

Dutch Science Shops: **Matching Community Needs with University R&D**

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“You have to keep in mind,” says Jan Weerdenburg, editor of two Dutch-language volumes on science shops in Holland, “the University of Amsterdam’s first science shop was located in a box. We had a box with files of client questions. When we wanted to work we would go pick up the box and take it to an empty room” (1999, personal interview).

So began the first Dutch science shop, as volunteer initiatives by students from the Dutch student movements of the late 1960s and early 1970s. These students and university employees sought at once to change the character of university research and to support activist groups working on issues pertaining to environment, feminism, nuclear resistance, minorities and the workplace.

Today Dutch science shops (“wetenschapswinkels”) are university departments that solicit questions from interest groups (such as environmental organizations, neighborhood associations, and nursing homes) and match univer-

sity scientists (mostly students but also recent graduates) to answer these questions through research. Other European countries including Denmark, Germany, and Northern Ireland have established science shops, inspired by what has been cast as “the Dutch model of science shops.”

Science shops attempt to redirect university R&D towards (economic and political) non-elites. In this way, they seek to directly satisfy the concerns of smaller groups, especially less financially powerful ones. This paper proposes that science shops produce university R&D in such a way that distributes expertise more equitably. They also work at developing a more invigorated citizenry and should be studied as one model of cooperation between experts and laypersons. Science shops mitigate the disproportionate power of business interests within the current university R&D environment by doing what Sclove and Scammel (1998:2) have called “commu-

nity-based research”: “research that is initiated by communities and that is conducted for – and often directly with or by – communities”.

In the first part of this paper I will briefly describe the need for democratic steering of university R&D and the Dutch context within which activists articulated and addressed this need. In the second part, I describe the clients of science shops, the avenues by which they come to ask for help, and the use they make of scientific research. In the third section, I describe what makes science shops tick: how they formulate a scientific research question from a client question, what talents and skills science shop workers use to do this, and what preconditions have enabled the establishment of science shops in the Netherlands. Throughout, I highlight some of the historical decisions/debates surrounding science shop practice. By doing so, I hope that we may not only better understand these endeavors, but also view their successes as lessons for the more equitable distribution of university R&D in other countries and in other ways.

The data in this paper comes from fieldwork I conducted in the Netherlands at science shops. I interviewed opinion-leaders from the first Dutch science shops. I also conducted extended case studies at four different universities where I met with university administrators, as well as science shop employees, clients, and student researchers. I performed archival research at the science shops and attended meetings with clients and science shop employees at various stages of science shop research. Interviews and quotations have been translated from Dutch.

Need for Science Shops

Ordinary citizens are underrepresented in today’s R&D environment. Within the so-called Triple Helix of government, university, and industry relations, there are limited mechanisms by which non-elites can marshal scientific and technical expertise. Supposedly, citizens are represented within this matrix – for example through government via their elected officials or via industry with their buying power. In practice, however, they have very little direct influence on the direction of R&D. As Sclove and Scammel (1998:3) put it, “right now, around the world, most research is conducted on behalf of private enterprise, the military, and national governments, or in pursuit of the scientific community’s intellectual interests. Consequently research agendas often favor elite groups, and – wittingly or not – help them maintain their privileged positions.

Policy analysts have been concerned about the exclusion of lay publics in scientific and technical decision-making (e.g. Cozzens and Woodhouse, 1990) and in particular, with the privileged position of business (Hamlett, 1992; Collingridge and Reeve, 1986). Substantial social costs are incurred when citizens are excluded from decision-making about science and technology (Lindblom and Woodhouse, 1993; Barber, 1984; Nowotny and Rose, 1979). For example, research on alternative biomedical technologies indicates that women patients want scientific and technical experts as collaborators, mentors, and guides, whereas what they often receive is paternalistic expert advice that devalues their role in the health-care process

(Hess and Woodell, 1998). Alternative models of decision making that involve laypersons include: technology assessment (Vig, 1992; Schot, 1992), consensus conferences (Simon and Durant, 1995), participatory design (Schuler and Namioka, 1993; Greenbaum, 1991; Ehn, 1989), and science shops. Woodhouse and Nieuwma (1997) theorize different roles for experts by making recommendations for when their input is useful; Hess and Woodell (1998) emphasize a more egalitarian relationship between experts and laypersons; and Epstein (1999) calls into question such a rigid distinction between so-called “experts” and “laypersons”.

History of Dutch Science Shops

The Dutch student movement in the late 1960s had an idea for mitigating these problems within the university. Students had accused universities of being ivory towers unconcerned with the broad distribution of their primary product, knowledge (Nelkin and Rip, 1979). One way to enhance the public benefit from university resources would be to work directly for the community. They would solicit questions from citizens and produce scientific research at their requests (Weerdenburg and Pennings, 1987). The idea was that they would “intermediate” between scientists and the public.

Independent efforts at this sprung up at several universities. In the late 1970s, notably in the chemistry departments at the University of Utrecht and the University of Amsterdam, students sought out small organizations and citizens for whom they could help directly with knowledge of chemical subjects. According to Peter van Broekhuizen present di-

rector of the University of Amsterdam Chemistry Science shop, “groups of active students started to do some advisory work for environmental and local groups. They tried to generate questions in society about the hazards of chemical substances in the environment and at work, and tried to answer these types of questions” (1998, personal interview). Before long, similar initiatives that began at other Dutch universities were awarded formal support by their universities – namely, overhead and a small budget. Bas de Boer, coordinator of the University of Amsterdam science shop for 15 years, explains this move as the second stage of the University of Amsterdam science shop, where they became “a normal part of the university” (1998, personal interview).

Early on, the science shops made an effort to be clear about exactly for whom they would work. Through internal discussion and through contact with a national coalition of science shops, they developed criteria for accepting research questions. Three criteria (or variations of them) were used at every science shop in Holland. The group asking the question must:

- have no commercial aims (and therefore allow all research to be public)
- be able to make a concrete policy change based on the research
- have limited financial means available to them to do the research (Leydesdorff and van den Besselaar, 1987)

These criteria, (or variations), were implemented by the groups of volunteers who ran the science shops in the first several years. Often these groups

made decisions by consensus. Although this lengthened the duration of intermediation, it was an attempt to apply ideological convictions to internal organizational structure.

In the late 1990s, these criteria remain the same – though with some qualifications. The most significant change has come under the third criterion, ability to pay for research on their own. Both the science shops and their clients professionalized. Environmental advocacy groups, labor unions and volunteer organizations, who were the main source for science shop questions in the 70s, gained credibility and their own expertise. Now many of them employ their own experts or can afford to commission professional researchers or research bureaus. To this day, science shops continue to work with these semi-professional and professional groups, as well as smaller “single-issue” groups. This may have been because the science shop found this question to be relevant, that it was relatively easy to find an interested student, or because the client preferred to use university resources rather than a professional research bureau. Medium-to-small businesses also direct their questions to the science shops. This happens usually when the company is in the start-up phases or would like to launch a new product. The science shop determines whether or not to give assistance on the basis of several (and sometimes less formalized) criteria, such as whether the product will have an environmental benefit or if it will help a market that is currently under-served (minorities, for example).

Though their purpose has always been very clearly oriented towards the better democratization of scientific and

technical knowledge by enhancing its distribution, a second aim was to serve as what de Boer calls an “early warning function”. Since their origin, a large but important goal was to alert university researchers to socially important topics (see also Hoogmeijstra and van der Luit, 1982). They hoped this would make university research less elitist and more relevant to the needs of regular citizens. Science shop employees are proud of the instances where the science shop has drawn the attention of university researchers to very pressing social concerns. José Dobbelsteen tells how the University of Nijmegen science shop conducted a study on how people make connections between their illnesses and the environment: “Now, seven years later, it is a very normal topic, you hear about these problems everywhere. But at that time we were the only ones paying attention to this” (1999, personal interview). While science shops are still marginal university actors, the claim that they contribute to university research topics is a substantiated one.

Organizational Structure

Dutch science shops differ from each other in their organizational placement at the university, the expertise and education of their employees, and the extent of their integration in the academic curriculum. In Holland there are two different types of science shop organizational structures. Centralized shops have a single office that employs part time workers from different disciplines. The science shop accepts questions and assigns them to students in a range of disciplines. Decentralized structures have more than one science shop, each lo-

cated within a university department. Questions are usually limited to that one discipline, and students majoring in that discipline research the question, however collaboration between decentralized science shops at the same university does occur.

The science shop will generally employ one or two primary staff members who are proficient (have reached a minimum of a master's degree) in that field, with the exception of two universities whose decentralized science shops are run completely by volunteers. Payment for science shop services is done on a cost-sharing basis that varies from client to client. Students may approach the science shop because of general interest in a topic or to support a group outside the university, but today they most often earn course credit as part of their final thesis. It is common for the science shop to provide the research for free and for the client to pay for material costs, including the final report. If a group cannot afford to pay then funding may be sought in the science shop's own budget, from another university department or even from outside the university. Some science shops offer university courses to leverage themselves within the university and to promote name recognition.

Community Access to Science

In this section of the paper I elaborate on some of the defining characteristics of the clients of Dutch science shops. I describe in more detail what kinds of client groups approach the science shops and for which kind of groups the science shop chooses to work. The trajectories by which these groups arrive at the sci-

ence shops and how they use its services is also discussed.

Science Shop Clients

The Dutch science shops were opened to increase the distribution of science primarily to the emerging left wing social movements of the late 1960s and early 1970s. In fact, many of the first science shop volunteers were themselves active in these organizations. This has included:

- environmental organizations
- labor unions
- elderly care organizations
- childcare organizations
- handicapped advocacy groups
- patient associations, disease support groups
- neighborhood organizations
- individuals

These groups are represented differently within different science shops. Different representations are the result of regional (economic, cultural) differences, personal interests of science shop employees, and internal policies. University pressure also plays a significant role. The University of Twente, for example, profiles itself as the "Enterprising University." To keep current with the university mission, the science shop has (not unwillingly) begun to recruit questions from small and medium-sized businesses to demonstrate that the science shop also can play a role in stimulating economic development.

Over the years, science shops have changed the groups for whom they mediate questions. This is more a consequence of the changing status of the client groups, than of a change in science

shop policy. Science shops now accept more questions from local governments, small and mid-sized companies, professional environmental groups, political parties, and smaller activist factions within labor unions. Still, science shops are reflexive about their own policies towards accepting and refusing questions based on the type of client. This has been a contentious issue among science shop workers and volunteers – sometimes more contentious than others. According to Angela Aalst, bookkeeper and secretary, at the Nijmegen science shop for fifteen years: “If a question came in from a group that had a different conception from the science shop, then there was always a criteria that could be found for why the question would not be accepted.” Today, the science shop is more likely to accept a client’s question based on the nature of the research, rather than by the type of client from which the question originated.

The science shops recognize and try to navigate the tensions involved in trying to serve a type of organization as well as certain broad societal goals. A compatibility of goals between the science shop and its clients is still important. As Aalst explains, “Now, one of the criteria is that the result from the research should not contribute to further inequality in society. And with that, you can make it clear that you shut out any far-right or racist groups” (1999, personal interview). The Groningen Chemistry Science Shop researched a question on battery recycling that originated from the National Labor Party (Partij van de Arbeid). Co-coordinator Henk Mulder, clarifies his science shop’s modus operandi: “We thought this was a good cause. It is not a huge political problem, but it

is a practical problem and [the client] could use the results, which is also a criterion for us to accept a question” (1999, personal interview).

Client Access to the Science Shops

In the last decade, Dutch universities have been cutting costs. Whereas university life once was very secure and predictable, it no longer affords those luxuries. Individual departments have been scaled back (and in many cases eliminated); students are expected to graduate within four years or face having to repay the government for their schooling. In such a university climate, the science shops (not unlike many university programs) must continually justify their existence. They do this by publishing yearly reports and by attracting publicity for their completed scientific reports. Science shops also legitimate their existence by seeking a steady stream of appropriate incoming questions, activities that can be typified as “demand-side”. A yearly report for the Maastricht University Science Shop (1994-5: 14) takes stock of this need to acquire new projects and documents steps taken to increase the number of new questions: “The science shop cannot just sit back and wait for new questions to come in. Efforts have been made to increase our publicity, to cluster several projects around a similar theme, and to do follow up research on previous studies.”

Naturally, then, clients come to the science shop by different routes. Clients may have

- read about a completed science shop project in a newspaper
- responded to an advertisement from the science shop;

- been familiar with university structure
- placed a call to the university switchboard and been connected to the science shop
- received a referral from another help organization or hotline
- worked for a science shop
- attended an informational session given by the science shop
- learned about the science shop through their affiliation with a professional organization or umbrella group

These are the formal and informal ways that clients find their way to the science shop. Science shop clients do not need a broad and deep understanding of the university in order to be helped. Many small organizations belong to a professional umbrella organization who knows about the science shop. Otherwise, those who seek scientific and technical assistance are often hindered because they just do not know where to look. A research project might originate with a lengthy search for the science shop, as it did for Hans Lips, a volunteer board member for the Dutch Vitiligo Patient's Association. After six months of looking for help to write an informational booklet on Vitiligo, he came across the science shop by chance. "I know someone who works at the Catholic University of Nijmegen in the public relations department ... I asked him if he knew a place for me to go within the university. A channel, a way to bore through ... to find someone who can help" (1999: personal interview). Since clients can find science shops by diverse trajectories, they are less compelled to understanding university structures before they can benefit from university research.

The Use of Science Shop Resources

Many social movement organizations seek to improve their political capital by amassing scientific expertise. Science shop clients often use the results of the science shops in national, regional, and local politics. Social movement studies have highlighted ways that scientific legitimacy is mobilized by political interest groups (Breyman, 1998; Epstein, 1996).

There are many reasons the group in question would want research from the science shop. It can be for both internal goals (making a change within their organization), as well as external ones (changing local or regional policy). Clients come to the science shop to:

- garner legitimacy
- initiate a dialogue with local/regional government officials
- acquire resources that will support an argument (infringement of noise limits; saving an historical building from demolition)
- determine whether additional professional advice would be useful
- learn about their legal options
- ask questions about their own organization (evaluation of current policy)
- learn more about their potential clients (market research)
- commission a literature search
- adapt a product currently on the market (room alarms in a nursing home which not everyone can use)
- develop a product for a very small interest group

As the list above illustrates, enhanced political capital is only one among many important benefits of the science shop.

For example, it is not always to win an argument; it may be sufficient merely to initiate a dialogue. Peter Viehen, of the Handicapped Platform in Maastricht, told me how the research by the science shop was enough to get them talking to local decision-makers: "Before that, they didn't take us seriously. We just wanted to be able to talk with them, and this study opened the doors to do that" (1999, personal interview).

Science shops in technical fields also make a significant contribution to distributing resources. They may provide smaller groups the results of laboratory tests that they could not otherwise afford. The Eindhoven Chemistry Science Shop uses diagnostic equipment to evaluate soil samples. "We are not certified," explains René, a fifth year student of chemistry, "so when we do an investigation they cannot use our report for legal purposes. But it helps to tell the client that it is worth going to a certified research bureau, otherwise they spend a lot of money and the result is nothing" (1999, personal interview). Other technical science shops, such as the Technical Healthcare and the Electrical Engineering science shops in Eindhoven, help develop and adapt products. In one project some electrical engineers were rigging an alarm system for a man with limited hand movement. In another, a student used simple air pistons in the design of a device that a woman with Rheumatoid Arthritis could use to pick up and move her baby around the house. The same science shop sought government support to build a prototype device that allowed an elderly man with unsteady hands to administer his own eye drops. Tailoring scientific and technical advice to the needs of local groups

can often produce results that benefit people beyond those in the original client group; the Technical Healthcare science shop has already received a request to deliver another 'piston-powered baby mover'. These projects may not be financially lucrative to industry, and they may not always be sexy for undergraduate college students, but they do distribute university R&D to groups who have otherwise very limited access.

Science Shops in Action

To learn from the example of the science shop it is important to understand the process by which they reconcile a client's need with the needs of university scientists and administrators. In this next section, I describe in more detail the way science shops operate. The original question from a client is developed into a scientific question and then answered by a university scientist – a process called "intermediating". Science shop employees accomplish this through various tactics, using standard procedures as well as personal skills and judgment. Finally, I propose certain enabling conditions that make the operation of the Dutch science shops possible.

Job Description of a Science Shop Employee

Science shop employees have a tendency to downplay the uniqueness of their own skills. In the absence of a developed vocabulary about expert-lay-person relationships, the tendency is to describe their work as a matter of intuition. The situation is made more complicated by the fact that many science shop employees do not consider them-

selves experts – rather they match expertise with certain needs. This description has a distancing effect that is beneficial to the science shop. If criticized for producing “biased” results, they point out that they did not do the research themselves. Their role was to find university students to do the research and university professors to be mentors.

While this is an important aspect of the boundary that protects a science shop’s reputation, particularly in times of controversy, it has also the potential to oversimplify what they do, making the matter of matching university resources to client needs seem straightforward and easy. A more complete understanding of this production of scientific knowledge requires a richer description of the tacit knowledge and strategies taken by science shop employees, and the cultural and political context in which those decisions are made. This has the significant benefit of providing insight into expert and layperson relationships that may prove useful for implementation elsewhere.

In the course of intermediating a question, a science shop employee performs specific tasks. These tasks and procedures sketch a different pattern of expert-lay interaction. The science shop employee:

- pays special attention to formulating the research question so that the outcome is more likely to be helpful to the client
- facilitates meetings between client, student and mentor
- explains research steps to student
- gives advice on a literature search
- keeps abreast of local events that may impact their clients or bring in new clients

- thinks inter-disciplinarily and multi-disciplinarily
- explains to the client the possibilities and limitations of science
- knows when press coverage could be used and help formulate angle
- works with the client to implement results.

Many of these tasks are now listed in a science shop coordinator’s job description, but this was not always so. In the beginning, the position of science shop employee was debated within science shops. Some believed that science shops should be run on a volunteer basis only and further, that all internal decisions should be made by consensus. Instead of formal positions and job descriptions they had mission statements and criteria for accepting client questions. However, as mentioned above, most science shops professionalized. A few years after universities started paying for the science shop’s budget, staff members were hired – in many cases a secretary would be hired first, followed shortly thereafter by a coordinator. Paid staff members now run all of the Dutch science shops. Unfortunately, these formal categories still do not go far enough in illustrating the multifaceted ways that individual science shop members approach their work. Additional personal accounts of decision-making and troubleshooting are needed to improve our understanding of the expert-lay relationships that the science shops cultivate.

From Client Question to Science Question

A client comes to the science shop with a problem. So begins the science shop’s

most difficult task: to turn the client's question into a researchable question, one which interests a university student and is feasible for him/her to answer. Not every client's question is accepted. Sometimes the question is referred to a more appropriate group. In other instances the science shop may encourage the client to come up with a way to answer the question on their own. That is, the science shop will work with the client to articulate the problem in a way that uses the clients' internal resources to solve. Science shop questions arrive in a variety of forms:

- the client comes to the science shop with a general problem
- the client comes to the science shop with a specific question
- the client comes to the science shop with a (sophisticated) written version of a research question
- the science shop uses their own internal resources to formulate a question and hires (recent) graduates to do the research
- the science shop follows local developments, formulates a question and then looks for a client who wants to sponsor the research and who could use the results

Next the science shop decides which questions it will answer, with which disciplinary resources. Science shop employees and the potential client talk about the client's needs. At this point, the client may be referred to another organization or even asked to go back to his/her organization to further develop their goals. If the science shop decides to accept the question, a follow up meeting may be held to further develop a research question. Once it has been de-

cidated which disciplinary methods and resources could be used to answer the question, an advertisement of that research question is placed in the university newspaper. If a student responds to the advertisement, and if the science shop thinks that student is qualified to research the question, the science shop will meet with the student, the student's advisor, and the client. Once a student begins work on a project, and even over the course of the project, the research question and methods may be revised and adapted.

Most Dutch science shops generally follow this approach to turn client questions into formalized science questions. Although they communicate about their methods via a formal network of Dutch science shops, they do not share standard methods beyond a general approach and conceptual framework. In the past, these methods were a source of debate among science shops. Some characterized the differences among science shops on the basis of "intermediation" or "participation." It was argued that centralized science shops acted more according to the intermediation model because they procured research rather than conducted it, whereas decentralized science shops were said to work more cooperatively with clients (participation). In practice though, the science shops have taken a range of strategies that vary over time, resulting from staff turnover and changing client questions. For example, the Nijmegen Science Shop (centralized shop) was said to follow the participation model, because "every research project is mentored by a group consisting of the client, science shop employees, and the researcher" (Hoogheimstra and van der

Luit, 1982: 6).

What is important to understand is that arguments over best science shop practice constituted a significant and long lasting discussion within and between science shops. Other arguments included whether shops should practice “action research”¹ and if they were actually hurting their client groups by strengthening the power of scientific experts over them. In the earlier decades of science shops, it was routine for a client to have worked in the science shop. Many science shop volunteers and employees, working with nonprofits, helped develop questions and direct them to the science shop. In Nijmegen, nicknamed the “Red City” for the strong presence of social movement organizations, the connection between science shops and nonprofits was very explicit. Science shops existed not just to help groups gain access to science, but to help emerging leftist social movements. To do this, the science shop organized around different research themes, which were developed in part through individual ties to certain social movements. There were five “sector groups” or research groups in the beginning: nuclear energy, housing, women, anti-militarism and labor (“working and not-working”). Discussions took place over how scientists with personal concerns or ties to a client group would be preferred over other scientists to work on the questions. For example, a scientist who had either encountered domestic violence from her husband or at home would be favored to carry out an research question for a battered women’s shelter. Over the years the attitude towards individual relevance to a question has diversified.

Some science shops encouraged this approach, whereas others saw it as somewhat of a hindrance to practicing “good science.”

Today, the drama of these debates has subsided. Present attitudes to these issues can generally be characterized as *laissez-faire*; whatever works for an individual science shop to generate and answer client questions is tolerated and respected. Discussions over “action research,” for example, seem to have ended with the 1970s and have been replaced by concerns for keeping their image current with the times and adapting to changing university environments. Science shop employees would rather not be hindered by characterizations of them as being “a hangover from the 70s”.² Emphasis is on acquisition of a steady stream of research questions that will attract student researchers and assist their client groups. To do this, the science shop may place an advertisement in the school newspaper with the research question already formulated. Employees also develop questions internally and hire recently graduated students to do the research. These projects also result in socially relevant and multi-disciplinary work – they are formulated by science shop employees who have developed sophisticated knowledge and networks about what concerns their client groups. For example, in Nijmegen the sector group “Minorities” is working to stimulate discussions about Christian and Muslim attitudes towards organ donation. The sector group “Gender” is sponsoring a research project on masculinity. Most science shops have a budget line for funding such research projects. An added benefit is that em-

ployees sustain their interest in their fields through involvement in intellectually stimulating work. The same budget line may be drawn on to finance the publication of a research report if the client is unable to pay for cost of materials.

Expanded Science Practice

The product that science shops deliver to their clients exceeds that which is regularly considered science. Within the rubric of scientific research and advice, the client receives a report that can be distributed to, among others, political officials, the press, other organizations, and individuals. In what is an extension of other university science practice, the science shop may also advise the client on public relations strategies, press coverage, and implementation of research results. In general, science shops address important regional issues, such as regional economic development. In Maastricht, for example, in a high profile science shop project, an environmental group requested counter-expertise from the science shop to examine statistics touted by a company who wanted to expand the regional airport. An economics student concluded that the expansion would not offer as many jobs as claimed by the company, and offered thoughts on other ways to create jobs in the region. While this type of research may occur elsewhere in the university, science shops deliver it to the client in a form that is intended to be directly used and implemented – either by the client or by other political actors. Further analysis of this aspect of science shop work is needed, but beyond the scope of this paper.

Cultural and Political Support for Science Shops

A growing number of European countries have science shops or similar initiatives. These groups are just now starting to collaborate effectively as a network. As this network grows, there will be increasing interest in how this model can (or must) be adapted to different countries, within the European Union and beyond. To assess what a European science shop policy might look like, we could use particular lessons about the Dutch science shops, namely, that certain political and cultural conditions support the sustainability of these or similar efforts. In conclusion, I propose some supporting conditions for science shops in the Netherlands.

In the Netherlands, often even the smallest volunteer organizations understand the value of scientific and technical expertise. Dutch society has a large number of specialized interest groups at the local, provincial and national level. These groups are led by educated people, or else have access to other help expert services such as a government-funded hotlines. The range of such support services in the Netherlands is also specialized. Telephone numbers, brochures, and government-funded organizations provide advice and support on many topics, to many interest groups. Specialized offices for legal aid give low-cost (sometimes free) advice. There are general offices for legal aid, as well as ones specialized in giving counsel on legal matters pertaining to children or to the environment. Additionally, the broad accessibility of interest groups strengthens the sciences shops position of not normally accepting questions from in-

dividuals: most likely there is a governmental or non-governmental organization (NGO) to which the individual can first turn for help

Even though science shops have always been relatively marginal at universities, their research and reputation is protected by being a university organization. Actors outside the university setting respect them and use their findings at the local, regional, and national levels. Their reputation as objective scientists is preserved as long as the university maintains its own reputation for objectivity. Their ability to publish reports with the university logo and with university professor names increases the credibility of the report, and hence the utility of the report to client groups. Should the science shop come under criticism because of a report's findings, the science shop may point out that it was not they who did the research – it was research intermediated by them. They will point out that the professor mentoring the project is accountable for the quality of the scientific work. In Holland, universities are widely respected and afforded a higher status than consulting firms and others who are hired to carry out research.

While science shops' positions within universities are often marginal, it is nevertheless secured by good relationships with university faculty and staff. These are people either in positions to make important financial decisions, or who can speak on behalf of the science shop when necessary. These administrators understand the value of the science shop's work, and support the need to provide university expertise to those who cannot afford it. Science shops have even capitalized on their marginal uni-

versity position as a way of securing local support. They have formed alliances with a diverse range of university groups. Science shops are allied with students because they provide them with guidance and research themes. They also contribute societally relevant research themes to university research groups. They perform a public relations function for the university through their direct relations with university communities.

The Dutch science shop coordinators (or a representative from each university with a science shop) attend a bimonthly Meeting of the Dutch Science Shops ("Landelijk Overleg Wetenschaps-winkels"). Through these meetings they can share strategies for strengthening their university position and carrying out their work. This national network of science shops also substantiates the positions of individual science shops by mapping them on to a national movement – their impact extends beyond the single university.

The cultural conditions in the Netherlands that have supported science shops are not limited to the Dutch student movement that first negotiated for this particular initiative. Science shops are supported by the widespread organization of Dutch society into interest groups as well as collective value that is placed on helping underprivileged people. Certain majority political parties have supported science shops within their science and technology policies, but even in the absence of that support, science shops have found university administrators to be sympathetic to their mission. And furthermore, the marginal position of science shops within the university has allowed them to make alliances with a broad range of university

actors. A national network of science shops has provided a forum within which they can discuss strategies for answering client questions and for preserving their university position.

Continued Support for Science Shops

In this paper I have argued that science shops perform a significant function, namely that they broaden the distribution of scientific expertise. To better understand them, it is important to understand not only how they operate, but also the political and historical context in which they work. I have sketched some of the contingencies within the Dutch science shops, especially their organizational structure and their client base. Science shops were established as part of a radical social movement that sought to change science practice. And their history is interesting for the ways they have adapted in a changing university climate and benefited from some of the unique aspects of Dutch society. The existence of science shops suggests that we remain open and optimistic to the possibility for additional models of expert and lay collaboration – ones that benefit both experts and laypersons, or even challenge the rigid distinctions between these knowledge categories. Cultural and political differences hold clues to how science shops or alternative models of distributing expertise can function and thrive in other countries. In other countries, science shops may need to work more directly on the development of an active and engaged citizenry – one that is, for example, organized into effective social interest groups. This may be a prerequisite for societal non-elites to approach the uni-

versity with their needs and questions. In any case, institutions that address the needs of citizen interest groups are as necessary today as they were when the Dutch science shops began thirty years ago.

Notes

- 1 Tony Hak describes “action research” as research where: “there is collaboration with the opposition (workers as opposed to the leaders of companies); other goals are formulated (against shift work rather than expansion of it); a different relationship between those researched is cultivated (a subject-subject relation rather than a subject-object relation); the research is reported in a different way (an action brochure); and a different theory of science is propagated (historical and dialectical materialism rather than neopositivism)” (Hak 1981, 15).
- 2 My thanks to Stuart Blume for this vivid metaphor.

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