore)*, no. 18. (July 1990): 4-6.
- Maude, Honor. *Solomon Islands String Figures*. Canberra: The Homa Press, 1978.
- Maude, Honor C. and Henry E. Maude. *String-Figures from the Gilbert Islands*. Wellington: The Polynesian Society Inc. 1958. Originally published in the *Journal of the Polynesian Society*, Vols. 45-47, 1936-38.
- Maude, Honor and Mark Sherman. "The String Figures of Yirrkalla: a Major Revision." *Bulletin of the International String Figure Association* 2. (1995): 87-187.
- Miller, Lawrence G. "The Earliest (?) Description of a String Figure." *American Anthropologist, New Series* 47, no. 3, (1945): 461-462. Accessed December 29, 2009.
<http://onlinelibrary.wiley.com/doi/10.1525/aa.1945.47.3.02a00190/pdf>
- Moore, Charles G. "The Implication of String Figures for American Indian Mathematics Education." *Journal of American Indian Education* 28, no1. (October 1988): 16-26.
- Murphy, James R. "String Figures: a brief description." Accessed December 29, 2009.
<http://www.torusflex.com/torusflex%20project1/string%20figures.html>
- Poston-Anderson, Barbara and Kristina Bathgate. "Communicating With String Figures." *Play and Folklore* 32, (August 1997): 2-8.
- Probert, Martin. "The Origin of String Figures, Part 1." Accessed December 28, 2009.
<http://website.lineone.net/~m.p/sf/origin1.html>
- Roberts, John, Malcolm Arth and Robert Bush. "Games in Culture." *American Anthropologist* 61, issue 4 (August 1959): 597-605. Accessed January 2, 2010. <http://www3.interscience.wiley.com/journal/122431606/issue>
- Roth, Walter Edmund. "Games, Sport and Amusements." *North Queensland Ethnography: Bulletin No. 4* (March, 1902)
- Roth, Walter Edmund. "String, and other forms of strand: basketry-, woven bag-, and net-work." *North Queensland Ethnography Bulletin* no. 1 (January, 1901).
- Storer, Thomas. "String Figures" (Part I) and "String Tricks" (Part II). *Bulletin of the String Figures Association* no. 16 (Supplemental). Tokyo: Nippon Ayatori Kyokai (1988): 1-410.
- Sutton-Smith, Brian. "Psychology of Childlore: The Triviality Barrier." in *A Children's Games Anthology: Studies in Folklore and Anthropology*, edited by Brian Sutton-Smith. New York: Arno Press, 1976. Reprinted from *Western Folklore* XXIX, no. 1 (January 1970): 1-8.
- Taylor, Michael. "Elastic Band Figures from the Philippines." *Bulletin of the International String Figure Association* 14, (2007): 101-105.
- Wikipedia, "Heraklas". Accessed December 28, 2009. <http://en.wikipedia.org/wiki/Heraklas>
- Wikipedia, "Oribasius". Accessed December 28, 2009. <http://en.wikipedia.org/wiki/Oribasius>

Notes

- ¹ Camilla Gryski, *Cat's Cradle, Owl's Eyes: A Book of String Games* (Toronto: Kids Can Press, 1983), 62-76.
- ² See Gryski, *Cat's Cradle, Owl's Eyes*.
- ³ "The Origin of String Figures, Part 1," Martin Probert, accessed December 28, 2009.
<http://website.lineone.net/~m.p/sf/origin1.html>
- ⁴ J. Joris Hage, "Heraklas on Knots: Sixteen Surgical Nooses and Knots from the First Century A.D.," *World Journal of Surgery* 32, no.4 (2008): 648-655.
- ⁵ Cyrus Lawrence Day, *Quipus and Witches' Knots: the Role of the Knot in Primitive and Ancient Cultures, with a Translation and Analysis of 'Oribasius de Laqueis'* (Lawrence: University of Kansas Press, 1967): 86-89, 124-126.
- ⁶ Kathleen Haddon, *Artists in String: String Figures: their regional distribution and social significance* (London: Methuen, 1930), 40.
- ⁷ Haddon, *Artists in String*, 148.
- ⁸ Caroline Furness Jayne, *String Figures and How to Make Them* (New York: Dover, 1962), 3.
- ⁹ Daniel Sutherland Davidson, "Aboriginal Australian String Figures," *Proceedings of the American Philosophical Society* 84, no. 6, (1941): 879.
- ¹⁰ Edward John Eyre, *Journals of Expeditions of Discovery into Central Australia*. London, 1845, quoted in Alfred Cort Haddon, introduction to Caroline Furness Jayne. *String Figures and How to Make Them: A Study of Cat's-Cradle in Many Lands* (New York: Dover, 1962), xv.
- ¹¹ Eyre, *Journals of Expeditions of Discovery into Central Australia*, xv.
- ¹² Joost Elffers and Michael Schuyt, *Cat's Cradles and Other String Figures* (Middlesex: Penguin, 1979), 98.
- ¹³ Alexander Johnston Abraham, *String Figures* (Algonac: Reference Publications Inc, 1988), 6.
- ¹⁴ Alice Bertha Gomme, *The Traditional Games of England, Scotland and Ireland*, Vol. I (New York: Dover Publications, 1964), 61.
- ¹⁵ *Sida pulchella* is the base name for *Gynatrix pulchella*, which was also previously known by its synonym *Plagianthus pulchellus*. In Victoria it is known as Hemp-bush. Malcolm McKinty, pers. comm., January 2, 2010.
- ¹⁶ Daniel Bunce, *Australasiatic Reminiscences of Twenty-Three Years' Wanderings in Tasmania and the Australias; including Travels with Dr. Leichhardt in North or Tropical Australia* (Melbourne: J. T. Hendy, 1857), 75.
- ¹⁷ William Bligh, "The Log of the Bounty," quoted in Alexander Johnston Abraham. *String Figures* (Algonac: Reference Publications Inc, 1988), 7.
- ¹⁸ Davidson, "Aboriginal Australian String Figures", 772.
- ¹⁹ Judy McKinty, "Some string figures of Kunwinjku-speaking women from Western Arnhem Land." Unpublished video recording, 2005.
- ²⁰ Frederick McCarthy, "The String Figures of Yirrkalla," *Records of the American-Australian Scientific Expedition to Arnhem Land: Vol 2. Anthropology and Nutrition*, (1960): 422.
- ²¹ McCarthy, "String Figures of Yirrkalla", 423.
- ²² McCarthy, "String Figures of Yirrkalla", 425.
- ²³ Honor Maude and Mark Sherman, "The String Figures of Yirrkala: A Major Revision," *Bulletin of the International String Figure Association* 2, (1995): 87-187.
- ²⁴ Walter Edmund Roth, preface to "String, and other forms of strand: basketry-, woven bag-, and net-work," *North Queensland Ethnography*, Bulletin no. 1 (January 1901).
- ²⁵ Roth, preface to "String, and other forms of strand".
- ²⁶ Roth, "Games, Sport and Amusements," *North Queensland Ethnography*, Bulletin No. 4 (March, 1902): 10.
- ²⁷ Roth, "Games, Sport and Amusements", 11.
- ²⁸ Roth, "Games, Sport and Amusements", 11.
- ²⁹ June Factor, *Captain Cook Chased a Chook: Children's Folklore in Australia* (Ringwood: Penguin Books, 1988), 181.
- ³⁰ Factor, *Captain Cook*, 191.
- ³¹ Factor, *Captain Cook*, 115.
- ³² Dorothy Howard, "String Games of Australian Children," in *Child's Play: Dorothy Howard and the Folklore of Australian Children*, eds. June Factor and Kate Darian-Smith (Melbourne: Museum Victoria, 2005), 161.
- ³³ Howard, "String Games", 161.

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- ³⁴ Howard, "String Games", 161.
- ³⁵ Barbara Poston-Anderson and Kristina Bathgate, "Communicating With String Figures," *Play and Folklore* 32, (August 1997): 3.
- ³⁶ Poston-Anderson and Bathgate, "String Figures," 3.
- ³⁷ Poston-Anderson and Bathgate, "String Figures," 7, 8.
- ³⁸ Poston-Anderson and Bathgate, "String Figures," 4.
- ³⁹ Poston-Anderson and Bathgate, "String Figures," 8.
- ⁴⁰ Brian Sutton-Smith, "Psychology of Childlore: The Triviality Barrier," in *A Children's Games Anthology: Studies in Folklore and Anthropology*, ed. Brian Sutton-Smith (New York: Arno Press, 1976). Reprinted from *Western Folklore* XXIX, no. 1 (January 1970): 1-8
- ⁴¹ Sutton-Smith, "The Triviality Barrier," 2
- ⁴² Sutton-Smith, "The Triviality Barrier," 5
- ⁴³ Poston-Anderson and Bathgate, "String Figures," 3.
- ⁴⁴ Haddon, *Artists in String*, 4.
- ⁴⁵ Davidson, "Aboriginal Australian String Figures," 768.
- ⁴⁶ John Roberts, Malcolm Arth and Robert Bush, "Games in Culture," *American Anthropologist* 61, issue 4, (August 1959): 597. Accessed January 2, 2010. <http://www3.interscience.wiley.com/journal/122431606/issue>
- ⁴⁷ Poston-Anderson and Bathgate, "String Figures," 7.
- ⁴⁸ Haddon, *Artists in String*, 7.
- ⁴⁹ Haddon, *Artists in String*, 145.
- ⁵⁰ Davidson, "Aboriginal Australian String Figures," 768.
- ⁵¹ Factor, *Captain Cook*, 17.
- ⁵² Judy McKinty, "Papua New Guinea Children's Games." Unpublished video recording, 1999.
- ⁵³ Judy McKinty, "Play in Papua New Guinea," *Play and Folklore* 37 (December 1999): 2.
- ⁵⁴ James Hornell, *String Figures from Fiji and Western Polynesia*, Bulletin 39 (Honolulu: Bernice P. Bishop Museum, 1927), 6.
- ⁵⁵ Honor C. Maude and Henry E. Maude, *String-Figures from the Gilbert Islands* (Wellington: The Polynesian Society Inc., 1958), 2.
- ⁵⁶ Haddon, *Artists in String*, 147.
- ⁵⁷ Jayne, *String Figures and How to Make Them*, back cover.
- ⁵⁸ McCarthy, "The String Figures of Yirkalla," 417.
- ⁵⁹ Davidson, "Aboriginal Australian String Figures," 780.
- ⁶⁰ Haddon, *Artists in String*, 142.
- ⁶¹ Howard, "String Games of Australian Children," 164.
- ⁶² For example Abraham, *String Figures*, 128; Charles G. Moore, "The Implication of String Figures for American Indian Mathematics Education," *Journal of American Indian Education*, Vol. 28, October 1988: 16-25; Thomas Storer, "String Figures" (Part I) and "String Tricks" (Part II), *Bulletin of the String Figures Association*, No. 16 (Supplemental), (Tokyo: Nippon Ayatori Kyokai, 1988).
- ⁶³ See "String Figures: a brief description," James R. Murphy, accessed December 29, 2009. <http://www.torusflex.com/torusflex%20project1/string%20figures.html>
- ⁶⁴ Poston-Anderson and Bathgate, "String Figures," 4.
- ⁶⁵ Haddon, *Artists in String*, 142.
- ⁶⁶ Nelson Cowan, "The development of working memory," in *The Development of Memory in Childhood*, ed. Nelson Cowan, (Sussex: Psychology Press, 1997), 163.
- ⁶⁷ Cowan, "The development of working memory," 1.
- ⁶⁸ Jayne, *String Figures and How to Make Them*, v.
- ⁶⁹ Judy McKinty and Dorothy Rickards, "Tops, Tales and Granny's False Teeth: Children's Traditional Play in a Paediatric Hospital," *Australian Children's Folklore Newsletter*, no. 18, (July 1990): 4.
- ⁷⁰ McKinty and Rickards, "Tops, Tales and Granny's False Teeth," 5.
- ⁷¹ For example: Walter William Rouse Ball, *String Figures: An Amusement for Everybody* (Cambridge: Heffer and Sons, 1925), 16; Haddon, *Artists in String*, 7.

Image sources:

p.1: The earliest known string figure, *Tetrakyllos Plinthios Brokhos*. Photo: Judy McKinty

p.4: Roth's Plate III. Roth, Walter Edmund. "Games, Sports and Amusements." *North Queensland Ethnography: Bulletin No. 4* (March, 1902): plate III – Mankind. Animals. Reproduced in Jayne 1962 (1906): 376.

p.8: String games as therapy. Photo: Judy McKinty