

**COPUS** [http://www.royalsoc.ac.uk/copus/index.htm]
**Royal Society** [http://www.royalsoc.ac.uk/index.htm]
**Royal Institution** [http:// www.ri.ac.uk]
**British Association for the Advancement of Science** [http://www.britassoc.org.uk/ info/brithome.html]
**Royal Society of Chemistry** [http://www.rsc.org/]
**Institute of Biology** [http://www.primex.co.uk/iob/iob. html]

Ray Mathias

# From public understanding to accessibility of science

**I. PUS in the UK**

The present PUS initiative in the UK is typically traced back to 1985 and the report from a working party commissioned by the Royal Society to »review the nature and extent of Public Understanding of Science in the United Kingdom and its adequacy for an advanced democracy.« The exercise also reviewed »the mechanisms for effecting the public understanding of science and technology and its role in society« and »to consider the constraints on the processes of communication and how they might be overcome.« The working party took evidence from scientists, industrialists, journalists and other interested parties, but not members of the public. Among the report's conclusions was the exhortation to scientists that they »must learn to communicate to the general public… and… consider it their duty to do so«, while the »Royal Society should make improving the Public Understanding of Science one of its major activities.«

Three pillars of the UK scientific establishment (the British Association, the Royal Institution and the Royal Society) responded to the report by setting up COPUS - the Committee on the Public Understanding of Science. COPUS [http://www.royalsoc. ac.uk/copus/index. htm] has an annual budget in excess of £ 300 000. This is partly funded by the Royal Society with the remainder from sponsorship funds. Each year COPUS bids for a further £ 200 000 from the Government's Office of Science and Technology to fund the COPUS Development Grant and SET (Science, engeneering and technology) Week grant schemes. COPUS runs activities itself and funds the activities of others. Since 1987, the scheme has funded 700 diverse projects around the UK, which have provided access to science, engineering or technology for a variety of audiences. The scheme offers three types of grant: seed grants (maximum £ 3000) to encourage local activities on a small scale, development grants (maximum £ 20 000) to support large scale initiatives and SET Week grants (maximum £ 3000) for events intended for the annual SET week. All these schemes have demanded imaginative and original projects, with priority given to those initiatives that would reach new audiences. However, COPUS, along with others who fund PUS activities, have recently acknowledged the need to support established, »tried and tested« ideas. They are increasingly willing to provide funding to successful activities that may continue to improve and go on meeting a need even with repeated use.

A committee of (about) 20 individuals drawn from the media, museums, education, science, engineering, government and public life oversee COPUS. The sponsors review and appoint the membership annually to try to ensure that fresh and wide-ranging views on public understanding of science issues are represented. The COPUS programme includes: fora for debate and discussion, booklets and workshops to share best practice and research, a grants scheme to support development of public understanding initiatives and the Rhône-Poulenc Prizes for the best in popular science writing in science books.

The founder organisations of COPUS are themselves active in PUST. The Royal Society [http://www.royalsoc. ac.uk/index. htm] lists among its objectives »fostering public understanding of science, and promoting science education and awareness.« The Royal Institution [http:// www.ri. ac.uk], among other activities, runs Christmas Lectures for children and Friday Evening Discourses for adults, which were started by Michael Faraday in 1826. The British Association for the Advancement of Science (BA) [http://www.britassoc.org.uk/ info/brithome. html] has a major role in promoting science understanding between scientific disciplines and among the public. Although based in London, the BA primarily operates through regional branches to promote science in local communities. The Association's flagship event is its Annual Festival of Science, which runs for two weeks in early September each year. This is a national platform for scientists to share their work with both experts and the public. The BA manages AlphaGalileo, an Internet press centre, which is a collaborative venture by several organisations and intended to improve the profile of European science in the media. The BA also organises and funds Media Fellowships, which provide short-term placements for practicing scientists to work in the media, enabling scientists to gain practical experience of the constraints under which journalists work. The BA (jointly with the Royal Society) publishes SPA (Science and Public Affairs) a quarterly journal that covers topics relevant to its title in a popular and accessible style. SCAN (the Science Awareness Newsletter), is also produced by the BA and promotes events and organisations connected with the public understanding of science. The BA also supports the work of the Association of British Science Writers, which promotes links between scientists and the community of professional science journalists. The BA coordinates ›Talking Science‹, a national database of science communicators that provides information on good public speakers in every field of science. BAYS is the Youth Section of the BA. Among other activities BAYS organises a national network of science clubs and BAYS days – relatively large scale, local, science events targeted at children.

The UK runs a National Week of Science, Engineering and Technology (SET) in March each year. The primary benefit of SET week is that it acts as a national focus for science communication activities. SET week has grown steadily since its inception and now consists of over 6000 events, spread throughout Britain.

A wide range of professional organizations (like the Royal Society of Chemistry [http://www.rsc.org/] and the Institute of Biology [http://www.primex.co.uk/iob/iob. html]), government research councils and private charities and foundations are also active in sponsoring science communication. Consequently, there is a considerable PUST movement in the UK and a gradual change in the relationship between scientists and the rest of society. The dramatic expansion in use of the Internet by ordinary citizens, and the parallel improvements in its functionality, are providing opportunities for global science communication. There are several excellent web sites around the world which range from simple experiments and demonstrations to information-dense sites targeted at particular audiences and focussed on specific subjects.

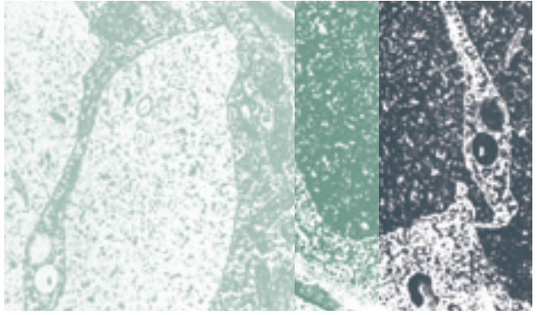
**II. Science communication at the John Innes Centre**

It is a paradox that the majority of people in the developed world enjoy lives that are safer, healthier, and more comfortable than at any time in history, as a direct result of science and technology (S&T). Yet, the common perception is that science is irrelevant, dangerous, uncontrolled and adds little of value to the life of the ordinary citizen.

This paper is a very personal view from a practitioner of Public Understanding of Science and Technology (PUST) activities at the John Innes Centre (JIC), Norwich. The Centre is Europe's premier independent research organisation in the plant and microbial sciences. Its mission is to carry out fundamental scientific research so as to contribute to scientific knowledge and improve the quality of life. As the JIC is knowledge based, and does not produce finished products, a significant element in its mission is the transfer of knowledge and technology to potential end-users. Such end-users are typically research organisations, universities and pharmaceutical, agrochemical, plant breeding and food companies. However, the Centre's ›end-users‹ are, in truth, the general public and not the intermediary exploiters of technology and information. In recognition of this the Centre seeks to make its science accessible to the general public, as well as specific interest groups.

I am not a trained science communicator. Since 1981 I have worked as a government research scientist in the area of plant biotechnology, first on the genetic modification of cereals and then on the development of somatic hybrids in Brassica species (the cabbage and oilseed rape family). During the last few years of my career as a bench scientist I became interested in the development of new oilseed crops. Plant oils are potential renewable sources of chemicals that could replace petroleum-derived industrial raw materials. In trying to develop projects in and attract funding to this new field it was essential to talk to a wide range of people: farmers, plant breeders, seed producers, seed-crushers, oil producers and politicians. This process of communication across scientific disciplines and to non-scientists alerted me to three key points:

1. many people are prejudiced against their own ability to understand science and the ability of scientists to communicate science;
2. the majority of non-scientists have a very limited understanding of science; and





3. if the science is not deliberately and clearly communicated, then no matter how good the science, it and/or the particular contribution of a research organisation will not be recognised.

Three years ago the JIC decided that it needed an individual who could manage its public profile, promote its science to a general audience and be proactive in handling the media. Several factors prompted this decision of which two of the more important were:

1. the Centre has grown rapidly from just over 200 scientists in the mid-1980s to over 850 at present. As a major European science centre it was felt the JIC should have more of a role in communicating science to the public,
2. the Centre's excellent world-wide scientific reputation was in sharp contrast to its profile among the UK public, politicians and end-users, where it was relatively unknown.

I was appointed to the post of Head of Science Communication and Education two and a half years ago. At that time the Department was completely new, without a history and with no infrastructure. The first step was to draw up a mission statement and list of objectives that would determine the Department's activities. These have not changed over the ensuing two years. Media activities have always been our highest priority, as a positive and helpful response to an enquiry will encourage the media to use you again and again. A media network provides the opportunity to proactively feed science stories to the media, rather than reactively responding to stories that are already running. PUST activities are our other priority. These are generally concentrated in the spring and early summer with a succession of shows and exhibitions.

**Why engage in PUST?**

There are many rationales for engaging in PUST activities, and the majority of these focus on the potential of PUST activities to provide information to the public and thus ›deliver‹ a better-informed public. The obvious, but erroneous, assumption that follows from this is that PUST is a means to educate a sceptical and/or ignorant public into greater acceptance of S&T. This view is often associated with contentious issues in S&T, where there is a perception (not restricted to scientists) that public anxiety arises from not understanding enough science. However, the evidence shows that greater understanding does not necessarily result in greater acceptance. If anything, improved understanding causes people to be more sceptical when evaluating scientific issues. This is a positive benefit, as scepticism reduces the likelihood of the public being misled by inaccurate or misleading statements. It does, however, require that scientists are better able to explain scientific issues as they face a more articulate, better-informed and sceptical public.

The public has the ability to understand and evaluate complex scientific information when that information is of direct importance in their lives, e.g., the risk/benefit analysis involved in considering surgical/therapeutic procedures. Increased understanding of science, and the scientific process, does empower citizens, potentially enabling them to participate in debate and make informed decisions about the use and role of S&T in society and their own lives. However, it is unclear how the general public can be encouraged to make informed and realistic evaluations of the need for scientific activities that have a the immediacy of everyday life. In the UK the government is currently championing the ›democratisation of science‹, and a general increase in scientific literacy that would facilitate the setting up, and maintenance, of a genuine democratic process. What ›democratisation of science‹ really means and how it is to be achieved remains undefined. The intention is to bring the general public's opinion into the government's process of deciding which areas of science should be supported. Whether this would extend to influencing the design of the regulatory systems of science and medical research is unclear. How such a project could ever be more than a crude barometer of public interest/concern is also unclear. The government has assembled a ›citizen's panel‹ of representative citizens that will be used as a sounding board on a range of issues – not only science. Initial work with the panel has tested the level of scientific understanding and awareness of scientific issues, and the preliminary findings are much as expected.

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Single issue pressure groups have attempted to pre-empt the government by assembling ›citizen's juries‹ to provide ›public opinion‹ on the lobby issues of interest to the pressure groups – with predictable results. Such pressure groups see ›democratisation‹ as a potential route to progress their agendas, but also fear that informed public opinion may not support those objectives.

Commercial companies, universities, research organisations and government science and education ministries are now acknowledging that they have a responsibility to communicate with the general public, providing information on their activities and their potential impact on the lives of the public.

PUST is also seen as a means to increase the profile of and interest in science and so »draw in« recruits to S&T courses in schools, colleges and universities. Increasing the general awareness of science, in its many guises, and its importance in society must be beneficial. However, the impact of these activities is difficult to evaluate, as many factors determine individuals« interests, career and lifestyle choices, etc.

All the above, with the exception of educating a sceptical public into acceptance of S&T, are valid reasons for engaging in PUST. However, if the recent PUST initiative in the UK has taught us anything, it is that PUST is not solely, perhaps not even primarily, about providing the public with information and facilitating their understanding of scientific facts. Often unsaid in discussions on the role of PUST, but in my opinion its most important aspect, is that it should be a sharing of wonder. Most scientists are enthusiasts for, if not obsessive about, their science and fascinated by the insight it gives them into the world in which we live. Rather than the cold, calculating, manipulative scientist of popular media and imagination, many scientists have an intense sense of the beauty and wonder of the systems they study. The natural world, as for many in my generation, was my introduction to science – as early school science was ›Nature Study‹. As I child I collected tadpoles and caterpillars, was fascinated by swarming ants, fished for crabs and hunted for lizards and newts. Parental concern over childrens safety now curtails much of their opportunity for exploration. Concern for the natural environment and the conservation of wildlife has, rightly, reduced the acceptability of collecting and keeping wild creatures. The modern child's introduction to science is more likely to be through computers than ›creepie-crawlies‹. But even in this computer generation, as with my own generation, few children pass through their childhood without a period when they are fascinated by dinosaurs or pester their parents for household pets.

For the majority this childhood curiosity and enthusiasm grows dim with the passing years, a process that may be aided, more than necessary, by experiences in school science classes. Yet, despite perhaps having been trained to believe that science is difficult and irrelevant, the interest may linger, not least because many people continue to be curious about the world in which they live. In addition the media constantly present the public with environmental concerns, technical developments, natural phenomena, familiar and bizarre plants and animals, medical breakthroughs, etc., that directly affect their lives or simply stimulate their interest. Thus the everyday world of the ordinary citizen provides countless ›hooks‹ on which PUST activities can be hung.

**Access**

The challenge for any PUST activity is to make the science accessible. This is generally taken to mean that the science has to be presented at the right level for the audience to be able to understand and interpret it. This is certainly important; however, accessibility is a much broader question than ›getting the words right‹. Accessibility is also a question of the location of the activity, of overcoming the prejudice and capturing the interest of the audience, of facilitating understanding, and of exposing the public to scientists and of exposing scientists to the public.

The geographic location of PUST events is of course critical to reaching the intended audience. It also has a significant effect on the make up of the audience. There is an immediate selection for a specific cross-section of any potential audience when the audience has to come to the event, rather than the event being delivered to the audi-



ence. Among all those who might be interested in the topic, only those who have the time, resources and motivation to travel to the event will attend. A PUST event staged in a shopping mall will reach a much broader and heterogeneous audience than an event at a botanic garden. A different audience would attend the same event staged during the evening at a university or at a central municipal library.

Communication between professionals, and especially scientists, is typically written. The majority of non-professional (and non-science) communication is visual and either is not written or written in a very different style to most scientific writing. The average reading age of the population in the UK is the equivalent of a 12-14 year old child. The UK newspapers that target the general public, rather than professionals, are written for this reading age and use a vocabulary of about 5 000 words. The average person will not normally read more than one paragraph before moving on to the next article in a newspaper. Examine a typical newspaper story and you can see that they are designed to deliver the story (that the paper wants to deliver) in the first paragraph, the remainder is explanation.

There are many types of PUST activities and depending on specific circumstances the urgency of capturing the interest of the audience will vary. People who have had to ›come to‹ the event have already committed themselves – especially if they have paid to attend. Initial impact is therefore less important than in a situation where people are »wandering by«, in which case arresting their attention is critical. There are circumstances where the audience is wandering by but is also a captive audience. For example, there have been a number of initiatives in the UK to raise science awareness through attractive posters on underground trains and buses. These posters deliver a simple scientific story or challenge the reader to reflect on the impact of science on their lives. This general raising of the public's awareness of S&T and its importance is a social aspect of PUST. However, the majority of PUST activities should meet people where they are, providing access to the science through the audience's existing interests and concerns. This is a key route to engaging an audience.

In my own area, plant and microbial science, there are many opportunities to deliver science through events on food, gardening, medicine, cooking, sport, health and environment. These topics provide access to a range of audiences. Some PUST practitioners have had great success with activities based on brewing and beer. For example, in the UK a popular pastime is the ›pub quiz‹. Local pubs organise evenings in which teams compete in (sometimes highly competitive) general knowledge competitions. One PUST group has used the quiz format, combined with materials available in every UK pub as experimental materials, to introduce science to this particular audience. Another successful subject is chocolate, which has been used as a ›hook‹ to draw audiences into demonstration lectures and experimental workshops on ›the science of chocolate.‹ Such workshops cover melting and crystallisation temperatures, phase changes, taste and flavour, psychological/physiological effects of chocolate, botany, etc.

I am sure there is a role for professional, trained PUST communicators, especially in science centres and museums designed to cater for large numbers of the general public. But to hand over the responsibility for science communication to ›professional communicators‹ is not an appropriate or effective means to carry out PUST. PUST is not just imparting scientific information, or describing the scientific process; an important element is finding out about scientists. It is not only the science that needs to be accessible, wherever possible PUST should give the public direct access to scientists (and vice versa). The need to establish a dialogue (however temporary) between the public and scientists is a neglected, or overlooked, aspect of PUST. This approach is resource intensive and a drain on scientist's time. Scientists are often reluctant to face the public – for a variety of reasons – and so it can be difficult to set up. But this is typically a powerful experience for both sides of the dialogue. The public is often surprised to discover that scientists are not universally happy with every aspect of science. The question of ›who to trust‹ is central to many of the contentious debates in modern science. A good opportunity to build, or re-build, trust is in face-to-face discussion. This human face of science and scientists is something that is often missing from S&T, and this contributes to the ›mystification«‹ of science.

*Being exposed to the public is a challenging experience*

The image of scientists as socially inadequate, eccentric boffins is much loved by the media, although in the more pejorative representations the mad professor (irresponsible and out of control) is preferred. The public is intelligent enough to see that these images are not real, but they also have little access to the reality.

PUST also enables scientists to find out about the public, to experience firsthand the concerns of the citizens, and to appreciate the true level of those concerns. Just as most people receive S&T through the powerful (and distorting) filter of the popular media, so the majority of scientists receive their information about the public's concerns through the same filter. An example is the current ›debate‹ in Europe over genetically modified foods. A segment of the UK media would have us believe that the population lives in fear and are near to open revolt because of genetically modified foods. The scientific community feels beleaguered, misrepresented and is unable to talk effectively about the science of GM because of the distorting effects of the media ›filter‹. In talking to a wide range of audiences it is clear to me that the public is concerned, but they are by no means taken in by misinformation. They do not know whom to trust and they do not understand why this technology is being used. They would like more information and they would like a choice. But, in my experience, the claimed general hostility and anger among the public does not exist in practice.

Science and scientists still remain isolated from the public. The idea of accountability is relatively new and in some quarters unwelcome, and scientists are suspicious of those of their number who are effective communicators on radio and television. Being exposed to the public is a challenging experience. Unlike a scientific debate, where the questions from one's peers may be difficult but more-or-less predictable, in discussion with the public the questions are unpredictable, inevitably wide-ranging and can also be extremely perceptive and pointed. However, the majority of scientists who engage in well-organised and structured PUST activities are excited and stimulated by the experience. If events are properly constructed and the science is made accessible, then the public will be drawn in, because their interest will have been captured and their imaginations stimulated. I have seen JIC scientists very excited because they have been able to communicate ›cutting-edge‹ science to members of the public who have, in turn, been able to understand and become fascinated by the subject.

Some scientists are naturally good science communicators, the majority require only guidance and practice to become very effective, and relatively few cannot be trained. Scientific communication typically uses patterns which are quite unlike non-scientific communication. In a reversal of scientific communication patterns, it may be necessary to deliver the conclusion at the beginning in order to convince an audience quickly that an explanation is going to be worth the effort and time needed to listen to or read it. And although scientists find jargon useful as a shorthand for complex ideas, in some cases it is part of the process of ›mystification‹ of science that is carried on by some scientists. Media training courses seek to teach scientists to communicate scientific ideas, discoveries and applications in just three or four short and simple sentences. The core messages of most courses are to use pictures and illustrations to describe ideas, to abandon the jargon and to eliminate the ›qualifiers‹ that make scientists feel comfortable. It can be a hard lesson, but I would recommend all scientists to undergo a short media-training course, whether or not they intend to ever speak to the media. Being trained to communicate simply, clearly, quickly and accurately the main points of a subject can dramatically improve a scientist's ability to communicate – not only with the public and the media but also with their peers.

In practice PUST has many guises and roles. PUST may be providing sizeable units of infomation on serious issues with the intention of educating an audience. At the other extreme it may be raising awareness of the role of S&T in everyday life through a ›light-weight‹, public-friendly activity. A one minute ›clip‹ of the latest scientific discovery on the evening news will reach a large audience and raise awareness of that particular field of science. It will have little effect on the public's understanding of science. A ›science of food‹ event in a local supermarket car park will reach fewer people, but its impact will be greater, especially if citizens are talking directly with scientists involved in food science. An adult evening class will consume even more time and resources and have greater impact on the students' understanding of a particular area of science. There is a place for all these approaches and many others besides.

A very successful PUST event has been participation in the Royal Horticultural Society's Chelsea Flower Show. This show is staged every year, for one week at the end of May, on the lawns of the Chelsea Hospital in London. The grounds are temporarily transformed into beautiful and exotic gardens. Full-grown trees are transplanted and extensive water features and buildings constructed as designers and their sponsors compete for coveted medals. Beneath a huge marquee plant nurseries construct indoor gardens and specialist growers show the best of their plants and flowers. The show is very prestigious and visited by many thousands of visitors from around the world who share a common interest in gardens and plants. Over the last three years the JIC has exhibited at Chelsea, not in competition with the plantsmen and designers, but as part of the show's ›scientific and education‹ section. Our objective has been to explain aspects of ›cutting-edge‹ science in simple, easily understood and attractive displays.

Last year our exhibit was ›A wonderful weed‹. At the front of this exhibit was a solid semicircular table on which we displayed our wonderful weed (Arabidopsis thaliana). Behind it we again created an attractive garden display. Arabidopsis is a common garden weed, 10–15 cm tall when in flower and rather insignificant in appearance. However, it is the focus of a multi-million dollar global research programme to map an entire plant genome. Because of its small size, rapid life cycle and very simple genetic make up it is ideally suited as a ›model‹ for biological and genetic studies. Many genetic mutations have been identified in Arabidopsis (such as late flowering and dwarfism) and used as a starting point to isolate the genes that control these characteristics. At the genetic level plants are very similar, sharing the same basic set of genes needed to encode all essential life processes. Consequently, it is possible to find the same mutations, and genes, in other plants. Thus on the display the public could directly compare normal, and dwarf plants of Arabidopsis with normal and dwarf forms of maize, caused by mutation of the same gene in two very different plants. Similarly, late flowering and normal Arabidopsis could be compared with normal and late flowering oilseed rape – again mutation of the same gene, producing the same change in very different plants. In total there were six different Arabidopsis mutations on display; in some cases their equivalents could be seen in several different plants. This was a powerful visual demonstration of the genetic similarity of plants and the value and use of »model« systems in science. The idea that anyone would exhibit a weed, wonderful or otherwise, at the Chelsea show caused a great deal of media interest.

Another successful PUST activity has been participation in a local Festival of Food and Drink. Held once a year over a weekend in early May this is a ›countryside‹ event that celebrates locally produced food and drink. It is a very non-threatening environment, everyone is out for a relaxed morning or afternoon, tasting, and perhaps buying good Norfolk food and drink. This year is the third year JIC will have a display, which is basically about science, but linked in some way to food and farming. As genetically-modified food has been in the news over the last two years we have used displays that describe how genes work, or the kinds of changes plant breeding has made to our food. The relaxed atmosphere encourages people to browse, pick up literature, watch simple experiments and to discuss their concerns.



Frauke Petry

# Auf der Suche nach Mitwirkungsmöglichkeiten

Im März 1998 wurde ich in den Bundesvorstand der Jungchemiker in der Gesellschaft Deutscher Chemiker gewählt. Zusammen mit Kommilitonen aus dem gesamten Bundesgebiet, Chemie ins Gespräch zu bringen, den Kontakt zu den Schulen zu beleben, den Erfahrungsaustausch mit der Industrie und den ihr nahen Verbänden anzustoßen, kurz: uns mit unseren Gedanken und Wünschen zur Chemie öffentlich bemerkbar zu machen – dies schien eine Aufgabe zu sein, in die Zeit und Mühe zu investieren lohnt. Und dazu kündigte die GDCh-Spitze auch noch ihre umfassende Unterstützung an! Ich war überzeugt, daß mein Engagement ein wenig dazu beitragen könnte, die Chemie als faszinierende Naturwissenschaft für Klein und Groß in die Öffentlichkeit zurückzuholen.

Heute, ein Jahr und viele Grabenkämpfe später, muß ich mir vor allem einen fundamentalen Irrtum eingestehen: Ich suchte den Grund für die fehlende Chemieakzeptanz unter all jenen, die ihr nicht nahestehen. Tatsächlich aber stießen wir bei dem Versuch, Chemie für jedermann erlebbar und verständlich zu machen, schon auf erheblichen Widerstand in unseren eigenen Reihen.

**Polyole am Kaffeetisch**

Solange ich zurückdenken kann, ist Chemie Bestandteil meines Lebens. Aufgewachsen in einer Kleinstadt in der Lausitz, in der 60 % der Bevölkerung im örtlichen Chemiewerk arbeiteten, nahm ich sie nicht nur über die Nase wahr. Mit einer Chemiker-Mutter und einem Vater, der sich beruflich mit der verfahrenstechnischen Umsetzung von Laborchemie in den Produktionsmaßstab befaßte, erinnere ich mich an viele Nachmittage, an denen neben meiner Schwester, meinen Eltern und mir am familiären Kaffeetisch auch Polyole, Isocyanate, Wärmetauscher und Hochleistungspumpen ›saßen‹. Klar, daß mich interessierte, was meine Eltern den ganzen Tag machten, auch wenn ich es eigentlich noch nicht so richtig verstand. Fasziniert haben mich die vielen kleinen Molekülzeichnungen, die meine Mutter hervorzauberte: aus Wasser wurde plötzlich $H_2O$, Salz war auch NaCl, und das Material, aus dem man Schuhsohlen, Sofafüllungen und sogar Isolierschäume herstellte, hieß Polyurethan. Ich bekam das Gefühl, daß sich mit Chemie ziemlich alles machen läßt.

Insgesamt habe ich vier Schulen besucht, an dreien davon habe ich Chemieunterricht genossen. Ich kann mich an viele Reaktionsgleichungen zum Auswendiglernen und einige wenige Experimente mit Flammproben und bunten Metallsalzen erinnern, die ersten Grundlagen eben, ohne die man sich nur schwer ›chemisch verständigen‹ kann. Um eine Sprache zu lernen, braucht man schließlich auch Vokabeln und Grammatik. Ich wartete auf die spannende Fortsetzung, die Schülerversuche, aber in der achten Klasse am Gymnasium wurde kein Chemieunterricht erteilt. Im neunten Schuljahr hatte es der Lehrer deshalb schwer: er mußte praktisch wieder von vorn beginnen. Ab der zehnten Klasse hatte ich an Schule Nummer vier einen neuen Chemielehrer, der nach seinem Studium in der Industrie tätig gewesen war. Sollte deshalb sein Unterricht soviel realitätsnäher und packender gewesen sein? Nach eineinhalb Jahren in Sparris Chemieunterricht belegte ich seinen Leistungskurs und beschloß bald darauf, Chemie zu studieren.

Beim Aufräumen der Schränke im Chemieraum fand ich kurz vor dem Abitur Folienserien für den Chemieunterricht, herausgegeben vom Verband der Chemischen Industrie (VCI), die ihren Weg nie auf den Tageslichtprojektor gefunden hatten. Auf Nachfrage erfuhr ich, es sei schwierig, diese Materialien unmittelbar ins Unterrichtskonzept einzubauen, den Lehrplan einzuhalten hätte letztlich auch für die Schüler größere Priorität. Schließlich müssen am Ende eines jeden Lernabschnitts Klausuren geschrieben werden.

Eine Umfrage unter Kommilitonen im Grund- und Hauptstudium an der Universität Göttingen Anfang 1999