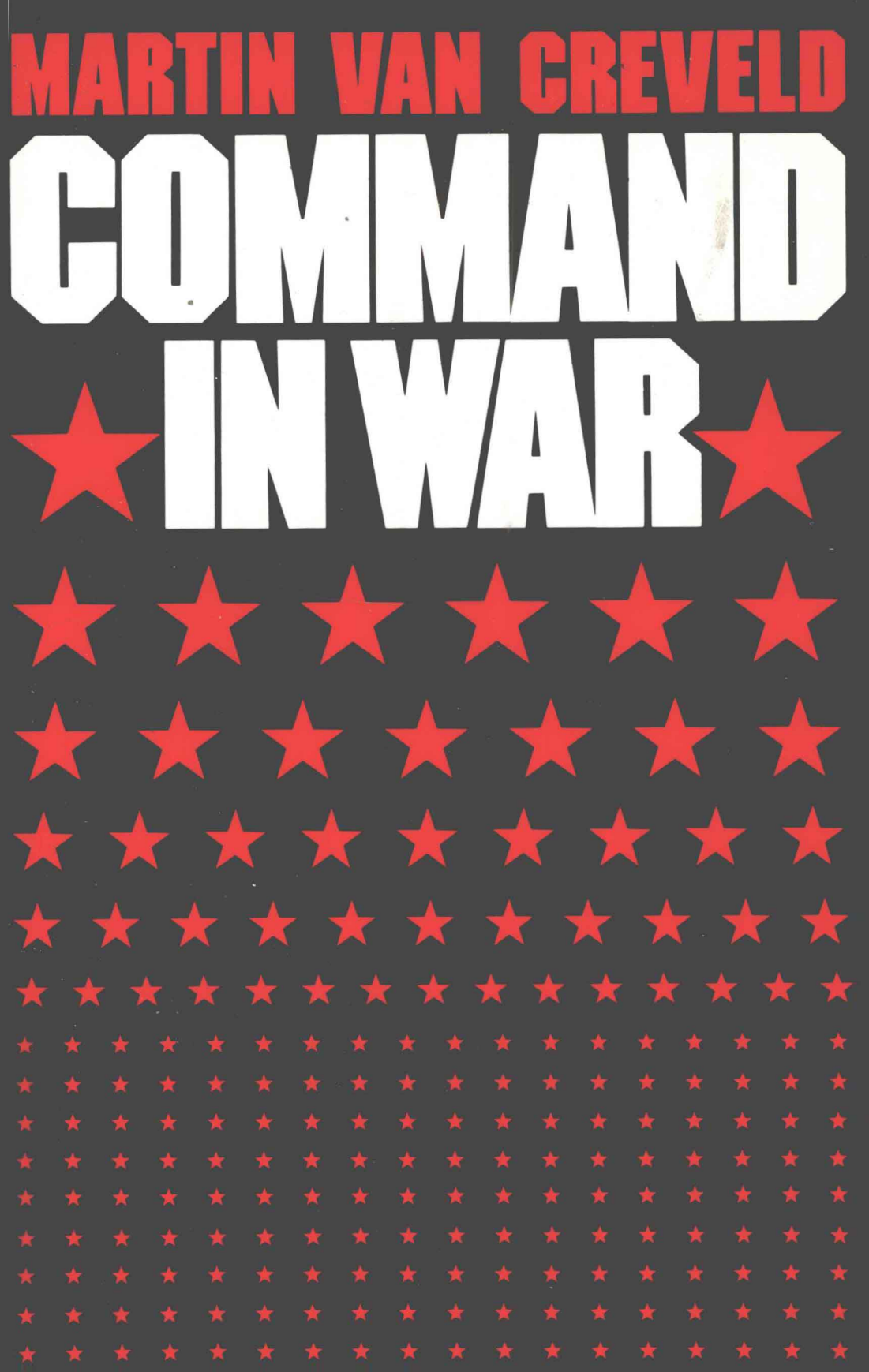
MARTIN VAN CREVELD

COMMAND IN WAR



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PREFACE

A BOOK the size of this one cannot be written without aid and support from a great many people, most of whom will have to remain unmentioned for lack of space. Among those who deserve more than the usual credit are Amnon Sella of the Hebrew University, Jerusalem, who first suggested a history of C^3 at a time when I scarcely knew what the initials meant; Edward Luttwak of Washington, D.C., who knew how to say the right words at a time of despair; Steven Canby, also of Washington, D.C., who supported the project from the beginning; and Andy Marshall, who was not put off by my early strange peregrinations but waited patiently for the work to be completed. Several of my colleagues at the Hebrew University, including Benjamin Kedar, David Asheri, and Amnon Linder, have read part or all of the manuscript and gave me the benefit of their advice. I have enjoyed many splendid discussions with, and the hospitality of, among others, Stephen Glick, Seth Carus, Irving and Florence Glick, David Thomas, and Aviva Hay. Blessed with such friends, a man is blessed indeed.

Finally, Dvora has seen me through the publication of this book during what were by no means always easy years. Without her good will, encouragement, and love it would never have seen the light of day. My debt to her is immense.

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INTRODUCTION: ON COMMAND

THIS BOOK INVESTIGATES the historical evolution of a function of war that acquired its name only a decade or so ago: that is, C^3 (Command, Control, Communications). I am no admirer of jargon, however; so instead of constantly writing out the full term or using the abbreviation, I will use the word "command" throughout in much the same way as people commonly use the term "management" to describe the manifold activities that go into the running of a business organization.

That the concept of C^3 should be so recent is, at first glance, surprising. The problem of commanding and controlling armed forces, and of instituting effective communications with and within them, is as old as war itself. A Stone Age chieftain had to devise the optimal organization and find the methods and technical means to command the forces at his disposal. From his day to ours, failure to consider and to solve the problem was to court disaster—indeed, to make it impossible for the forces to exist.

Though the problem is anything but new, its dimensions have grown exponentially in modern times, especially since 1939. This growth is due to a number of factors: (a) the increased demands made on command systems[1] by present-day warfare; (b) technological developments that have multiplied the means at the disposal of command systems; (c) changes in the nature of the command process, resulting from the interaction of factors (a) and (b); (d) the appearance of new weapons systems that, when coupled with

structural changes inside command systems themselves, have increased the vulnerability of command systems; and (e) the rise in costs, caused by factors (a) through (d). I will discuss each factor in turn.

(a) The increase in the demands made on command systems is due to the greatly enhanced complexity, mobility, and dispersion of modern armed forces. The enormously swollen number of specialized troops, units, functions, and pieces of equipment that make up a modern technological army—a present-day Bundeswehr division, for example, contains some nine hundred different Military Occupation Specialties (MOS), as compared to only forty in a 1939 Wehrmacht infantry division—has made overall coordination and control both more important and more difficult. Simultaneously, the speed and the range of modern weapons have reduced the time in which to exercise coordination and control to a fraction of what it was only a few decades ago, in some cases to the point where command functions—intercepting missiles or low-flying aircraft, for example—can only be performed automatically, by machines whose capacity for fast, accurate calculation far exceeds that of the human brain. Conversely, the speed and the range, coupled with greatly increased striking power, have compelled armies to spread out over enormous areas; a battalion may easily hold a front ten times as wide as did its predecessor two hundred years ago, and its deployment in depth may mean that the space it occupies is hundreds of times as large.[2]

(b) The second factor that has revolutionized command is the development of communications and data processing technology. Over the last thirty years, a large number of new devices have been put into the hands of man, among them television and computers, mobile telephones and data links, and image intensifiers and remote-controlled sensors. Two questions—really two sides of a single coin—have arisen: What is the effect of the new devices on existing methods, and how can the devices best be put to use?

The significance of the technological revolution for the problems of command is even clearer when it is seen that the last three decades have produced, for the first time in history, artificial devices capable of reproducing or amplifying the functions not merely of man's limbs and sensory organs but, to a growing extent, those of his

brain as well. This has given birth to a host of questions for which little or no precedent existed. Which are the strong points of man, and which are those of the new machines? How, in consequence, should the burden of work be divided among them? How should communication ("interface") between man and machine, as well as among the machines themselves, be organized?

(c) The increasingly complex demands made by modern forces and by modern warfare, on the one hand, and the appearance of technical devices capable of meeting that demand, on the other, together have led to an explosion in the amount of data processed by any given command system to carry out any given mission. As the quantity of data rose, the difficulty of interpreting it in preparation for decision-making grew, causing staff to be piled upon staff and computer upon computer. New techniques, from operations research and systems analysis to cybernetics and games theory, were developed in order to cope with the flood of data. The growing size and sophistication of command systems led to new and difficult problems of management; learning to master them has turned into a lifelong job. As anyone familiar with the size and modus operandi of modern staffs will realize, the danger of command becoming an end unto itself is a real one indeed.[3]

(d) It has always been necessary to protect command systems and enable them to function effectively under the adverse effect of enemy action, but this problem too has assumed new dimensions in recent years. The size of headquarters and the signature that they leave in the form of electronic emissions make them prime targets for the precision-guided munitions (PGMs) now coming into use. Moreover, the dependence of command systems on electronically transmitted data flows has rendered them vulnerable to electronic warfare designed to interrupt those flows.[4] Growing reliance on formal computer languages, even though it increases speed and precision, also leads to a loss of the flexibility and redundancy of normal language, which raises nagging questions about the system's ability to survive the elimination of some of its parts. The attempt to solve this problem by providing an increased number of communication nodes, and by the automatic switching of data flows from one to another, leads to further complexity. And so the cycle continues.

(e) A very important outcome of these developments, and one

that renders their study imperative, is the exponential rise in costs. Regarded as a fraction of the army's overall costs, the price of command systems was traditionally almost negligible. A relatively small staff (even Moltke's General Staff in 1870 numbered only approximately seventy officers, as against close to a million men that it controlled during hostilities against France), some wagons with filing cabinets and maps, a pool of mounted orderlies, and such technical contrivances as field telescopes, standards, trumpets, drums, and pigeons (later supplemented by telegraph and telephone) formed the sum total of command systems.

Beginning in World War II, however, and increasing in pace thereafter, the situation changed. Organizations and devices associated with the gathering, storage, and transmission of information began to eat into the inside of armed forces, so to speak. This has reached the point that they now form by far the most important component of the price tag of airborne and naval weapons systems, and their share in those of land-bound systems is also rising year by year. Paradoxically, even as the per-bit cost of data processing fell by a factor of ten over each of the three decades from 1950 to 1980,[5] the cost of command systems rose so much that it now threatens to swallow up entire defense budgets. Something, it appears, has gone radically wrong—so wrong, indeed, that the continuation of the same trend may soon lead to a point where command systems, for the first time in history, will be perfect simply because there is nothing left for them to command.

These developments, for all the dangers of unmanageability and even catastrophic failure that they entail, present a source of opportunities as well. Precisely because the complexity of armed forces and the multiple missions that they must perform (from counterinsurgency to nuclear deterrence) make overall coordination more important than ever, and owing to the unprecedented range of gadgets at its disposal, the role that command may play in determining the outcome of present-day military conflict is crucial. By making possible a faster, clearer reading of the situation and a more effective distribution of resources, a superior command system may serve as a force multiplier and compensate for weaknesses in other fields, such as numerical inferiority or the politically induced need to leave the initiative to the enemy. Which, to use a primitive example, is more

cost effective: another nuclear-powered aircraft carrier, or a communications and data processing system that will enhance the effectiveness of existing ones? Should money be invested in additional tanks, or is it perhaps better spent on a computer to model their employment? Such questions will never be easy to answer, but the very fact that they can be—and increasingly are—asked points to the growing importance attributed to command systems. Given the problem of rising costs, the dilemma is likely to become even more important in the future.

To take part in the debate concerning the command requirements of present-day military forces, or to prescribe solutions for those requirements, is beyond the purpose of this book. My purpose here is to consider Western military history on land, already analyzed from so many different points of view, in terms of the evolution of command systems and the way in which such systems operated. Such a study will certainly not eliminate the command problems facing modern armies; however, it may well shed some additional light on their nature, identify the main factors involved and the way they interact through change, and help indicate the direction in which reform should move. In making the attempt, moreover, I am doing no more than previous historians have. No sooner was materialism turned into dogma by Karl Marx than history, previously considered the domain of politics and battles (not to mention royal bedrooms), began to be recast in terms of production and consumption. No sooner had the unconscious been unveiled by Freud than history came to be rewritten in terms of an Oedipus complex. The case of command is similar. To look at old facts through new glasses, then to make use of the facts in order to gain a better understanding of those glasses—that, after all, is just what makes history worthwhile.

THE NATURE OF COMMAND

Command may be defined as a function that has to be exercised, more or less continuously, if the army is to exist and to operate. The definition is a happy one, since it serves to bring out the extraordinary importance of command; few other functions carried out by, or inside, the armed forces are as important in both respects, existence and operation.

The need for command arises from, and varies with, the size, complexity, and differentiation of an army. A one-man army requires no command, at least not in the sense that a hundred-man army does. An army operating as a single, solid, homogeneous block (phalanx) of men would be, and was, comparatively simple to command—to the extent, that is, that its unwieldiness and the limited repertoire of missions that it could fulfill allowed it to be commanded at all. Once a force of any size is subdivided into several subunits, however, the problem of assigning a specific mission to each, and of ensuring proper coordination among all, becomes much more difficult. These difficulties grow with the number of units, the power and range of their weapons, the speed at which they move, and the size of the spaces over which they operate. Should the units in question become specialized—that is, acquire different characteristics and missions—the difficulty of coordinating the various factors while maintaining the cohesion of the whole grows further still.[6] The role of command, in other words, increases with the sophistication of the forces—which, as has already been said, helps account for the attention paid to it in recent years.

The responsibilities of command, apart from the obvious and often by no means trivial job of looking after itself, are commonly divided into two parts. First, command must arrange and coordinate everything an army needs to exist—its food supply, its sanitary service, its system of military justice, and so on. Second, command enables the army to carry out its proper mission, which is to inflict the maximum amount of death and destruction on the enemy within the shortest possible period of time and at minimum loss to itself; to this part of command belong, for example, the gathering of intelligence and the planning and monitoring of operations. The first type of responsibility we shall term function-related, the second output-related. That the two are mutually dependent and by no means entirely distinct—can an army exist without intelligence? or defeat the enemy without its own justice system being in good order?—is a matter of course. The classification, nevertheless, is a useful one, as is shown also by the fact that in practice the two functions are frequently entrusted to separate parts of the organization.

Another and equally useful way of looking at command is to ask not what its responsibilities are but what it does. The exercise of

command in fact involves a great many things, not all of which can be clearly separated from each other. There is, in the first place, the gathering of information on the state of one's own forces—a problem that should not be underestimated—as well as on the enemy and on such external factors as the weather and the terrain. The information having been gathered, means must be found to store, retrieve, filter, classify, distribute, and display it. On the basis of the information thus processed, an estimate of the situation must be formed. Objectives must be laid down and alternative methods for attaining them worked out. A decision must be made. Detailed planning must be got under way. Orders must be drafted and transmitted, their arrival and proper understanding by the recipients verified. Execution must be monitored by means of a feedback system, at which point the process repeats itself.

This presentation of the process of command as a cycle oversimplifies things insofar as it fails to recognize that, in practice, the incoming information is of inconsistent value; 99 percent of it is likely to disappear without a trace, whereas the remaining 1 percent may have a profound effect on operations—though whether this means that the 1 percent would be of value even without the 99 percent is a different question altogether.[7] The various stages are not fixed: some authors differentiate them into a larger number, others condense them into a smaller one.[8] The neat charts in books on business administration notwithstanding, the stages have borders that are not easy to draw in practice, and they are likely to be carried out, in part at least, simultaneously rather than in succession. Finally, far from being governed solely by the objective requirements of the situation, they interact and influence each other so that the beliefs underlying interpretation (for example) may well determine the way data are gathered and classified. Nevertheless, the description does present a fairly good theoretical picture of what command is all about.

A most interesting way of looking at the functions of command is to try to work out the qualities of an imaginary, "ideal" command system, an approach that will make it possible to extrapolate back toward reality in much the same way that Newtonian mechanics worked out the movements of actual bodies from those of imaginary ones moving along (nonexistent) straight lines in (nonexistent)

empty space at (nonexistent) constant speed. An ideal command system, then, should be able to gather information accurately, continuously, comprehensively, selectively, and fast. Reliable means must be developed to distinguish the true from the false, the relevant from the irrelevant, the material from the immaterial. Displays must be clear, detailed, and comprehensive. The mental matrix, individual or collective, against which information is analyzed and transformed into an estimate of the situation must correspond to the actual world rather than to one that existed twenty-five years previously or not at all.[9] The objectives selected must be both desirable and feasible, two requirements that are not always compatible. The alternative ways of action presented to the commander and his staff should be real, not just subterfuges presented as a matter of form. (As Moltke remarked to his aides, the enemy always seemed to have three alternatives open to him and he usually chose the fourth.) Once made, the decision must be firmly adhered to in principle, but not under any and every circumstance. Orders should be clear and unambiguous; they must tell subordinates everything they should know, but nothing more. Monitoring should be close enough to secure reliable execution, but not so close as to undermine the authority and choke the initiative (or even, as sometimes happens, the very ability to act) of subordinate commanders at all levels.

As this discussion implies, differences between various command systems can often be resolved into the various ways in which they approach these problems. The methods used for dealing with increasing complexity; the relative attention paid to function-related and to output-related responsibilities; the emphasis laid on any given part of the command process; and the specific strengths and weaknesses displayed in relation to the ideal—taken together, these qualities will go far toward defining the nature of any given command system. Whatever the solution adopted, the demands made on command systems are clearly of the utmost importance. With everything operating as it should and the manifold parts nicely balanced and meshing with each other, command may act as a force multiplier; Napoleon's presence on the battlefield was said by some of his enemies (this is attributed variously to Blücher and to Wellington) to be worth a corps of forty thousand men. Conversely, a failure at any point may put the entire chain in jeopardy—when, for

instance, a decision is based on an out-of-date piece of information. It is quite possible for errors made at more than one point to reinforce each other or, if the commander is lucky, to cancel each other out. War being by nature confused and the process of command complex, it is virtually certain that some breaks and errors will occur, a fact that a wise commander will take into account and provide for. While failure to do so may well result in catastrophe, it is equally true that not even the greatest victories in history resulted from anything like a perfect command system; in many cases, indeed, victories were won in spite of, rather than because of, the way the army's command system operated. So it has been in the past; and there is little doubt that, the introduction of modern communications and data processing systems notwithstanding, it will be so in the future.

THE EVOLUTION OF COMMAND

The functions of command, as I have said, are eternal. Provided he had a force of any size at his disposal, a Stone Age chieftain would have been confronted with them—all of them—just as much as his present-day successor is. Insofar as the forces at his command (and those of the enemy) were very much smaller, simpler, and slower in action, the functions of command were also simpler to carry out. On the other hand, the chieftain in question would hardly even have had writing materials, not to mention a pair of binoculars or an adding machine, to assist him in exercising those functions, which in turn would have placed very close limits on the size and effectiveness of the forces he could command. In balancing the task facing the Stone Age chieftain against the means that were available to him for carrying it out, there is little reason to believe that the exercise of command as such has become more difficult since Alexander showed how it should be done.

Although the functions of command are thus not subject to change (it is certainly conceivable for the way in which they are carried out to vary, however, and for their relative importance and relationship to each other to do the same), the means at its disposal as we know them today are, without exception, the result of long and continuous development. A useful method for classifying these

means is to divide them into three categories: organizations, such as staffs or councils of war; procedures, such as the way in which reports are distributed inside a headquarters; and technical means, ranging from the standard to the radio. The combination of these three should make it possible, in principle, to describe the structure of any command system at any given time and place.

The evolution of command systems does not take place in a vacuum, however. Their development is partly a response to changing requirements. A modern mechanized brigade, capable at a pinch of covering 150 miles per day, obviously cannot be commanded by the same technical means as a Napoleonic cavalry brigade capable of no more than a fifth of that distance. An invader reaching from the English Channel to Verdun, to use the example of World War I, cannot be perceived, much less countered, by means of personal observation such as was employed by commanders in past centuries. Developments in weapons, tactics, strategy, and a host of other factors will require command systems to match. The latter are thus reflections of the art of war as it exists in any given period; they are affected by, and in turn affect, the state of that art.

Like other parts of the art of war, however, command also has its own history, which is to a limited extent autonomous and independent of other components. In particular, since the means at its disposal are diverse, a development in any one of them almost always entails a change in the rest. For example, it was the procedure of submitting daily detailed strength reports, established toward the end of the eighteenth century, that created the requirement for specialized personnel and thus gave birth to the first general staff. Once staffs existed, pen and paper, not to mention desks and filing cabinets, became much more important than they had previously been. The switch from oral to written operational command, largely accomplished within the century from 1750 to 1850, meant that far more attention could be paid to systematic analysis. Thus, the various elements of command systems interact with each other and with the processes of command, and they push development along.

Finally, developments in command have often been stimulated by outside factors, particularly technological ones. The employment of the telescope, for example, enabled Frederick the Great to establish his headquarters at a fixed location overlooking the battlefield

rather than having to rush around it, as was the practice of Gustavus Adolphus a century before. Samuel Morse hardly had the U.S. Army in mind when he invented the telegraph, but once the telegraph existed its military significance was soon appreciated. The same holds true for the telephone (originally invented as a by-product of research aimed at providing aids for the deaf) and the radio. The effect on organization and procedures, and indeed on the conduct of war, of all these inventions has been profound.

The evolution of command, in brief, is as complex as that of any other part of the art of war. Moreover, its study presents some unique problems, which form the theme of the next section.

THE STUDY OF COMMAND

To understand the evolution of command through time, it is first of all necessary to work out a matrix into which it will be possible to fit the command system employed at any given time and place. What, one might ask, were the demands made on a given command system by the existing state of the art of war? In what ways were these demands met? What organization, if any, was provided for the purpose? What technical means (even an arm being waved up and down constitutes a technical means) and what procedures were employed? How was intelligence procured and processed, and in what manner were plans arrived at? What means of communication existed, and how did their characteristics affect the transmission of information? How was the execution of orders monitored, and what control, if any, did the commander exercise over the course of events? As one writer has pointed out, existing military literature makes surprisingly few efforts to answer these questions, if indeed it asks them in the first place.[10] While books on management and "decision-making theory" have multiplied promiscuously in recent years, works on command as here understood are, for one reason or another, rare. Save perhaps for the occasional intercepted or misunderstood message or the broken-down radio, it is indeed possible to study military history for years and hardly notice that the problem exists. A possible explanation may perhaps best be put in terms of a homely analogy. Few people pay any attention to long-distance telephone calls unless they are exceptionally difficult (or easy) to make.