CONVERSATIONS WITH JOHN ROBINSON [1]

by RONALD BROWN

The life of John Robinson

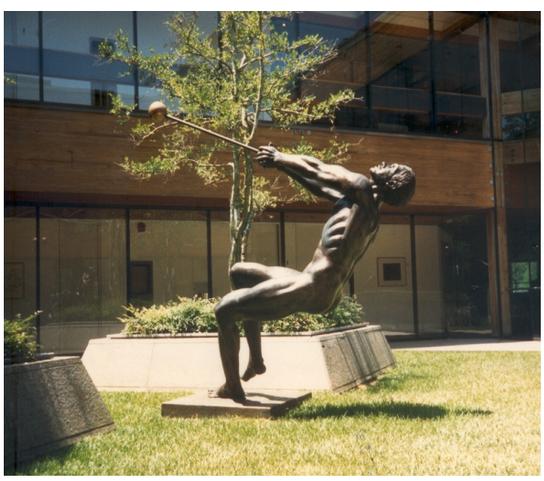
John was born in London in 1935. He attended Melbourne Grammar School in Australia, and Rugby School in England. At 17, he joined the Merchant Navy to travel around the World, but stopped off in Australia at his father's suggestion. This lead to a seventeen year stay, doing many jobs, Jackerooing on outback stations, and some cattle droving. He joined the last Mounted Police Patrol and trekked on horseback through 1100 kilometres of the King Leopold Ranges ofthe Kimberleys. In the 1950s he bought a 1600 acre virgin scrub block in the Ninety Mile Desert of South Australia and for ten years he and his wife developed a sheep fann where his three sons were born.

It was there in the evenings that his real education began. He read widely from a range of books emphasising man's place in the universe. In the night, there was the Southern sky, of extraordinary brilliance. He bought a 4.5 inch reflector to find his way among the constellations, aided by Hoyle's "Frontiers of Astronomy". An experience with ball lightning startled him into wonder.

At the age of 35 he sold the farm, with enough money to support himself for two years to try his hand as a sculptor. He decided to do this in England, Europe being the Mother of Western Art. His mother said she knew for a long time that this would be his career. She reminded him of the unused gift of woodcarving chisels at the age of twelve, explained, she said, by a fortune teller's forecast that her youngest son would be a sculptor! Without any training, he started his new career.

His representational sculpture ranges from the monumental to the exquisite and the playful. His **Acrobats** stands in Maui, Hawaii; at the National Sports Centre, Canberra; and also in West Germany and the U.K.; a forty-eight foot version is in the planning stage.

Gold maquettes of the **Hammer Thrower** have been given annually as awards by the U.S. Sports Academy to America"s sporting famous.



His sculptures of children are all over the world. You may have seen his **Leapfrog Children** at the Royal Academy Spring Show in 1982.

The **Umbrella Children** (below) adorns the Atrium of the Blackrock Hospital, Dublin, and Glebe Park in Canberra.

1 This is an edited and reformatted version, June 2016, of the article with the same title in “Symbol
Robinson, which formed the catalogue/brochure for his exhibition at the Royal Society PopMath

He has also done sculptures of **Her Majesty the Queen** (above), Her Majesty the Queen Mother, Sir Hugh Casson. and President Reagan.

The sculptures shown at this International Congress of Mathematical Instruction are all part of the **Universe Series**. The Series consists of 42 bronze sculptures and 10 wool tapestries. Number 1 of the Edition of each piece was bought by the City of Canberra in 1980.

He finds that the forms which he expresses in the Universe Series arise from his life and his experience, from an attempt to realise and to honour themes which are part of life and evolution. Laurens van del Post's book on Jung introduced him to the Realm of the Unconscious. Jung's book Man and his Symbols forced John to look for Symbols within Geometry: Spheres, Ovoids, Cones. Squares and Pyramids.

John Robinson says the form of **Eternity** (p.4) came to him in some kind of a dream, and it was then a matter of realising it. It was only later that he found that the somewhat simpler idea of a Möbius Band was well known. But it is remarkable that the more complicated form which he has realised should have been seen by him in this way.

The titles of the sculptures are not intended to be prescriptive, but to present a 'doorway', and to emphasise that the form is not an abstraction but a symbol, which may yet be seen in different ways by different people.

John Robinson's association with Australia is reflected in the double commission of two casts of the sculpture **Bonds of Friendship** in the dimensions 2.6 by 1.8 metres. One with a patinated finish stands at Sallyport in Portsmouth and marks where the crew and passengers of the First Fleet assembled for embarkation in 1787. It was unveiled by Her Majesty the Queen in 1979. The following year a second casting with a highly polished finish to symbolise the "New World" was unveiled at the site of the First Fleet landing in Sydney Cove.

What we call chance has played a considerable part in his life, and my own contact with him is a good example of this. It would not have taken place without two other activities of mine: some public lectures on "How Mathematics gets into Knots", and an involvement with the Royal Institution Mathematics Masterclasses for Young People. I am very much an amateur in the mathematical theory of knots, but I love to collect items which will illustrate the lectures, and showed the intuitive connections of mathematics with the wider world. Our subject of mathematics needs to be presented as part of a wide culture, related not only to the sciences, in which it plays a deep and essential part, but also as expressing one aspect of man's adventures in discovery and investigation.

One day in May, 1985, I was walking down Albemarle St. from a meeting on Masterclasses at the Royal Institution. As I passed the Freeland Gallery (now at his. Studio in Somerset), and with some time to spare, I decided to wander inside, enticed by the sculptures of children and animals shown in the window. To my amazement, I found also some strong and beautifully crafted knot sculptures. Clearly, photographs of these had to be added to my collection. On my next visit to London, I got in touch with the Gallery Director, and the Gallery sent me photographs. which I used in lectures, and in an exhibition. Later in 1985, I borrowed a maquette of the **Rhythm of Life (below)** to accompany my Mermaid Molecule Discussion on "How Mathematics gets into Knots". Slides of the sculptures also formed part of a London Mathematical Society video on the same theme.

I Even then John's path and mine had not directly crossed. In October, 1988, was asked by the Royal Institution if I could make suggestions for exhibits to accompany a Friday Evening Discourse by Sir Michael Atiyah on "The Geometry of Knots" at the beginning of November. It was a pleasure to suggest the International Guild of Knot Tyers; Lady Wilson, who had written a book on Celtic interlacing: some parts of our own exhibition, "Mathematics and Knots"; and of course the sculptures of John Robinson. All this was very well received by a surprised crowd, crushed into the Library of the Royal Institution.

I had already been planning to take our own exhibition "Mathematics and Knots" to the International Congress of Mathematical Instruction at Leeds, 1989, with its theme of “The Popularisation of Mathematics”. It only then occurred to me that John might like to be involved. He suggested that with the available time for planning. it would be possible to produce something more substantial and impressive. This is the background to what you see now.

Of course, I had to visit his studio in Somerset, and see a full range of his sculptures in their outside setting. We were delighted to find in us both a similarity in age and temperament, an interest in concepts and relationships, a desire to imagine and to realise, and a sense of fun in things. Another link between our lives was that in the late 1960s, when he was beginning to be urged towards sculpture, I was beginning to discover glimpses of a strange and fascinating world of "higher dimensional algebra", which seemed to offer a new way of understanding and calculating with some geometric forms. So when we finally met, our collaboration in the presentation of his sculptures quickly assumed an air of purpose and inevitability.

Mathematics, form and art

The response of all my colleagues to the photographs of John's sculptures was immediate and enthusiastic. It was also clear that the sculptures had a special place at this International Congress with its theme of the Popularization of Mathematics. So John and I discussed how this response was related to the conception and realisation of the sculptures.

Both mathematicians and artists are interested in forms and their relations. Mathematicians often also appreciate the emotional value of forms. But the contrast is perhaps that the artist is primarily concerned with working, enhancing, and expressing this kind of emotional value.

This is most clearly seen in the sculpture **Elation**, an edition of which was a gift by the British Olympic Association to the International Olympic Committee, Lausanne. We can all see reasons for the relevance of the title: the broad base, the lifting planes, the punching upwards, the lift towards the sky, the pointing. All these we respond to. On the other hand, the mathematical relevance of this combination of forms is not so clear. The reason for choosing the sculpture for this exhibition was not the possibility of some mathematical relationships, but because of the relevance of the theme of Elation to the whole of this Congress. The broad base represents the wide support of and interest in Mathematics which must be there if the subject is to flourish, while the pointing towards the sky signifies the lifting of the heart which is also necessary if this support is to have purpose. It was for similar reasons that the sculpture was chosen by the British Olympic Association as their gift.

Mathematics is generally regarded as the dry subject of school, made up of routine, boring, arcane and irrelevant calculation, and nothing to do with discovery and imagination. But for its researchers. it is an adventure in the world of form in which the search for relationships among forms is the main goal of the trade, and in which known mathematics

is the craftsman's tool.

Mathematicians mainly like to investigate the logic of a form, and its relation to other forms. to calculate, to understand, to describe, to discover the full complexities and beauty of a situation. We like to know what is true, not only in one case, but also in general.

The revolving mobile. the **Rhythm of Lif**e (above), is a single band of bronze, which can be seen as if it were wrapped round what the mathematicians call a torus and what everyone can think of as a doughnut. or inner tube. The band is a kind of knot, what is called a torus knot. As you follow the band. you go 4 times round the central hole whilst going 15 times round the core, or tube. The sculpture was made of fifteen pieces, welded together. The shape is called by mathematicians a (15,4)-torus knot. The numbers 4 and 15 are not themselves prime numbers, but they are relatively prime, in the sense that only the number 1 divides both 4 and 15.

At this stage mathematicians begin to search for the general rule. This rule turns out to be that there is an (*m*.*n*)-torus knot for any numbers *m* and *n* such that only 1 divides both *m* and *n*. This is where imagination enters, in divining the general rule from the particular. Where logic enters is in relation to knowledge. How do we really know that for any such numbers, such a knot exists? To answer that, we have to relate numbers and geometry, counting and shape. The search then becomes not for emotional value, but for truth and knowledge, which has its own range of values.

One of the themes of the sculptures is that of the circle. To the Greeks, it was the perfect figure. To the Chinese, it is the symbol of the **Universe** (right):

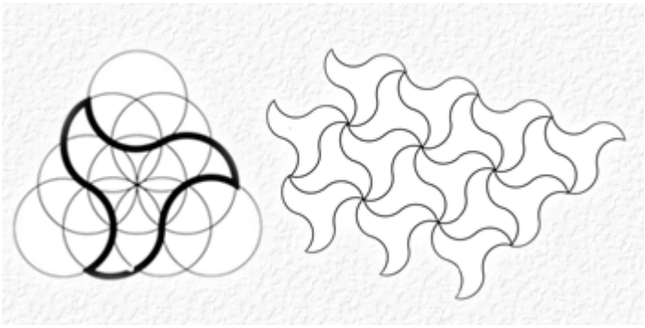
The circle conveys to all of us the idea of travel and return. But a journey should have content. John Robinson has discovered in his sculptures a deep mathematical construct, the fibre bundle. As you travel round the circle, the fibre, that is, the cross-section, travels with you. It is not static, but twists, so that when you return, the fibre is not the same, but is in a different and symmetrically placed position.

In **Dependent Being**s (left), the fibre, the cross-section, is a square. Now the edges of the square form, as they move, two surfaces, which are the "Dependent Beings" of the title. The paths of the vertices of the square form two linked paths, like the solids in **Bonds of Friendship (above)**.

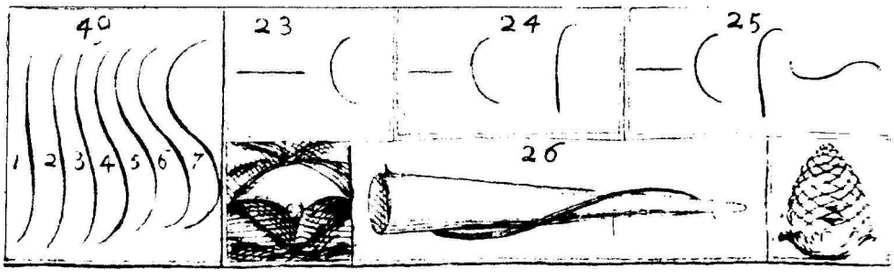
In **Eternity** (left} the fibre, the cross-section, is a triangle. A vertex of the triangle makes a path as you go round the circle. But it takes three traverses of the circle for the vertex to return to its original position. In this journey, the vertex has formed a path which is a trefoil knot.

In **Music of the Spheres** (right) , the fibre is the shape of a famous tile from the Harem in the Alhambra in Spain. This tile is notable also because its repetitions can fill a plane.

The form of the tile is created by the circumferences of six circles, their centres being on the circumference of a seventh circle, plus three circles with alternate centres where the six circles intersect. The sides of the tile are three "lines of grace".



Again there is a three-fold symmetry of the tile which makes up the fibre, and the vertices of the tile describe a path which is again a trefoil knot. A feature of this sculpture is the presence in various forms of the "line of grace" which is repeated in the sculpture **Line of Grace**[2] (exhibited at Leeds for the first time). The words come from Hogarth's account of the Analysis of Beauty



163. Detail of Plate 1 from The Analysis of Beauty (1753) by William Hogarth. 'Waving-lines [23-5] ...
The precise serpentine line, or line of grace, is represented by a fine wire, properly twisted around the ."figure of a cone [26].
... Though all sorts of waving-lines are ornamental, yet ... there is but one precise line, properly to be called
the line of beauty ….number 4 [49].'

The **Line of Grace** is a cone on which can be seen Hogarth's S-shaped line. Collapsed to its base the line of grace becomes a spiral. The spiral is an old form in art and history, used to symbolise Mystic Knowledge (dreaming) by the Celts (Ireland, Spain, Malta), by the Etruscans, by Greeks and Egyptians, in India and China, and by Australian Aboriginals and North American Indians.

For mathematicians, the spiral is important because it also contains the idea of convergence, reaching towards what is different, of travelling and approaching a different form. Alternatively, the spiral arises out of a point, or out of nothing, as in the theme of **Embryo** (right)

while two spirals make part of the form of **Conception** (left)**.**

The spiral carries with it a suggestion of infinite processes. It is in dealing with the logic of such infinite processes that Mathematics reveals some of its deepest secrets.

Many artists have expressed their feeling for Mathematics. The link of Mathematics with the work of the graphic artist M.C. Escher is well known. In his bland way, he wrote of his own work: *"My aim is to depict dreams, ideas or problems in such a way that people can observe and consider them."* In a more forceful manner we have from "Conversations with Rodin", in F.Lawton, p.156 and J.Cladel, p.401:

"*I have come to realise that geometry is at the bottom of sentiment or rather that each expression of sentiment is made by a movement governed by geometry. Geometry is everywhere present in Nature. A woman combing her hair goes through a series of rhythmic movements which constitute a beautiful harmony. The entire rhythm of the body is governed by law ...* "

and symbolism, and the realistic expression and honouring of a range of emotion and human activity, perhaps we have to go back to Leonardo da Vinci. John finds himself responding particularly to the following quotations from Leonardo da Vinci, by L.H. Heydenreich (Macmillan, New York, 1954):

Leonardo's imagination is a visual one ... These playful manifestations of mathematical speculation seem to us to reveal, as it were in abstraction, a tendency which dominates Leonardo's entire artistic production: his predeliction for geometrical proportioning and centring of every composition ... . It inspires too his projects for buildings .... the Adoration of the Magi ... the Battle of Anghiari, are dependent upon the application of geometric construction; for here, too, the general proportions of the pictorial structure are largely determined by mathematical considerations,

2 This sculpture is now called **Innocence, see final Notes.**

such as those of centring and balancing of the various parts .... the artist-investigator understood mathematics .. a unique combination of logic and imagination, abstract and concrete thought, so that its very essence makes it a natural bridge between artistic and scientific activity. "Proportion is not only found in numbers and measurements but also in sounds, weights, times, positions, and in whatever powers there be."

Of course, my own favourite quotation from Leonardo has to be that from the margin of a sheet of anatomical sketches (Windsor 19118v):

"Let no one read me who is not a mathematician." :

Ronnie and John in conversation at his studio in Somerset

Notes added 2018:
More information and some animations can be found on the official web sites

http://bradshawfoundation.com/jr/

and also on

http://groupoids.org.uk/publar.html#JR

http://groupoids.org.uk/popmath/cpm

The last also has a link to the web version of the exhibition on "Mathematics and Knots".

The sculpture **Line of Grace** has now been called **Innocence.**
It is shown here**:**