

# Working within the System

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*This article is dedicated to my mother.*

## 1 Introduction

“There is no homeostasis whatever. We are involved in the business cycles of boom and failure, in the successions of dictatorship and revolution, in the wars which everyone loses, which are so real a feature of modern times,” writes Norbert Wiener in *Cybernetics* (The MIT press, Cambridge 1961, p. 159).

But war is not only “a feature of modern times”, it also involves people who act and thus define “modern times”. I will describe my involvement in warlike matters, as a child, as a student, as a scientist, as a trade unionist, as a member of a works council, and as a participant in an anti-war movement. Finally I ask: *Why* is war so real a feature of current times? And, could there be means for a modernizing of modern times such that war would be no longer so real a feature? I think that one has to study political economy and the reasons for economic non-cooperation in order to find an answer on how to defeat war.

## 2 Childhood and Youth

I remember a scene in summer 1942 when I was two and a half years old: I was sitting in the garden and eating rhubarb compote. Presumably this was before the first bombing night in these days which I also remember. From then on, the war was a mysterious fate that accompanied me in the following three years: The “others” fighting “us”.

It took years to understand what really happened at that time. Last year, I took a look at my Latin schoolbook. The first phrase concerning Romans was: “*Romani bellum amabant.*” – The Romans loved war. All the following sentences in this short lesson concerned war (*Ludus Latinus, Lese- und Übungsbuch I.* 4<sup>th</sup> ed., Ernst Klett Verlag, Stuttgart 1950, p. 7). He who taught this stuff to boys of eleven, twelve years had been a officer in the nazi army. He understood nothing of what had happened. “*Vae victis*” he often commented on the situation six or seven years after this war.

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I would like to thank my colleagues Bernd Müller for translating the German quotations, and Stéphane Beauregard for totally reworking my awkward English. I would like to thank all my unnamed colleagues who also stood against military research.



**Figure 1.**  
A feature of modern times. Why?

I lived in Saarland, which since 1948 had an autonomous government and an economic and customs union with France. There, people were very interested in the French colonial wars in Vietnam and in Algeria. A Frenchman who taught us a special French course became a soldier and was killed in Algeria. My father fell in the German attack on Moscow. He was a member of the “Propaganda Kompanie” and a photographer. A journal<sup>1</sup> published *His Last PK-Film* showing an exploding Soviet tank (see Figure 1) in the “midst of a battle”. My stepfather was able to leave Stalingrad just before it was enclosed by the Soviet army. He often spoke of situations where he had luck, and he told of the German murderings he had seen in the Ukraine. Sometimes, on Sunday, I visited the cinema where the newsreels showed artillery duels from the Korean war. The war stories of the adults were mixed with radio news of the British-French bombing of Cairo when the Suez channel was nationalized. In those years, US Marines also invaded Lebanon. During the Hungarian revolt, I heard a man say triumphly: “Within one year I’ll be back at Königsberg!” (Kaliningrad). A class excursion took us to the battlefield of Verdun in France where during World War I some hundred thousand people were killed. We had a look at the bones of ten thousands of soldiers assembled in the “bone house”. Our French teacher accompanied us. When he was born his home town, Metz, was part of the German “Kaiserreich”. It is now in France. I can’t count the wars that assigned this region to France or else to Germany.

When writing essays in class, I preferred political themes. I wrote down without critique what I had read in the newspaper some days before. An example: Western Germany should have the Bomb because of its responsibility to defend itself and not to burden others with this task. During a sunny spring morning in 1957, our teacher of physics entered the classroom and, looking straight at us, he opened the

<sup>1</sup>I possess one page of this journal without title and date. Pictures are commented on in German and Spanish.

lesson: “Is it a big thing or not?” “It” was the “Göttinger Erklärung” (Goettingen Declaration) against the German Bomb which had been published a few days before. Our teacher knew some of those who had signed. They were his teachers at Göttingen University where he finished his studies in Physics and Mathematics a few years previously. Before he could start his studies after the war, he took part in submarine warfare including a long enclosure in his boat on the floor of the sea while being attacked by a submarine hunter. (This was dramatized in the film “Das Boot”).

In this lesson in April 1957 I learned that it was possible to stand against war, that scientists are responsible for what they are doing, that war should not be so real a feature of our times. This responsibility had as a result to stand *against* the Bomb. This contrasted to the responsibility reported by the newspaper which had as a result to stand *for* the Bomb.

### 3 Entering Computer Science

Many such episodes were mixed in my head when, shortly after my prediploma in Mathematics and in Physics, the University’s Institute for Applied Mathematics offered me a job as a technical assistant. It was a job in computer science, in the field of artificial intelligence, pattern recognition, radar signal extraction (military and civilian), and cybernetics – all at the end of 1961. In this job, I wrote an excerpt on “prediction theory” (April 1962). I remarked that during the second world war Wiener developed a mathematical method yielding a high hit rate when firing on attacking planes. In the next lines, I mentioned weather forecast and the controlling of a moon rocket as similar tasks. I had no military ambitions or realistic military ideas in this context, and in the sequel I looked to understand the underlying mathematics.

The “logical” counterpart of Wiener’s airplane hitting project were well developed airplanes based on mathematical computations. In *Cybernetics* (p. 5) Wiener writes:

At the beginning of the war, the German prestige in aviation and the defending position of England turned the attention of many scientists to the improvement of anti-aircraft artillery. Even before the war, it had become clear that the speed of the airplane had rendered obsolete all classical methods of the direction of fire, and that it was necessary to build into the control apparatus all the computations necessary. (...) Accordingly, it is exceedingly important to shoot the missile, not at the target, but in such a way that missile and target may come together in space at some time in the future. We must find some method of predicting the future position of the plane.

Prediction theory and short tellings of the institute’s director on computations of airplane wings showed to me in the early 1960s that mathematics could be used, like screws, for military as well as for civilian purposes. Only a few changes in methods and formulas would be needed. There were no frontiers.

## 4 My First Job

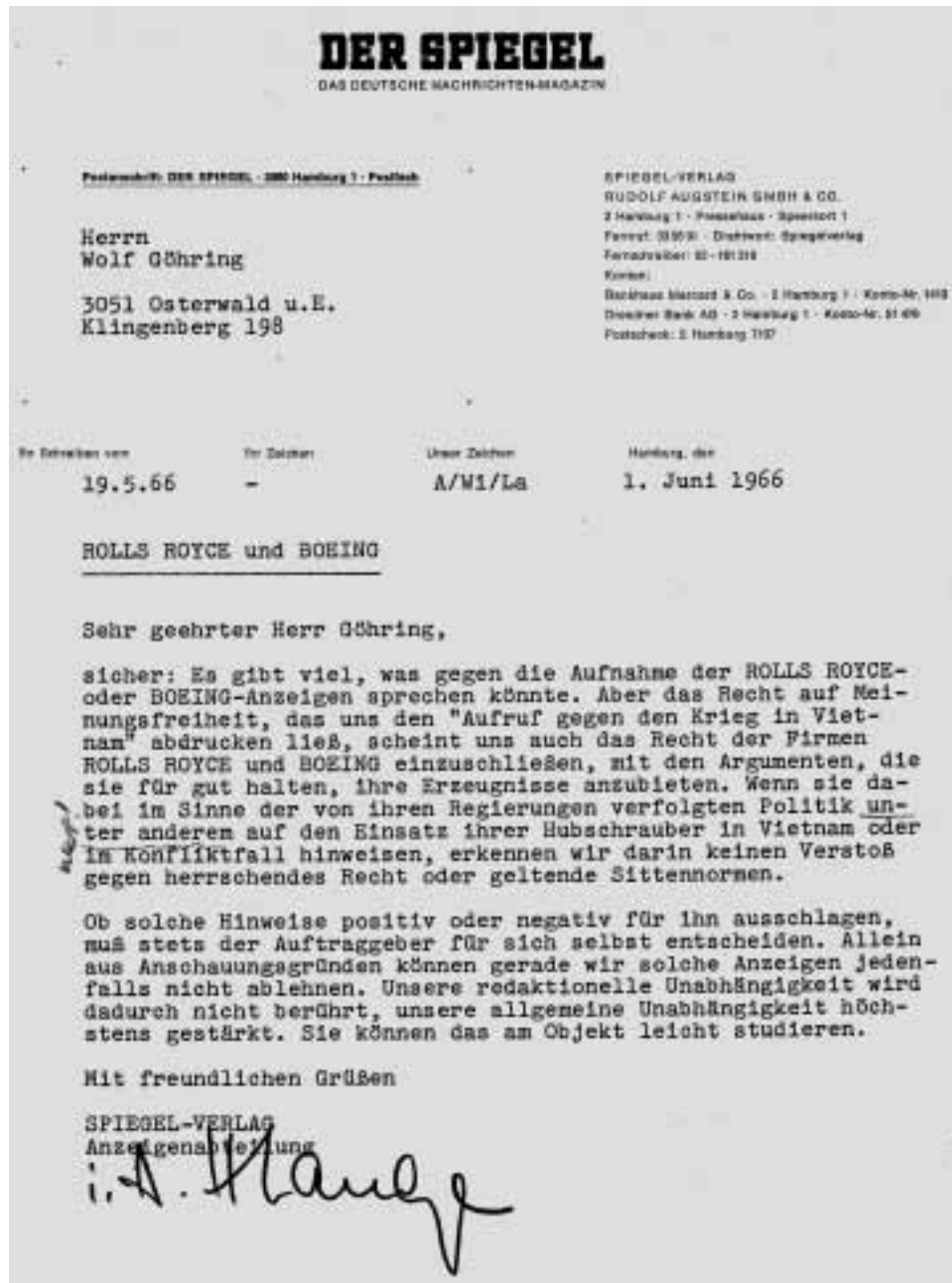
The assistant professor who supervised my diploma thesis (Vergleich von Lernprozessen. Universität des Saarlandes, January 1965) became director of an institute of computer science. He offered me a job in the field of learning and pattern recognition. When I arrived at my new job I joined a small team with two other colleagues. Within a year, we would get a PDP-7 with a display and a lightpen. We were to implement a time-sharing system and attach some 5-channel teleprinters disposed by the German telecom. In using the display and the lightpen we were to study man-machine dialog and pattern recognition – all in 36 kB of RAM. The project was financed with more than half a million Deutsch Marks from the German Federal Department of Defense.

By pattern recognition I understood the recognition of characters. The German DoD meant recognition of sonar echos: submarines, torpedos, even shoals of fish. As an alternative, they meant moving symbols around the screen and recognizing “good” or “bad” situations of tanks in a battlefield, “controlled” and “optimized” by an operator in front of a display in a command and control center. What does that say about my responsibility for what I was doing as a novice in science?

During the following months, we tried to figure out what to do with the PDP-7. At this time, the magazine *Der Spiegel* published an advertisement for ROLLS ROYCE showing tanks and another one showing BOING’s “Chinook 2” over an extended jungle with a headline: “It passed its test in Vietnam!” The advertisement said: “This helicopter is suited for all your logistic tasks! Wherever you want to go with this helicopter it goes easily. You can transport two howitzers with their staffs.” I wrote a reader’s letter (May 5, 1966) to *Der Spiegel*. I asked what *Der Spiegel* wanted to suggest: Should I use the helicopter to solve logistic problems when trying to illegally transport people from the German Democratic Republic (GDR) to Western Germany or in trying to rob a bank? In a few lines, they answered:

Quite surely, there are many reasons to refrain from accepting the ROLLS ROYCE or BOEING advertisements. But we think the right of freedom of speech which made us print the ‘Call against the war in Vietnam’ also includes the right of the companies ROLLS ROYCE and BOEING to offer their products using arguments which they hold to be adequate. We cannot see a violation of common law or common ethical norms when these companies refer, among other things, to the operation of their helicopters in Vietnam or in a case of conflict quite in the line of the political point-of-view of their governments.<sup>2</sup>  
[Letter from *Der Spiegel*, June 1, 1966, their sign: A/Wi/La. See figure 2].

<sup>2</sup>“Sicher: es gibt viel, was gegen die Aufnahme der ROLLS ROYCE- oder BOEING-Anzeigen sprechen könnte. Aber das Recht auf Meinungsfreiheit, das uns den ‘Aufruf gegen den Krieg in Vietnam’ drucken ließ, scheint uns auch das Recht der Firmen ROLLS ROYCE und BOEING einzuschließen, mit den Argumenten, die sie für gut halten, ihre Erzeugnisse anzubieten. Wenn sie dabei im Sinne der von ihren Regierungen verfolgten Politik unter anderem auf den Einsatz ihrer Hubschrauber in Vietnam oder im Konfliktfall hinweisen, erkennen wir darin keinen Verstoß gegen herrschendes Recht oder geltende Sittennormen.” [Translations by Bernd Müller]



**Figure 2.** No violation of ethic norms.

“Quite in the line of the political point-of-view of their governments” meant being in line with the faking of the Tonking incidence. I never more bought *Der Spiegel* though sometimes I read it.

My colleagues and I had no idea what to do with rectangles on the screen which should symbolize tanks. We had ideas of what to do if such symbols concerned flowchart elements or elements of electrical circuits. Thus I looked to implement some of *these* ideas (Input of geometric structures via CRT display and light-pen; experiences with program “FLUSS”. In: W. Händler, J. Weizenbaum (eds.): *Display use for man-machine dialog*. Carl Hanser Verlag, München 1972, pp. 245–246). Submarine detection by sonar signals? This meant lengthy formal computations using the whole apparatus of Fourier transforms, correlations, and integration formulae. Some months after I started with my job and half a year before I wrote the letter to *Der Spiegel*, I had a meeting with my boss, a delegate from the Department of Defense and another from a firm that built electronic devices for the German Navy. I was the youngest in this meeting on technical and organisational aspects of a possible project on submarine detection by sonar signals. We talked in this meeting as if it was an everyday subject. Eventually I would have to work on this theme, in which case I would have to undergo a security check. I don’t know if the check occurred. Later on, a colleague did this job instead of me.

## 5 In Touch with Command and Control Systems

In October 1966, I attended a NATO summer school on “Display Use for Man-Machine Interaction” in Paris. Participants came from universities, industry, and military organisations. Hardware, software and some applications were presented, such as touch screens and flight control. One talk concerned the ergonomics of the display workplace of a military ground operator. The system was connected to a ground network and flying airplanes. The better the ergonomics, the better the operator can control an air-attack. A few weeks later, I attended a 3-day NATO conference in Munich on “Systems for Command and Control”. It concerned the presentation of battlefield situations in command and control centres for groups of officers in order to make decisions for military operations in distant battlefields. The techniques presented were primitive – compared to today’s video projection technology, but they were used in the war against Vietnam. In 1972, William J. Pomeroy described this in the *Daily World Weekend Magazine* (Dec. 16, 1972, pp. 6–7). I follow here the quotation in *Marxismus und Informatik* (by Jean Claude Quiniou. Pahl Rugenstein Verlag 1974, p. 149, orig. in French). Pomeroy tells us that already in 1968 there were leaks from Pentagon sources of electronic or automated battlefields. Great areas of Vietnam and Laos had been equipped with electronic detectors. This was the first stage of the electronic battlefield. The second one was a command and control centre equipped with computers that collected and processed information and sent commands. The third stage was a network of weapons. The command and control centre was connected with the Pentagon via satellite. An officer could be sitting in Washington, where he could react to electronic signals and operate weapon systems in almost any part of Indochina.

## 6 Responsibility for What I Do. But How Does this Work?

During the conference days at Paris, I met a Swiss girl and her German boyfriend, both selling paintings. We described what each of us was doing, and how we were living. I told of the conference and its military aspects. Then we had a long discussion through this night. Am I responsible for the application of the results of my research? “You are”, he said. “Quit this job. I stay in Paris in order not to serve in the Western German army.” My answer: “But I need a job, I can’t quit it. And I try to find civilian applications. I can’t stop others from using my results for military applications.” “All you do in this field is for military applications”, he replied. Research for the war which is “so real a feature of modern times” as an inevitable fate? At the institute, we also discussed these problems. One of my colleagues agreed to produce results for civilian instead of military use. It would be better to use the money of the Department of Defense in this way, otherwise it would be used to purchase military hardware. He supported me in developing a system for testing character recognition (Eingabe handschriftlicher Zeichen über einen Bildschirm und ihre Erkennung. In: *Elektronische Rechenanlagen* 12 (1970), pp. 188–193). Clearly, this very individualistic approach to avoid military research couldn’t be generalized.

I often had my lunch at the cafeteria of a nearby university. Political groups distributed their flyers at the entrance to the cafeteria. In 1969, the basic group of the “Sozialistischer Deutscher Studentenbund” (SDS) at the mathematical-physical faculty offered a pamphlet entitled *Research and Destroy*. The authors criticized the term “pure science” and showed how mathematics was involved in the real existing Vietnam war. They illustrated this point with copied extracts from diverse papers: Marvin B. Schaffer: Lancaster Models of Guerilla Engagements, in: *Operations Research*, May–June 1968, p. 457f, Frank Mc Nulty: Kill Probability for Multiple Shots. An unnamed conference had a track entitled “Vietnam Applications” where Nigel Howard from the Management Science Center of the University of Pennsylvania presented “Applying Metagame Theory to the Vietnam Conflict”, other speakers on “Optimizing Strike Force Planning”, “Optimal Allocation of Air Strikes”, and “Time Dependent Predictions of Guerilla Actions”. In a job posting, the Stanford Research Institute (SRI) searched for “Weapon Systems Analysts and Operations Analysts [...] who desire to apply their experiences to systems problems”. SRI offered them “a free investigative approach” and “competitive salaries and excellent fringe benefits.”

## 7 Working in Industry

From late 1969 I worked for a German manufacturer of electronics, of both the civilian and military varieties. I joined a group which developed an operating system for commercial applications. In the hall where the computers were installed some were programmed by militaries: Civilian and military applications intermixed in the same hall. A colleague who helped me with a technical problem

told me that he was developing a system for South Africa's Navy. It should serve to control for military reasons the sea traffic around the Cape. This cooperation with South Africa in 1970 took place while UN sanctions against this country were in effect.

I suspect that during the first year of my work at this firm, I was under surveillance since letters needed five days to arrive at my home. The military engagement of this firm may be illustrated by another affair. The secretary of our group married. Her husband studied computer science at a technical university. His studies were financed by this firm, and therefore he had to offer them his work services when he finished his studies. Shortly before his marriage he signed a contract. It seemed to be clear where he would begin to work after his honeymoon. But when he arrived on his first working day at 8 a.m. they refused, without any argument to allow him to work. What happened? Though the workplace was a civilian one, he failed the security check because his Austrian *father* had worked a dozen years ago as an engineer in East Germany.

## 8 Public and Collective Effort against Military Research

The period from 1965 to 1972 proved to me the difficulties in following one's responsibility when one is simultaneously subject to wage labor. By contract, I had sold my work services. The other side of the contract decided what work I had to do. Within the relationship of wage labor, I had no formal right to refuse military research. It was only by chance and in an individualistic manner that I could avoid an engagement in military research. But I had learned to engage myself in the following years *publicly and collectively* against military research.

In 1972, I entered the German national research institute for computer science (Gesellschaft für Mathematik und Datenverarbeitung GMD) which was owned by national and state Governments. At GMD, I joined the trade union. There, I found a forum of other people who discussed – among other things – the question of military research. In 1971, the Government offered a draft for new statutes of the institute, and in 1974 they sent a second draft. I looked for differences to the first one, and I found an omitted phrase, namely: The institute serves exclusively peaceful purposes.

What could this mean? *Publicly and collectively we stated that we are opposed to military research.* We initiated a broad movement among the 600 employees of the institute. We wrote a petition saying no to military research, signed by about 350 employees. Their reasons for signing the petition ranged from general ethical, political, economical or social considerations to personal experiences especially during World War II or to labor conditions.

There were a lot of public meetings in the institute, where directors also participated. Heavily discussed was whether “peaceful purposes” should be compatible with “military purposes”. Some argued that military purposes could be peaceful, an argument similar to the old Roman one: *si vis pacem para bellum*. As common sense we found: Even if others outside the institute are willing to work in military projects, this is no reason that we should do it also. *But it would be impossible*

*to us to control the usage of our results.* Mathematical formulae, methods, ideas, computer programs are products like butter or woollen socks: they can be used by civilians as well as by soldiers. When producing these things, it is essentially unknown who will buy and use them later on.

Our activities encouraged people in other national research labs to stand against military research; in return, they also encouraged us. Formally, our activities were unsuccessful, since the Government *refused* to include the peaceful purposes clause in the statutes of GMD. But practically we had become too suspicious for the military and we were no longer potential partners for them. We didn't reach a demilitarization of society but our activities had been an important step forward: In a collective effort, we made it publicly known that we didn't want to work on military projects. In the following years, we tried to consolidate our position. We informed the public on the problem of military research, not only at GMD but also via the trade union and via the union of works councils of public research institutes (Arbeitsgemeinschaft der Betriebsräte von Forschungseinrichtungen, AGBR). The Strategic Defense Initiative SDI, the German involvement in the second Gulf war, an intended cooperation of GMD with Bundeswehr by using a military multi-media lab were some occasions to inform the public on our position. Through these public and collective efforts, we could prevent the militarization of some part of public research. *But in general, we couldn't prevent military research in society.*

About eight years after the affair on "peaceful purposes" a governmental administrator – a physicist – proposed to the works council that GMD should develop intelligent mines. These mines would be placed along the border with East Germany. They would analyse the noise spectrum of an arriving tank and detect if it is a West-German or a Soviet one. In the latter case, the mine would explode. The administrator didn't mention that such mines would also be sold on the weapons' world market and used especially in civil war regions. Maybe he was thinking only to save some jobs in a munitions factory near GMD which produced mines. I participated in this meeting, and in the next works assembly at GMD I publicly stated that I was against this project in the field of pattern recognition and artificial intelligence. Later on, I found that producing ammunition had a bad tradition in this region. A few miles away about fifteen thousand workers produced most of the ammunitions for the German "West-Front" during the first World War (Oral information from town's archive in Siegburg).

## **9 Federal Government: Integration of Civilian and Military Research**

It is worth giving some details of the dispute in 1974/75 with the Federal Government. Hans Matthöfer, Secretary of the Federal Department of Research and Technology (BMFT), answered the petition in accordance with the Federal Government's "Research Report IV" (Forschungsbericht IV) to the Bundestag:

Political and factual reasons let the Federal Government emphasize that the defense research should not isolate itself. Furthermore, the Government holds the opinion that further integration of the Bundeswehr into society necessitates the transfer of defense relevant research work not only mostly to a defense internal organization [...] but also to existing scientific institutions.[...] Yet it is not intended to change the daily working circumstances of GMD in the future by offering GMD defense oriented tasks on a large scale.<sup>3</sup> [Matthöfer to GMD, November 6, 1974. All papers quoted in this chapter are to be found in the archive of the works council at Fraunhofer Gesellschaft Institutszentrum Birlinghoven, formerly GMD, Sankt Augustin. Folder §111 Gesellschaftsverträge]

In a meeting (October 30, 1975) with delegates of the petitioners, Matthöfer declared: Those who claim that GMD should serve only peaceful purposes are communists dependent on Moscow, or pacifists. For pacifists there would be no place at GMD. (Public report of GMD's works council. November 5, 1974). Within the next months some publications quoted this report which forced Matthöfer to deny his remark (Matthöfer to the works council, February 20, 1975). Based on some affidavits, the works council maintained its position (Works council to Matthöfer, March 11, 1975). Matthöfer answered that he had expressed his stand against pacifists, that anybody who didn't want to join a military research project would be disciplined. His "short remark on communistic efforts", he wrote however, "did not refer to those persons who have their very private conflict of conscience in mind, but to those who want to hinder the Government in following a majority decision and conviction in the Federal Republic and in looking for the proper defense abilities of this democracy. [...] To exclude GMD in principle from the legitimate task of defense research in a democratic state would contradict the basic decision for defense measures in the Federal Republic and therefore is not acceptable for me."<sup>4,5</sup> (Matthöfer to the works council, May 28, 1975) The newly elected works council (I now was member of it and its new president) published in the institute a short comment which also was communicated to Matthöfer. It was

<sup>3</sup> "Die Bundesregierung legt aus politischen und sachlichen Gründen Wert darauf, daß sich die Verteidigungsforschung nicht isoliert. Sie ist vielmehr der Ansicht, daß eine weitere Integration der Bundeswehr in die Gesellschaft es auch erforderlich macht, die für die Verteidigung notwendigen Forschungsarbeiten überwiegend nicht einer verteidigungsinternen Organisation, [...] sondern den vorhandenen wissenschaftlichen Einrichtungen zu übertragen. [...] Es ist jedoch nicht beabsichtigt, die Betriebswirklichkeit in der GMD dadurch zu verändern, daß in Zukunft in großem Umfang verteidigungsbezogene Aufgaben an die GMD herangetragen werden sollen."

<sup>4</sup> "(Meine) kurze Bemerkung über kommunistische Bestrebungen (stand in einem ganz anderen Zusammenhang. Sie) bezog sich auf diejenigen, denen es nicht um ihre ganz persönliche Gewissensentscheidung geht, sondern die die Bundesregierung daran hindern wollen, der Mehrheitsentscheidung und -überzeugung in der Bundesrepublik zu folgen und für die Verteidigungsbereitschaft dieser Demokratie zu sorgen. [...] Die GMD prinzipiell von der Verteidigungsforschung als legitimer Aufgabe des demokratischen Staats auszuschließen würde im Widerspruch zu(r) Grundentscheidung für die Verteidigungsbereitschaft der Bundesrepublik stehen und kann daher von mir nicht akzeptiert werden."

<sup>5</sup> This was stated during the time of the "Berufsverbote".

stated as a joint view “that quite ostensibly research for the defense sector, which means military research, cannot be reconciled with peaceful purposes.”<sup>6</sup> (Works council, June 30, 1975. See figure 3) Matthöfer reacted with a new letter: “I cannot understand your position which discriminates in principle and impedes all support of the manifold efforts to keep up the outer security of the Federal Republic by involving GMD in respective projects and tries to make it impossible. (...) Also, I cannot share your position that defense oriented research would contradict tasks which serve peaceful purposes.”<sup>7</sup> (Matthöfer to the works council, August 13, 1975. See figure 4).

Eleven years later, this debate had an echo. On August 27, 1986, Josef Rembser from BMFT talked on “Actual questions on international politics in science and technology”<sup>8</sup> before an assembly at DESY (Deutsches Elektronensynchrotron Hamburg). DESY’s works council had invoked this assembly of the employees, and it communicated Rembser’s paper to AGR. Concerning military research outside the nuclear sector “there exists an interesting exchange of letters from the year 1974 between the Gesellschaft für Mathematik und Datenverarbeitung (GMD) in Birlinghoven/Bonn and the Federal Secretary of Research at that time, Hans Matthöfer”<sup>9</sup>, Rembser said. He quoted in full length Matthöfer’s letters of November 6, 1974 (pp. 11–12), and of August 13, 1975 (p. 13). He commented: “The statements of the Federal Secretary of Research more than 10 years ago, a social-democratic Secretary of Research by the way, point in the right direction concerning the question if military research is allowed in the non-nuclear fields of work of our Institutions of Major Research”<sup>10</sup> (p. 13). Rembser asked how far statutes constituting *peaceful purposes* would allow *research for defense*. “This question is to be seen [...] in the context of the foundational tasks of most of the Institutions of Major Research in the nuclear research and nuclear technology sectors. Here, in May 1955 the Federal Republic of Germany declared in the context of the Declaration of Sovereignty of the Three Occupation Forces bound by international law that research and use of nuclear energy is conducted only for peaceful purposes and that the development, production and possession of nuclear weapons are renounced on a voluntary basis.”<sup>11</sup> (pp. 10–11)

<sup>6</sup> “[...] daß sich offensichtlich Forschung für den Verteidigungsbereich, militärische Forschung also, mit friedlichen Zwecken nicht vereinbaren läßt.”

<sup>7</sup> “Ich kann Ihre Haltung, jegliche Unterstützung der vielfältigen Bemühungen um die Aufrechterhaltung der äußeren Sicherheit der Bundesrepublik Deutschland durch Mitarbeit der GMD an entsprechenden Projekten grundsätzlich zu diskriminieren und zu verhindern, nicht verstehen. [...] Ich kann auch Ihrer Auffassung nicht folgen, verteidigungsbezogene Forschung stehe in einem Widerspruch zu friedlichen Zwecken dienenden Aufgaben.”

<sup>8</sup> “Aktuelle Fragen internationaler Wissenschafts- und Technologiepolitik”

<sup>9</sup> “... gibt es einen interessanten Schriftwechsel aus dem Jahre 1974 zwischen der Gesellschaft für Mathematik und Datenverarbeitung (GMD) in Birlinghoven/Bonn und dem damaligen Bundesforschungsminister Hans Matthöfer.”

<sup>10</sup> “Die Aussagen des Bundesforschungsministers vor mehr als 10 Jahren, eines sozialdemokratischen Forschungsministers im übrigen, sind auch heute richtungsweisend für die Frage der Zulässigkeit militärischer Forschung in den nicht-nuklearen Arbeitsgebieten unserer Großforschungseinrichtungen.”

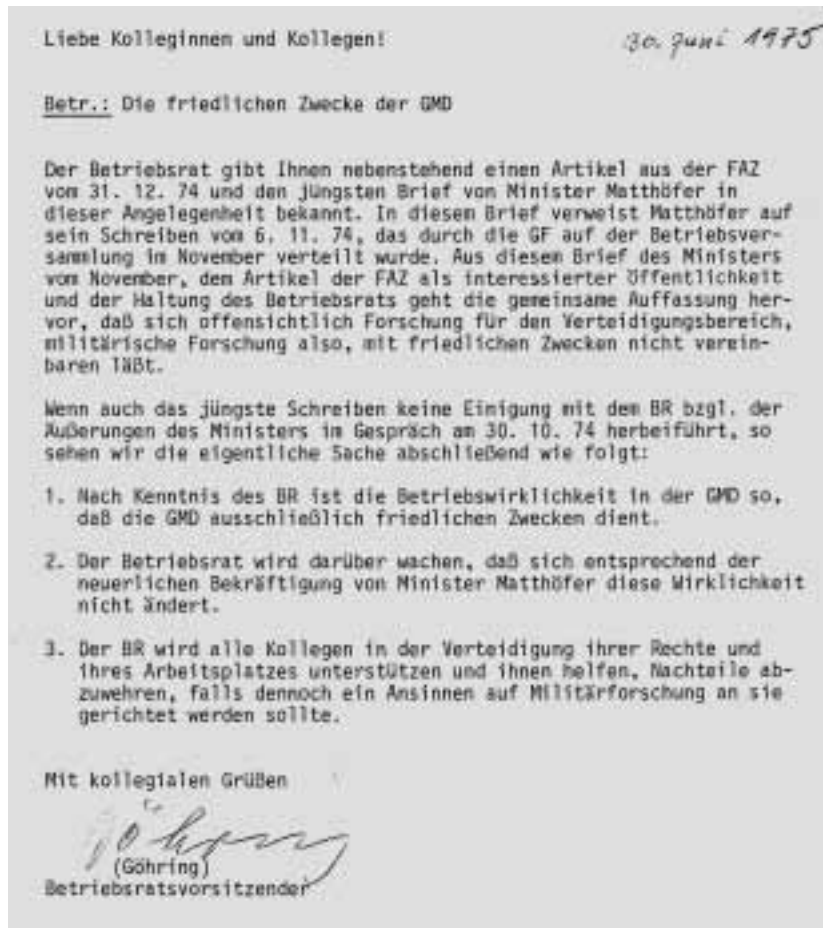


Figure 3. Peaceful purposes *irreconcilable* with military research.

Matthöfer *refused* to fix “peaceful purposes” since he didn’t want to exclude the possibility of military research at GMD. Fixing peaceful purposes in the statutes would exclude this possibility as in the political declaration of 1955. When the works council confronted Matthöfer with the logical consequence of his position, he did not agree “that defense oriented research would contradict tasks which serve peaceful purposes.” He interpreted refusing military research as an impeding of “the manifold efforts to keep up the outer security of the Federal Republic.”

<sup>11</sup> “Die Frage hängt [...] mit den Gründungsaufgaben der meisten Großforschungseinrichtungen auf dem Sektor Kernforschung und Kerntechnik (zusammen). Hier hat die Bundesrepublik Deutschland im Mai 1955 im Zusammenhang mit der Souveränitätserklärung der 3 westlichen Besatzungsmächte völkerrechtlich verbindlich erklärt, sie betreibe die Erforschung und Nutzung von Kernenergie ausschließlich zu friedlichen Zwecken und verzichte freiwillig auf die Entwicklung, die Herstellung und den Besitz von Kernwaffen.“

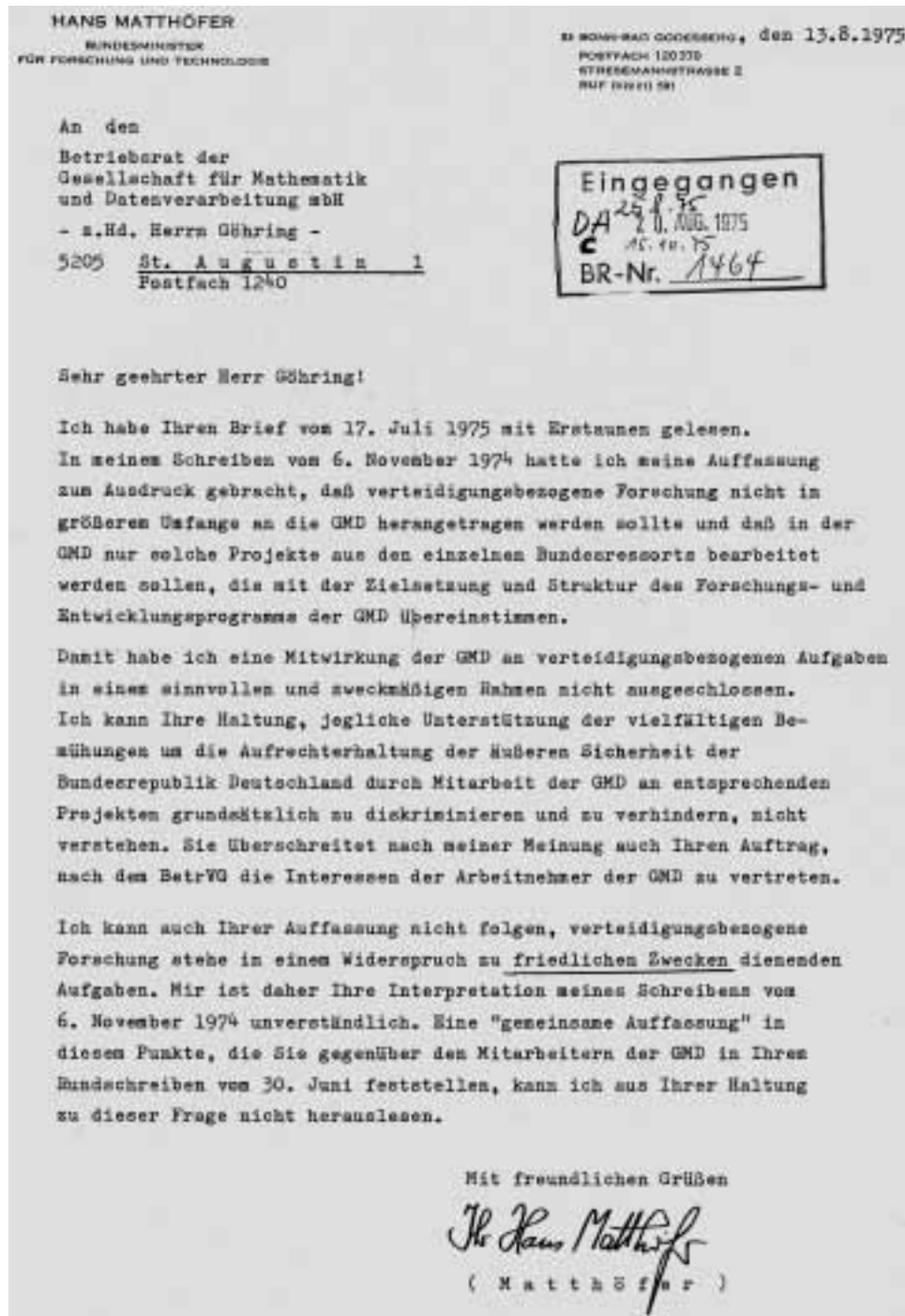


Figure 4. Peaceful purposes *reconcilable* with military research.

## 10 Military Research, Warfare, and War as Part of Political Economy

In his talk at DESY Rembser generalized the intertwining of military research and security politics. He underlined that “science and technology determine international politics not only since our days” and he named the nuclear bomb, the radar and the Haber-Bosch synthesis. Science and technology would also be used as instruments of foreign politics he explained. “This is increasingly true in our days where we can observe an exacerbating race for technological leadership, for the early utilization of new technologies in civil markets”<sup>12</sup> he stated (p. 2) The amount of military R&D in the Federal Republic, he mentioned, was still low as compared to other countries, even if it was then increasing. (pp. 5–6). He regretted that “it is not always easy for our colleagues in the military research and technology sector to declare publicly that they work for military customers. Also in our country, things are approaching the situation in other Western countries because of an increase of objectivity in the attitudes of the public and the scientific community. Nevertheless, R&D for defense purposes still have a shadowy existence within scientific life.”<sup>13</sup> (p. 9) As an example for “ideologies”, “incrustations”, “one-sided political valuations”<sup>14</sup> he pointed to an advertisement in *Die Zeit* (May 23, 1986) where scientists declared that they would engage themselves in impeding SDI-research in German national research labs.

With respect to SDI, Rembser stated: “The SDI discussion, as it was and still is conducted in a small part of the German scientific community, gives me cause for worry because of its narrow-minded fundamentalism and because of the one-dimensional earnestness of the discussants. Must we as Germans again and again be in such a way thoroughly and without compromise, even intolerant when it comes to political and social positions? Why don’t we have an eye on our European neighbors, Scandinavia or Great Britain? We did not operate always with luck in our recent history when we wanted to be the schoolmasters or forerunners of Europe, or even of the whole world. Do we have to back out, to refuse technologies as the first, acting alone and without consultation or synchronization with our Western and Eastern neighbour countries while around us and in the farther

<sup>12</sup> “Dies gilt in wachsendem Maße in unseren Tagen, in denen wir einen sich verschärfenden Wettlauf um technologische Führung, um die Erst-Nutzung neuer Technologien für zivile Märkte beobachten [...]”

<sup>13</sup> “Es ist für Kolleginnen und Kollegen aus der militärischen Forschung und Technik nicht immer einfach, dazu zu stehen, daß sie für militärische Auftraggeber arbeiten. Zwar nähern sich auch bei uns die Verhältnisse dank objektiver werdender Haltung von Gesellschaft und wissenschaftlicher Community der Situation in andern westlichen Staaten. Dennoch führen FuE für Verteidigungszwecke im wissenschaftlichen Leben noch ein gewisses Schattendasein.”

<sup>14</sup> “Ideologien”, “Verkrustungen”, “einseitige politische Bewertungen”

world a thoroughly reflected ‘getting in on’ these technologies takes place?”<sup>15</sup> (p. 18) In this philippic on the opponents to the *military* SDI, Rembser didn’t name the technological research areas of SDI. Two pages later he lists these areas, yet he doesn’t give any remark on responsibility if one would do research on “kill assessment”, “directed- or kinetic-energy weapons”, on “lethality” or on “battle management” (p. 20). He called such research “a thoroughly reflected ‘getting in on’ these technologies” that would happen abroad. Then he discussed the US policy on research and development: “The strengthening of their own technological capacity by enforcing defense research in important sectors of basic research and leading-edge technologies is part of the openly-stated U. S. politics. These political goals are primarily coined according to geostrategic goals, they are not motivated scientifically or technologically. Technology certainly is always a specific factor.

Many U.S. companies finance [...] a large part of their R&D costs via military orders. [...] It goes without saying [...] that the transfer of technologies from the military into the civilian sector – and clearly vice versa – will be most smooth when taking place in the management and in the organisation of one and the same group of companies. In this context, American companies have great advantages over their European and Japanese competitors.”<sup>16</sup> (p. 22)

Let’s summarize: Rembser called the position of those who are opposed to military research to be of “narrow-minded fundamentalism”, of “one-dimensional earnestness”, and “intolerant”. He claimed to orient “our engagement” on the positions of our European neighbours. He called it an “objective attitude” if one accepts military research as it is done abroad. He followed Matthöfer in the “further integration of the Bundeswehr into society”. With “exacerbating race for technological leadership, for the early utilization of new technologies in civil markets”, Rembser stated the indissoluble intertwining of warfare, economy and competition. In sum, he showed in his talk before this assembly of wage laborers

<sup>15</sup> “Die SDI-Diskussion, wie sie in einem kleinen Teil der deutschen wissenschaftlichen Gemeinschaft geführt wurde und wird, macht mich besorgt durch ihre enge Grundsätzlichkeit und den eindimensionalen Ernst der Diskutanten. Müssen gerade wir Deutschen immer wieder besonders gründlich und kompromißlos, ja intolerant sein, wenn es um politische und gesellschaftliche Standpunkte geht? Warum orientieren wir uns nicht an europäischen Nachbarn, etwa an Skandinavien oder an Großbritannien? Wir haben in unserer jüngeren Geschichte selten glücklich operiert, wenn wir Schulmeister oder Vorreiter in Europa, ja sogar in der Welt sein wollten. Müssen wir als erste, allein und ohne Abstimmung bzw. ohne Gleichtakt mit unseren westlichen und östlichen Nachbarländern Ausstiege aus bestimmten Technologien vollziehen, bestimmte Technologien verweigern, während um uns herum und in der entfernteren Welt ein wohlüberlegter Einstieg in diese Technologien erfolgt?”

<sup>16</sup> “Die Stärkung des eigenen Technologiepotentials durch forcierte Verteidigungsforschung in wichtigen Sektoren der Grundlagenforschung und der Hochtechnologien ist erklärte US-Politik. Es ist eine Politik, die primär von geostrategischen Zielsetzungen geprägt wird, nicht aus wissenschaftlich-technischen Motiven. Technologie ist dabei immer ein besonderer Faktor.

Zahlreiche US-Unternehmen finanzieren [...] einen großen Teil ihrer FuE-Aufwendungen aus militärischen Aufträgen. [...] Es ist unstrittig, [...], daß der Transfer von Technologien aus dem militärischen in den zivilen Sektor – und natürlich auch umgekehrt – dort am besten funktioniert, wo er sich im Management und in der Organisation ein und derselben Unternehmensgruppe abspielt. Hier gibt es große Vorteile amerikanischer Unternehmen gegenüber der ausländischen, europäischen und japanischen Konkurrenz.”

– scientific, technical and others, who depend on public funds and on funds from third parties – that military research, warfare, and war are an integral part of political economy which, indeed, has been a fact for a long time and which has not changed during the few years since Rembser's talk.

## 11 Conclusion

A moral, ethical or pacifistic view on military matters and a consideration of personal responsibility are helpful and worthy. Empirically, one can see that war has never been overcome by pure moral or ethical arguments. This approach has failed for thousands of years. Responsibility is claimed from those opposing military research as well as from those supporting it. Also, war was never overcome by an argument like *Si vis pacem para bellum*. This argument also has failed for at least two thousand years. Also modernized versions as we find them in our newspapers will fail.<sup>17</sup> *Parare bellum* – preparing war, or, in Matthöfer's words, "the manifold efforts to keep up the outer security" means to produce weapons. This production is an integral part of the social system of producing things.

In answering why war is so real a feature of our days one has to analyze the *economic system*, or, in other words, the *political economy*, and *how* war is embedded in it. Or, if one denies the need for this analysis, then the answer has to be found in separating this question from political economy (like separating variables in solving some differential equation). The claimed analysis would include how war could be overcome.

The solution lies – as I see it – in a superseding ("aufheben" in the dialectical sense) of the existing system of exchange. In some way, things are produced *independently* from each other. This independence leads to that these products become merchandise which are to be sold and bought on a market where competing sellers and competing buyers meet each other. *As an absolute contrary to war and competition, mankind needs cooperation and an instrument that facilitates it.* The instrument may be found in information and communication technology. Its real purpose lies in connection and cooperation instead of competition and waging war *despite the fact* that it is used today to "optimize" one's position in competition and hence in war. This contradiction indicates the driving dialectic of the future development<sup>18</sup> which, step by step, will enhance cooperation. Through an extremely enhanced cooperation mankind could supersede the system of merchandise production.

<sup>17</sup> A typical example is the political comment by MARTIN WINTER in *Frankfurter Rundschau* (August 1, 2002, p. 3): "Only a Europe which is able to defend itself and which is willing and able to apply military force outside of its borders will be powerful enough to be able to prevent wars." ("Nur ein Europa, das sich selbst schützen kann und bereit und fähig ist, militärische Macht auch jenseits seiner Grenzen einzusetzen, wird genug Gewicht auf die Waage bringen, um Kriege verhindern zu können.")

<sup>18</sup> Concerning civilian economy this dialectic is explained to some extent in: Wolf Göhring: Was kommt nach E-Commerce? – Eine Perspektive für die Informationsgesellschaft. In: *UTOPIE kreativ* 137 (March 2002), pp. 233–243.

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