

# Science for Nonviolent Struggle

by Brian Martin

[Brian Martin is at the Department of Science and Technology Studies, University of Wollongong.]

It is often noted that between one quarter and one half of scientists and engineers worldwide are engaged in military-related research and development. Critics argue that these scientists should be working instead on nonmilitary projects in food production, health, transportation, education and a host of other topics<sup>1</sup>.

For scientists, the choice seems to be between research for war and research for something else unrelated to dealing with conflict. It is uncommon for those who oppose military research to be able, through their scientific investigations, to promote some alternative means for promoting security.

Many of the things done by scientists in the peace movement do not require scientific training: holding meetings, writing letters, lobbying, joining rallies. Many concerned scientists do, often, write articles and information sheets about technical topics such as nuclear and chemical weapons. Still, this seldom has much direct connection with their ongoing research. When scientists take a stand against weapons of mass destruction, their impact stems more from the symbolic value of being scientists than from laboratory research.

One exception to this pattern was the boycott by many scientists of participation in work related to the Strategic Defence Initiative. But the idea of a boycott of star wars research was not accompanied by an equally well-defined idea of alternative research.

One of the reasons why it is difficult to replace 'science for war' with 'science for peace' is that most strategies for peace rely on strictly diplomatic or political measures which pay no special concern to science. Peace treaties, disarmament proposals, common security measures and world government rely largely on the talents of diplomats, negotiators, politicians and, sometimes, social scientists. There are a few cases, such as the Pugwash movement, in which scientists and engineers use their specialist skills to help develop arms control measures. But most natural scientists are left to sit at the sidelines and wait for the agreements.

There is, though, one alternative to war that has a significant potential role for scientists and technologists: social defence.<sup>2 3 4 5 6 7</sup> This can be defined as nonviolent community resistance to aggression as an alternative to military defence. Social defence is also known as nonviolent defence, civilian defence and civilian-based defence.

There are numerous methods for nonviolent struggle, including petitions, marches, rallies, strikes, boycotts, sit-ins and alternative institutions.<sup>8</sup> These methods can be used to directly oppose a military invasion or coup, by directly hindering the aggressor. But perhaps more important is the role of nonviolent action in undermining support for the aggressor, whether that support is in the country under threat, in the home country of the aggressor, or among the troops themselves.

It is at this point that research and development for nonviolent resistance become important. In any systematically planned program of social defence, science and technology have an important role to play.<sup>9</sup> It is useful to consider a number of different areas.

## Industry

Often one of the main aims of an aggressor is to take control of industry. Therefore it is important for managers and/or workers to be able to shut down production. This was certainly a goal of many resisters to the Nazis in occupied Europe, 1939-1945. But what if the aggressors torture the workers or their families to force them to keep production going? One solution is to design manufacturing systems to include vital components which, if destroyed, cannot easily

be replaced. Spares could be kept in a safe place, such as another country. Torture would not help to replace the components, and would become pointless.

In some industries, a better strategy might be to decentralise production so that it would be difficult for an aggressor to 'take control' easily. It might be desirable for small-scale operations to be easily disabled but also to be easily re-enabled.

On the other hand, in some cases the aggressor may wish to destroy industrial facilities in order to subjugate the population. In such cases, it would be important to develop systems that are resistant to sabotage by outsiders.

There are a host of industrial design problems requiring research and development. It should be clear that these problems cannot be addressed as isolated technical puzzles. The meshing of technical and social domains is crucial, and close consultation would need to be made with workers and others.

## Food, energy, shelter, transport

Against a ruthless aggressor, pure and simple survival becomes important. Basic services need to be maintained. Although few aggressors have tried to starve a population into submission, it is important to be prepared.

Large-scale monocultures are vulnerable to disruption. A more resilient food system would include many local gardens and food-bearing trees. Relevant research here includes seed varieties robust to lack of fertilisers and pesticides, nutritious diets from wild natives, and methods for long-term storage of food.

Centralised energy supplies, such as power plants, are highly vulnerable. Small-scale renewable energy systems are much more resilient. As well as continuation of current studies of such systems, there needs to be investigation of systems that could be maintained in the face of hostile action. Easily repairable systems would be highly desirable. Similar considerations apply to shelter and transport.

## Health

Social defence is based on nonviolent action by the defenders, but there may still be violence by the aggressors. (Many proponents of social defence argue that nonviolence by one side reduces the likelihood or severity of violence by the other side.) For example, in the intifada, many nonviolent Palestinian resisters have been severely beaten or killed by Israeli troops.

In such a situation, it becomes important for there to be medicines and medical techniques that can be easily administered by non-specialists. There need to be strategies to maintain health in the face of occupation, food shortages, curfews, harassment and other contingencies. As well as physical health, psychological well-being is crucial.

It is also useful to be able to determine whether torture has been used, and to authoritatively show this to a wide audience. Demonstrating the violence of the aggressor is an enormously powerful tool.

## Communications

One of the first things commonly done in a *coup d'etat* is to occupy radio and television stations. Communications are crucial to legitimacy in modern society. If social defence is to work, it must both have effective communications systems of its own and be able to disrupt the communications of the aggressor. The radio played a vital part in the resistance in Czechoslovakia in 1968. In the Iranian Revolution — a largely nonviolent overthrowing of a heavily armed and brutal regime — the clandestine circulation of revolutionary cassette tapes played an important role.

In general, person-to-person network communications systems such as telephones, short-wave radio and computer networks are more resilient and useful to a resistance than are one-to-many communications systems such as television. It is crucial to maintain communications with people in other countries. In the cases of the Indonesian invasion of East Timor in 1975, the military coup in Poland in 1981, and the Beijing massacre in 1989, attempts were made to cut off communications with the 'outside world'. In the latter case, supporters of the pro-democracy movement in China maintained overseas communications through fax machines and computer networks. In Fiji, the widespread use of short-wave radio for inter-island communication meant that non-government communication could not be cut off in the wake of the military coups in 1987.

Knowledge of what is 'really going on' is usually extremely damaging to the aggressor. Genocides are usually carried out in secrecy<sup>10</sup>, and publicity is a potent tool against them. Scientists can aid in this by exposing the use of technologies for repression in other countries and the role of outside corporations and governments in aiding this repression<sup>11</sup>.

There are a host of important areas in computers and communications worthy of development for social defence: 'non-jammable' broadcasting systems; cheap and easy-to-use short-wave radio; miniature video recorders; encrypted or hidden communications via computers, telephone and radio; ways of destroying or hiding computer information. Some relevant systems already exist but are not widely available or known.

The psychology of aggressors and resisters also needs attention. The use of humour - for example, taken up by the mass media as a human interest story<sup>12</sup> - is one way to undermine respect for authoritarian regimes or policies. Studies in the psychology of obedience and resistance need to aim at insights that can be readily learned and applied by citizens.

A well prepared system of social defence would be a powerful deterrent to aggression. It would be difficult to subjugate a society which had a decentralised industrial system that could be easily disabled by the workers, which was self-reliant in food, energy and transport, and which had a dense and effective communications system. Add to this regular training - including simulations - in nonviolent action, systematic learning of foreign languages, and cultivation of support among sympathetic groups in a variety of countries, and the society would be difficult indeed to conquer.

None of this will be possible unless people believe the society is worth defending. Military defence can be used to defend a dictatorship, but social defence will only work if the people are committed to it.

## Conclusion

Social defence, defined as nonviolent resistance to aggression serving as an alternative to military defence, provides a possible agenda for scientific research and technological development. So far, though, almost nothing has been done along these lines.

One reason is that the idea of social defence is new: as a comprehensive package, it dates from the 1950s. Since then, it has been developed by peace researchers, been widely debated (especially in European peace movements), and been adopted by, for example, the German Green Party. But most governments have been uninterested, in spite of a few official reports. Social defence, after all, is a challenge to their power.

A social defence research and development programme would be quite inexpensive compared to existing military R&D. Yet, while money has continued to flow for military-related research, there has been little money for science and technology for nonviolent resistance. At the beginning of the 1980s, the Netherlands government courageously initiated a social defence research programme, although

funding for only one of the many planned projects was eventually provided<sup>13</sup>.

Social defence is not guaranteed to be successful, any more than military defence is guaranteed to be successful. But because military methods have so often led to disaster, surely alternatives are worth developing. Social defence has promise, but it has not yet been tried. Scientists and technologists have a role to play in helping bring about such a trial.

From *Science and Public Policy*, vol. 19 (February 1992), 55 - 8.

[Ralph Summy gave helpful comments and Steve Wright provided numerous valuable suggestions for examples to be included in this paper.]

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## International Network of Engineers & Scientists for Global Responsibility (INES)

Hamburg, 23 July 1992

Dear Colleagues,

We are very pleased to welcome you as a member of INES. Officially the membership will start at the next Council meeting in October. Would you please give us the name of your delegate for the Council as soon as possible? Thank you very much.

(sgd) Reiner Braun, Executive Secretary

[The Executive has asked Raymond Haynes to act as SANA's delegate to the INES Council - Ed.]