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# *Bath institute of Medical Engineering*

*Report & Accounts  
31 March 2009*

TUESDAY



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24/11/2009

375

COMPANIES HOUSE

**BIME**

Bath Institute of Medical Engineering



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## BATH INSTITUTE OF MEDICAL ENGINEERING

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*Consultant Rheumatologist*

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*Retired General Practitioner*

Mr R. J. Oldale

*Design Consultant*

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*Consultant to the Rutherford Appleton Laboratory  
in Medical Microsystems*

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*Head of Clinical Measurement, Royal National Hospital  
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Professor A. W. Miles

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(Chair)

Mr R. Oldale (from 10.3.09)  
(Chair)

Professor R. Orpwood

Dr P. Lawes

Mr M. Bishay

*Consultant Surgeon*

Professor D. W. Robinson

Dr S. Franks

*General Practitioner, Bath*

Mr G Giddins

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*Consultant in Rehabilitation Medicine*

Professor A. J. Medland

Dr A Taylor

*R&D Manager, RUH*

Dr M. R. Hillman

*(Secretary)*

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Mr S. Adams, *Production Unit Supervisor*

Mr T. Adlam, *Mechanical Design Engineer*

Mr D. Bishop, *Production Technician*

Dr H Boyd, *User Interface Engineer (from 1.12.08)*

Mr M. Breakwell, *Mechanical Technician*

Dr B. Carey-Smith, *Head of Electronics*

Mr J. Chadd, *Electronics Design Engineer (to 31.10.08)*

Ms J. Chann, *Evaluation Scientist*

Mr C. Davey, *Evaluation Centre Manager (to 30.9.08)*

Mrs N. Evans, *Occupational Therapist (part-time)*

Mr R Faulkner, *Electronics Engineer (part-time)*

Mr S. Gale, *Electronics Technician*

Mr S. Halsey, *Mechanical Design Engineer*

Dr M. R. Hillman, *Principal Engineer*

Mrs R. Hooper, *Secretary*

Mr H Khadra, *Electronics Engineer (from 30.3.09)*

Mr R. S. Matthews, *Production Unit Technician (part-time)*

Professor R. Orpwood, *Director*

Mrs S. Rouse, *Secretary (part-time)*

Mr M. Rouse, *Senior Workshop Technician*

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Mr S. Wilson, *Ergonomist (to 30.9.08)*

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## BIME – OUR AIMS

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Our charity is a design and development organisation working to improve the quality of life of people with disabilities and healthcare problems. We employ a team of professional design engineers and support staff who work closely with medical and healthcare professionals, and importantly with disabled people and other end-users. This multi-disciplinary approach to design work, where other professionals and end-users are involved as part of the design team, ensures that completed projects are truly effective and provide users with the support they need. The team places great emphasis on developing a sensitive understanding of the needs of the client and patient, and a willingness to work closely with them to evolve solutions appropriate to their needs. In addition to our design work we have a longstanding Evaluation Centre set up to evaluate safety critical medical equipment, in order to improve patient care and reduce the risk of injury or death from its use.

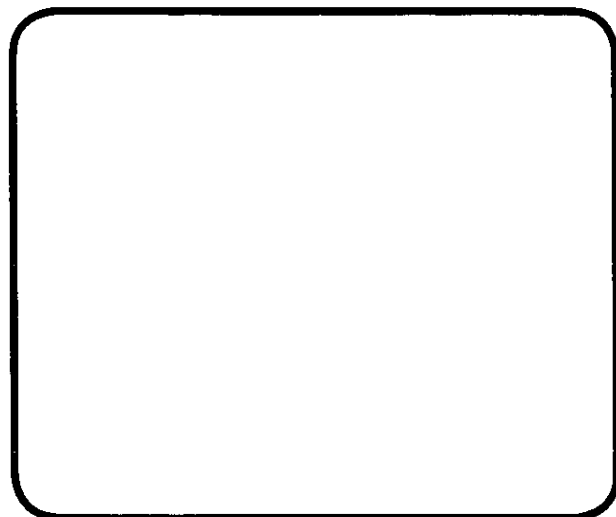
Our Institute is an independent body. It was founded, and continues to be maintained, by charitable donations and grants. It is housed within the Royal United Hospital in Bath, and its work is associated with the University of Bath, with which it has strong technical links. We have a close working collaboration with a wide range of disability support organisations, hospital departments and clinicians, occupational therapists and physiotherapists, academics, and other design organisations, throughout the UK. These strong links, together with contact with a large number of individual disabled people, provide us with the projects we undertake, and also provide guidance and evaluation of the solutions we develop.

We judge our success in terms of the number of people who are able to benefit from our designs, and so one of our key aims is to ensure that all successful design solutions are made available. To this end much effort is put into discussions with potential manufacturers to arrange production and marketing. Of course many disability products have quite small markets and in these cases we arrange batch manufacture ourselves and sell the products on a non-profit basis, either directly from the Institute or through marketing companies. In this way we can ensure our resources lead directly to improvements in people's quality of life.

The Institute started in 1968, so this last year we celebrated our 40th anniversary. During that time we have been involved in well over 300 projects, with over 120,000 new devices having been made available. All this work has depended very heavily on the financial support of a large number of charitable trusts and companies, to whom we are extremely grateful.



Speakers at our 40th Anniversary celebration at Bath University. Left to right; Prof Jane Gilliard (National Dementia Strategy Programme Manager at the Department of Health), Prof Richard Mawditt (BIME Trustee), Ms Claire Large (Administrative Director Dunhill Medical Trust), Dr Mary Stopes-Rowe (daughter of our first President, Sir Barnes Wallis), Mr Steven Roberts (Manager at Bath Royal United Hospital), Prof Roger Orpwood (BIME Director), and Dr Peter Lawes (BIME Chairman).



Our stand illustrating our dementia support work at an exhibition at Olympia organised by the Engineering and Physical Sciences Research Council to highlight some of the major projects it has recently funded.

## BIME Chairman's message 2009

Over the last 12 months much has happened in BIME and much is about to happen. Firstly, I am proud to announce that BIME has a new President succeeding Lord Ara Darzi. Baroness Masham of Iltan is a cross-bench member of the House of Lords and leads several campaigns and groups fighting for the interests of disability groups. BIME looks forward to a long and fruitful association with Baroness Masham.

The BIME programme of projects and its output of devices is as impressive as ever. Congratulations to Professor Orpwood and the BIME team in continuing to provide their patients, therapists, clinicians and customers with the service which they have grown to expect. On the financial side, income has fallen over recent years and costs have risen. Reserves are healthy, but the investment return is no longer what it was and BIME does need to balance the books. NHS funding of medical device evaluation has seen a new competitive tendering process put in place. BIME had benefited from a successful three-year rolling contract over 25 years, but following the changes it has had to explore new sources of funding from infusion pump manufacturers and associated companies.

Revised and modernised Articles of Association are expected to be fully implemented at the 2009 AGM in October. Dr A.K. Clarke, Mr R. Cross, Dr N.R. Nutt and Dr J. Robertson have all stood down from the Council, and I will stand down as Chairman at the 2009 AGM. Dr A.K. Clarke has also stood down as Chairman of the Projects Committee, a position he has held since 1984. BIME is very grateful to Dr Clarke, Mr Cross, Dr Nutt and Dr Robertson for their advice and assistance. They have contributed greatly to the growth and success of BIME. Mr Richard Oldale is the new Chairman of the Projects Committee, and brings a wealth of knowledge of the disability equipment industry. With sadness, I report that Sir George Godber, past President of BIME, died on 10th February 2009. Professor Roger Orpwood is due to retire at the end of 2009 having served BIME in a number of roles for most of its 40-year existence, including Director since 2004. He has guided BIME well over the last 5 years. We are very grateful to Roger for all that he has contributed in his several roles over all his time with BIME and especially the last 5 years.

This being my final Chairman's message, I would like to close with a long list of thanks: to the staff for their dedication to such a worthwhile cause, their inventiveness, creativity and hard work; to the University and its staff for their professional and businesslike administrative services; to the Royal United Hospital Trust both as landlord and project collaborator; to all our suppliers, subcontractors, vendors, advisors, customers, distributors, marketeers for all the obvious reasons; to the medical practitioners, carers, therapists and patient groups who bring their device needs to BIME thereby feeding the portfolio of new projects; to the patients and subjects without whose advice, feedback and collaboration, design and evaluation efforts would be ineffective; to Council and Projects Committee members giving the benefit of their contacts, experience and collective wisdom; to all those who help fund BIME, both charities and grant giving organisations; and to all the above for their friendship and continuing support. I have enjoyed my 12 years as Chairman of Council and before as Vice Chairman and Council member. BIME has grown and I am sure it will continue to do so under the guidance of a new Chairman, new Director and a newly structured Council. I wish BIME well.

Peter Lawes, PhD, CEng.  
Chairman

## Director's Introduction

This last year has been a special one for BIME, having reached the milestone of our 40th anniversary. As you might expect we have had some good celebrations, with the highlight an evening event at the University of Bath with around 150 guests, representing so many people who have been involved in the venture that is the Bath Institute of Medical Engineering. It was very pleasing to welcome Dr Mary Stopes-Rowe, the daughter of our founding President, Sir Barnes Wallis. The celebratory events underlined just how far we have come in 40 years, with so many innovative and pioneering designs developed.

Our work has been well recognised during the year. We were invited to engage in a study conducted by the Academy of Medical Sciences on ageing, and in work to monitor the progress of the Government's Dementia Care Strategy. We were also invited to take part in a showcase exhibition organised by the Engineering and Physical Sciences Research Council (EPSRC) to highlight some of the major recent projects they have funded. Our work was a part of the exhibit covering healthcare technology. The EPSRC, together with their equivalent in Canada, also encouraged and funded us to organise a liaison group involving ten key players in each of the two countries in the field of technology and dementia care. This group of researchers, organised by Tim Adlam from BIME and a colleague in Canada, promises to coordinate work in the two countries in this important and rapidly progressing field.

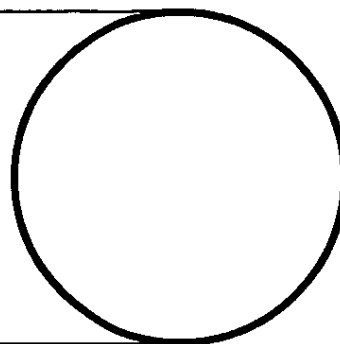
The above recognition is of course encouraging, but the work of BIME is really all about supporting people, and it is the human stories that surround our activities that provide our key motivation. The work reported in this review to help children with whole body extensor spasms is a key illustration of this work. Some of these children have never been able to sit in normal seating. Throughout the whole of their short lives they have had to be supported on the laps of their parents and other carers. We have started doing some work in collaboration with Great Ormond Street Children's Hospital to develop special seating that has been shown by our pilot work to provide an innovative way of supporting these children, and thereby enabling them and their parents to get on with a reasonably normal life. It is projects like this that underline what BIME is all about.

For me nostalgia is also in the air, as I shall be retiring at the end of the year. I have greatly enjoyed my time at BIME. Ask anyone who has worked here or been involved in project work with us, and they will tell you that BIME is a very special place. It attracts very high calibre employees, all of whom are highly motivated to use their skills to make a difference to the lives of people less able than themselves, and they have been an inspiration to work with. They have brought smiles to the faces of many thousands of disabled people through their work, and I will really miss them and the very special work they do. For all the people involved in this venture, including all the funders whose crucial support enables the work to take place, I wish to pass on a very heartfelt "thank you".

Professor Roger Orpwood, Director

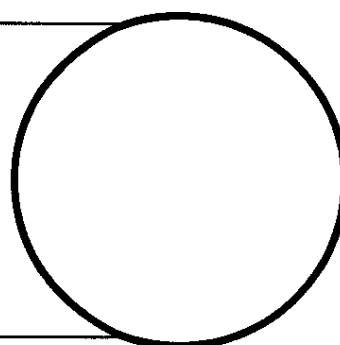
## Compliant seating

We are exploring a project with occupational therapists at Great Ormond Street Hospital to develop compliant seating systems. Some children with cerebral palsy have extensor spasms which cause them to involuntarily straighten themselves out. Normal rigid seating appears to make the problem worse, and they often have to be supported on a carer's lap. We have found that a seat with support surfaces that move with the child as they spasm and gently return them to a sitting position when the spasm subsides makes them much more comfortable. This project, funded by Action Medical Research, is optimising the design of such seating.



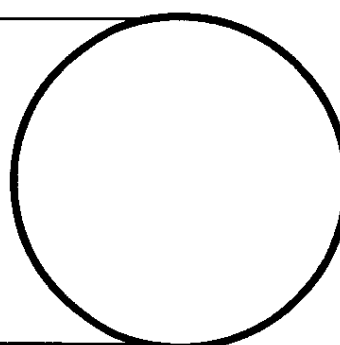
## Moving Target

Through our local connections to the Children's Centre at the Royal United Hospital, Bath, we are developing a hand/eye co-ordination toy for young disabled children. The current development has a row of touch sensitive panels that light up in succession, giving the appearance of movement. When the child hits an illuminated panel with a ball there is a visual and audible reward. The unit has been evaluated at the Children's Centre, and we are now looking into companies that could market the moving target.



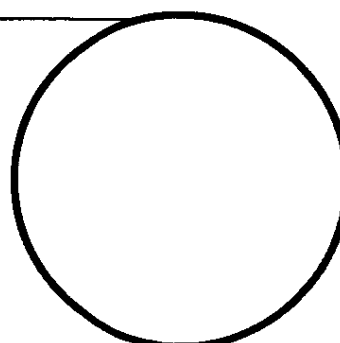
## The WizzyBug

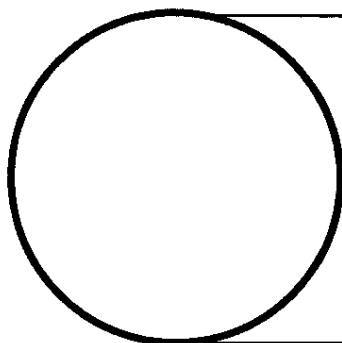
Wizzybug is an electrically powered mobility toy designed for disabled children aged 2-4 years old. The vehicle is designed to help the development of these children's spatial awareness, their motivation to explore their environment, and also their social skills. But above all the Wizzybug is designed to be fun! Nearly 50 Wizzybugs have now been made available through our Production Unit, with many children benefiting. We are currently in discussion with a number of companies that could take over the production and marketing from us, thereby enabling many more children to benefit from this unique device, both in the UK and overseas.



## Sensory Garden

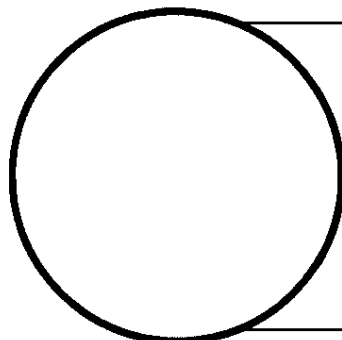
The sensory garden is the idea of a care assistant at a local Cheshire home, and is in the form of a weatherproof armchair that surrounds each individual's wheelchair. The armrests and tray accommodate removable plant troughs, allowing a variety of plants to be used, all grown and maintained by the clients at the home. The back and headrest of the armchair accommodate climbing plants, and allow for the hanging of wind chimes and mobiles. The chair is currently being evaluated at the home, and on completion it will be shown to other Cheshire home residents around the country, with a view to making further units.





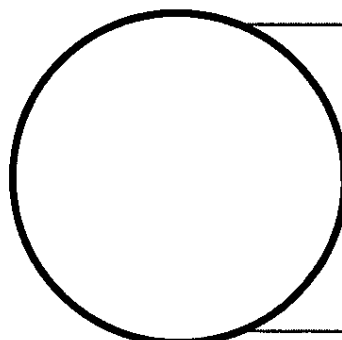
## **Wheelchair Toddler carrier**

BIME has in the past developed a very successful wheelchair babycarrier, to enable wheelchair users to transport their young children. Of course children grow up! Once children have become toddlers they will walk a little, but will become tired, and will then want to ride on their parent's wheelchair. To help them do this safely we have been designing a small folding seat for toddlers that attaches to the front of the chair. The first prototype is currently being evaluated, and the completed successful design will be made available alongside the babycarrier through our production unit.



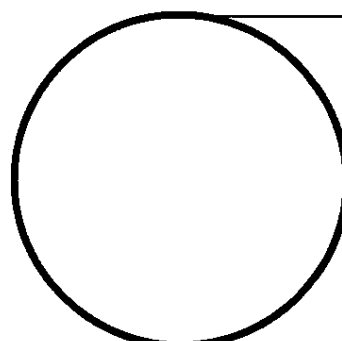
## **Brain Injury Rehabilitation**

There is the potential for technology to assist in the rehabilitation of people with acquired brain injury. In collaboration with the Brain Injury Rehabilitation Trust (BIRT) and with clinicians within the NHS, we are exploring where technology may assist in the areas of behaviour management, particularly anger management, as well as with lifestyle monitoring and task sequencing for this client group.



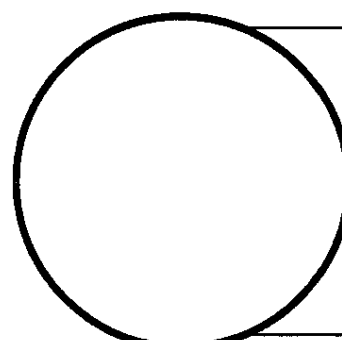
## **Flooring**

We have been liaising with local researchers and geriatricians to look at ways of reducing injuries from falls in older people. One solution we have explored is to design flooring that is quite rigid for normal walking but which is soft and energy absorbing if someone falls on it. Pilot work, including tests on one possible design, has been successful and we are currently seeking support to fully develop the concept.



## **The Bristol Buggy**

The Bristol buggy is a castored frame that supports children in full body plaster casts, allowing them to be pushed around. The child is held in a comfortable upright position, allowing them to engage in normal daily activities, and transforming their quality of life and that of their families. This kind of buggy has been successfully in use for 5 years by the Bristol Royal Hospital for Children, and we were invited by the NHS's South West Innovations hub to modernise the design. Our initial prototype is being evaluated with children in the hospital, and a commercial partner is being sought to make the buggy available.



## **Wheelchair shopping trolley**

BIME currently sells a wheelchair baby carrier through its production unit. This baby carrier fits on the front of a manual wheelchair. It is proposed that a variation of the supporting frame and the existing means of mounting it to the wheelchair frame could be used for other purposes, perhaps to carry shopping or gardening tools as examples. We have already built a couple of prototype devices and are now proceeding to develop it for production.

*Riley has a severe form of cerebral palsy, and since birth he has been unable to use normal seating because it causes him to experience spasms which make his whole body straighten out.*

*"Sometimes he will scream and cry as though we are trying to sit him on a bed of nails, which is incredibly upsetting" (Dad)*

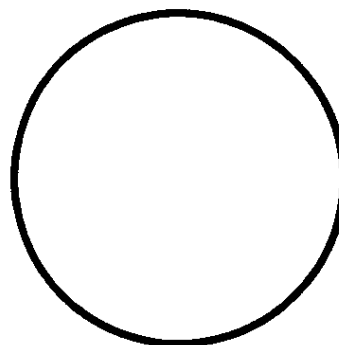
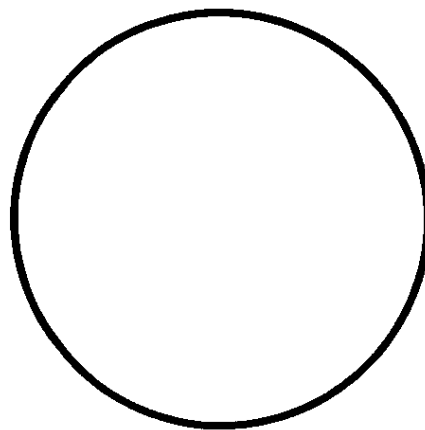
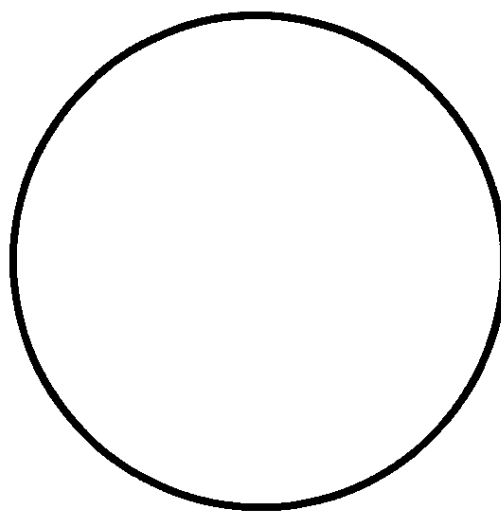
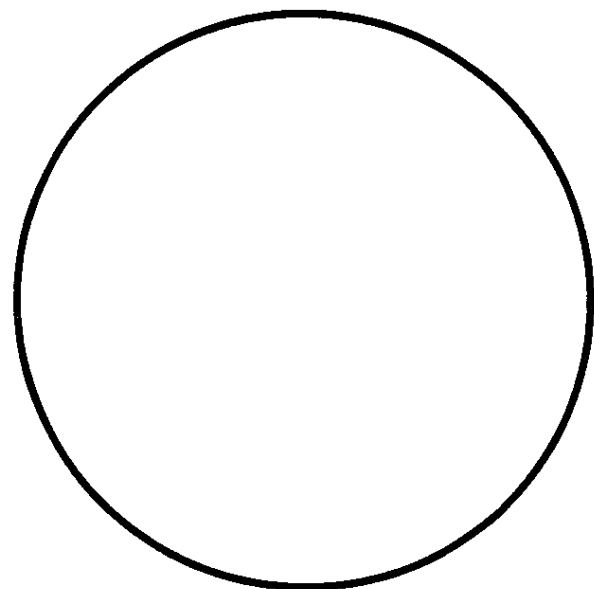
*But observations of how children like Riley can be made comfortable suggests a solution.*

*"When he's on my lap I can move with him and the spasms, and gently bring him back to a sitting position." (Mum)*

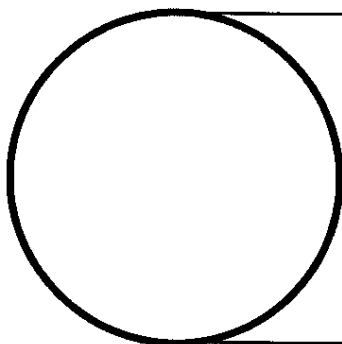
*BIME is working with Occupational Therapists from Great Ormond Street Children's Hospital to develop a seating system that emulates mum's actions. It moves with Riley when he spasms, and then gently returns him to a comfortable position as he relaxes. The work is funded by the charity Action Medical Research.*

*"A chair like this could radically change Riley's life for the better and help improve our family life too" (Dad)*

*BIME is monitoring how different aspects of the chair design can enable Riley to be comfortable, and hopes to conclude with a generic design for young children like Riley.*

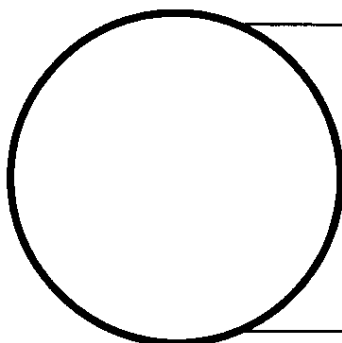






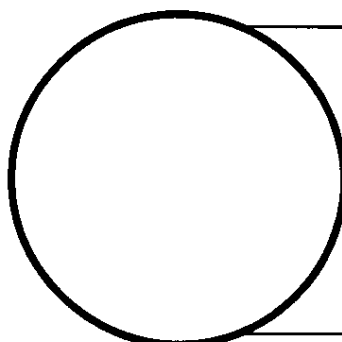
## **SomnIA – Sleep In Ageing**

It is recognised that poor quality sleep is a common problem among older people. BIME is a partner in a multi-disciplinary collaborative research project aimed at understanding and improving sleep quality in later life. Our specific focus is on developing sensor-based technology, such as automatic lighting and automatic assistance calling, which addresses some of the factors which contribute to poor quality sleep among older people. Information about behaviours and routines that affect sleep is being collected from older people and their carers, both in care homes and in the community, and this is being used to enable new designs to be explored.



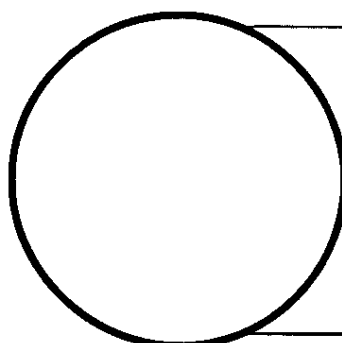
## **Novel Assessment of Nutrition and Aging (NANA)**

BIME has received a grant to collaborate with the Universities of St. Andrews, Sheffield, and Reading to develop an integrated and technology-assisted toolkit for nutritionists assessing the impact of nutrition on the physical and mental health of older people. The NANA toolkit will enable nutritionists to assess the impact of nutrition on physical and mental health simultaneously for extended periods of time.



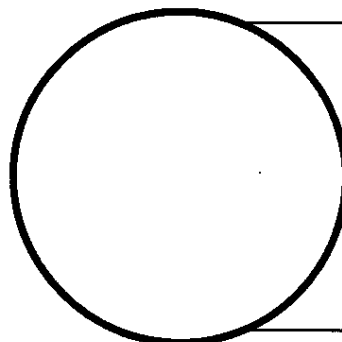
## **Long-handled bottom wiper**

We recently received a request from the Thalidomide Trust for a modified version of the folding bottom wiper, with a longer reach, that would be suitable for their clients. We have built up two prototype devices with different folding geometries, to be tested by clients of the Trust. These are currently under evaluation, and we are waiting for feedback before progressing the most appropriate concept to small scale production.



## **Backrest for children with restricted growth**

Children with restricted growth find the seat on ordinary school chairs are too deep to be comfortable. Our backrest provides back support with a firm and deep cushion securely attached to the back of the chair. Our original prototype was successful, but expensive to make. A new design that is easier to manufacture is currently under evaluation. It is hoped this device will complement our raised footrest designed for these children.



## **Referrals**

The Institute operates a funded referrals system for carrying out work for the Royal United Hospital in Bath for paediatric services and medical physics. Regular referrals from paediatric services include such items as fitting oxygen bottles to prams and pushchairs for children & babies who need oxygen therapy, and other one-off designs to help the children's mobility and development. The system benefits many local children and has the added advantage that projects started through this link can often form the basis of full design projects, and thereby benefit many other children as well.

## SOPHIE AND WIZZYBUG

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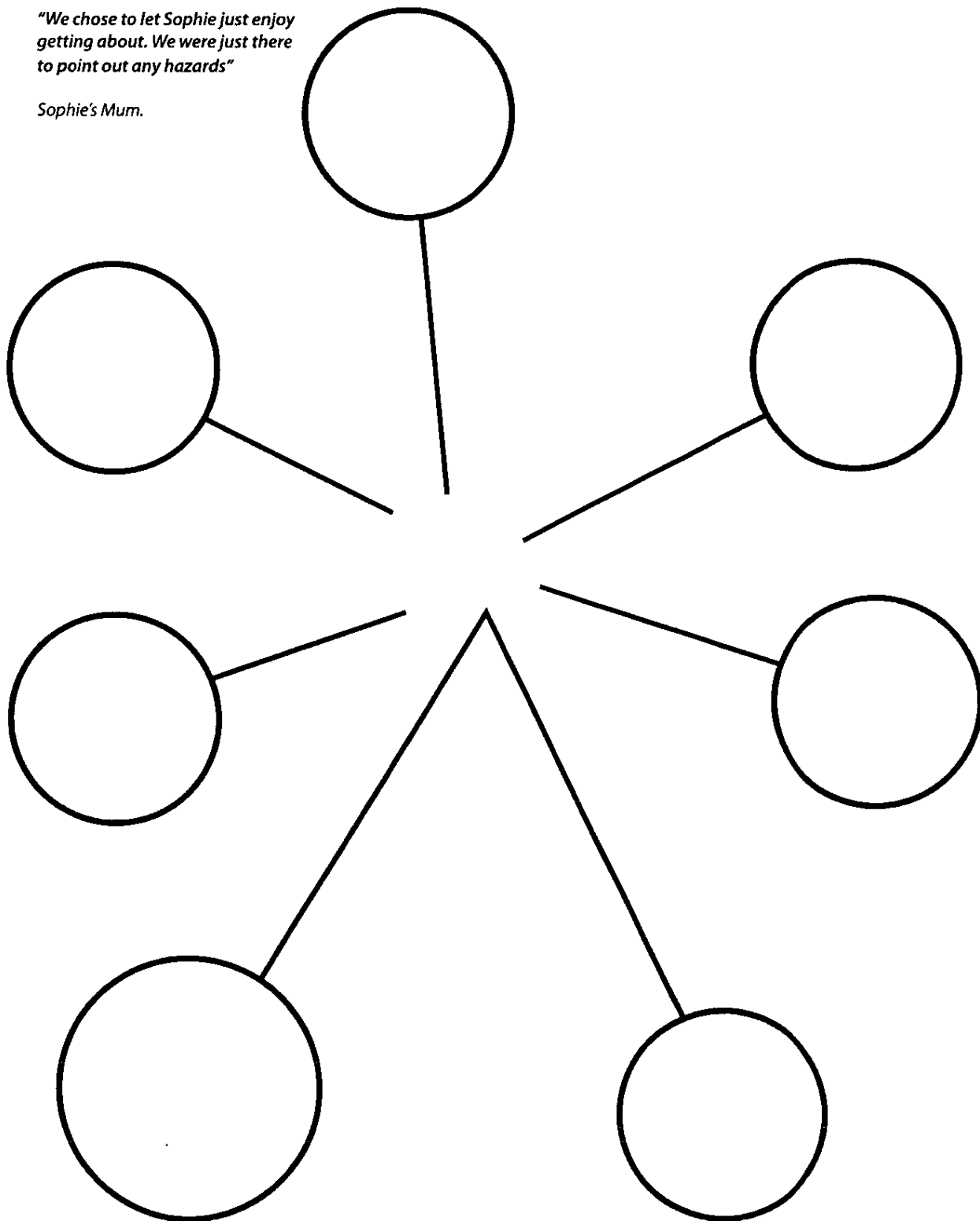
Sophie is unable to walk, and this lack of mobility during her young formative years could have a major effect on her development. Wizzy has transformed all that!

*"Sophie learned to control the Wizzybug quickly....didn't need any encouragement"*

*"It gave her the freedom to play without us being on top of her. It gave Sophie her own space."*

*"We chose to let Sophie just enjoy getting about. We were just there to point out any hazards"*

*Sophie's Mum.*



## Introduction

Over the last few years we have been heavily involved in designing assistive technology for people with dementia. We pioneered the development of "smart" homes for people with dementia, and we are currently engaged in evaluating smart home installations. Our links with people with dementia and their professional and personal carers has spawned a whole series of other projects. These projects are described below, together with further work on simple stand-alone technology.

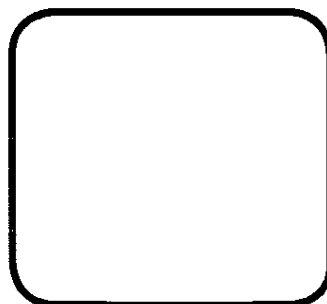
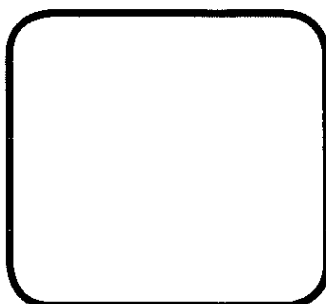
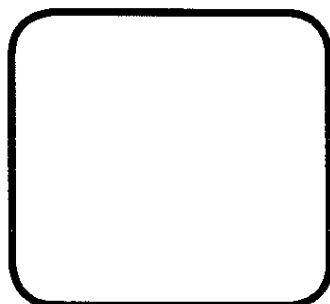
## Smart Home

The smart house uses sensors to monitor the occupant's behaviour and responds to problem situations by activating support devices, such as automatic lighting, or verbal prompts to discourage night time wandering. Our original project, known as the Gloucester Smart House, saw the development of a wide range of sensors and support devices, driven by the results of a needs-survey run with personal carers of people with dementia. The work used a design philosophy which attempted to generate designs that emulated the techniques used by personal carers when dealing with these problems. In this way the technologies were very user-friendly, and aimed to promote the dignity and self-reliance of the person with dementia in their own home. The new technologies do not rely on the use of call centres, like telecare, but rather encourage the users themselves to deal with problem situations through verbal prompts using the recorded voice of a trusted carer, and provide backup if this is not possible.

## Smart home evaluations

A complete autonomous smart home has been installed in a care home in Deptford in London, and was used by a client for over a year. He was well supported by the technology and able to enjoy much independence. His sleep improved, he was much more continent, and his night-time wandering was much reduced. This was a very satisfying outcome for a major BIME project, and a large amount of data was collected and analysed. A further installation has been provided in a care home in Bristol, this time using radio-based equipment so no extra wiring is needed. The tenant was again well supported for about a year. She has a less developed dementia than our Deptford client, and was well able to report her feelings about the support equipment.

The two evaluations have enabled the technology to be refined to a level of maturity where we are quite happy for it to be installed in people's own homes, and we are currently seeking support for this work. Enabling people to stay in their own home for as long as possible was a primary aim of the work we have been doing. We need to continue to provide the evidence needed for manufacturers and care professionals to adopt the new technology.



## SMART HOUSE FOR PEOPLE WITH DEMENTIA

*"It's very useful ... yes to ... if you get out of bed it's dark and you can't see where you are and what you are about and it is a good thing to have the lights come on"*

Direct quote from tenant

*"The data logging has provided more information about his lifestyle which has helped our understanding i.e. his restlessness at night and tiredness during the day and the technology can then be set to address the situation and improve quality of life by reminding him to go back to bed if he is up for longer time periods at night"*

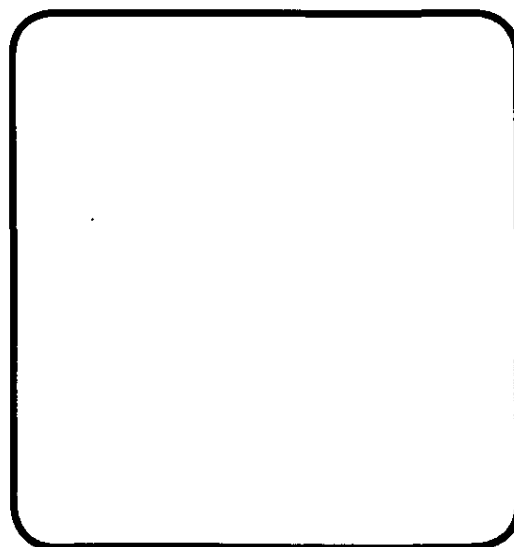
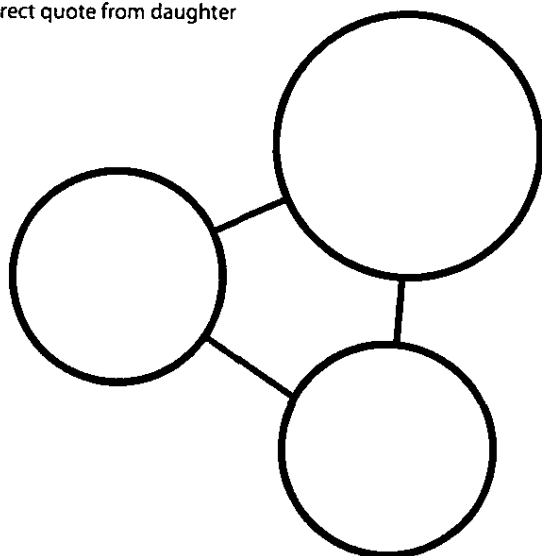
Direct quote from daughter

*"It has stopped him going out of the door where they might have been chasing him off round the building..."*

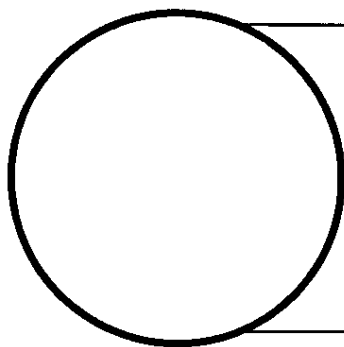
Direct quote from daughter

*"I feel the messages are particularly important because dad has no short term memory and because of this you can normally tell him what to do or direct him where to go and he will not resist but will follow easily. The messages give him the right commands at the most crucial time which is what he needs."*

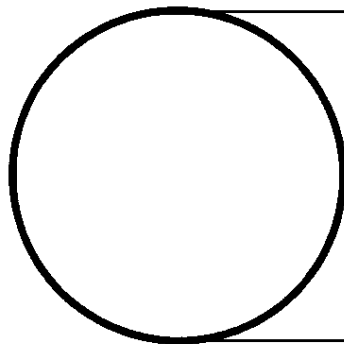
Direct quote from daughter



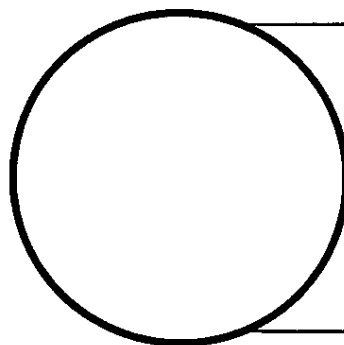
Our tenant in London had quite a severe dementia but was supported for over a year by the technology installed in his apartment. His sleeping improved markedly, he was no longer incontinent, and his wandering out at night was much reduced.

**ENABLE**

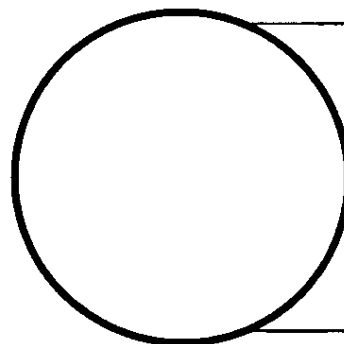
This was a project funded by the European Commission to explore the impact of simple technologies on the quality of life of people with dementia and their carers. It involved several EU countries and our contribution was the development of several items of technology

**INDEPENDENT**

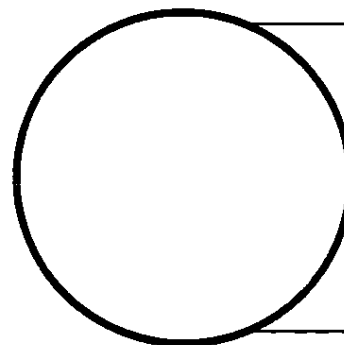
The INDEPENDENT project was a collaboration between ourselves and other groups from Liverpool and Sheffield Universities. The project looked at how technology can more directly be used to improve the quality of life for people with dementia. The work started with a thorough survey to try and identify issues that are important to people with dementia as far as quality of life is concerned. These issues were used to generate a large number of potential items of assistive technology, and four of these were selected for design and development work at BIME; a simple music player, a conversation prompter, a sequence support device, and a "window-on-the-world" social inclusion device.

**Prompts and reminders**

This project is being run in collaboration with psychologists from the University of St. Andrews, and is supported by the American Alzheimer's Society. It aims to investigate the best ways of providing prompting to people with dementia, to give them guidance and help them with carrying out tasks. Some prompting technology already exists, but there are currently no guidelines about which types of prompting (verbal, written) are the most successful.

**Reducing Social isolation**

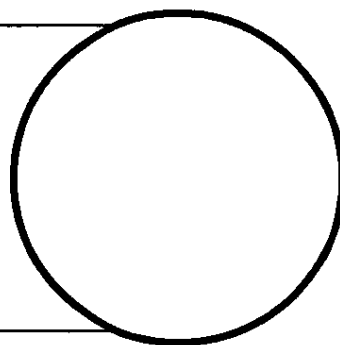
The INDEPENDENT project summarised above looked at trying to enable a virtual visit for the person with dementia to the home of their family. A camera in the family home provided images via the internet to the person with dementia so they could see what was going on, and get a sense of immersion in the family environment. The control interface clearly needed more work, and we have just embarked on a study to look at designing a touch-screen device to enable a very intuitive interaction for the person with dementia.

**UK/Canada collaboration**

There is a small community of people now world-wide who are exploring the role of technology to support people with dementia. Some collaboration between 10 people in the UK and 10 colleagues in Canada has been aiming at facilitating ideas about joint research projects. We have had one meeting in Toronto and another with us in Bath. The collaboration is being led by us and the Intelligent Assistive Technology & Systems Lab, University of Toronto. This initiative had research council funding, and we are currently in the process of identifying specific research strands involving people in the two countries.

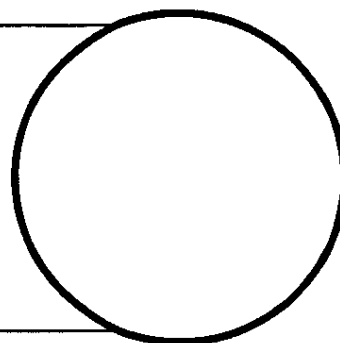
## Mains Monitor

Monitoring the lifestyle of the occupant is an important step in providing appropriate support. The mains monitor plugs into any mains socket and detects when an appliance, such as the kettle or TV, has been switched on or off. The information can be used to reassure the carer of the occupant's wellbeing.



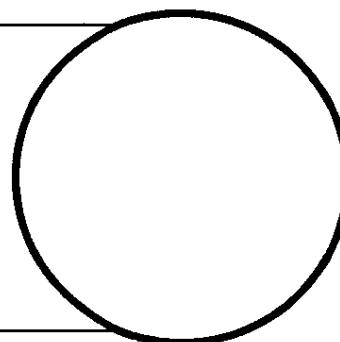
## Cooker Minder

BIME's extensive experience in developing cooker monitors for people with dementia has been consolidated into a single affordable device which is simple to install and use. The cooker minder detects smoke or unlit gas and switches the cooker off. The user can turn the cooker on by simply pushing a button, or a carer can be alerted remotely. The device includes a verbal and visual prompt system to guide the user if an incident occurs. An evaluation of the device is underway, the results of which will guide any further refinements.



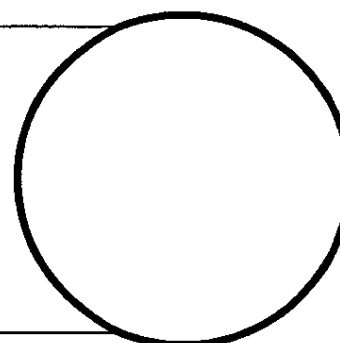
## Music Player

The simple music player aims to enable people with dementia to very simply access music of their choice whenever they want. A large amount of work has been put into developing suitable intuitive controls, which anyone can understand. The final device uses MP3 technology, and can store a large amount of music. The device has very simple means for turning on/off and for selecting music, and has successfully completed evaluations. We are currently liaising with the AT Care Centre in London to explore making this device available.



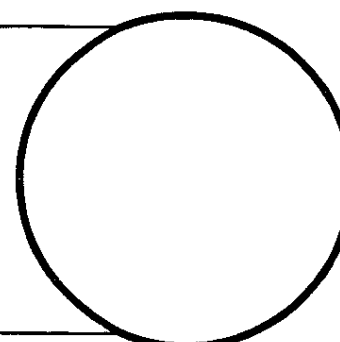
## Smart Taps

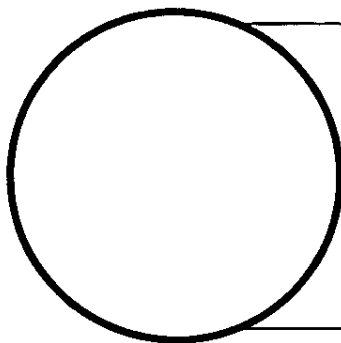
A "smart" tap has been designed primarily for use in our smart home installations. The new tap uses a series of ordinary on/off valves to provide electronic control of the water flow. Because of this capability the house is able to turn off the water in emergencies, whilst still enabling the user to subsequently operate the tap as normal. A new controller and the new flow control hardware have been tested, and the tap is ready for our next installation.



## Nightlight

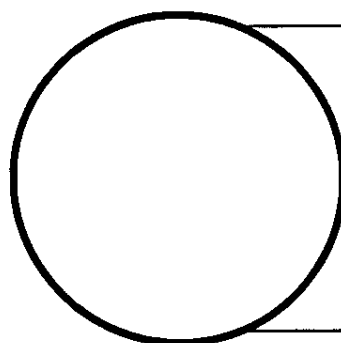
This lamp can be controlled by our Bed Occupancy Sensors to turn on and off as users get in and out of bed. It has been found to be very helpful to people with dementia to provide orientation at night and help prevent falls. Currently a new low voltage version is being developed to reduce production costs. User trials with this new version have proved successful.





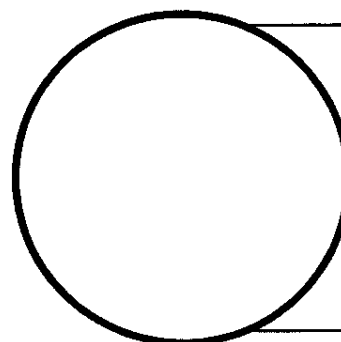
## **IMRT scanner**

Radiation therapy aims to destroy cancerous tissue while causing minimal damage to surrounding tissue. To ensure modern treatment techniques such as Intensity-Modulated Radiotherapy (IMRT) fulfil these aims, an accurate method of measuring the dose delivered is required. One technique uses radiation sensitive gels which alter their physical properties when exposed to radiation. This project aims to investigate changes in these gels using ultrasonic scanning. BIME is involved in providing engineering support to this project.



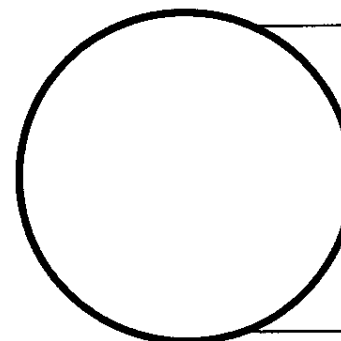
## **Three dimensional ultrasound of the hand**

Both MRI and Ultrasound have been shown to be very sensitive for detecting early signs of joint damage in rheumatoid arthritis, but due to high demand and expense MRI is currently unsuitable for routine use. This project has developed a three dimensional ultrasound system for the diagnosis of rheumatoid arthritis in the hand. The work is based at the Royal National Hospital for Rheumatic Diseases in Bath, and BIME has provided an imaging tank and hand support



## **Dynamic Heart Phantom**

This project originated as a referral from the Medical Physics Department at the RUH in Bath. We were asked to develop a beating-heart phantom for a gamma camera. The camera is used to provide images of the heart as it beats using a technique called gated SPECT. Our phantom enables the images to be calibrated so that the volume of blood pumped by the heart can be measured. The prototype device has performed well and its development is currently being finalised.

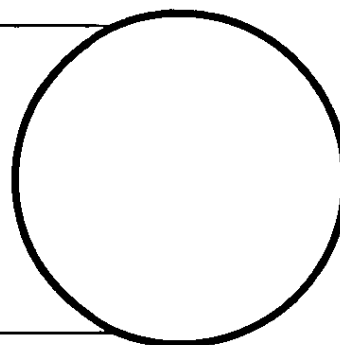


## **Bladder stone removal**

We have been liaising with the Bristol Urology Institute to look at devices to break up and remove bladder stones in an outpatient setting. Techniques for stone debris removal have been tested successfully, and means for breaking up larger stones are being examined. The work has excellent support from urologists in Bristol, and funding is currently being sought for a programme to fully develop the system.

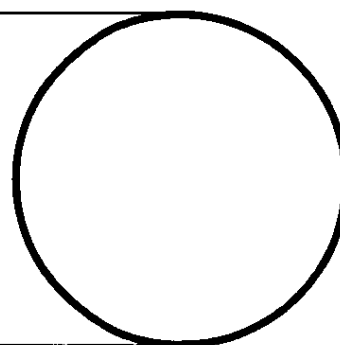
## Gait analysis

This collaborative project involves working with European Technology for Business (ETB) to investigate one of the applications for their newly-developed motion sensors. BIME is investigating the potential for using the leg-worn sensors to measure the gait of people who might be prone to falling. Measurement studies will be carried out to determine the best way to obtain clinically useful results, with the overall aim being to identify older people who are at risk of falls, and refer them to a specialist falls clinic before a fall occurs.



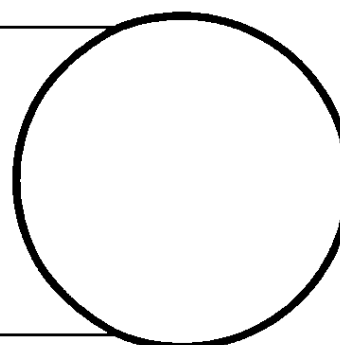
## Targeted Training

We are designing a prototype modular system that can be used to position and support children for use in Targeted Training at the Movement Centre in the National Orthopaedic Centre, Oswestry. Targeted Training is a physiotherapy regime where movement training of disabled children is focussed on one area of the body at a time. Our frame has to support the child in a standing position, but also has to enable their easy and safe manual handling. The prototype device is now with the Movement Centre who are trialling it with children.



## Projects with the South East NHS Innovations Hub

BIME has completed a feasibility study and is undertaking some design work for the South East NHS Innovations Hub. The work is commercially sensitive, but we can say that it is in collaboration with clinicians from the Basingstoke and North Hampshire NHS Trust, and is expected to lead to an innovative new product that will significantly reduce risks to many post-operative patients at home.



## Referrals

The Institute operates a funded referrals system for carrying out work for the Royal United Hospital medical physics and bioengineering department in Bath. Many of the projects are small adaptations and jigs, but some major ones include the heart phantom described above, and this has attracted further funding.



## **MAKING SUCCESSFUL DESIGNS AVAILABLE**

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A key aim of ours is to ensure all successful designs are made available to whoever can benefit from them. Some designs are licenced to manufacturers, but we also manufacture some items ourselves through our Production Unit, and sell them on a non-profit basis, either directly from BIME or through marketing companies. This work is undertaken to ensure that disabled people can benefit from all our successful designs, even those that are not commercially viable, and many have benefited from this activity. These items can be seen on our website, and some items from our catalogue are shown below.

**Toilet Handles**

**Comfort Potty Seat**

**Baby Walker**

**Prone Wedge Strap**

**Sit 'n' Ride Toy**

**Toilet Trainer**

**Reachstick**

**Noisy Ball**

**Bottom Wipers**

**Communicator Clamp**

**Handy Jack**

**Easy Grip Clamp & Paper Holder**

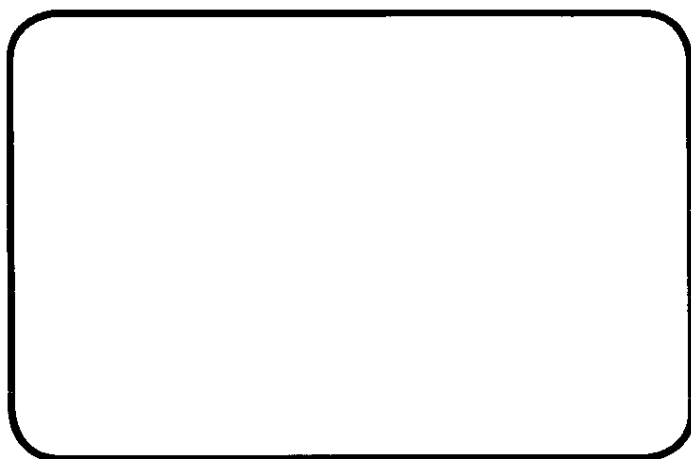
**Carer Alarm**

**Adult Walker**

The evaluation centre in BIME has been providing evaluation reports for the NHS for over 30 years. Funding for this work has been provided in recent years through the Centre for Evidence-based Purchasing (CEP), part of the Purchasing and Supply Agency (PASA). Although the core specialism of the Centre is infusion devices, the scope of the work has been much broader in recent years with evaluation studies commissioned on a wide range of equipment. The BIME Centre has been one of the most successful of those supplying the CEP, and over the last year six evaluations were completed, all with reports published, as described below.

1. **Buyers' guide "Portable Pumps for Home Parenteral Nutrition"** covers technical, operational, economic and purchasing issues related to portable ambulatory pumps for provision of Total Parenteral Nutrition (TPN) therapy to patients in home settings, with a review of all TPN pumps currently available in the UK.
2. **Buyers' guide "Add-on power devices for manual wheelchairs"** provides a comprehensive guide for the currently available add-on power devices that can be attached to manual wheelchairs to offer powered mobility, again with a comprehensive review comparing technical information on the available devices.
3. **Buyer' guide "Dose error reduction systems for infusion pumps"**. A detailed market review is provided, presenting comparative data for each of the systems available in the UK, including data on the technical specifications and usability issues.
4. **Buyers' guide "Urodynamic systems"** discusses different types of systems currently available, and provides readers with the relevant information regarding technical, operational, economics and purchasing issues.
5. **Buyers' guide "Ambulatory syringe drivers"** contains detailed information on the available models of small size portable syringe pumps, widely used in the UK in symptom management for cancer patients and palliative care. The buyers' guide compares all syringe drivers available in the UK, and includes results of a usability assessment and a user survey.
6. **Evaluation report "AD Ambulatory Syringe Driver"** provides the results of a full-scale technical evaluation of this battery-powered syringe pump that is relatively new to the market. The report also offers the results of the user survey and usability assessment.

Following reorganisation of the way the CEP manages evaluation work the BIME Evaluation Centre is no longer getting work directly from it, and it is now able to offer free-lance evaluation work for a number of organisations. A successful series of evaluations were completed for a major clinical trial in Europe, and several others are being considered. The lab is a major centre of expertise in the UK in infusion pumps, and the reputation and respect it has earned over the years in this field, as well as the large number of clinical contacts it has amassed, is being used to attract sub-contract studies from a number of organisations. The Centre looks forward to continuing to use its expertise to support future development of clinical devices through the professional evaluation service that it can offer.



## GOVERNANCE AND COUNCIL

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The governing documents of the Institute are the Memorandum of Association and Articles of Association. The Memorandum was revised in 2007 to bring it up to date, and the Articles have also been revised this year in line with best practice and legislative changes. The revisions to the articles followed an Effectiveness Review debated by Council. The revisions are fairly significant and aimed at ensuring that BIME has the most effective and efficient structure to be able to meet and exploit present and future opportunities and challenges. The amended versions of both the revised Memorandum and Articles has been filed with Companies House and the Charity Commission. The Company is Limited by Guarantee and as such has no share capital.

The Institute is managed by a Council of trustees which meets three times a year in addition to the AGM, with the day to day running invested in the Director. Two extra meetings have been held this year; a Planning Meeting convened to discuss the Effectiveness Review, and an EGM to discuss the draft revised Articles of Association. The Council members are elected by Council according to the charity's Articles of Association, bearing in mind the skill mix needed for effective management. Formal induction procedures are being discussed following the Effectiveness Review. Although the Institute is an independent legal entity, it has a longstanding association with the University of Bath. The University appoints members to the Council. The University provides management services to the Institute, and there are also technical links between the Departments of the University and the Institute. The Council has identified the major risks to which the Institute is exposed, and a policy is in place to mitigate those risks.

At the AGM in October it was unanimously resolved to re-elect Dr Nigel Harris to serve as a Member of Council for a further period of three years. It was noted that Dr A Clarke, Mr R Cross, Dr J Robertson and Dr N Nutt are standing down from Council, and we are very grateful for the long and loyal service they have all provided to the Institute. We greatly appreciate the assistance and dedication of all our Council members.

We are very pleased to announce that Baroness Masham has agreed to take on the office of President of BIME. Her very active membership of the House of Lords and her keen interest in health and disability matters makes us very pleased indeed to welcome her to the Institute.

### Projects committee

The Projects Committee kept all the above projects under active review, under the Chairmanship of Dr A K Clarke. Dr Clarke has now stood down as Chairman and his successor is Mr Richard Oldale. We are extremely grateful to Dr Clarke for his longstanding Chairmanship of this important committee of the Institute, and thank him for the support and guidance he has provided. Dr Okirie has also stood down from the projects committee, and we are very grateful for his support. The Projects Committee serves a very important role in bringing a wide range of expertise and experience to comment on the project work of the Institute, and to guide its programme of activities. We are very grateful to the members of the Committee for their valuable support and advice, and the time they give to this work.

### Finance

The last year has been a difficult one for the charity from a financial point of view. The work of the Institute ranges from short, relatively simple, projects to some quite sophisticated and longer-term pieces of work. To finance such projects support is sought from both charitable sponsors and grant awarding bodies. Both sources have become increasingly competitive. The general economic downturn has led to less funding being available for charitable organisations, and the Institute has been unable to maintain the growth over recent years in its charitable income. We are fortunate that through our association with University of Bath we have been able to attract grant funding for some of our longer-term projects, and our reputation in the dementia care field has assisted with this activity. However several of the grants awarded last year didn't get started until quite late in the year which also adversely affected our income. Additionally, the coming to an end of a major contract with the NHS has led to the loss of some overhead support. So the last year has been a challenging one financially, and has resulted in a significant negative balance which is clearly of concern. Our reserve policy has enabled us to cover the losses but this cannot be sustained. A financial review was completed towards the end of the year with several actions concluded in order to bring our finances back onto a sustainable course. Initiatives for increasing both our appeal income and our grant income are being pursued, together with alternative sources of income through sub-contract activities. Better financial controls are being implemented to ensure our production activities fully meet our aim of keeping this aspect of our work cost neutral. The impact of all these measures will be closely monitored to provide timely guidance on decisions over further costs savings.

The bulk of our income (and associated expenses) listed under consultancies, royalties and sales in our accounts relates to sales made through BIME's Production Unit. This activity forms a vital part of our ensuring successful designs are made available to those who can benefit. Sales of successful designs are made on a non-profit basis.

Our work is supported by a large number of generous sponsors. May we express our warm thanks to the many sponsors listed on the last page of this report who have kindly supported us this year. They have enabled us to maintain our work on the many projects that are described above, and their support has enabled the improvements in quality of life that we seek for our clients.

### Reserves

We are committed to a programme of design project work, and a key requirement to enable this work to be completed is the high level of skill brought by the engineering team. It is crucial to the success of BIME's activities to have the mix of professional design skills that enables us to tackle the variety of projects with which we are presented, and to do so with the necessary level of sensitivity and

understanding of the problems faced by the people we support. In order to attract and maintain the high level of engineering design skills needed to ensure completion of the programme underway at any given time, it is important that we are able to provide a degree of security for these employees. Consequently the Institute's reserve policy identifies a reserve level of £500,000 that can provide this security, together with provision to cover redundancy payments. In addition a provision to maintain the running costs of the Institute for one year is included, and a reserve to cover the replacement of major capital equipment. This is a lower figure than previously and so the accounts provide for the balance to be transferred to unrestricted funds. The reserve policy is reviewed annually.

### **Financial and legal support**

Although the Institute manages its own accounts and financial arrangements, it purchases some accounting support from the Finance Department at the University of Bath. The Institute banks with Barclays Bank plc, 1 Churchill Place, London E34 5HP, and the accounts were audited by R.S.Porter & Co, Chartered Accountants, of 77/81 Alma Road, Bristol BS8 2DP, to whom we are very grateful. Legal support for amending the Memorandum and Articles of Association was through solicitors Stone King, 13 Queen Square, Bath, BA1 2HJ.

## **EDUCATIONAL AND PROFESSIONAL ACTIVITIES**

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Our Memorandum of Association includes an educational role for the Institute's work, and several activities have been carried out during the year.

### **Annual Lecture**

Our 40th Annual Lecture was presented by Professor Tom Kirkwood, Director of the Institute for Ageing and Health at Newcastle University. He presented a lecture entitled "Engineering a better quality of older life" that was very much enjoyed. The Annual Lecture for 2009 will be given at the University of Bath on Friday 23rd October by Dr Alan Cottenden, Senior Lecturer in Medical Physics at University College London. We are sure we can look forward to another interesting lecture.

### **Training**

It is important that the expertise we have at BIME is used to guide future generations of young engineers who wish to enter our profession. During the year we have undertaken several activities.

- Advice for several undergraduate design projects
- A complete rehabilitation engineering module was run by staff at BIME for undergraduates in the Department of Mechanical Engineering at Bath University
- Two students were welcomed on placement at BIME as part of their Part 1 training under the IPeM vocational training scheme for Clinical Scientists
- Provision of lectures for the Masters course for rehabilitation engineers being run at King's College London
- Provision of lectures for students at Coventry University studying for the Postgraduate Certificate in the Effective Use of Assistive Technologies
- Provision of Smallpiece masterclass at the University of Southampton.

BIME's training activities are supervised by Mike Hillman, and the undergraduate course is coordinated by Tim Adlam. Both activities are felt to be an important contribution to the next generation of medical engineers in the UK.

### **Professional activities**

Several staff members are involved in various professional bodies in the UK and some international ones.

- Mike Hillman is a member of the Medical Engineering Division Board of the IMechE (Institution of Mechanical Engineers)
- Mike Hillman is an IPeM examiner for part 1 Trainees in "Assistive Technology" & "Medical Engineering Design"
- Tim Adlam is the secretary of the Engineering Group Board of the Institute of Physics and Engineering in Medicine
- Tim Adlam is a member of the programme committee for 3rd Workshop on Behaviour Monitoring and Interpretation - Well Being, Paderborn, Germany
- Tim Adlam is a member of US Alzheimer's Association Working Group on Technology
- Roger Orpwood is a member of the International Editorial boards of the journals, Medical Engineering and Physics, and Integrative Neuroscience
- Roger Orpwood is a member of the Academy of Medical Science's working group considering ageing issues
- Lena Skryabina is a member of the British Standards Committee on infusion devices
- Lena Skryabina sits on the committee of the Infusion Devices e-Learning Programme Expert Reference Group.

## PRESENTATIONS AND PUBLICATIONS

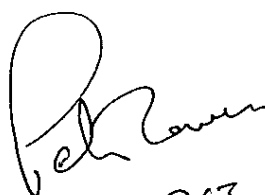
Although the key outcomes of BIME's work are new devices that can help improve quality of life for disabled people and patients, it is also important for our work to be presented at scientific conferences and through publications. All presentations in other countries and many in the UK are funded by grants.

### Presentations

- Adlam T, Orpwood R, Wisbeach A (2008). "Design Considerations in Compliant Seating for Children with Whole Body Extensor Spasms" Recent Advances in Assistive Technology and Engineering, Coventry.
- Adlam T, Orpwood R, Wisbeach A, (2008) "Bending with the Wind: Compliant Seating for Children with Whole Body Extensor Spasms", Ann. Conf. IPEM, Bath.
- Adlam T (2008), "Living in a Future Smart House for People with Dementia", Ann. Conf. IPEM, Bath
- Carey-Smith B, Adlam T, Orpwood R, Evans N (2009), "Building a Robust Evaluation of Smart House Technology for People with Dementia", International Workshop on Technologies to Counter Cognitive Decline, London.
- Halsey S, (2008). "Paediatric equipment past, present and future, and BIME," Ann Sci Meet IPEM, Bath
- Hillman M, (2008). Intelligent wheelchair control - Advanced concepts in wheelchair design. Invited speaker at British Society of Rehabilitation Medicine Spring Conference, Birmingham
- Hillman M (2008). What a Part 1 examiner is looking for. IPEM Engineering Trainee Study Day, Cardiff
- Hillman M (2008). Getting new Assistive Technology designs into production. IPEM Annual Scientific Meeting, Bath
- Orpwood R, Chadd J, Howcroft D, Sixsmith A, Torrington J, Gibson G & Chalfont G (2008). User-led design of technology to improve quality of life for people with dementia. 4th Cambridge Workshop on Universal Access and Assistive Technology, Cambridge
- Orpwood R (2008). Reflections on assistive technology. Annual Scientific Meeting of the Institute of Physics and Engineering in Medicine, Bath
- Orpwood R (2008). The impact of autonomous smart homes on the independence of people with dementia. SPARC workshop on "Technologies for health, rehabilitation and self-management of long term conditions, Bath.
- Orpwood R (2008). Evidence of the benefits for people with dementia of autonomous smart home installations. Invited lecture at Assistive and Telecare Technologies research: achievements and new directions, Sheffield.
- Orpwood R (2008). Wireless smart homes and devices for the elderly. The 3rd Annual European Congress on Wireless and Digital Cities. Barcelona.
- Orpwood R (2009). Technologies for healthy living and well-being. Bridging the gaps meeting at the RUH, Bath
- Orpwood R (2009). Experience of using technology for people with dementia. Research Institute for the Care of Older People Conference, Bath
- Orpwood R (2009) Involving people with dementia in the design of new technologies. KT-EQUAL workshop on "Enabling people with dementia and their carers through use of new technologies", Reading.

### Papers

- Adlam, T (2008) "Using Shape Memory Alloys", Catalyst: Secondary Science Review, 19, 4-6.
- Chan J, Davey C, Wilson S, Skryabina E. (2008) Buyers' guide "Add-on power devices for manual wheelchairs": (CEP 08033:London)
- Davey C, Skryabina E, Chan J, Wilson S (2008). Buyers' guide "Portable Pumps for Home Parenteral Nutrition": (CEP:London)
- Orpwood R, Adlam T, Evans N, Chadd J and Self D (2008). Evaluation of an assisted - living smart home for someone with dementia. Journal of Assistive Technologies, 2, 13- 21.
- Orpwood R, Chadd J, Howcroft D, Sixsmith A, Torrington J, Gibson G and Chalfont G (2008). User-led design of technology to improve quality of life for people with dementia. In "Designing Inclusive Futures" eds P Langdon, J Clarkson and P Robinson. (Springer-Verlag:London). pp185-195.
- Orpwood R (2009). The use of Smart Technology in the Management and Rehabilitation of Executive Disorders. Invited Chapter in "The Rehabilitation of Executive Disorders - a guide to theory and practice", eds M Oddy & A Worthington. (OUP:Oxford). pp.233-254
- Orpwood R (2009). Involving people with dementia in the design process - examples of iterative design. In "Dementia, Design and Technology - time to get involved" eds P Topo and B Ostlund. Assistive Technology Research Series Vol 24. (IOS:Amsterdam) pp79-95
- Orpwood R, Chadd J, Howcroft D, Sixsmith A, Torrington J, Gibson G and Chalfont G (2009). Designing Technology to Improve Quality of Life for People with Dementia: User-led approaches. "Universal access in the Information Society". (in press)
- Skryabina E, Chan J. (2008) Buyers' guide "Ambulatory Syringe Drivers": (CEP:London)
- Skryabina E, Chan J. (2009) Evaluation report "AD Ambulatory Syringe Driver": (CEP:London)
- Swithinbank L, Gammie A, Skryabina E, Chan J, Wilson S, Davey C. (2008) Buyers' guide "Urodynamic systems": (CEP:London)
- Wilson S, Davey C. (2008) Buyers' guide "Dose error reduction systems for infusion pumps": (CEP:London)

  
23 Oct. 2009

Company law requires the Council to prepare accounts for each financial year which give a true and fair view of the state of affairs of the company and of the surplus or deficit of the company for that period. In preparing those accounts, the Council is required to:

- Select suitable accounting policies and then apply them consistently
- Make judgements and estimates that are reasonable and prudent
- Follow applicable accounting standards, subject to any material departures disclosed and explained in the accounts
- Prepare the accounts on the going concern basis unless it is inappropriate to presume that the company will continue in business.

The Council is responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the company and to enable it to ensure that the accounts comply with the Companies Act 1985. It is also responsible for safeguarding the assets of the company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

**Auditors**

R. S. Porter & Co. have expressed their willingness to continue in office and a resolution to re-appoint them will be proposed at the annual general meeting.

**The Council submits its report together with the audited financial statements for the year ended 31 March 2009**

**By order of the Council**

**M G W Humphriss**

**Honorary Secretary 8 June 2009**

ACCOUNTS

**Independent Auditors' Report to the members of Bath Institute of Medical Engineering Limited**

We have audited the financial statements of Bath Institute of Medical Engineering Limited for the year ended 31st March 2009 which comprise the Statement of Financial Activities and Balance Sheet and related notes. These financial statements have been prepared under the historical cost convention and the accounting policies set out therein.

**Respective responsibilities of the Council and auditors**

The Council members, who are also the directors of Bath Institute of Medical Engineering Limited for the purposes of company law, have responsibilities for preparing the Council's Annual Report and the financial statements in accordance with applicable law and United Kingdom accounting standards. These are set out in the Statement of Council's Responsibilities.

Our responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and United Kingdom Auditing Standards.

We report to you our opinion as to whether the financial statements give a true and fair view and are properly prepared in accordance with the Companies Act 1985. We also report to you if in our opinion the Council's Annual Report is not consistent with the financial statements, if the charity has not kept proper accounting records, if we have not received all the information and explanations we require for our audit, and if information specified by law regarding the Council's remuneration and transactions with the charity is not disclosed.

We read other information contained in the Council's Annual Report, and consider whether it is consistent with the audited financial statements. We consider the implications for our report if we become aware of any apparent misstatements or material inconsistencies with the financial statements. Our responsibilities do not extend to any other information.

**Basis of opinion**

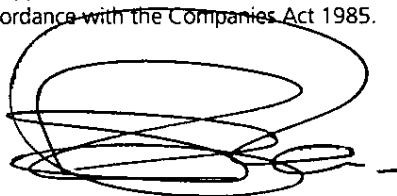
We conducted our audit in accordance with United Kingdom Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgements made by the Council in the preparation of the financial statements, and of whether accounting policies are appropriate to the Charity's circumstances, consistently applied, and adequately disclosed.

We planned and performed our audit so as to obtain all information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

**Opinion**

In our opinion, the financial statements give a true and fair view of the state of affairs of the Charity as at 31st March 2009 and of its incoming resources and application of resources, including its income and expenditure, for the year then ended and have been properly prepared in accordance with the Companies Act 1985.

**R. S. Porter & Co.**  
**Chartered Accountants**  
**77/81 Alma Road**  
**Clifton**  
**Bristol BS8 2DP**



**14 May 2009**

## STATEMENT OF ACCOUNTING POLICIES

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**This Statement of Accounting Policies forms part of the Accounts.**

- (a) **Accounting convention**  
The accounts have been prepared in accordance with the historical cost basis of accounting and in accordance with Statement of Recommended Practice "Accounting by Charities" Revised 2005.
- (b) **Taxation**  
No provision for taxation, deferred or otherwise, has been provided in these accounts as the Institute is a registered charity (registered number 256335) and is therefore exempt from taxation (other than Value Added Tax) under Section 505 of the Income and Corporation Taxes Act, 1988.
- (c) **Assets received as donations**  
No assets have been donated to the Institute, other than financial donations.
- (d) **Cash flow statement**  
No cash flow statement has been prepared as it is considered that no material benefit would be derived from such a statement.
- (e) **Sponsored research**  
Income from sponsored research is the recovery of direct expenditure incurred during the year and overheads relevant to that year.
- (f) **Replacement of assets**  
Items of equipment are expensed and charged through the Statement of Financial Activities. However, motor vehicles are capitalised and depreciation charged over the expected operational life of the asset.
- (g) **Investments**  
Dividends and interest from investments are credited to income on receipt and include the associated income tax credits.  
  
Investments are shown in the Balance Sheet at the mid-market price quoted by the London Stock Exchange. Gains and losses on the revaluation and realisation of investments are credited to the Investment Fund in the Statement of Financial Activities.
- (h) **Restricted Funds**  
For research projects, expenditure is direct costs including all contracted staff hours. Income is the income from research councils to cover the direct costs.  
  
For restricted projects, expenditure is the total of all invoiced costs plus all recorded staff hours spent on the project with a 45% charge to cover support costs and overheads. Income is the donated income specified for each project, received in the year.
- (i) **Designated Funds**  
The Council of the Institute exercises its discretion in the creation of designated funds to meet future expenditure and in the utilisation of those funds. Any annual surplus on the Statement of Financial Activities transferred to the Accumulated Fund is shown after making transfers between funds.
- (j) **Incoming Resources**
  - a) Donations, bequests, grants and subscriptions are accounted for as soon as their amount and receipt are reasonably certain. For unsolicited donations, this is when received.
  - b) Interest is accounted for in the period it is receivable.
  - c) Consultancy, sales and royalties are accounted for in the period in which the relevant goods or services have been provided. Contractual income received in advance has been deferred.
  - d) Intangible Income.
- (k) **Resources Expended**  
All expenses are accounted for on an accruals basis. Direct and indirect charitable expenditure represents expenditure in the furtherance of the work of the Institute. Fund raising expenditure consists of appropriate printing and postage costs and a proportion of administration costs.



# STATEMENT OF FINANCIAL ACTIVITIES

YEAR ENDED 31 MARCH 2009

		Unrestricted Funds	Restricted Funds Research	Restricted Funds Projects	Designated Funds	Total Funds 2009	Total Funds 2008
INCOME AND EXPENDITURE	Note	£	£	£	£	£	£
<b>INCOMING RESOURCES</b>							
Donations		147,069		28,080		175,149	178,903
Grants for sponsored research			275,079			275,079	273,295
Subscriptions		126				126	142
Interest		41,285				41,285	51,399
Consultancies, sales and royalties		246,482				246,482	158,054
<b>Total Incoming Resources</b>		<b>434,962</b>	<b>275,079</b>	<b>28,080</b>	<b>0</b>	<b>738,121</b>	<b>661,793</b>
<b>RESOURCES EXPENDED</b>							
Direct expenditure on general activities:							
Salaries and Wages	5	271,558				271,558	327,657
Materials and Equipment		165,822				165,822	89,478
Direct expenditure on sponsored research:							
Salaries and Wages	5		248,534	38,016		286,550	245,426
Materials and Equipment			2,020	476		2,496	5,614
Administration, exhibitions and professional fees			10,623			10,623	14,646
Travelling and conferences			13,902	84		13,986	7,609
Indirect expenses:							
Rent	6	321				321	192
Premises		9,131				9,131	9,289
Administration, exhibitions and professional fees	7	28,083				28,083	16,016
Travelling and conferences		10,640				10,640	6,443
Fund Raising Expenditure							
Salaries		12,521				12,521	11,611
Materials and equipment		6,342				6,342	5,006
		<b>504,418</b>	<b>275,079</b>	<b>38,576</b>	<b>0</b>	<b>818,073</b>	<b>738,987</b>
		(69,456)	0	(10,496)		(79,952)	(77,194)
<b>NET INCOMING (OUTGOING) RESOURCES</b>							
For the year from continuing operations							
Realised							
Write-back previous years' unrealised gains							
Unrealised		(77,553)	0		0	(77,553)	(21,762)
		(147,009)	0	(10,496)	0	(157,505)	(98,956)
Transfer to restricted project funds as opening balance		(11,215)		11,215			
Transfer to restricted project funds for yr 08/09	13	(13,353)		13,353			
Transfer from designated fund to unrestricted	12	474,000			(474,000)		
<b>31 March 2008</b>		<b>17,976</b>			<b>974,000</b>	<b>991,976</b>	<b>1,090,931</b>
<b>31 March 2009</b>		<b>320,399</b>	<b>0</b>	<b>14,072</b>	<b>500,000</b>	<b>834,471</b>	<b>991,975</b>

# BALANCE SHEET


31 MARCH 2009

	Note	Unrestricted Funds £	Restricted Funds £	Designated Funds £	Total Funds 2009 £	Total Funds 2008 £
<b>FIXED ASSETS</b>						
Quoted Investments	9			319,545	319,545	397,098
Motor Van		3,818			3,818	5,090
		<u>3,818</u>	<u>0</u>	<u>319,545</u>	<u>323,363</u>	<u>402,188</u>
<b>Current Assets:</b>						
Debtors Sundry		150,169			150,169	127,436
Pre-payments		291			291	285
University of Bath	10	0			0	0
Money Market deposits		249,633	14,072	180,455	444,160	608,221
Bank balances		36,367			36,367	24,944
Petty Cash		22			22	42
		<u>436,482</u>	<u>14,072</u>	<u>180,455</u>	<u>631,009</u>	<u>760,928</u>
<b>Current liabilities:</b>						
Creditors and Accruals	11	(119,901)	0	0	(119,901)	(171,141)
		<u>316,581</u>	<u>14,072</u>	<u>180,455</u>	<u>511,108</u>	<u>589,787</u>
<b>Net current assets</b>		<u>316,581</u>	<u>14,072</u>	<u>180,455</u>	<u>511,108</u>	<u>589,787</u>
<b>Total assets, less current liabilities</b>		<u>320,399</u>	<u>14,072</u>	<u>500,000</u>	<u>834,471</u>	<u>991,975</u>
<b>Represented by:</b>						
Accumulated Fund		320,399	0		334,471	17,975
Designated Funds	12			500,000	500,000	974,000
		<u>320,399</u>	<u>0</u>	<u>500,000</u>	<u>834,471</u>	<u>991,975</u>

Approved by Council on 8 June 2009

P Lawes  
Chairman

Dr P. T. MAGEE  
Vice Chairman

  
23 OCT 2009

ACCOUNTS

# NOTES TO THE ACCOUNTS

YEAR ENDED 31 MARCH 2009

## 1. LIMITATION BY GUARANTEE

The Company is Limited by Guarantee and as such has no share capital. Under the Constitution, each member of the Institute is liable to contribute £10 in the event of winding up.

The number of members as at 31.03.09 is:

2009	2008
15	14

## 2. CHARITABLE STATUS

The Company is a registered charity (no 256335).

## 3. COUNCIL

No remuneration is payable to the members of the Council of the Institute.

## 4. INTANGIBLE INCOME

There is no intangible income

## 5. EMPLOYEES

Particulars of employees are as shown below:

Wages and Salaries

Social Security Costs

Other Pension Costs

£	£
473,316	498,144
33,666	34,967
63,647	51,583
<u>570,629</u>	<u>584,694</u>

No employee earns more than £60,000 per year.

## 6. LEASEHOLD PROPERTY

A lease of the property at the Medical Sciences Centre was entered into on 26 May 1995.

By the terms of the lease, the annual rent is set at £180 (Excluding VAT). The lease expires on 28 September 2067. There were no capital costs to the Institute. A separate lease charge is paid for one extra room in the Wolfson Centre

## 7. AUDIT FEES

Audit fees of £350 are included under the heading of Administration, Exhibitions and Professional Fees.

## 8. DIRECTORS' AND OFFICERS' LIABILITY INSURANCE

The Institute has effected Directors' and Officers' Liability Insurance cover.

This is included within the University of Bath Insurance policy, for which there is no additional charge incurred by the University.

## 9. QUOTED INVESTMENTS

Value @ 31.03.08

Unrealised Gains/(Losses)

Value @ 31.03.09

£
397,098
(77,553)
<u>319,545</u>

The Investments are shown in the Balance Sheet at market value.

## 10. RELATED PARTY

For administrative purposes the Institute's staff payroll is processed through the University of Bath.

Salary costs are invoiced by the University to BIME. Consumable items and stationery are charged at cost; the total of these charges is insignificant.

## 11. CREDITORS AND ACCRUALS

VAT

Sundry Creditors

Accruals

£	£
15,156	16,422
49,076	54,033
55,669	100,868
<u>191,901</u>	<u>171,141</u>

## 12. DESIGNATED FUNDS

The Institute has considered the appropriate level of reserves to be designated and concluded that £500,000 is the appropriate level at this time. This has been calculated as the cost if all staff had to be made redundant, basic salary and running costs for 1 year, with a modest balance for capital replacement. Funds for short-term engineering appointments

Balance on reserve: 31.03.08  
Transfer to Unrestricted funds  
Balance on reserve: 31.03.09

£
974,000
(474,000)
<u>500,000</u>

### 13. RESTRICTED FUNDS

Following internal review it has been felt necessary to create restricted funds for all projects supported by specific donations. A restated opening balance has been created for these funds based on analysis of donated income and expenditure for previous years for these projects.

Restricted Funds - 2008/09

Fund	BF 0708	Expenditure	Income	Transfer from/ (to) general	CF 0809
RESEARCH	£	£	£	£	£
Somnia (ESRC)	-	(47,386.00)	47,386.00	-	-
Compliant Seat (AMR)	-	(16,418.00)	16,418.00	-	-
UK/Canada dementia workshop (EPSRC)	-	(10,215.00)	10,215.00	-	-
Gait Trainer (TSB/ALIP)	-	(12,556.00)	12,556.00	-	-
Dementia prompting (ETAC)	-	(523.00)	523.00	-	-
NANA Nutrition (ESRC)	-	(359.00)	359.00	-	-
CEP-PASA Evaluation Centre	-	(168,265.00)	168,265.00	-	-
Video for Dementia (Pan Bath)	-	(8,107.00)	8,107.00	-	-
PBSPCRC Research support	-	(11,250.00)	11,250.00	-	-
<b>Total Research</b>		<u>(275,079.00)</u>	<u>275,079.00</u>		
PROJECT					
Cooker monitor	4,032.00	(8,548.00)	-	4,516.00	-
Low voltage night light	(3,319.00)	(3,655.00)	9,850.00	-	2,876.00
Dementia "How are they getting on"	-	(1,885.00)	1,750.00	-	(135.00)
School chair backrest	2,735.00	(128.00)	-	-	2,607.00
Toddler carrier	-	(3,028.00)	6,680.00	-	3,652.00
Wizzybug development	-	(13,837.00)	5,000.00	8,837.00	-
Wizzy walker	-	-	150.00	-	150.00
Wizzy User Guide	-	-	1,500.00	-	1,500.00
Long handled bottom wiper	2,500.00	(407.00)	-	-	2,093.00
Mobile sensory garden	965.00	(5,786.00)	3,150.00	-	(1,671.00)
Wheelchair carry-all	4,302.00	(1,302.00)	-	-	3,000.00
<b>Total Project</b>	<u>11,215.00</u>	<u>(38,576.00)</u>	<u>28,080.00</u>	<u>13,353.00</u>	<u>14,072.00</u>
Project Expenditure Breakdown					
	Labour	38,016.00			
	Materials	476.00			
	Travel	84.00			

### 14. SUPPORT COSTS

The following support costs are identified.

	£
Management - Director	31,518
Finance management	12,666
IT	3,428
HR (provided by University of Bath)	0
<b>Total</b>	<u>47,612</u>

ACCOUNTS

Under £200: 26 Donors

**DONATIONS RECEIVED**  
**Year Ended 31 March 2009**

The following were exceptionally generous in their donations:

The Hadley Trust	G M Morrison Charitable Trust
Roper Family Trust	Mason Bibby 1981 Trust
Emmandjay Charitable Trust	Mrs L D Rope Third Charitable Settlement
Charles Wolfson Charitable Trust	Imperial Tobacco Group Plc
Renishaw plc	Bonus Trust
Jenour Foundation	Basil Brown Charitable Trust
W G Edwards Charitable Foundation	Vivienne & Sam Cohen Charitable Trust
H B Allen Charitable Trust	Coutts Charitable Trust
CHK Charities Ltd	Dandia Charitable Trust
Barbara Ward Children's Foundation	Gilbert & Eileen Edgar Foundation
Elizabeth & Prince Zaiger Trust	Good Neighbours Trust
Ballinger Charitable Trust	Robert Kiln Charitable Trust
John Rayner Charitable Trust	Raymond & Blanche Lawson Charitable Trust
Edwin George Robinson Charitable Trust	Lynn Foundation
F H Muirhead Charitable Trust	MacCabe Family Charitable Trust
Jane Hodge Foundation	Next Retail Ltd
Col W W Pilkington Will Trust Pilkington Charitable Trust	St Jude's Trust
Chapman Charitable Trust	Staples Trust
Dorothy Howard Charitable Trust	Tensys Ltd
George John & Sheilah Livanos Charitable Trust	Wilkinson Charitable Trust
Dowager Countess Eleanor Peel Trust	Worshipful Company of Gardeners Charity Trust
PF Charitable Trust	Richard Cadbury Charitable Trust
Dr L H A Pilkington Charitable Trust	Harris & Sheldon Group Ltd
David Uri Memorial Trust	Waitrose
Bruce Wake Charitable Trust	Ethel & Gwynne Morgan Charitable Trust
Rotork Controls Ltd	Miss J M Bisgood
Sir James Reckitt Charity	Mrs A L K Cadbury
P F Edwards Charitable Trust	George Henry Collins Charity
Mr & Mrs J A Pye's Charitable Settlement	Dr J D Garnish
Bath Health District Social & Sports Club	Mr A Knowles
C Rowbotham Charitable Trust	A & S Lass Charities Ltd
Alchemy Foundation	Stannah Group
Anona Winn Charitable Trust	Stella Symons Charitable Trust
Armourers & Brasiers' Gauntlet Trust	Wessex Water
Arnold Burton 1998 Charitable Trust	Ardwick Trust
A M Fenton Trust	MODCARE - Bath
Greenhill House	Thomas Curtis Charitable Trust
Martin Isherwood Memorial Trust	Reuben Foundation
Kobler Trust	Cecil Rosen Foundation
Land Securities Group Plc	Towergate Charitable Foundation
Oakdale Trust	Michael & Anna Wix Charitable Trust
Mr Michael Pilch CBE	Worshipful Company of Engineers Charitable Trust Fund
Sir Jules Thorn Charitable Trust	
Tomkins Plc	
Dame Violet Wills Will Trust	

5 Donors wished to remain anonymous