AKADEMIA OBRONY NARODOWEJ

WYDZIAŁ WOJSK LĄDOWYCH
KATEDRA SZTUKI OPERACYJNEJ

Ppłk dr Kazimierz SIKORSKI

WYBRANE ASPEKTY MOŻLIWOŚCI BOJOWYCH ZGRUPOWAŃ WOJSK W ŚWIETLE ZMIAN JAKOŚCIOWYCH POLA WALKI

Wykład w języku angielskim

WARSZAWA 1991

AKADEMIA OBRONY NARODOWEJ

WYDZIAŁ WOJSK LĄDOWYCH
KATEDRA SZTUKI OPERACYJNEJ

Ppłk dr Kazimierz SIKORSKI

WYBRANE ASPEKTY MOŻLIWOŚCI BOJOWYCH ZGRUPOWAŃ WOJSK W ŚWIETLE ZMIAN JAKOŚCIOWYCH POLA WALKI

Wykład w języku angielskim

WARSZAWA 1991

..Dr. Kazimierz SIKORSKI
ONAL DEFENCE ACADEMY (PR)

SOME ASPECTS OF THE COMBAT POWER OF MILITARY CONCENTRATIONS, IN THE LIGHT OF QUALITATIVE CHANGES OF BATTLEFIELD

Gentlemen!

I am sincerely honoured to have the occasion to speek to you, as the first Polish military specialist visiting your Academy. Thank you very much for your kind invitation and warm reception. I hope, soon, some of you Gentlemen, will visit National Defence Academy in Warsaw too. You are welcome.

I think, it is a very good idea to conduct such activity. I mean visiting each other and working together. If we wish for peace, and I am sure we wish, we have to understand war, in the same sense as Liddell Hart in his old maxim. If we are to understand war, we have to study it profoundly, and, I think, you agree with me that to study together is much easier and effective, than to do so alone. But please foregive me this digression from the subject of this lecture.

Gentlemen, I would, like to present my views on some aspects of the combat power of military concentrations, in the light of the qualitative changes of battlefield.

I am going to touch such points as:

- the nature of combat power;
- the trends of evolution of war;
- some views on the structure of battle system;
- the conclusions relating to the changes of battlefield;
- employment of the systems approach to study the agents of combat power; and

- conclusions referring to the development of combat power in the environment of modern battlefield.

1) The nature of combat power.

So, let´s consider the nature of combat power. I think, to look into definitions is a good way to get to the bottom of things. Three are many definitions of combat power. I have chosen there of them.

The First one states that we can consider the combat power as the totality combat characteristics and technical capabilities necessary to accomplish particular missions. The combat power depends on the degree of: complement; training and number and quality of equipment.

The second definition states that the combat power can be considered as the total quantitative and qualitative coefficients which characterize the units´ power to fulfil particular missions in the required time and situation. The combat power depends on the number of soldiers, training, morale discipline, available weapons and equipment, organization of forces and logistics; as well as on the relative power of the opposing forces, terrain, climate and weather and so on.

I prefer the third definition which states that combat power is a combination of the phisical means available to a commander and of the moral strenght of his command. It is significant only in realtion to the combat power of the opposing forces. In applying the principles of war, the development and application of combat power are essential to decisive results.

Taking into account the already mentioned definitions and other ones you can see that the gist of combat power includes the ability to conduct missions succesfuly in any environment of

„ Combat power is a combination of the physical means available to a commander and the moral strength of his command. It is significant only in relation to the combat power of the opposing forces. In applying the principles of war, the development and application of combat power are essential to decisive results."

Figure 1. Definition of the combat power.

battlefield. The problem of combat power development is very complicated and complex because there are involved nearly all factors of human biosphere, both physical and mental ones, as for as they are related to a battle. Furthermore, the battle is being transformed all the time, so that it is very dificult to define precisely the essence of the matter, particularly in the case of development and application of combat power in the future battle, when we are not sure, or even do not know, what exactly the opposing forces are, and when and where the battle will take place. There are many other unknown factors, of course. We can reduce the unknown, if we observe carefully the trends of evolution of war.

2) The trends of evolution of war.

Evolution of war has not been regular. For above two thousands years, until the XX-ies century, the war had not been transformated much. There were some changes, of course. You can observe the growth of size, the growth of fire-power, the growth of mobility and may be other changes but all of them had been developing very slowly.

The XX-ies century brought not only the violent forcing of these trends but also the rapid development of the others such as: the growth of armour, aviation, CBR weapons; the extention of range of weapons; the growth of automatization, computerization and of military applications of electronic in general.

The development and military application of the information means have acquired a big importance lately, too.

It seems, that during the last seventy - eighty years, all the blessing of civilisation has been adaptoted for the development of battle system.

- The growth of size;
- The growth of fire - power;
- The growth of mobility;
- The growth of armour;
- The growth of range of weapons;
- The growth of CBR weapons;
- The growth of automatization;
- The growth of information means;
- The growth of computerization.

Figure 2. Some trends of the evolution of war.

War has become so large, bloody and expensive that both politicians and military specialists started looking for more effective development and application of combat power. It was necessary to identify the structure of battle system and to build its model in the first place.

3) Some views on the structure of battle system.

As you know, Gentlemen, to model a modern battle is a hard problem of the art of war. It has happened so because of the complexity and variability of battle. It doesn't exist constantly and is transformed permanently, so none can forsee what it will really look like and nobody is able to describe it in such a way that one can build its precise model.

It seems to be a kind of a vicious circle. As long as you had not studied a battle, you would not have been able to model it, and until a battle has not been modelled you can not study it profoundly. One would wonder if there is any possibility to solve this problem. There have been many attempts of this. At first they were related directly to the forces.

For example, army was compared to the egg and its three essenti elements were distinguished as follows (look at figure 3):

- the shell-egg - the combat units;
- the white - the command system; and
- the yolk - the combat service support.

The author stressed that destroying one of them incapacitated the others for acting.

The second example is illustrated in figure 4. The battle system (BS) contains two operations systems A and B (OS/A and OS/B). Each of them consists of the Destruction System (DS), the Destruction Control System (DCS), the Maintenance System (MS) and

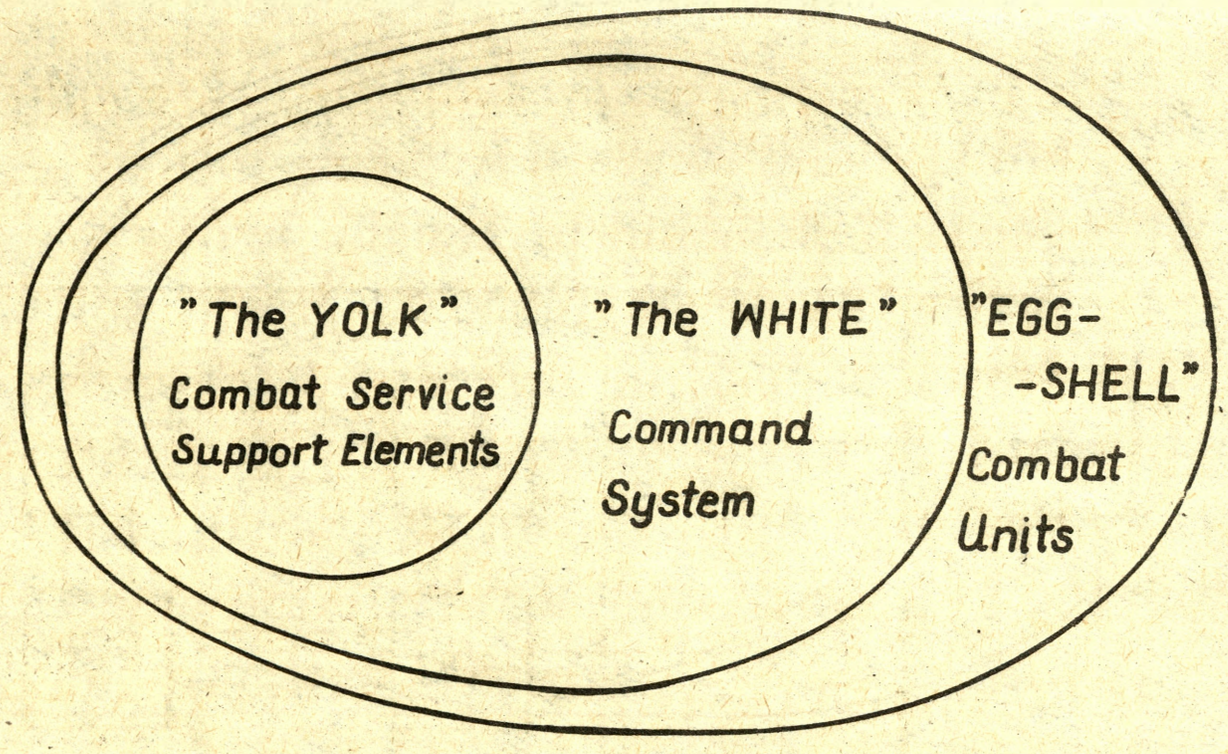

Figure 3. The army's anatomy by J.F.C. FULLER.

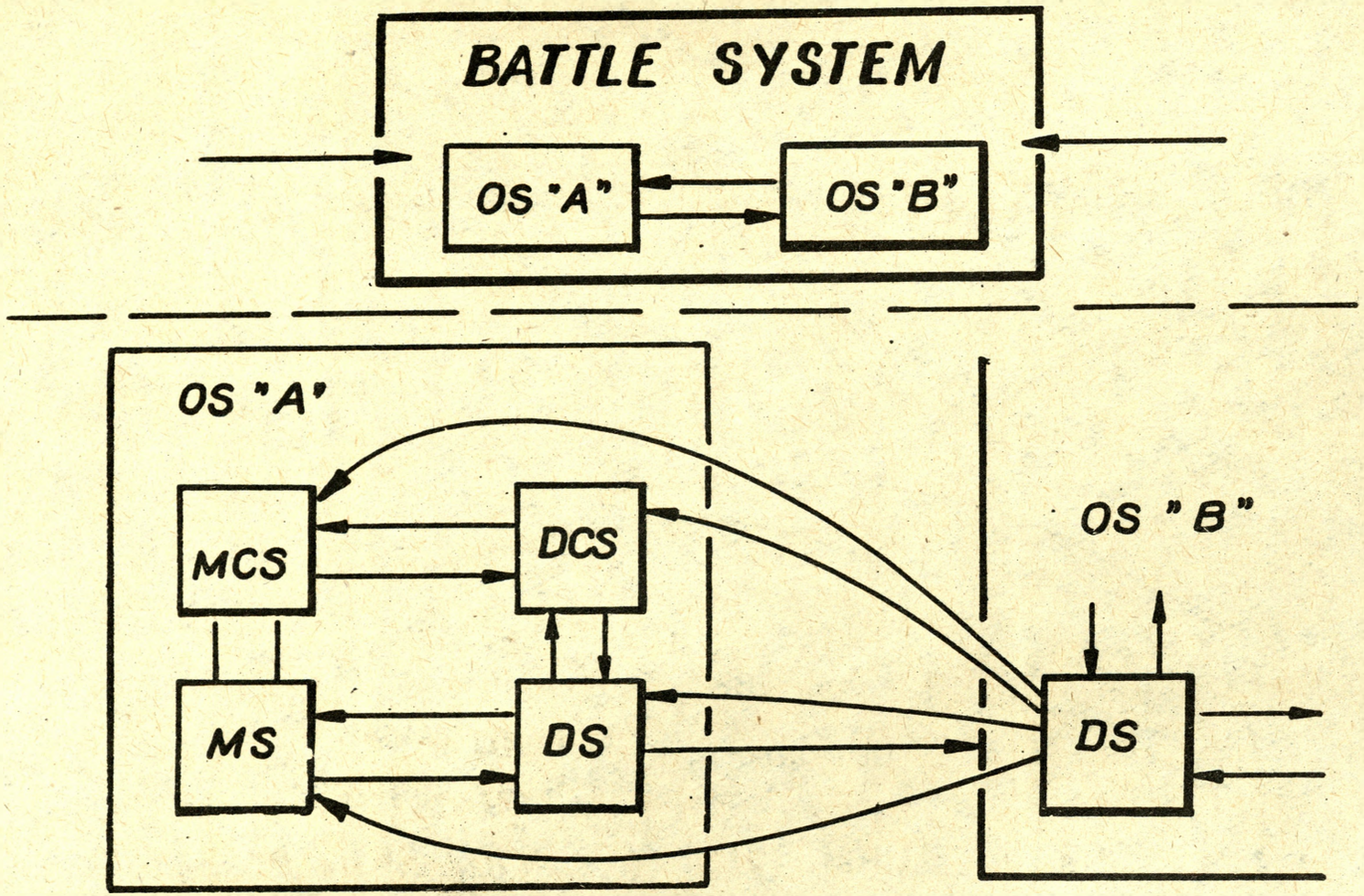

Figure 4. Structure of a battle system

the Maintenance Control System (MCS). DS influences all elements of the opposing OS. Only a few elements and relations have been exposed in this presentation, the ones of destruction, control and maintenance. Destruction seems to be the most important one.

The third example is illustrated in figure 5. According to this approach there are eight "dimmensions" of the war which one should consider to model a modern battle. They are points (posts, targets), distance, area, altitude, time, information, electromagnetic spectrum and will. System relations have not been exposed but the compostion of the battlefield factors is a very intresting one.

Another approach is illustrated in figure 6. There are five Battlefield Functional Areas (BFA) of: manoeuver, fire support, air defence, intelligence/electronic warfare, combat service support. None of the BFA has been eposed especially, and they seem to be relatively equivalent. If so, this is a qualitatively new approach to battle modelling.

One more view of battle system is illustrated in figure 7. This is the FOFA "Triad", which has been described as "the eye" (Surveillence and Tarset Acquisition), "the brain" (C^3I Systems) and "the fist" (Attack Assets) for FOFA. In this model there is much of truth of a modern and future battle. I think, modern armed forces have allready got sufficient number of proper attack assets to destroy an enemy and it seems to me, that nowdays combat potential of military concentrations depends much more on the ~~xxxx~~ abilities of the command, control and intelligence systems than on the kill potential, though it still remains a very important one.

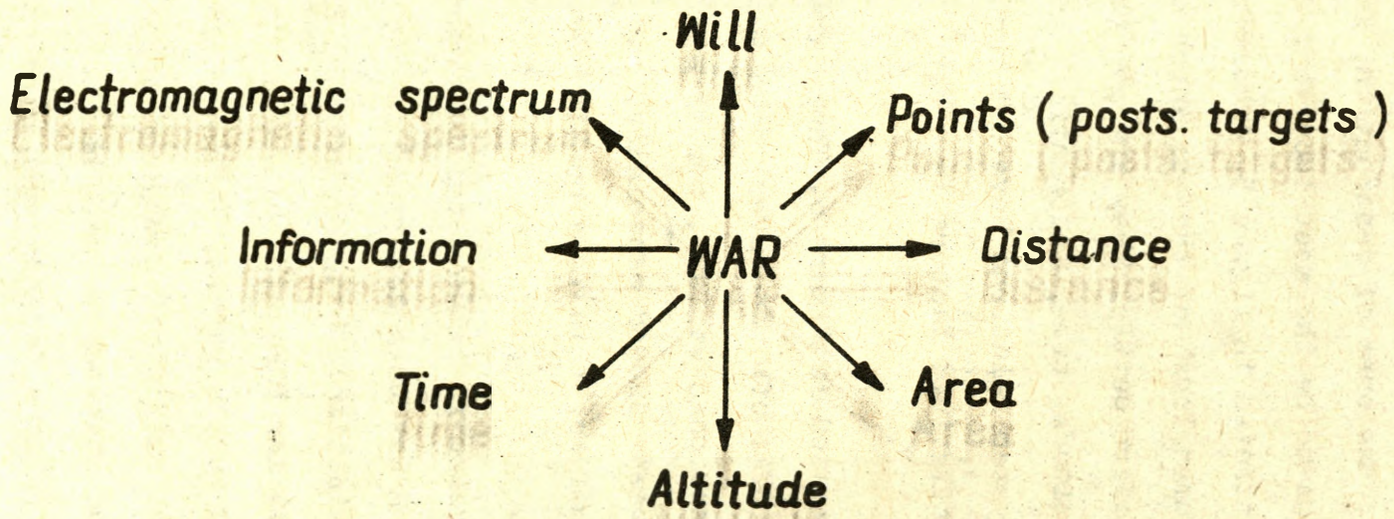

Figure 5. Dimmensions of the war.

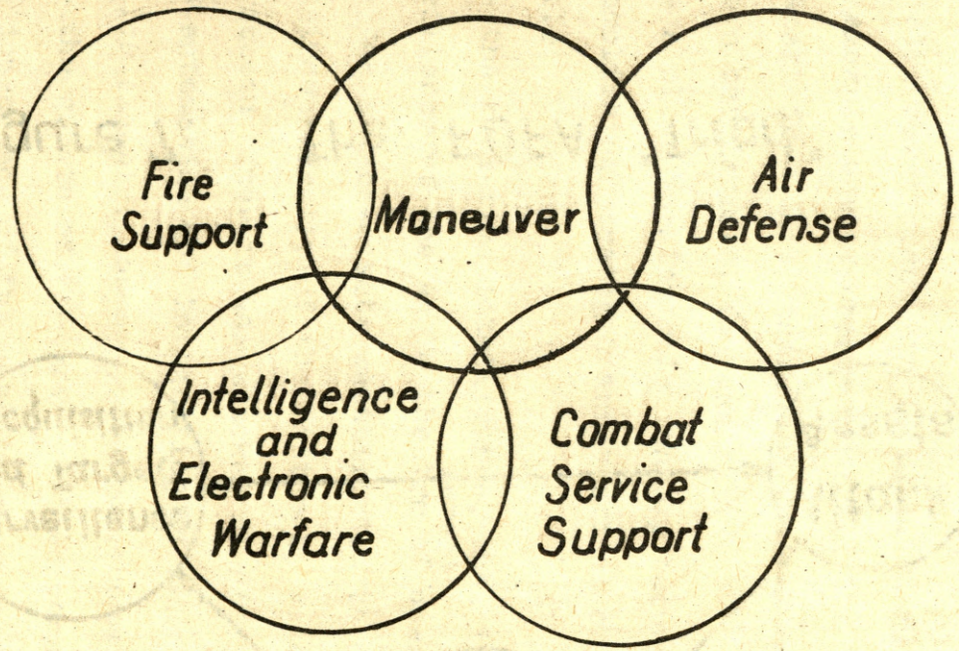

Figure 6. The battlefield functional areas

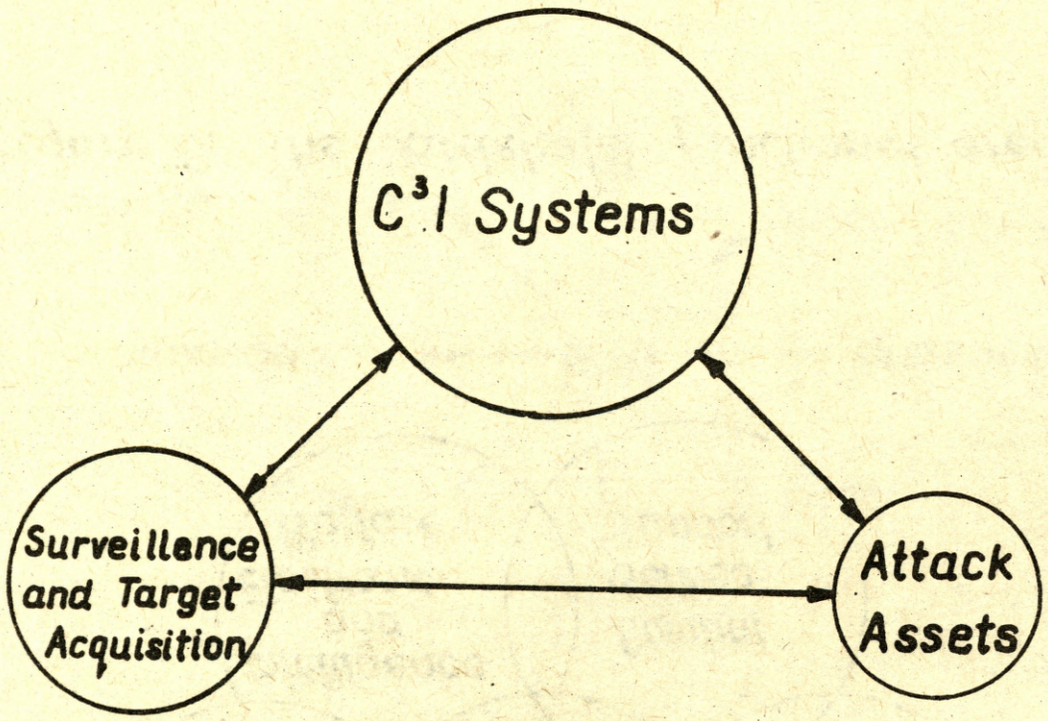

Figure 7. The FOFA "Triad"

4) The conclusions relating to the changes of battlefield.

Gentlemen, I think that the considerations which I have made hitherto allow to draw up some conlusions relating to the changes of battlefield.

First of all, I would like to stress that, the battlefield is no longer a piece of ground on which a battle is fought, as it used to be defined. Modern battle is fought both on the graund and in the air, outer space and in other dimmensions or spheres, such as, for example elelctromagnetic spectrium and information environment

Apart from this, there are several qualitatively new agents of modern battlefield, for example:

- a close working relationship between air and land forces in accomplishing strategic and tactical objectives of the AirLand Battle;

- the real-time intelligence, that is target acquisition and surveillence of the whole theatre (area) of operations;

- the attack-assets capabilities to destroy any target, all most independently of the distance, weather, and climate, in a few second after it was tracked down;

- automation and integration of many processes of battle, such as, for example. command, control, communication and intelligence;

- the growth of "intelligent" weapons and information means; an

- dependence of the combat power on electronic means.

As you can see, Gentlemen, many new designations have come with the domain of the notion of "battlefield". Indeed, we should rathe use the term "battlespace" instead of "battlefield". In fact we should change not only the terms but also the way of thinking and acting in the environment of modern battle.

It seems to me, that the best way to study the possibility of developing and applying combat power, in such complicated circumstances, is to employ the systems approach in order to study the battle.

5) Employment of the systems approach to study the agents of combat power.

System theory offers a formal framework which can be used to model a battle. This framework contains methodical principles that can be generally applied to entities independently of types of elements, relations and the dynamics between them.
A battle is being modeled in many military centers and institutes. There are many systems approaches, but a more fundamental survey often reveals the uniformity of opproach in principle. Particularly two principles are often ignored or underestimated, the one which states that the sum of subsystems or elements must represent a hundred percent parent system or subsystem, and the other one, which states that subdivision of a system, subsystem or element must show all its directly subordinated subsystems or elements.

Speaking from experience, I would like to notice, Gentlemen, that it is very useful to consider a battle as complex, dynamic system composed of: elements, states, relations and unifications. The example, I would like to present, is illustrated in figure 8. A set of elements of the battle system contains: the military concentrations of opposing forces and some components of biosphere filling the space of battle (SO), particularly: gerographic environment, social and economic substructure; biological environment, information environment, government and population.

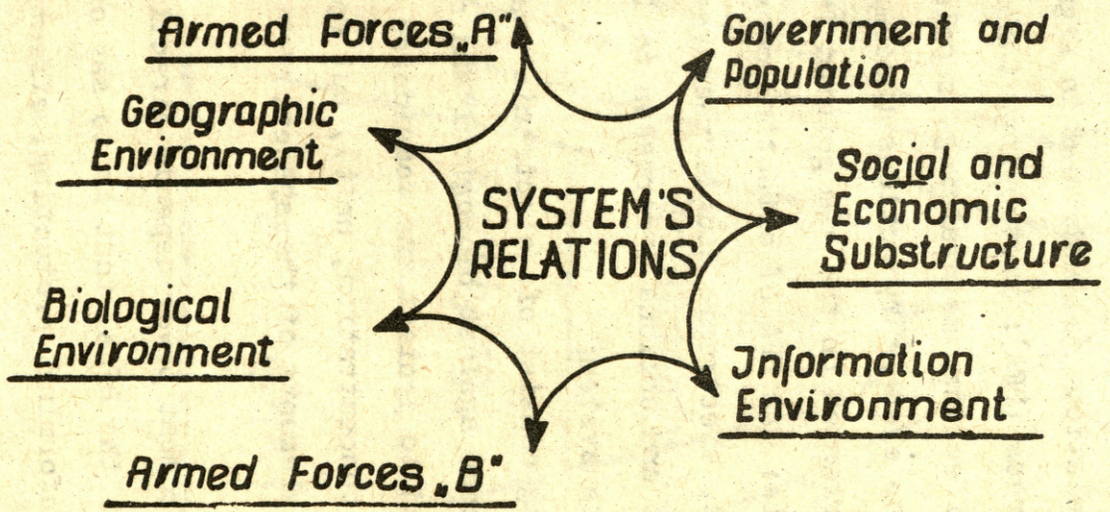

Figure 8. The general system of a battle.

This is the highest level of generalization, of course.
It is possible to perceive an element as a system if it is felt appriopriate and necessary, and if it is possible to subdivide it into elements. The process can be continued as long as it is deemed expedient for the particularness of the model. I think, a battle should be reflected in models as "a system of systems"

A set of the system relations (illustrated in figure 9) contains seven Battle Functional Areas (BFA): protecting, informing, decision making, translocating, effecting, maintaining, supplaying. Each of the BFAs consists of the elementary actions (accomplished before and during operations) oriented on the aim pointed in the name of proper BFA. For example: the BFA of effecting consists of: air and land fire support, electronic countermeasures, destruction of the hostile air threat and actions undertaken to influence the elements of the battle system;

- the BFA of protecting consist of: electronic counter-countermeasures, camouflage, defence against biological and chemical agents and other actions oriented to protect the considered battle subsystem/element (military concentration, unit), but not to influence directly other elements of the system;

- and so on.

It can be proved that combat power depends directly on effectiveness of activity in all the BFAs, that is to say on effectiveness of decisionmaking, informing, protecting, effecting, translocating, maintaining and supplying.
This idea is illustated in figure 10.

The research has not made it possible yet to formalize the general function of combat potential/combat power.

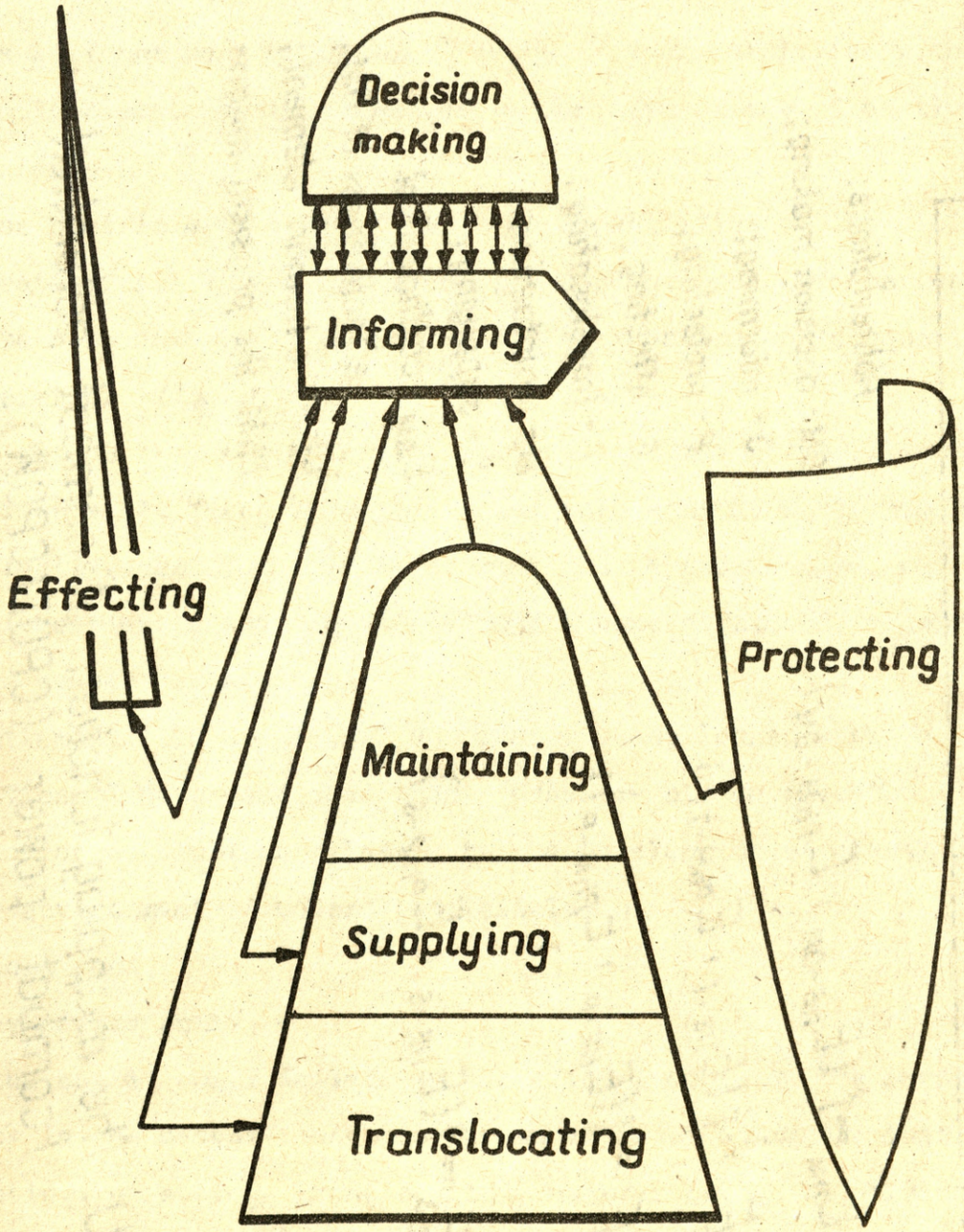

Figure 9. The battle functional areas.

$$CPOT/CPOW = F(E_{DM}, E_J, E_P, E_E, E_T, E_M, E_S)$$

$$E_{DM} = f(E_{HE-DM}, E_{PhM-DM});$$

$$E_J = f(E_{HE-i}, E_{PhM-J});$$

$$E_P = f(E_{HE-P}, E_{PhM-P});$$

$$\vdots$$

$$E_S = f(E_{HE-S}, E_{PhM-S})$$

Abbreviations:

DM - decision making;
J - informing;
P - protecting;
E - effecting;
T - translocating;
M - maintaining;
S - supplying;
E_{DM} - coefficient of effectiveness of DM;
HE - the human element;
PhM - the physical means.

Figure 10. The mapping function of combat potential /combat power (CPOT/CPOW).

Perhaps it will not be necessary, if commanders are satisfied with their units combat power, presented in the form of set of partial coefficients.

These coefficients reflect relative capabilities of the military concentration/unit in the particular/each BFAs. Such information would be very useful for a commander while preparing and conducting the operation (figure 11).

The method of calculating the partial coefficients is illustrated in figure 12. There have been taken into account such factors as: effectiveness of the human element and physical means, capabilities ofthefriendly and opposing/standard concentrations, expenses of the considered mission.

Gentlemen, I am not going to bother you any longer with the mathematics. I have mentioned those formulas only to give the grounds for conclusions relating to the development of combat power in the environment of modern battlefield.

6) Conclusions.

They are as follows:

- the combat power depends on the effectiveness of the forces' activity in the battle functional areas of decisionmaking, informing protecting, effecting, translocating, maintaining and supplying;

- both the physical means and human element must be taken into account while combat power is estimated;

- the structure of military concentrations shuld be adjusted to the structure of battle functional system (in the first place the structure of the command system shuld be adjusted);

- the combat power depends more and more on the effectiveness of protecting (comouflage, electronic counterconterneasures, etc.) and on the translocating (air-land mobility) as well as on the

$$CPOT/CPOW = [E_{DM}(1:1{,}5), E_J(1:2), E_P(4:1), E_E(1:2), E_T(3:1), + E_M(1:2), E_S(3:1)]$$

or :

$$CPOT/CPOW = 2{,}5:1$$
(kill potential)

Figure 11. Which presentation of the combat potential/combat power would a commander like to have while decision making ?

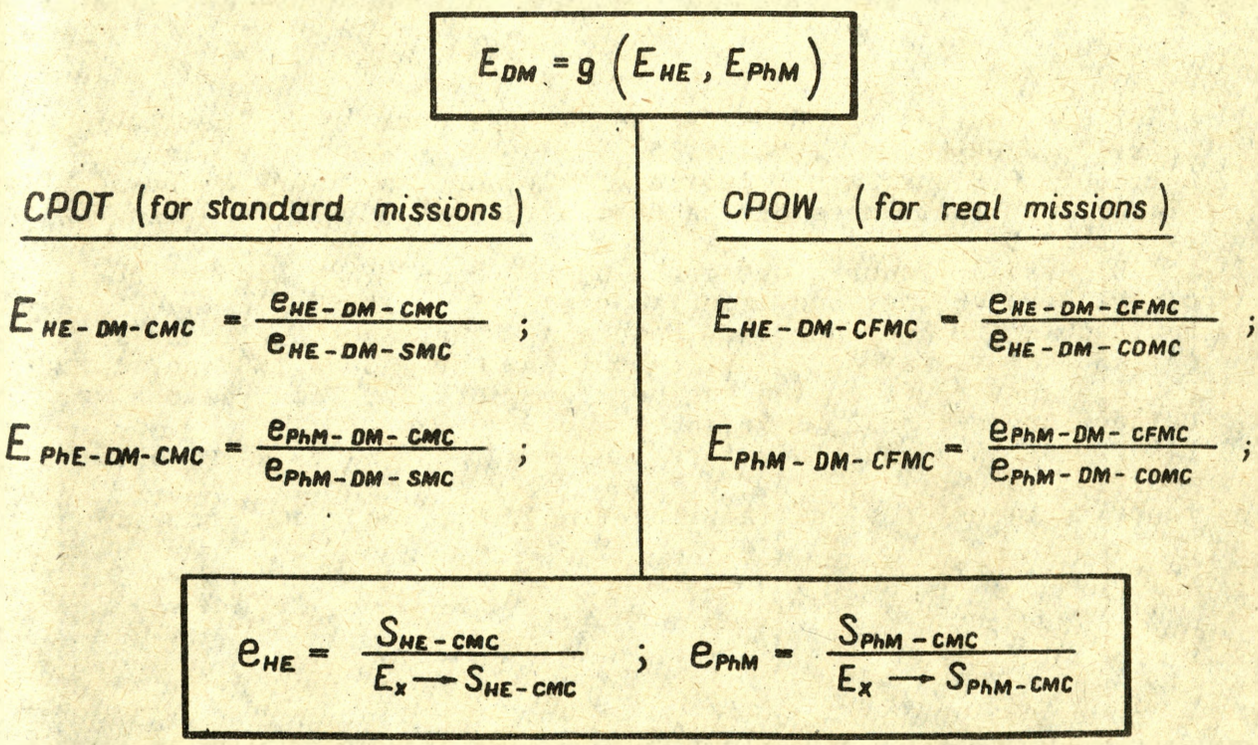

Figure 12. The mapping functions of coefficient of effectiveness of (for example) decision making. (CMC - the considered military concentration, SMC - the standard MC, CFMC - the considered friendly MC, COMC - the considered opposing MC, E_x - the expenses).

effectivness and quality of decision making and informing.

Gentlemen

If any of the items, which I have presented hitherto, inspires your interest, I am fully satisfied.

Thank you very much for your kind attention.

Endnotes

1) LTCol E.A. Muller von Bank "A Systems Approach to an Identity Crisis", SIGNAL, may 1990, p.35;
2) Col.Prof. P.Sienkiewicz "Teoria efektywności systemów kierowania" (Theory of Efectivness of the Control Systems), ASG WP, Warszawa, 1979, p.146;
3) Col R. Grabau "Sechs Dimensionen des Krieges" (Six Dimmensions of the War), Soldat und Technik, nono.1,2,3, 1986;
4) R.J.Rechter, D.F.Bender, W.A.Holdrege, J.Walbeck, C.Pizzutelli "ATCCS An Integrated C Environment", SIGNAL, June 1989,pp.181-188;
5) Sir B. Kenny "FOFA in the Northern Army Group", International Defence Review, no 2, 1990, p.145;
6) LTCol Dr. K.Sikorski "Niektóre problemy modelowania walki zbrojnej" (Some Problems of a Battle Simulation), Myśl Wojskowa, no.2,1991.

Druk AON nr 470/WW