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Thinking aloud

Science for non-violent struggle

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Organised non-violent struggle, as an alternative to military methods, can be greatly aided by appropriate scientific research and technological development.

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

IT IS OFTEN NOTED that between one quarter and one half of scientists and engineers world-wide are engaged in military-related research and development. Critics argue that these scientists should be working instead on non-military projects in food production, health, transportation, education and a host of other useful topics.[1]

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' 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 give no special concern to science. Peace treaties, disarmament proposals, common security measures and world government rely largely on the talents of diplo-

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mats, 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 on 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.[2,3,4,5,6,7] This can be defined as non-violent community resistance to aggression as an alternative to military defence. Social defence is also known as non-violent defence, civilian defence and civilian-based defence.

There are numerous methods of non-violent struggle, including petitions, marches, rallies, strikes, boycotts, sit-ins and alternative institutions.[8] 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 non-violent action in undermining whatever support there is for the aggressor, whether that support is in the country under threat, in the home country of the aggressor, or among the troops themselves.

Historical examples

To obtain some feeling for what a non-violent resistance would be like, it is useful to turn to historical examples. In 1923, French and Belgian troops occupied the Ruhr because of a failure by the German government to pay reparations imposed at the end of World War One. Military resistance was out of the question; the German government called for non-violent resistance. Support from the German people was widespread, and the occupiers were faced by non-cooperation from coal miners, civil servants, shopkeepers and many others.

In spite of brutal repression, this resistance was maintained until called off by the German government, whose economy was in collapse. Even so, the resistance had a degree of success. Public opinion in France and Belgium was outraged by the atrocities carried out by their troops. The occupiers withdrew in 1925.[9]

In August 1968, Soviet and other eastern bloc troops carried out a massive invasion of Czechoslovakia, hoping to quickly set up a puppet government and smash 'socialism with a human face'. There was no resistance from the Czechoslovak military, nor from western countries.

However, there was an amazingly effective spontaneous non-violent resistance, from the political leadership down. People talked to the invading soldiers (who had been told they were there to stop a capitalist takeover) and undermined their loyalty so quickly that many had to be rotated out of the country in a matter of days. The radio network continued to broadcast messages of resistance, and jamming equipment being brought in by rail never reached its destination due to calculated action by rail workers.

Unfortunately, the Czechoslovak leadership did not realize the power and dynamics of the non-violent resistance and made unwise concessions in Moscow, leading to an end to the active phase of the resistance. Nevertheless, it took fully eight months before a puppet government could be installed. Furthermore, the non-violence of the resistance made the justice of the Czechoslovak position perfectly clear to all observers, and greatly contributed to the subsequent disillusionment with the Soviet model in communist parties around the world.[10]

Non-violent resistance can also be a potent tool against military coups, a problem for which the military is obviously the cause rather than the solution. In 1961, there was a coup in Algeria led by generals who were opposed to moves by de Gaulle to grant independence from France. There was a spontaneous show of opposition in France — an invasion from Algeria was not out of the question — including a symbolic one-hour strike supported by ten million workers.

Even more effective in thwarting the coup was non-cooperation by members of the armed forces in Algeria. About half the bomber force left the country, as pilots simply flew out and did not return. Some soldiers withdrew co-operation by just staying in their barracks. Others reported for duty but caused inefficiency by failing to pass on communications, losing files and so forth. The coup collapsed after four days without a shot having been fired against it.[11]

These examples, a sample of many available, cannot prove the effectiveness of social defence. They are, though, indications of possible methods of struggle using non-violent action. Most importantly, in each of these cases the resistance was spontaneous: there was no advance planning for non-violent struggle. To judge social defence by spontaneous use of non-violent action would be like judging military defence by uses of violence in which there was no military production, no military training and no advance planning.

Role of R&D

It is at this point that research and development for non-violent resistance become important. In any systematically-planned program of social defence, science and technology have an important role to play.[12] 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 decentralize 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 there would have to be close consultation with workers and others.

Basic survival

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 fertilizers and pesticides, nutritious diets from wild native species, 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 non-violent action by the defenders, but there may still be violence by the aggressors. (Many proponents of social defence argue that non-violence by one side reduces the likelihood or severity of violence by the other side.) For example, in the *intifada*, many non-violent 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'état* 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 non-violent 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 generally extremely damaging to the aggressor. Genocides are usually carried out in secrecy,[13] 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.[14]

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[15] — 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 non-violent 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 non-violent 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 non-violent 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.[16]

Social defence is not guaranteed to be successful, any more than military defence is. 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.

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