



ARCHIVED - Archiving Content

Archived Content

Information identified as archived is provided for reference, research or recordkeeping purposes. It is not subject to the Government of Canada Web Standards and has not been altered or updated since it was archived. Please contact us to request a format other than those available.

ARCHIVÉE - Contenu archivé

Contenu archivé

L'information dont il est indiqué qu'elle est archivée est fournie à des fins de référence, de recherche ou de tenue de documents. Elle n'est pas assujettie aux normes Web du gouvernement du Canada et elle n'a pas été modifiée ou mise à jour depuis son archivage. Pour obtenir cette information dans un autre format, veuillez communiquer avec nous.

This document is archival in nature and is intended for those who wish to consult archival documents made available from the collection of Public Safety Canada.

Some of these documents are available in only one official language. Translation, to be provided by Public Safety Canada, is available upon request.

Le présent document a une valeur archivistique et fait partie des documents d'archives rendus disponibles par Sécurité publique Canada à ceux qui souhaitent consulter ces documents issus de sa collection.

Certains de ces documents ne sont disponibles que dans une langue officielle. Sécurité publique Canada fournira une traduction sur demande.

November-December 1977

EMERGENCY
PLANNING
Digest



Emergency Planning
Canada

Planification d'urgence
Canada

EMERGENCY PLANNING Digest

Vol. 4, No. 6

November-December 1977

Contents

Post-Strike Scene - U.K.	SIR LESLIE MAVOR	2
Beneath the Surface	G. N. SISSON	5
Basic Principles of Civil Defence	DR. U. EICHSTADT	8
Swiss Compulsory First Aid	ARTICLE	12
Nuclear War Life and Death Issues	E. ULSAMER	13

Published by:
EMERGENCY PLANNING CANADA
Ottawa, Ontario

Director General: Victor J. Walton

The EMERGENCY PLANNING DIGEST publishes six editions annually to provide current information and reference material on a broad range of subjects dealing with civil emergency planning. Copies may be received regularly by written request to Emergency Planning Canada, Ottawa, Ont. K1A 0W6.

In addition to publishing articles which reflect Canadian policies Digests may also publish articles by private individuals on subjects of interest to emergency planning programs. Such DIGEST articles and views expressed by contributors are not necessarily subscribed to by the Government of Canada.

Editor: Alex. M. Stirton

© Minister of Supply and Services Canada 1977
K1A 0S9

ISSN 0317-3518

POST-STRIKE SCENE — U.K.

By

Air Marshal Sir Leslie Mavor, KCB, AFC, DL, FRAeS, RAF (Ret'd)

At the NATO Civil Defence Training Seminar held at the United Kingdom's Home Defence College, York in May, Sir Leslie Mavor the college Principal presented the paper from which the following has been extracted. Sir Leslie developed his themes of planning, education and preparation of key staff in peacetime and of leadership and governance in the aftermath of war. After illustrating the effects of a hypothetical nuclear attack on the UK he continued. . .

The message for those of us concerned with promoting civil preparedness and training in the U.K. is that it is very different from the popular view that nuclear war would see the end of all life in this country — and indeed in any other that was involved. However, I have to say that even this survival estimate depends on sound plans having been put into effect before attack. If they weren't, then the numbers of survivors might be cut by half.

And what about the effect of such an attack on the control structure, on communications, on essential services, on law and order and so on — or of the movement of people that will almost certainly take place regardless of advice and make everything more difficult?

Many of the decentralized centres of government, i.e., the wartime civil headquarters, will have been destroyed — and the gaps will have to be filled as best we can. Communications will be seriously disrupted in many areas, with roads and railways blocked and telephone lines, exchanges and radio masts destroyed or otherwise put out of action. This means that the intelligence about people, about essential services, and about all other resources that is vital to crisis management will be scarce: and not only that; in the immediate aftermath of attack, the flow of information will depend so much on word-of-mouth contact between shocked and disorientated people that it will often be unreliable and will certainly be very local in nature.

At this stage, intelligence gathering and processing will have a very high priority, and is an area where any surviving military forces and the police could do a lot to help. (Incidentally, when we consider that many of the local government officers picked for intelligence duties in wartime civil headquarters are public relations or information officers with little formal experience of handling raw intelligence, the need to train these people in this exacting skill is obvious).

Because of damage to roads and railways and the lack of fuel and electricity, it will be very difficult to send help where it is needed, even if surplus resources are available for transfer and those who control them know where to send them: which is one reason why, in our planning, we assume that in the early days after attack

there will be little or no capacity for mutual support beyond what you might call "walking distance".

Although there will be an abundance of combustibles to give warmth and for cooking fires, and of scrap timber, rubble and other rough building materials for primitive shelters, resources such as food and energy will be very short in most parts of the country. Moreover, to ensure longer term survival, the more vital commodities will have to be conserved, and stocks protected in store and when being moved. In the same way, such power as is available for industrial or household use will have to be controlled and rationed in accordance with a phased programme for recovery.

And all these extremes of hardship, strain, discomfort and want will be hitting a battered, shocked and hungry people: people who have grown up in all the ease, and comfort, and benefits and orderliness of life in a modern, advanced, industrial society. There will be those in whom the will to survive will be unquenchable, but there will be others who, as the agony drags on, will grow more and more weary of the immense effort in adapting to new ways of life and methods of work, more and more distressed by the mounting toll of victims of radiation sickness, and more and more resentful of their fate. And not only resentful of their fate, but, as Professor Nailor* implied, given any sort of opportunity for complaint or grievance, resentful of authority. Indeed, such is the capacity of the human mind for self-protection, that in such a situation it tends to turn, not against those who have brought it about, but against those who are trying to put things right.

As a wartime prime minister of this country once said, "What makes war so terrifying is that it is waged by men. No human effort brings forth more clearly and impressively the strongest qualities of mankind as a whole". And we can say that this battle of recovery is likewise going to be fought by men, and in the immediate aftermath of nuclear war the qualities of leadership displayed by those in authority are going to count above all else. If the morale of the survivors is going to

*Professor Peter Nailor was professor of politics at the University of Lancaster, at the time of this seminar. He is now professor of history at the Royal Naval College, Greenwich.

be maintained — which is just another way of saying if we are going to see effective government by consensus, the law maintained and order preserved, then those in authority will have to be able to win the support of the people: as there will be no means of commanding it and the surviving police and military forces will be far too few to support any rule by force, even if this were ever to be contemplated. In order to win this support, those in authority must be able to spell out their objectives, both short and long term, to persuade people that these objectives are sensible and in the common good, and to gain their approval for the measures and methods by which they mean to attain them, however tough and uncompromising. All of which explains why, in aiming to prepare those who have been earmarked for this crucial leadership role, we think of preparing them, not only in the sense of telling them what they need to know and educating them in the practices and procedures of civil defence, but of making them mentally fit and ready for what may one day face them.

So much, then, for the likely effects of nuclear attack on this country; a statement so general that it must not lead us to think that a uniform situation will exist across the country after attack, that each part of the country will be affected in roughly the same way and face the same sort of challenges in survival and recovery. Even in this small, highly industrialized and overcrowded island the likely target systems are spread unevenly, with the few dense concentrations of industrial muscle lying close to sizeable, thinly populated areas that have little economic potential and no military significance at all. As I have already implied, the chances are that those parts of the country holding no nuclear targets will come through more or less undamaged by blast or fire; their problems will be those of fall-out radiation, a massive influx of refugees, of surviving without external supplies of food, energy, raw materials, finished products and other resources, and in a state of physical, social and economic isolation. In these areas, communications systems will have very largely survived. This should mean, firstly, that the link-up between district and county and region headquarters will come about fairly soon after attack and, secondly, that the leaders at these different levels will know what is happening and should be able very quickly to set about the job of bringing order out of chaos and to embark on a co-ordinated operation for recovery. On the other hand, the main target areas will be so badly knocked about as to be beyond effective self-help: they will have to be more or less discounted until, in due time, adjoining areas get sufficiently on their feet to come to their aid.

In between will lie those parts of the country that have been hit hard, but have not suffered a technical knock-out, and so find themselves poised on a knife's edge between recovery or further deterioration. Unless they can at once begin to revive — and this is where planning and preparation and training beforehand will pay off — such areas will tend to go rapidly towards

collapse. Their fate will depend on the inter-action of various factors. For example, if the attack leaves many survivors but destroys most of what is needed to sustain life, competition among survivors could set off a cycle of deterioration. Competition — or conflict — for scarce food would lead to misdirected and inefficient use of what was available; recovery efforts would be hindered; shortages would worsen; conflict would intensify; and the social system would start on a descending spiral towards disintegration. It is in these critical situations, where things may seemingly go either way, that the quality of leadership available will be decisive.

Under good leadership and effective management the initial position will be held whilst everyone takes a deep breath and recovers from the shock, ground will not be lost by default. Sensible and timely decisions and action will be seen to be taken, the community will react favourably, and life will be ordered surely, even if slowly, towards recovery.

The point in all this is that these areas that are left poised between recovery and collapse may well represent the bulk of the country, and the way things go in them may well decide the ultimate fate of the country as a whole. How things go in these areas will hang on the plans and preparations made beforehand, and the value of our training programmes. And the final point I always make in this connexion — and especially when speaking to those whose responsibilities lie in our biggest cities — is that some of the most bomb-worthy target complexes may be numbered among these areas of decision. We know that the big cities will be high on the enemy's target list, but to assume that each and every one will inevitably be dealt a knock-out blow, and hence to say, "why bother about civil defence in these areas" is to credit the enemy, his weapons and his delivery systems with an infallibility for which there is absolutely no historical precedent. Whatever the sums look like beforehand, in the fog of war much goes wrong.

So much for the fog of war. What about the fog of peace that surrounds this little paper with its assumptions, estimates, informed guesses and deductions about the effects of nuclear attack on these islands? Let me conclude by summarizing them for you.

- The attack will be aimed at putting us quickly out of the reckoning by disabling the country militarily, politically and economically.
- Factors such as the distribution of target systems, the 'stay-put' policy and differences in local states of preparedness will cause the effects of attack to vary widely throughout the country. The main target areas are likely to be so badly hit as to have to await outside help for recovery in the long term. On the other hand, areas holding no nuclear targets are unlikely to be crippled by blast or fire. Here the

machinery of government should swing quickly into action, and the prospects of recovery in the shorter term will be good. Between these extremes will be the areas which, though hard hit, will not have suffered a technical knock-out and will stand on a knife's edge between recovery or collapse.

- These areas of decision are likely to make up the bulk of the country, and the way things go in them may well decide the ultimate fate of the country as a whole. And how things go in them will hang on the plans and preparations made by each beforehand, and good leadership, organization and the acquired ability of crisis managers to make sound and timely decisions against all the noise of the nuclear aftermath.
- This good leadership will require, inter alia, the ability of controllers and commissioners to win the support of the surviving communities, and thereby to achieve effective government by consensus, with

recourse to force in exceptional and limited circumstances only.

- The only enemy within our gates will be the disaffected.
- In training to survive and surmount the consequences of such an attack, preparation in the sense of making those designated for war appointments mentally fit and ready for what may face them will be just as important as any formal education in the requirements, procedures and practices of civil defence. The pay-off in practical terms will be immense.
- If between now and the unhappy event of nuclear attack, the local authorities as a whole were to achieve the standard of preparedness required by statute, and the government itself were to take timely action for transition to war, as much as two-thirds of the population would survive to bring about our national regeneration. ▲

BENEATH THE SURFACE

Cheaper, Safer, more efficient Structures

by

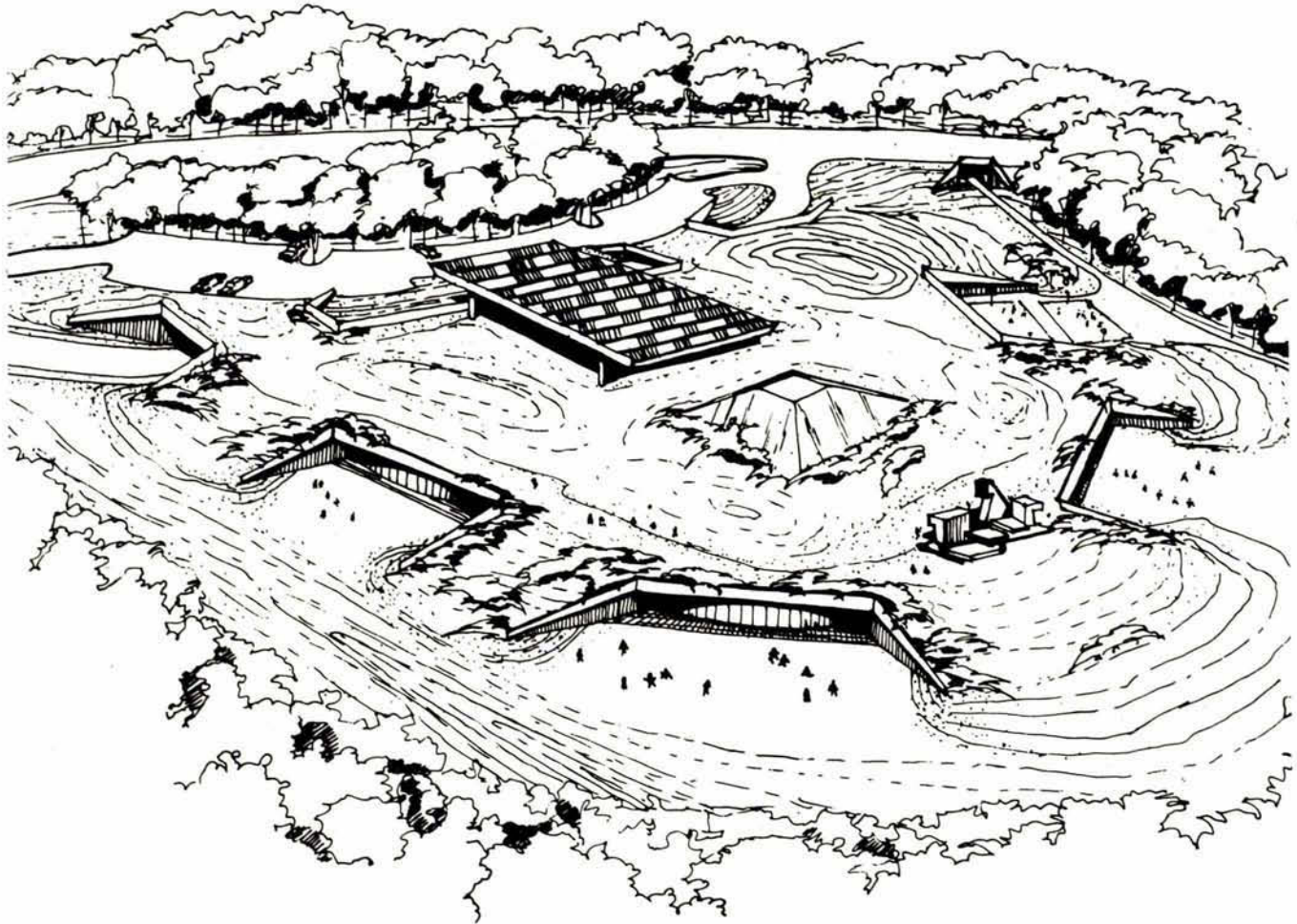
George N. Sisson

Defense Civil Preparedness Agency Research

High land costs and soaring energy costs have recently spurred an already growing effort to make more use of underground space. The 60,000-square-foot underground Terraset Elementary School, for example, under construction in the planned new community of Reston, Virginia, about 20 miles west of Washington, D.C., will use up to 80 percent less energy than a conventional school of the same size. Several underground schools have been in highly satisfactory operation in the United States for more than 10 years, but the Reston school was specifi-

cally designed — complete with solar heating — to combat the energy crisis. Heating and air conditioning in most parts of the United States must be designed to accommodate 100 degrees or more of temperature variation, whereas those systems in the constant-temperature underground environment must accommodate only a 15 to 20 degree range.

Not only does the underground environment (sometimes called subterranea) offer major long-term energy



UNDERGROUND SCHOOL — This is an artist's sketch of the modern underground Terraset Elementary School, now under construction at Reston, Virginia. The school was designed specifically to combat the energy crisis.

savings, but in some cases the initial cost also is actually less. One architect designed and built his own house underground, an attractive home with the rooms facing a central atrium. He reported the construction cost to be 25 percent less than the same house aboveground, plus the fact that the underground house cut in half the energy consumption of the structure.

Interest Precedes Energy Crisis

Even before the energy crisis, interest was growing in the use of underground space. A national conference was held in 1972 where 85 papers, addressing many aspects of excavation technology, were discussed. A follow-up conference was held in 1974 and again in 1976. A special study in 1974 sponsored by the National Science Foundation and the Engineering Foundation reported that widespread use of underground space could lead to the release of about \$60 billion per year to other social and environmental needs. More than just dollar savings, the report states:

"... Although urban systems have produced opulence, amenities, and many desirable features, they have also produced poverty, squalor, filth, pollution, congestion, and a host of severe imbalances which reverberate across the entire land. As urbanization grows at about four times the rate of population growth, which is deemed to be exploding, how can the direction of the urban systems be changed to upgrade the systems themselves and their outputs? What are the alternatives?"

The underground environment, which is still largely an unspoiled frontier to which man can apply his creativity, offers a battery of alternatives. . . ."

One might logically ask: Is this "unspoiled frontier" really being exploited?

Sweden Leads in Technology

Recently some 25 underground construction experts from Sweden made presentations in six major U.S. cities concerning their underground construction experience and equipment. The meetings were part of a joint Sweden-U.S. agreement to cooperate on matters of underground construction, rapid excavation, and rock tunneling.

The Swedes are internationally renowned for their advanced technology in rock excavation, and they export their technology and equipment to many countries throughout the world.

Sweden makes intensive use of underground space. (Swedes call it Terraspace.) Quite a few Swedish cities in the range of 15,000 to 50,000 population lie above excavations which average about 10 cubic yards of space per person. In fact, when contemplating a new project, the Swedes approach it from the point of view — why not put it underground? Thus it is not surprising to find all-weather rail and highway arteries, power

plants, factories, a wide variety of stored items, and countless other items and activities located underground in Sweden. In Stockholm four huge civil defense shelters have been constructed which function quite well in normal times as parking garages.

Swedish experts have also developed a wide variety of machines which can excavate almost any shape and configuration imaginable. One "human-fly" type of device advances an opening along any desired direction and angle, its track periodically bolted to the tunnel wall as it advances. Another machine resembles a giant crab, reaching forward and plunging its huge claw-like steel arms into freshly blasted rock fragments and then pulling them back onto a conveyor belt.

The Swedes have not only demonstrated the feasibility of storing various forms of energy underground, but in their experience it has actually been cheaper than conventional storage. Depending on circumstances and needs, petroleum, liquefied natural gas, hot water, and compressed air can be stored economically in rock excavations.

Other Countries Also Dig It

Although Sweden is generally regarded as a leader in underground construction, some of the advantages have been recognized in other parts of the world. A recent issue of *Pravda*, for example, notes: "In current planning for construction, the effort to make best use of space is being directed directly into the bowels of the earth." The article goes on to report that in North Chertanovo, roads, pneumatic motor transport for garbage disposal, entrances to storage areas for stores, garages, parking places, and all modes of communication are underground.

In Tokyo, faced with skyrocketing land costs and also limitations on building heights because of threat of earthquakes, many enterprises have gone underground. Shopping centers, streets, restaurants — even a hotel. One major advantage of controlled environment space is the clean air. Imaginative architectural treatment and lighting also can result in very tasteful and comfortable surroundings.

Montreal's huge underground Place Ville-Marie shopping complex underlies several blocks of the city. Here "shirt-sleeve" weather prevails throughout the year. Shops of every variety can be reached with the greatest ease and comfort on a single level in a clean, bright environment undisturbed by traffic, foul air, and noise.

Even U.S. Is Looking Down

The use of underground space in the United States lags behind that in Sweden and some other European countries. There are a number of reasons for this. The three national conferences noted earlier concentrated on means of improving the speed and lowering the cost of excavation. Because of our limited activity with un-

derground as compared to aboveground construction, there is also a limited supply of specialists who understand how to evaluate and use underground space. An objection sometimes raised — that it would be psychologically unsatisfactory to place our many activities underground — has been largely disproved by the many successes in using underground space.

In spite of our limited activity, there are some interesting examples. The Brunson Instrument Company in Kansas City, Missouri, decided in 1954 to excavate its plant out of solid limestone. The plant still functions, turning out a wide variety of precision measuring instruments on 140,000-square-feet of floor space.

In Pennsylvania, a firm has been using an abandoned limestone mine for farming for 40 years. This activity employs some 500 workers underground to grow mushrooms for shipment to points throughout the country.

Following the oil embargo in 1973-74, the Congress enacted the Energy Policy and Conservation Act which calls for the establishment of a Strategic Petroleum Reserve Program. The act authorizes storage of up to one billion barrels of crude oil and petroleum products as a buffer to dull the economic damage which would result from any future embargo. The Federal Energy Administration plans to store the oil underground in salt domes and abandoned mines near refineries, pipelines, and tanker terminals.

Important Pay-Off for Civil Defense

The advantage of underground space, which is available and suitable for civil defense use, is obvious. Underground space offers virtually complete protection from radioactive fallout and thermal radiation, would in

many cases be free of mass fire effects, and provide substantial protection against blast waves — all keys threats associated with nuclear attack.

Certainly Switzerland has recognized the civil defense aspects of underground space. The recently completed Sonnenberg Super Highway Tunnel through the Alps, near the City of Lucerne, doubles as a civil defense shelter. The Swiss believe it to be the largest shelter in Europe and perhaps the world. A guided tour was given to a group from mainland China who expressed special interest in it. The late Chou En-lai claimed that the great majority of large and medium Chinese cities were underlain by networks of tunnels as protection against nuclear attack.

Underground space is indeed a largely "unspoiled frontier" in the United States. An impressive set of benefits could be realized by utilizing this space. Every aboveground facility must have incorporated into its design certain features to withstand temperature, wind, snow, ice, and in some areas, earthquakes. By creating the proper environment underground, these problems become minimal. Exterior maintenance practically ceases to exist. Unsightly communication and power cables disappear. An all-weather environment is created and, since it is controlled, pollution control can be designed into the system.

While the interest in developing underground space in this country is strong, it is still shared by a relatively small number of knowledgeable people. Hopefully, more people will soon begin to appreciate the many beneficial applications of construction which appear — or perhaps more accurately, disappear — beneath the surface. ▲

THE BASIC PRINCIPLES OF CIVIL DEFENCE

by

Dr. Ulrich Eichstadt

President of the Academy for Civil Defence, Bonn-Bad Godesberg, Germany

Proceeding from the modern state's functions of establishing and maintaining order, and of providing contingency services and security, and from the meaning and significance of political, psychological and economic stability, the President's paper, from which this is an extract, deals with the nature and tasks of Civil Defence and with the concept, role and necessity of this particular aspect of German national security policy. The tasks of NATO Civil Defence in the national domain are presented and commented on as is the dependence of military defence preparations on the effectiveness of Civil Defence preparations and the requirement of strengthening the police and the Federal Border Guard.

The Nature and Tasks of Civil Defence

Necessity, Functions and Concept of Civil Defence

Up to the end of the 19th century the defence of all states was essentially incumbent upon the armed forces alone. Restricting defence to that understood in a purely military sense, however, no longer meets the demands of our times. The reasons for this lie in the extraordinary susceptibility of modern industrial nations to disruption, in the eruption of ideological antagonisms, and in the weapons technology which has advanced at so rapid a rate during the last decades. Like any other nation, the Federal Republic of Germany, too, must guard against the endangering or the loss of its internal stability, any attempt by foreign powers, through political or economic blackmail, to impose their will upon it,

and any military threat or attack from an external source. In view of these dangers modern security policy cannot forgo the civilian component.

As the experiences of the recent past have shown, we have been confronted, time and again, by political crises which conjured up the danger of a military conflict. These crises need not necessarily have their causes in Europe but may spread from other parts of the world into ours. A steadily increasing significance therefore attaches to crisis management.

In view of modern communication techniques, crises do not go unnoticed. The public reacts very quickly to international tensions, creating a great deal of alarm which can escalate from fear to panic and flight. This psychological instability impairs the will to maintain national integrity and the moral power of resistance of the population, especially since an enemy will try to bring about and promote such a process of disintegration by all available means of agitation and propaganda. Further undesirable consequences must be expected to affect the supply situation in our country:

- panic buying and hoarding of vital foodstuffs,
- the scarcity of commodities, especially of petroleum products,
- disruption and stoppage of our foreign trade, especially imports, and
- financial transactions.

These can easily lead to supply crises in view of our dependence on imports.

Similarly, it must not be overlooked that the 4.1 million foreign workers are an uncertain factor. We must expect that some portion of them will try to return to their own countries in critical situations. Therefore we must take into account severe labour losses, particularly as the majority of the foreign workers are skilled workers who cannot readily be replaced.

Dr. Ulrich Eichstadt

President of the Academy for Civil Defence in Bonn-Bad Godesberg.

Eichstadt, Ulrich, born in Danzig on May 23rd 1925. Studied law and history at the Danzig Institute of Technology and at the Universities of Königsberg, Posen and Göttingen.

1947 — Took doctor's degree in law

1951 — Took doctor's degree in philosophy

1947-53 — With the Department of Justice of Lower Saxony

1953 — Staff member, Mainz Institute for European History

1953-67 — Various assignments, Federal Ministry of the Interior

From 1967 — Directorate of Civil Defence

From 1967 — President of the Academy for Civil Defence.

In critical situations we must furthermore expect a considerable reduction in public security and order through demonstrations and agitation against our determination to defend ourselves; wildcat strikes aimed at the impairment of our supply system; increased espionage activities; the commencement of sabotage, especially against public utility installations, transportation facilities, and the postal and communications systems, and terrorism and other violent crimes.

Unrest among foreign workers will result in an increased exacerbation of the security position. We must cope with all these phenomena. If that doesn't succeed then, without a single shot being fired, our defence will stand exposed as having feet of clay. Within the scope of crisis management, an extremely important role therefore devolves upon the civilian sector when one considers, for example, psychological consolidation, the supply situation as it affects the population and public consumers, and the maintenance of security and order.

If, beyond that, a crisis leads to an immediate military threat, then we are compelled to mobilize our defence resources. Since defence preparedness is not great enough in peace time, it must be increased in a time of crisis. In the military sector the relevant means are the implementation of mobilization and strategic deployment. In the civilian sector we are compelled to convert the administration, the economy and public life as a whole to meet the exigencies of war.

The corresponding measures of civilian planning comprise:

- providing the administration with the capacity to act and react,
- adjusting the administrative system to the requirements of the situation,
- activating all plans for the protection of the civilian population,
- managing the potential of the economy to achieve maximum output for the purposes of defence, and
- supporting parallel efforts in the military sector.

In this way an enemy can be shown the will of the free West to maintain its national integrity, and the risks of an attack. Therefore, the achievement of a state of preparedness for defence is not only an escalation factor but also a very important deterrent factor.

Now, we cannot dismiss the possibility of crisis management breaking down and our getting involved in a military conflict despite all efforts for the preservation of peace. Since modern war, by its very nature, is not just a confrontation of armed forces but rather a struggle of peoples embracing all fields of life, precautionary civil defence measures cannot be forgone.

This is because of the mere fact that the civilian population is endangered to a higher degree by virtue of modern weapons technology. Because of this, the protection of the civilian population is accorded a high

priority since any defence would lose its meaning if, in its implementation, the population were to be sacrificed. Beyond that, however, military conflicts can be decided today not only by overcoming hostile armed forces, but also by eliminating the civilian potential, be it through blockade or through air strikes, by the undermining of the internal order of a state through subversive actions, and by the wearing down of the power of moral resistance of its population by the weapons and methods of psychological warfare. Civilian planning and measures must therefore take this aspect into account as well.

For all these reasons, extensive contingency measures are needed, not only in the military but also in the civilian sector, without which measures the existence of the state, the lives of its citizens, and the effectiveness of its military defence, would be called into question. For this reason military defence was joined by civil defence. This development does not apply to the Federal Republic of Germany alone, but also to all Western and neutral foreign countries; it applies in particular to the member states of the Warsaw Pact who are increasingly building up their civil defence parallel to their military build-up. Accordingly, military and civil defence today constitute an inseparable whole. Modern defence is conceivable and meaningful only as total defence, i.e., as a combination of military and civil defence efforts.

Consequently, by civil defence we mean the total of all planning and measures of a non-military nature which are necessary in the interest of crisis management and in the interest of our defence.

The present civil defence of the Federal Republic of Germany has diverse origins. In the beginning there was air raid protection; its genesis reaches back to the time of the First World War. Before and during the Second World War it was strongly intensified and then after the end of the war, it was dissolved. In the beginning of the 50's the federal government again entered the air raid protection field. Later on, this field was further expanded into the present "Zivilschutz" (civil protection) which now, as well as the protection of the population, also comprises residency regulations (concerning transients and foreign nationals) as well as medical services.

In the spring of 1955, immediately before the accession of the Federal Republic of Germany to NATO, the NATO council recommended that member states begin building up a comprehensive civil defence system without delay. In view of the possibility of war breaking out, the council demanded that contingency measures be taken

- for the preservation of national and government functions,
- for the protection of the civilian population,
- for the preservation of tolerable living conditions in times of crises and war, and
- for the support of military defence by the civilian sector.

The Federal Republic of Germany adopted this recommendation for Civil Emergency Planning from which, in the course of time, it developed the present civil defence system. On the basis of a request by the German Bundestag (Federal Lower House) the definition of civil defence, still valid today, was then adopted in the summer of 1964. Like military defence, the civil defence of the Federal Republic of Germany, too, is embedded in the NATO treaty. This is the reason for the sub-division of both components of our total defence systems into a NATO sector and a national sector.

The Tasks of NATO Civil Defence

NATO Civil Defence comprises: the exchange of experiences and the co-ordination of the civil defence systems of all the member states in the Alliance, co-operation in planning for crisis management, the establishment and activation of civilian NATO war agencies, and the execution of bilateral and multilateral agreements on civil defence, especially on trans-border traffic.

In peacetime the fulfilment of these tasks is incumbent upon a comprehensive organization of committees in which all states are represented. Thus, within these groups, civil defence also makes a contribution towards the strengthening of the Alliance and closer cooperation with our partners.

The Tasks of Civil Defence in the National Sector

The emphasis of the civil defence efforts, however, lies in the national sector. In this sector there are four main fields of activity:

- the maintenance of national and government authority,
- the "Zivilschutz"
- meeting supply and commodity requirements, and
- the support of the armed forces.

The Maintenance of National and Government Authority is of pre-eminent importance for making political decisions in times of crisis, for ensuring their implementation by the administration, for controlling the deployment of civil and military forces and resources, and for ensuring a reliable supply system for the civilian population and the armed forces. This field of activity comprises the safeguarding of legislative procedures, the maintenance of the administration of justice and the functions of government, political leadership and administration. It includes, in addition, the maintenance of public safety and order through the various police forces, the Bundesgrenzschutz (Federal Border Guard), and the Office for the Protection of the Constitution, as well as the maintenance of the mass media and its facilities, i.e., radio, television, and the press.

"Zivilschutz" represents the second field of activity of our civil defence system. It comprises all measures designed to protect the civilian population from enemy action, and to obviate or reduce its effects.

This comprises: self-help by every citizen in the form of self-protection; warning by sirens against impending attacks or the use of NBC warfare; forming and equipping civilian emergency forces, with state support, through peacetime disaster control organizations; building shelter space in the form of putting public shelters in order, erecting multi-purpose installations in connection with the construction of underground parking facilities and subways, and promoting the building of private shelters; taking of measures regarding residency regulations, i.e., to prevent uncontrolled population movements, and regarding the systematic evacuation of areas especially exposed to danger; maintain medical services; protecting cultural assets. The very nature and scope of these tasks show "Zivilschutz" as being the main component in the total civil defence system.

Meeting Supply and Commodity Requirements represents the third field of activity of our civil defence system.

This comprises: the provision of food and fodder, and of commodities for trade and industry; the provision of water and the removal of sewage; the provision of electricity, petroleum, natural gas and coal; the safeguarding of the transportation system and of the postal and telecommunications services, as well as the meeting of financial needs and civilian personnel requirements.

Finally, **the Support of the Armed Forces** represents the fourth and last field of activity. There is no doubt that the armed forces can carry out their task of deterrence and defence only if the civilian sector contributes to the achievement of their operational capabilities and their freedom of operation. Thus the civilian sector must: make personnel and materiel available to the armed forces for mobilization augmentation; increase its performance in the fields of transportation and telecommunication; clear roads for military traffic, and restrict and direct movements of refugees that may occur; furthermore, important tasks devolve upon the civilian sector with regard to supplying the armed forces and repairing military equipment.

Military defence is highly dependent on civilian support. If military requirements are not met by the civilian sector, then military defence readiness is jeopardized, and consequently, deterrence is doubtful and peace is in danger.

Consequences for the Security Agencies

Despite the constantly increasing potential of the Warsaw Pact there is at present no acute danger of war in Europe. However, we must constantly be concerned

about dangerous international crisis that can at any time involve the Federal Republic of Germany.

In times of crisis and during states of alert, as well as in the event of war, a special significance attaches to the maintenance of public security and order as one of the most essential prerequisites for our defence. In situations of that kind it is imperative to ensure the continuation of the constitutional system and to protect the safety of our citizens.

In addition to their peacetime functions, the police forces of the different *Länder* (German states) will be faced with numerous new challenges. Here the main problem is to combat crime, which always increases during unstable times, and to protect important civilian facilities. Also, one must expect a considerable increase in requests for official assistance in the implementation of the various defence and contingency laws. In addition, in situations of that kind, one must expect subversive activities in the form of attempted incitements to rebellion, wide-spread sabotage and terrorism, and gang activities. As the situation is further aggravated, military deployment and the control of refugees require police assistance. In addition to the above, there is participation by the police in evacuating and blocking off designated areas and providing aid where damage has occurred. In so far as these tasks do not deal with acts of war within the meaning of international law, but rather with dangers to national resources or to our free democratic system, any defence against these dangers, according to Article 91 of the Constitution, is primarily the responsibility of the *Länder* police in support of which the Federal Border Guard may also be committed. In addition, once a state of alert or a state of war has been promulgated, the Bundeswehr is given authority to protect civilian facilities and to take over traffic regulation.

Unlike the Bundeswehr and Federal Border Guard, the police forces retain civilian status even in the event of war. After the commencement of hostilities as defined by international law they are not allowed, therefore, to employ force against enemy combatants. Meanwhile the available police forces (federal and *Länder*) are not adequate to discharge all those responsibilities which arise in times of crisis or during periods of alert or actual hostilities, should they occur.

Contingency measures must therefore be taken to ensure that police and Federal Border Guards can be substantially reinforced in the above situations. For that purpose it is necessary to exploit every opportunity to appoint officers of the auxiliary police force and to set up a reserve whose members are trained when times are normal. Furthermore, the police ought to be excused from any tasks whose execution does not necessarily require the involvement of a law enforcement officer. Finally, detailed arrangements are required to ensure cooperation between the general internal administration, the different federal and *Länder* departments, the Bundeswehr and the police.

In view of the time pressure that prevails in times of crisis it is out of the question to postpone action on essential tasks until such time as acute danger actually arises. Rather, it is better to institute contingency measures in more or less quiet, normal times. What has been neglected in peacetime cannot be made up when war breaks out.

It is also in this sense that the motto of NATO must be understood: Vigilance is the price of freedom. This motto has special validity for the public security sector as an indispensable component of our civil defence system. ▲

SWISS COMPULSORY FIRST AID

As from 1st March 1977, in accordance with the Swiss Federal Government's ruling on the admission of persons and vehicles to the roads, future drivers of private cars, lorries and motor bicycles enrolling for the driving test must provide proof of having taken a casualty first-aid course. The aim of these courses is to teach potential car drivers and motor cyclists how to act in case of a road accident in order to prevent further accidents. They are also taught how to give casualties first aid before the arrival of qualified medical personnel.

By deciding to compel future drivers of motor vehicles to take a casualty first-aid course, the problem has been tackled at its base. After an accident, the first link in the chain of optimal medical intervention, however efficient it may be, is in the great majority of cases formed by Mr. and Mrs. Smith. It is they who can then "decide", to a large extent, the outcome for the victims of the accident by their behaviour.

The purpose of the compulsory courses is to teach the very first steps to take before the arrival of the doctor. This training is thus not intended for emergency first-aid specialists but for anyone, and the subject matter is correspondingly limited to essentials. With regard to this, the circular sent out by the Federal Ministry of Justice and Police on implementation procedures for this ruling indicates a certain number of requirements which the courses will have to satisfy.

The training program is divided into three sections:

- Behaviour in case of accidents in general: how to take stock of the situation at the site of the accident, notice any dangers, take safety precautions on the spot, remove persons in imminent danger and prevent further damage.
- Behaviour particularly required in case of road accidents: how to take stock of the situation and the state of casualties, take safety precautions on the spot, alert the police and ambulance and give first aid.
- First aid (how to reestablish and maintain the necessary functions for survival):
 - lay the casualty down correctly,
 - give artificial respiration,
 - stop bleeding,
 - avoid shock.

The teaching equipment comprises the indispensable items for the practical work, such as models for the artificial respiration (one for every four participants), model heads in cross-section, film projectors, etc.

The minimum duration of the course is 10 hours, spread over four afternoons. The certificate will only be given to participants who have never been absent from the course.

The organization of the course is to be exclusively undertaken by the institutions trained by the Federal Ministry of Justice and Police. It will be these institutions, and not the instructors, who will organize the courses and hand out the certificates.

The instructors will be trained by the Army Health Service, the Federal and Cantonal Civil Defence Offices or by the Medical First-aid and Rescue Commission of the Swiss Samaritan's Alliance.

Those exempted from taking such a course are: doctors, dentists and veterinary surgeons; qualified medical personnel; the instructors of the first-aid courses; the Army medical personnel; Civil Defence first-aiders and medical assistants; and the active members of certain voluntary organizations specified by the circular of the Federal Ministry of Justice and Police.

The new regulation will result in a considerable increase in the number of people capable in the future of giving a casualty first aid. Of course, appropriate first aid can also be of vital importance in situations other than traffic ones. Indeed, in Switzerland approximately one person in twenty loses his life in an accident, and less than half such accidents occur on the road. ▲

NUCLEAR WAR

The Life-and-Death Issues

by

Edgar Ulsamer

Senior Editor Air Force Magazine

This article analyzes a recent Defense Department study of potential casualties associated with various types of nuclear conflict. It is reprinted here by permission of AIR FORCE Magazine, published by the Air Force Association, Washington, D.C.

Few issues of national policy rival in emotional impact the specter of "megadeaths" associated with nuclear war; probably none is as unpredictable and as devoid of concrete information. Yet the quintessence of strategic deterrence rests on imagining the unimaginable and, when seen through a would-be aggressor's eyes, on convincing him that his potential gain isn't worth the price of admission.

Future historians may well treat Dr. James R. Schlesinger's stewardship over the U.S. Department of Defense as the heyday of the art of deterrence. Under his direction, deterrence matured into an instrument for rationally and systematically controlling the threat of nuclear war or, in the worst case, for terminating it at the lowest possible level of intensity.

Deterrence, in the last analysis, is terror manipulated in a peacekeeping role. Flexible, or limited, deterrence is at the low end of the scale of terror. That scale extends from the relatively few deaths, measured in thousands, and the localized destruction associated with a limited attack on military targets (limited counterforce), to the wholesale annihilation of an all-out (countervalue or assured destruction) attack on an adversary's industrial and economic centers. It is, of course, not easy to find solace in the casualty forecasts of even the most limited nuclear conflict, but there is no arguing the fact that they provide a firm basis for the concept of flexible deterrence as espoused by the Defense Department under Dr. Schlesinger's aegis.

The difficulty in "qualifying" the consequences of various levels of limited nuclear attack stems from the absence of empirical data (except for Hiroshima and Nagasaki) and, most importantly, from the wide range of variables that can be fed into any number of credible scenarios. Consequently, even the most meticulously researched casualty assessments can be made to look suspect by insinuating that the underlying scenario is unrealistically optimistic. This opportunity for rhetoric is not overlooked by those who oppose the concept of flexible deterrence.

Senate Report on Limited War

In September 1975, the Subcommittee on Arms Control, International Organization, and Security Agreements of the U.S. Senate's Foreign Relations Committee released the most comprehensive findings to date, compiled by the Defense Department and other agencies, on the effects of limited nuclear war. The central conclusion of these analyses is that in attacks on military targets one side can limit in a meaningful way the other side's civilian casualties. Moreover, the difference in casualties between a war fought on the basis of assured-destruction objectives and one seeking the destruction of only the adversary's offensive strategic capabilities is vast, probably involving a factor greater than ten to one.

According to the Department of Defense assessment, a limited attack on important military targets in the U.S. would cause relatively few civilian casualties. In the case of a nuclear strike against the Nation's heavy military air transport fleet and the associated MAC airlift bases, the toll could be as low as 70,000. In the case of an attack on the 200 ICBM silos of the Malstrom AFB Mont., complex (about a fifth of the U.S. ICBM total), DoD's casualty estimate ranges from 120,000 to 310,000. In the case of comprehensive attack on all of SAC's ICBMs and bombers, as well as the Navy's SSBN (ballistic missile submarines) bases, casualties would range from 3,200,000 to 16,300,000, with 6,700,000 the most probable toll. By contrast, an attack on the U.S. industrial and economic centers could be expected to cause about 100,000,000 casualties, according to the DoD study.

When a thermonuclear weapon of a given yield explodes on or near the surface of the earth, the ranges of the immediate effects are "fairly well defined," according to a DoD assessment conducted under the direction of the Department's Deputy Assistant Secretary for Strategic Programs, E. C. Aldridge, Jr. (The study was undertaken at the subcommittee's request and followed its guidelines. The assessment is an extension of detailed testimony given before the subcommittee by Dr. Schlesinger in September 1974.) Within a certain radius from

ground zero, destruction "due to blast and shock, initial nuclear radiation, and thermal effects will be so great that survival of inhabitants in conventional structures is improbable. At considerably greater distances from ground zero, the immediate effects will be weaker or nonexistent and the delayed effects, those . . . associated with the radioactivity present in the fallout, will predominate. It is the phenomenon of radioactive fallout that introduces the greatest uncertainty into assessments of the casualties that would be expected to result from nuclear attacks on the United States," according to the DoD analysis.

Radioactive contamination of the earth's surface by a nuclear blast occurs in two ways. One results from the generation of neutrons (subatomic particles that are lethal in large doses), which are captured by the soil; the other is caused by fallout of radioactive particles from the cloud formed by the explosion. The amount of contamination and its distribution over the earth's surface, according to the DoD study, "are principally dependent upon the energy yield of the explosion, the relative contributions of fission and fusion to the yield, the height of burst, the nature of the surface over, or on, which the detonation occurs, and finally the meteorological conditions at the time of the explosion and shortly thereafter. For a given amount of fallout distribution; the number of fallout casualties that can be expected to occur is determined primarily by the protection afforded the local populace against residual nuclear radiation."

'Clean' and 'Dirty' Weapons

Thermonuclear weapons have two principal parts: a fission trigger (in fact, an atomic bomb) that initiates the fusion process, or burn, of the second, thermonuclear, part. The relative sizes of the two parts can be adjusted to achieve different results. The fission segment is the principal cause of fallout. The term "clean" nuclear weapons — meant only in the relative sense — indicates that the fission trigger has been made as small as possible in relation to the fusion segment. Conversely, nuclear weapons can be made "dirty" by emphasizing the fission portion and through use of materials with a long radiation half-life in order to prolong the contamination of a given area. The so-called cobalt bomb falls into this category.

The DoD study, based on current intelligence estimates, assumes use of Soviet nuclear warheads whose yield is derived slightly more from the fusion portion than from the fission segment.

Strategic planners assume that nuclear attacks will involve two forms of weapon detonation — in the air above the target, or on the ground, right on top of a hardened target. (A third technique, involving a heavy, shielded warhead penetrating deep into the ground before detonation, is still being explored, but appears to have sizable drawbacks and limited advantages.)

Critical Factors Involved

The highest degree of lethality (destructiveness) from an accurately delivered warhead is obtained through airbursts at relatively low altitudes. This so-called optimum height of burst varies, depending on the weapons' yield and other factors. In an operational sense, the advantages of such a detonation could well be negated by the ultraprecise fusing required as well as by the attendant magnification of guidance errors. Warheads descend on their targets at an angle, thus compounding the problems of fusing accuracies of a weapon exploded above the ground compared to one detonated on the ground.

Nuclear scenarios are further complicated by the so-called fratricidal effect that can destroy or deviate a warhead that follows too closely behind the detonation of a prior one. Yet, for a high probability of success in an attack against a given target, an aggressor is almost certain to assign two reentry vehicles (RVs) against it. In order to do this while minimizing fratricidal effect, the attacker is most likely to airburst the first RV and groundburst the second.

Assumptions about the numerical ratio between air- and groundbursts are crucial to casualty estimates. A warhead that is detonated on the ground spews up much more debris and, therefore, can cause several times the number of fallout casualties as would a weapon of the same yield that is exploded in the air.

Probably the most effective ways for an attacker to minimize civilian casualties are by selecting targets that are not near large population centers, and by what the DoD assessment calls "target offset." This means attacking a military target in a way that deliberately minimizes the casualties in nearby urban areas. While it may seem incongruous that an aggressor would be so concerned about collateral damage, defense strategists count on reasonable efforts to spare the civilian population in case of limited nuclear exchanges.

DCPA Analyses Cited

A related and equally decisive factor affecting casualties is the relative degree of protection against residual nuclear radiation afforded the local population following an attack. According to analyses by DCPA, the Defense Civil Preparedness Agency, the radiation dose rate inside a standard brick residence without basement is likely to be no more than twenty percent of the rate encountered on the outside; the dose rate that will prevail in a residential basement would be about four percent of that encountered outside the building. Casualty estimates are affected in a decisive but debatable way by assumptions about the percentage of the U.S. population that might seek shelter.

Basic environmental conditions existing at the time of an attack and within a few days thereafter can significantly affect casualties. Dust, fog, rain, and snow can't be predicted, yet will help determine how far out

the burst's thermal energy is propagated and thereby affect the nature and size of the fire storm that accompanies nuclear blasts. These factors were not measured by the DoD analyses because of the inherent high degree of uncertainties.

Another meteorological factor, wind, is more predictable, at least on a seasonal basis, according to the Defense study. The number of casualties (the combined total of fatalities and nonfatal injuries) resulting from an attack on all major strategic weapons concentrations in the United States can change by a factor of three, depending on wind conditions. Prevailing winds in the primary U.S. military target areas can be assumed to be at their strongest in March and November. Typical wind patterns cause the least spread of nuclear contamination in June and July, according to DoD's findings.

Aiming At the 'Most Probable'

Casualties from a massive attack on U.S. industrial and transportation centers can be calculated reasonably precisely, according to DoD. In such a case, between 95,000,000 and 100,000,000 of the U.S.'s 150,000,000 urban population would be casualties. Assumptions about casualties, resulting from comprehensive attacks on all major military targets or from a limited attack on such targets are subject to the variables mentioned earlier. Defense Department analysts, therefore, base their estimates on attack scenarios ranging from worst to best case, but centered on what can be considered most probable. All scenarios are predicted on current intelligence estimates and are "written" to be militarily effective from the attacker's point of view. The effects of weapons yield and burst height were found to be crucial.

In an attack on the 150 ICBM silos of the Whiteman AFB complex near Sedalia, Mo., about 170 miles west of St. Louis, a strike by two RVs per silo with a yield of 550 kilotons each, detonated in the air at optimum burst height, would cause 2,000,000 casualties. The same

kind of attack with three-megaton warheads detonated on the ground would drive up the casualty toll to 10,300,000.

In the case of a comprehensive attack of 1,054 ICBM silos, SAC's forty-six bomber bases, and the Navy's two SSBN support bases. DoD's first scenario assumed one optimum height and one groundburst per ICMB silo; a pattern attack against the bomber bases; one optimum height burst per SSBN base; and optimum utilization of available population shelters. Militarily, such an attack, based on Soviet ICBM accuracies determined by current intelligence, would result "in sixty percent (silo) destruction; severe damage to virtually all aircraft hangars, administration buildings, and maintenance facilities located on each SAC base; destruction of any aircraft flying within 8 nautical miles of any of the forty-six SAC bases; ninety percent probability of capsizing or rupturing the pressure hulls of the SSBNs in port; severe damage to virtually all SSBN storage facilities, administration buildings, wharves and piers, and mechanical handling facilities located within 1.5 nautical miles from ground zero," according to the DoD assessment.

The resultant civilian casualties would be 3,200,000. The casualty toll jumps to 16,300,000 with two changes in the same scenario; going from airburst to groundburst in attacks on ICBM silos, and assuming only limited utilization of available shelters. Yet the military effectiveness of such an attack would be slightly below that of the first scenario, with only fifty-seven percent of the USAF ICBM silos destroyed.

In summary, the study reconfirms this coldly comforting verity of nuclear war: As the assumed perpetrator of a "limited nuclear attack against selected military targets in the U.S., the U.S.S.R. has significant control over the number of expected U.S. fatalities that could result from such an attack." Maintaining U.S. strategic deterrence at a level of perceived equality, and with a broad range of flexible options to deter limited or general nuclear attack, obviously must remain the cardinal defense requirement of the United States. ▲