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AUSTRALIAN ARMY JOURNAL

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Australian War Memorial

Bombarding Joyce feature, Tarakan, on 10 June 1945 from a range of 400 yards. In support of the 2/23rd Battalion were two 25-pounders, one 3.7-inch anti-aircraft gun and the guns of three tanks. The larger guns systematically blasted

Military Uses of Terrain Evaluation

*Major W. W. Lennon
Royal Australian Engineers*

Introduction

THE subject of terrain evaluation, like so many other currently popular studies and techniques is not a new one. Although scientists throughout the world are at present investigating the subject, it has been practised intuitively in diverse fields for many years. One of the better known historical examples was Hargreaves' successful search for gold in 1851 in country near Summer Hill, N.S.W., which was similar in appearance to gold bearing country in California.

The aim of terrain evaluation is to provide a quantitative description of physical characteristics of terrain from which additional information may be deduced about a particular area. Experience shows that certain groups of physical features recur in similar relationships in different places throughout the world. If two areas can be proved to be similar, then information may be deduced about one area from knowledge of the other. Detailed information about terrain, such as type of soil and vegetation, climate and weather patterns and availability of natural resources is of value to agriculturalists, industrialists, engineers and armies.

What is Terrain Evaluation?

What does 'terrain evaluation' mean and how does it work? The principle of the technique can best be illustrated by use of an analogy. Instead of terrain, an unknown object is considered; certain physical characteristics are described by an observer, and this data fed into

After graduating from the Royal Military College in 1956 Major Lennon attended the University of Queensland for a degree of Bachelor of Mechanical Engineering. Service with 17 Construction Squadron followed until 1962 when he was attached to the Snowy Mountains Hydro-Electric Authority. Posted to 7 Field Squadron in 1963 he became, in 1964, an Interchange Officer with the 25th U.S. Infantry Division (Hawaii). In 1965 he was OC of 20 Field Park Squadron which was redesignated 20 Engineer Support Squadron.

As OC of 1 Field Squadron he served with 1 ATF in Vietnam in 1966 after which he returned to 17 Construction Squadron as OC. Since May 1967 he has been SORE 2 in the office of E in C, AHQ Canberra.

the system to produce a classification of the object. From the classification certain other information is extrapolated:

- a. Information collected by observation of unknown object:
 - (1) has 2 legs.
 - (2) Has 2 arms.
 - (3) Has 2 hands each with 5 fingers.
 - (4) Has no tail.
- b. Evaluation system classifies 'Human'.
- c. Classification of 'Human' predicts additional information such as:
 - (1) Has 2 eyes.
 - (2) Has 2 ears.
 - (3) Seldom grows taller than 6 ft.
 - (4) Walks on two legs on ground.

The predictions of c are not necessarily correct. In fact the classification of b could be wrong — perhaps the classification should be 'Ape'. The accuracy of b is proportional to the amount and accuracy of data collected and supplied to the evaluation system. It is noteworthy that some correct information might be predicted, even though the classification be wrong.

Current techniques require the study of a wide range of different types of country, measurement of various quantitative parameters, and classification of terrain types. Research is continuing in several countries to develop systems of terrain classification and evaluation which can be applied to various fields. The parameters and categories of classification which are most significant for military purposes have not yet been finally established. However when the evaluation system has been developed it will be possible to classify almost any geographical area by measuring parameters. Naturally the more parameters which can be measured the higher will be the degree of accuracy of classification of the area. Once the area is classified then a prediction can be made regarding likely values for other parameters. The reliability of the prediction cannot be higher than the reliability of classification of the area, and this in turn will be proportional to the amount of information put into the system to classify the area.

Army Applications

Predictable information from known data will be of value in planning of military operations at high levels. At lower levels terrain evaluation will assist with prediction of engineering characteristics of areas. Not the least important feature of interest will be the question of suitability of particular terrain to cross-country movement by wheeled and tracked vehicles.

Military planners will be able to use the results of terrain evaluation to assess the suitability of any area for operations, and the

information produced may necessitate tailoring the composition of a force to suit special circumstances which will be encountered. For instance, if it is revealed that ground bearing pressures and moisture content will not support armoured vehicles then an operation may have to be postponed to the dry season, or be supported by some means other than by armour. Information for the logistic planner will also be available. The occurrence of water, timber, and other natural resources will affect the extent of maintenance required, as will condition of roads, frequency of water gaps, and suitability of sites for airfields and helipads.

Military engineers will be vitally interested in the results of terrain evaluation, since this information will give an early indication of the extent and nature of work to be encountered in a theatre.

Some engineer stores and material may have to be imported to a theatre if there is no indication of the existence of local resources, for example, timber could be scarce. In other cases the need for special equipments may be predictable from terrain evaluation information — such as well-boring rigs in dry country, or soil-stabilizing machines where natural rock is scarce.

The Armoured Corps will be interested in cross country mobility. It should be possible to ascertain ground bearing pressure, moisture content, or even some new 'mobility index' from which an assessment may be made whether tanks, personnel carriers and other armoured vehicles will be able to move.

Artillery will be interested in hardness of the ground, not only at the gun position — for establishing a solid gun platform — but also in the target area. The nature of the soil at the target may direct what form of ammunition should be used.

Other arms and services will generally benefit indirectly from the application of terrain evaluation. In its most refined form, terrain evaluation may allow forecasting of the time required to dig a weapon pit in a particular location.

Data Collection

In civil applications, such as for agricultural, industrial, or civil engineering purposes, the collection of data can be accomplished by conventional means. It may be possible to classify a particular area by measuring a few critical physical characteristics. Thus, by selective 'sampling' of the terrain a large body of information can be revealed about the area. For military purposes, however, and to a limited extent for civilian applications, collection of initial data will have to be done by some remote means.

Obviously, if an area is enemy-occupied then measurement of soil bearing strength and moisture content may be difficult. Current research is investigating aerial photography techniques, especially

using limited spectrum means. The use of colour filters and infra-red photography reveals much more information than conventional methods. It is hoped eventually that terrain may be classified entirely on the basis of special aerial photographs.

In the meantime, collection of data for military purposes may have to be accomplished by clandestine means. Small infiltration teams may be sent into enemy occupied territory to physically reconnoitre. With the aid of some special tools, they will be able to take samples of soil and vegetation and measure other physical quantities. In conjunction with photographs and a report of what was seen these pieces of information should be adequate to classify the area, and by extrapolation, provide additional information. Such information may include the suitability of the soil for road construction, or for cross country travel by tanks in the wet season, or for airfield site selection.

As soon as a satisfactory military system of terrain evaluation is developed it will be desirable to commence collection of data from areas of strategic interest. Collection and storage of data now on certain areas of South-East Asia may eliminate the problem of securing information in more difficult circumstances at a later date. One advantage of the technique is that it measures natural characteristics, most of which will change infrequently, and consequently amendment and updating of data will seldom (if ever) be necessary. Some few parameters, however, will change so frequently that up to date readings will have to be superimposed, for example, moisture content.

Processing of Data

The collation, storage and processing of data for the system will be best accomplished by means of modern machines. World-wide data will require large processing equipments, but at the lowest levels terrain evaluation may be practised in the field with the aid of simple card index systems, or even tables and nomographs. Since current military thinking leans continually further towards electronic data processing as an aid to a number of problems, the availability of machines, and access to information must increase with time. The time is probably not far away when a signalled question from the combat zone may be answered by a computer in the logistic area in a matter of minutes. It is not unreasonable to visualize a tank squadron commander sending a signal in roughly the form 'Advise mobility factor at GR 1234' and receiving in minutes a figure which gives him a quantitative assessment of trafficability to his tanks, allowing for weather and seasonal factors. The advantages of such a system are obvious. Used in conjunction with other data, quantitative terrain properties could provide the military engineer with 'instant design' for an airfield or a road. The computer, given ade-

quate data, will be able to propose a preferred alignment for a road. It will be able to advise what areas may be searched for gravel or for water with a high probability of success.

Conclusion

Terrain evaluation is not, and never will be the universal panacea on all matters geographical. Many of the refinements described here are some distance in the future — some may never eventuate. Although several different approaches are being investigated now to yield a workable system there will always be shortcomings. The problem of data collection, even in a limited area will constitute an enormous task, and operation of processing equipment will call for trained technicians. Predicted information will never be infallible, though a high probability of accuracy should be attainable. This probability should be assessable by the computer (being dependent on quantity and veracity of input data) and any information provided by the system on a particular piece of terrain should be accompanied by a statement of probability.

No matter how complex or vast the equipment, the quantity of data, or the name of the technique may be, terrain evaluation is merely the application of a scientific approach to a particular exercise in observation, analysis, and common sense. □

SYRIAN CAMPAIGN, JUNE-JULY 1941

The campaign was won chiefly by the infantrymen's determination, physical strength and endurance. In those sectors where at length the fight resolved itself into an affair of attrition, the attackers eventually surpassed the defenders. After the fighting the French leaders volunteered that the Australian troops had proved more rugged than their own. One report quotes a French colonel as saying, 'Until I saw your infantry crossing the Damour River and fighting in the mountains, I believed the Foreign Legion were the toughest troops in the world.' The 5th Indian Brigade, the most experienced troops in Syria — excepting perhaps the 2/3rd and 2/5th Australian Battalions — had fought magnificently, as they and other Indian regular formations had done in the Western Desert and Abyssinia.

At the end of the fighting, men on each side were probably equally fatigued. Those infantrymen who had been in the three earlier campaigns in which Australians had fought considered that the Syrian operations were more exhausting than those in Libya or Greece; and in few later campaigns did diarists in infantry, cavalry and artillery so constantly refer to fatigue, mental and physical, to a consequent prevalence of 'slight shell-shock', and the weeding out of those who were less fit in mind and body. It had been a costly and wearing campaign, bitterly fought out against the troops, mostly mercenaries, of a former ally. On the credit side was some strengthening of the strategical position in the Middle East, and the experience gained, particularly by an Australian formation which was soon to play a decisive part in a more critical campaign in another hemisphere.

— Gavin Long, *Greece, Crete and Syria* (1953)

Equipment Development for a Mobile Army

The United States approach and some of its possible effects on Australia

*Major D. J. Binney
Royal Australian Engineers*

Introduction

ABOVE the doorway at the entrance to the United States Combat Developments Command is a large sign saying 'Today's Vision, Tomorrow's Victories'. The Command, established in 1962 and commanded by a Lieutenant-General has the mission, perhaps oversimplified here, of establishing the form of future warfare and the organizations, tactics and equipment required to wage it successfully.

As a result of its studies, which naturally incorporate current field experience, the Command is able to produce reasonably detailed, accurate and standardized requirements of the Army's future equipment needs. The purpose of this article is to explain how an element of Army Materiel Command; the Research, Development and Engineering Directorate of the United States Mobility Equipment Command, the Mobility Equipment Command Research & Development Centre, researches and develops its share of the required equipment and to mention how the development processes of this and other centres may affect Australia.

Major Binney graduated from RMC in 1952 and was allotted to RAE. He has since served in a variety of engineer units including appointments as Officer Commanding 1 Field Squadron (1962-63), and BMRE HQRAE 1 Div (1965). In addition he has had attachments to 2 Airfield Construction Squadron (RAAF) in Malaya (1956-58) and to the Commonwealth Department of Works on roads and airfields (1960-61). He completed Staff College at Queenscliff in 1964. More recently he was the Force Engineer on HQ AFV in Vietnam (1966) and at present is attached to AAS Washington as the engineer exchange officer in the United States.

Major Binney is a civil engineer, a corporate member of the Institution of Engineers, Australia, a member of the American Society of Civil Engineers and is employed on the development of combat support equipment in the Military Engineering Department of the Mobility Equipment Research and Development Centre.

The Higher Organization

The simple organization shown in Figure 1 highlights the United States Department of Defence structure and the relative situations of the Combat Developments Command and the Army Materiel Command. It further shows the organization within Army Materiel Command. Within Army Materiel Command are a number of sub-commands each with specific self-explanatory responsibilities. Mobility Equipment Command briefly has the responsibility of providing the army's equipment needs, not provided for elsewhere, to maintain its mobility whilst denying the same mobility to the enemy. It is the function

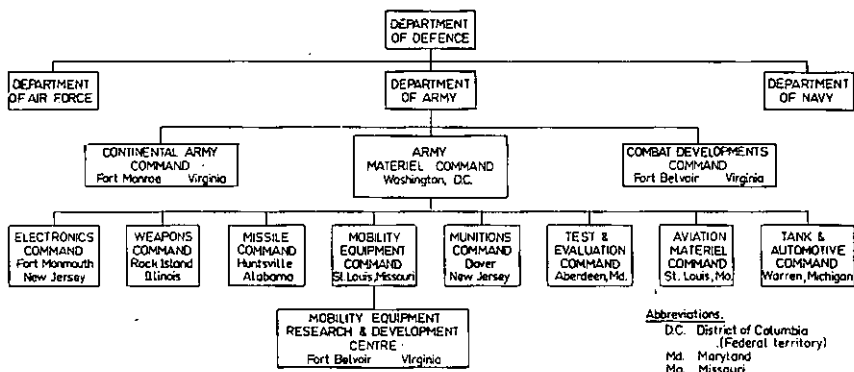


FIGURE 1. OUTLINE ORGANIZATION - DEPARTMENT OF DEFENCE.

of the Mobility Equipment Research & Development Centre as the research, development and engineering directorate of the command, to develop that equipment by basic research, engineering or product improvement.

The Centre's fields of endeavour cover earthmoving, bridges and marine craft, industrial engines and turbines, mine warfare, material and fuel handling, fortifications and obstacles, environmental control, camouflage and deception, electric power and propulsion, water purification, direct energy sources, nuclear weapons effects, detectors and sensors, materials and environmental testing.

Background

The United States Army Mobility Equipment Command Research and Development Centre (USA-MERDC) is located at Fort Belvoir, Virginia, some 15 miles south of Washington, D.C. By coincidence Combat Developments Command is located in the same area. Fort Belvoir is also known as 'the home of the Army Engineers' as it was once a purely Engineer Area. The Centre is a descendant of a series of special engineer boards established at Fort Totten, New York in 1870 to develop and test military equipment. From 1947

to 1967 it was the Engineer Research & Development Laboratories (ERDL) at Fort Belvoir. When the Army was reorganized in 1962, ERDL was transferred from the Corps of Engineers to the Mobility Command, one of the seven original sub-commands of the Army Materiel Command. Two years later, the laboratories were designated the Research and Development Directorate of Mobility Command (MOCOM) Mobility Equipment Center (MEC). In 1966, MEC was elevated to a command and in September, 1967, the laboratories were redesignated the Mobility Equipment Research & Development Centre. The Centre is staffed by ten officers, a handful of enlisted men and 1400 civilians almost half of whom are scientists, engineers and technicians. The Commander is, and has in the past always been, an Engineer officer.

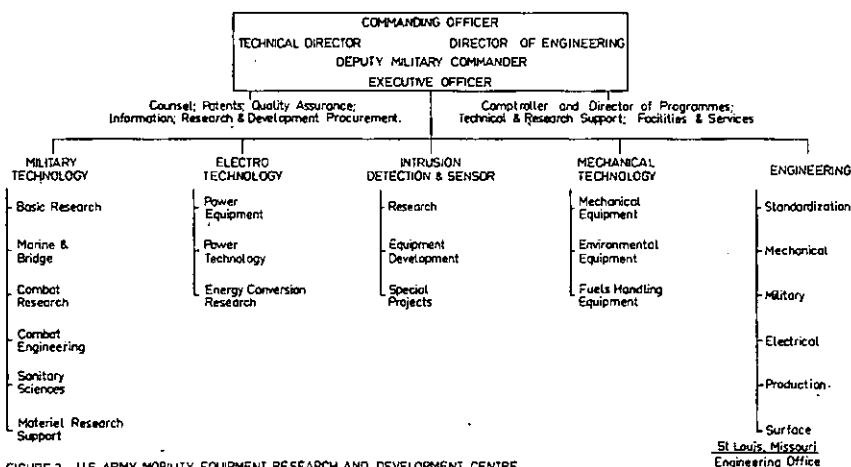


FIGURE 2. U.S. ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTRE

Organization of the Centre

The outline organization of the Centre is shown in Figure 2. The Centre may be considered in two elements, one made up of its four research laboratories and the other its engineering laboratory. The former, within their own speciality, undertake the basic research and produce model equipments. The latter translates the research model into a good production item. It produces the drawings and specifications necessary to allow the equipment to be built. In addition, it modifies suitable commercial equipment to meet military requirements.

Research

The personnel responsible for research within the laboratories are among the leading scientists and engineers in their field. In

many cases they are pioneers in fields which have no industrial counterparts. They are well versed in current developments in new materials, products and processes which might be applied to existing or future equipments. They have the capacity to conceive ideas and recommend equipment development which may have been overlooked by the responsible agencies.

The diversity of the Centre interests is reflected in the varied and, in many cases, unique facilities for research and development housed at the laboratories:

- An electric power laboratory affords instrumentation and equipment to test voltage, power factor and frequency of 'precise power' generators for missile systems, under controlled temperature and humidity. Facilities for fuel cell research also are housed in two laboratories.
- In development of missile support equipment, USA-MERDC has added an air conditioning and heating laboratory. Unique in Government installations, it combines in one central location every air conditioner test required from drawing board to production line.
- Test facilities are available for high pressure air compressors so necessary to the proper functioning of missile systems.
- A power plant laboratory has been expanded with the additional cells and automatic data acquisition systems for evaluation of power packages, such as reciprocating engines, turbines, special engines and engine accessories.
- Hundreds of acres of test courses and miles of instrumentation permit engineer design test of tractors, ditchers, and other equipment for operational capability, manoeuvrability and stamina.
- Electromagnetic pulses which are generated by nuclear explosions are simulated in an air-supported hemispherical shelter 105 feet high and 210 feet in diameter.
- Petroleum equipment test facilities include a full-scale model airfield fueling system and other devices to study new fuel decontamination equipment, as well as a military pipeline to test component parts.
- A 300-ton hydraulically actuated test frame lets engineers know just how much of a load their new bridges will bear, while Gunston Bay on the Potomac River serves to put floating bridge equipment through its paces.
- Minefield test lanes, with representative soils from every corner of the world, give information on electromagnetic soil properties which is recorded for mine detection research.
- A shock test tube simulates blast effects of high explosives for mine warfare research. In demolitions research an explosives

test sphere contains the effects of actual explosions. Basic research into the very nature of explosives is conducted with the aid of mass spectrometers and highly specialized equipment.

- New and improved materials, such as alloys, plastics, rubbers, paints and fungicides run the gamut in the Materials Laboratory test tubes and machines. A climatic test chamber simulates altitude up to 35,000 feet, temperatures from minus 85 to 165°F, and dew, fog, frost and wind. There is also a tropic test chamber to simulate climatic conditions in the tropics.
- Support services include data processing, instrumentation and engineering services and pictorial science. Machine, woodworking, model and paint shops provide the ultimate in developmental fabrication.

Engineering

The engineering element of the centre converts the research model to a standardized, well specified and documented, technologically produceable equipment. It also evaluates unsatisfactory equipment reports and develops equipment modifications when required, tests preproduction models i.e. the first equipments off the contractor's line, reviews training literature and maintenance scales and modifies commercial equipment to meet the broader, but more rigid military requirements. Often it develops specifications from which military end items are purchased without going through the research and development cycle. Almost without exception the engineering is directed towards the letting of a contract with a civilian firm. Occasionally a contract is let to a civil firm to undertake the engineer study and design concept for a proposed equipment.

Response Times

As in all other facets of military and civilian life, priorities play a significant part in research and development. How long the development of an equipment takes will vary, naturally, with those priorities. Urgent special requirements for Vietnam have been met quickly and efficiently often within weeks. These have ranged from sandbags to CONEX transporters, road ploughs to airortable water supply equipment.

Normally, however, equipment under development is designed to come into service some years hence. It is therefore subject to more comprehensive research, engineering and testing. Before being accepted for general service procurement, the equipment is tested by Test and Evaluation Command, a sub-command of Army Materiel Command. Often these tests, which are made against the original requirement prepared by Combat Developments Command, may take almost as long as the research and development stage. This is often due to test time required to establish probabilities of

operation for specified periods of time without breakdown. For example where an initial requirement is that an equipment have 90% probability of operating 1,000 hours without unscheduled maintenance it follows that, if one equipment is subsequently tested, it will need to be run for 11,000 hours or 1 year 93 days non-stop to establish whether the requirement has or has not been met. It is obvious therefore that during research, development and testing, regular reviews of requirements and progress are necessary. This in fact occurs in what are termed In Process Reviews where all interested parties are represented and modifications are made if essential and tolerable. Often they may lead to abandonment or postponement of the project, subject to further research. The decision may well be one of accepting an equipment in service which does not fully meet the requirement or a determination that the equipment is not yet essential in the light of immediately foreseen operations. Such a decision is made by Combat Developments Command.

In any case the development of good, well tested equipment is a process which will take years and not weeks.

Modification of Commercial Equipment

A commercial equipment is designed for a specific market. It is engineered to exploit high usage of manufactured proprietary service parts and is backed by an efficient service system which includes factory trained technicians. It will not operate in a broad range of environmental conditions and incorporates components made of materials often only readily available in peacetime. It does not normally fit the military requirements and therefore requires considerable modification. On Centre experience 20—25% of the components on a commercial equipment require modification to suit the military purpose. The process involving specification and drawing changes is not a simple one. It is, however, the best approach for many equipments, especially those with a not specifically military flavour such as earthmoving equipment.

Comparisons and Effects

The Combat Developments Command incorporates Corps representation e.g. Engineer equipment requirements will originate with the engineer agency in the Command and will fit the concept developed in the same Command. The Australian Combat Development Directorate is considerably smaller than its United States counterpart and its concepts therefore broader, covering nowhere near the same world-wide scope or detail. In the Australian Army equipments have sponsor directorates and the requirements evolve in those directorates depending on how each directorate, within limits, interprets the general concept. The principle is the same, the practice quite different.

Australia develops some military equipment, some it purchases overseas. Much of the equipment purchased is developed in the Mobility Equipment Research & Development Centre and similar centres. It is essential, therefore, that before purchasing an equipment we should be quite clear what the equipment was developed to achieve, i.e. what the original requirement was. If this is not clear we may well acquire an equipment not necessarily designed to meet even closely our particular need or expect more of it than we shall receive. There are tanks for one purpose and tanks for another, there are water desalting (desalination) equipments for one type of water and water desalting equipments for another, there are equipments which form part of a train and are useless individually, there are families of equipments the advantage of which will not be felt unless the entire family is incorporated in the system e.g. reciprocity of parts, there are throwaway equipments or components the luxury of which our logistics system, let alone our budget, might not be able to afford, there are personal equipments designed for a soldier backed by one type of logistic system, fighting to a particular concept, with regular resupply, and personal equipments designed for another soldier backed by a different logistic system, fighting to another concept with less frequent supply. Further, there are equipments in which we may be very interested, which we may await expectantly and which are abandoned or returned to the laboratory or the drawing board. The result, which may not be significant in the broader United States arsenal, may well cause a significant chink in Australia's armour.

Conclusion

The United States system for development of new equipment is a relatively smooth and efficient one which we would do well to understand, not specifically because Australia needs to follow such a system exactly, but because without this knowledge we might make bad equipment selection which neither Australia nor the United States would want.

In addition, it is worthy of note that the processes of equipment development for military purposes, whether occurring in the United States, France, the United Kingdom, Australia or elsewhere, are markedly similar. In each case good equipment is rarely developed overnight. Further, the equipment is often obsolete when it is issued i.e. when compared with the state of the technological art at that time. Equipment development in this day and age is rather like playing leapfrog, you hit the front only temporarily with a particular equipment design. The art is to decide when to stop researching and start producing, and when to stop being jumped and start jumping. Sound foresight is the prerequisite in any case. □

Have Fronts and Flanks met their Waterloo ?



*Warrant-Officer L. Nicholson,
Royal Australian Infantry.*

Scene 1

THE bugles sounded the charge, and Marshal Ney's Imperial Cavalry plunged forward through the mud of Mont St. Jean endeavouring, by infiltration, wheeling and outflanking, to break through the massed ranks of the British 3rd Division which, drawn up in hollow squares, defied their every effort of penetration.

By retiring the inner front ranks to meet a threat from the rear, or by left and right forms reinforcing the flanks to repulse attacks from that direction, and by placing the blank files — vacated by fallen comrades — in the centre and rear ranks, a solid wall of musketry was always presented to the frustrated enemy.

The Emperor was to regret his decision to commit Ney's splendid horsemen in a frontal assault against such disciplined mass tactics, for it was the tactic of the hollow square which carried the day for Wellington and laid the foundation for the victory which finally defeated Napoleon.

One hundred and fifty years later, Australian Officers, Warrant Officers, NCOs and soldiers alike also have reasons to regret the resounding victories engendered by the tactic of the hollow square, for this has plagued them to this very day.

Warrant Officer Nicholson enlisted in the infantry in 1948. He served with 3 RAR from 1954 to 1962, including periods spent in Malaya, and on detachment to the PIR and to RMC Duntroon as an instructor. He was with 2 RAR (1962-64) and with the Royal Queensland Regiment (1964-66). He recently returned to 51 RQR after a period spent as an AATTV adviser for Regional and Popular Forces in South Vietnam.

Scene 2

A 20th century company parade ground — an instructor is drilling his platoon which is carrying out 'turnings on the march'.

The instructor gives the order 'Platoon will retire . . .', and then waits expectantly for Pte Average to mark time through the blank files so that the 'cautionary' and 'executive' orders may be given. But alas, Pte. Average, who has not had this responsibility for several weeks has forgotten, and thereby incurs the wrath of his instructor.

Later — another order, 'Platoon will advance, RIGHT TURN'. This time, the instructor, who has temporarily forgotten his front, is in error for he should have ordered 'retire'. Several interesting things can happen when this type of mistake is made:

- Some of the platoon who are unaware that an incorrect order has been given faithfully carry out a RIGHT turn.
- Others, probably including the more experienced NCOs, know the order is wrong and, anticipating the actual movement required, carry out a LEFT turn.
- The remainder, caught with their proverbial pants down, go every which way.

Later still — the platoon is marching to the right in threes and the instructor gives the command 'Change direction right, RIGHT FORM'. Of course, he should have said ' . . . FORM SQUAD'. Here is where we get a real mix-up, people go everywhere. The results of these fairly common errors are well known to all who have drilled men or have been drilled themselves, so they will not be repeated here, with one exception.

When the above mistakes are made the spirits of the men being drilled go down rapidly and the platoon finishes up muttering darkly under its collective breath about the capabilities of the instructor.

Problem 1

The Drill Manual states 'Bad words of command destroy good drill and lower morale'. This is a very true statement, for nothing is more designed to destroy the morale of a squad honestly endeavouring to drill well, than an instructor who continually makes mistakes in his words of command.

But can the blame be fully laid on the instructor — or can some be levelled at the system? It is possible, I submit, that the greater blame can be apportioned to the system, for we have retained an inherited drill theory of fronts and flanks, blank files, formations and words of command from the beginning which, in this day, seem to be outmoded.

The soldier of today requires a more complex and technological knowledge than his counterpart of yesteryear, and it is felt it would lead to a higher level of efficiency if he were not confronted with the necessity of learning and applying our present drill theory, too complicated for all except the continual user.

Amongst those who have difficulty with our present system are: Unit and sub-unit commanders, specialist personnel including officers and OR, inexperienced junior officers and NCOs, CMF officers, NCOs and soldiers, most cadet personnel, those who are employed full time in an 'A' or 'Q' job and have become 'rusty' on the subject, and of course inexperienced soldiers and recruits. All of whom, when put together, make up the majority of our army. In fact, the only group who appear to *fully* understand the system are hoary old WOs and NCOs — unfortunately a small minority.

Simplicity of procedure is normally the best approach to any course of action, and provided this simplicity does not detract from the overall result there would appear to be no reason why the simpler course should not be adopted. We endeavour to simplify most other military procedures, e.g. battle procedures, admin procedures, medevac, minor tactics (with contact drills) etc, yet we still retain a relatively complicated drill theory. Too, the complications in our current theory necessitate instruction *in* that theory. This subject normally requires two periods. Firstly, the blackboard or blanket-board lecture, and then a parade ground 'practical' to confirm the lecture. To say nothing of the time required for Officer and NCO candidates to study in preparation for examinations.

The two periods referred to above are taught at all officer training units, WO and NCO courses, recruit courses, and in many schools and most units throughout Australia; amounting to thousands of hours of valuable training time each year.

As well as having retained our present drill theory we have also retained, unnecessarily I feel, many individual drill movements which have outlived the ideas for which they were conceived. Amongst those which could possibly be discarded on the above basis are:

- Form Squad. This movement is no longer used for constructive purposes and could well be taken out of the book. Too, it is often confused with left and right forms as mentioned above.
- Salute to the front. A 'fill-in' drill movement which is often used by instructors merely because it is in the book and on the pretext that it develops co-ordination. It has little merit as all the movements involved are in the book individually. Besides, the actual movement is never carried out as laid down, because the book allows no time for reporting the facts for which the officer was approached in the first place.

- Proving. The present movement is useless. If a number of personnel prove at the same time in answer to a given question it is virtually impossible to see who is proving. Invariably the instructor will order 'Hold your hands right up' to get an accurate count. There is a definite case for retaining some form of proving, but let it be practical, e.g. left arms extended vertically.

There are many more unnecessary and outmoded movements left in the DM which the reader may find for himself without too much difficulty.

In relation to our present drill theory, the fact that the FRONT never changes — even when it is at the rear, and THE LEFT never changes, even when it is on THE RIGHT, and similarly with THE RIGHT — would appear to be the crux of the problem.

This brings in the diabolical idea of the prefixes 'THE' and 'YOUR' when advancing and retiring respectively. In the days of hollow-square warfare, the fact that the front should not change may have been quite acceptable, but it is certainly outmoded in these days of 'fluid-front' fighting, and it has little application to 20th century drill.

Why should our front not change? By remaining inflexible with this drill principle, we introduce many complications, e.g. when a squad has to move to THE LEFT in threes and then execute a right about turn, to say nothing of the preamble required in a word of command when a squad is to diagonal march from threes or in line — for they are neither advancing nor retiring, nor moving to 'the' (or 'your') left, nor 'the' (or 'your') right.

Suggested Solution

There are several effective methods of simplifying our drill manual, some of which are suggested here:

- Rid ourselves of all unnecessary and outdated drill movements.
- Delete our present fronts and flanks theory in its entirety.
- Whilst retaining our present 'cautionary' and 'executive' words of command, change our 'explanatory', as in the following instance: 'Squad will turn about, ABOUT TURN', for surely the explanatory command 'Squad will turn about —' explains much more to the squad than 'Squad will move to the left in threes —'. And similarly 'Squad will turn to the right —' is much simpler than 'Squad will retire —'. As this suggested system would delete any static directing flank, this could still be nominated by the instructor — as it has been all along — by the commands 'by the right' or 'by the left' after a change of direction or formation.

- We could also delete threes, file and single file from our 'cautionary' when turning to a flank as has been done all along when turning into line. For instance, we do not find it necessary to say 'Squad will advance into three ranks'.

Also, the cautionary I have suggested above would be quite sufficient to tell the squad what is to be done next. In unit drill, 'in column' could be added where necessary.

Our present 'explanatory' commands (e.g. when in threes turned to the right, 'Squad will move to the left in threes') do not in fact tell the squad which movement they are to do next, but only tell them the formation they will find themselves in once they have done it.

Therefore, it is not an 'explanatory' for the next movement but only an 'explanatory' for the formation brought about by that movement. As the individual soldier must therefore think back from there to anticipate what his next movement will be, it is found necessary to make a pause between the 'cautionary' and 'executive' words of command to give him time to think (DM Sect. 6, Para. 9). If we were to adopt this suggested system, he would not be required to do any mental gymnastics during each command but would be *told* what to do and have the whole thing simplified.

- Change our blank file positions so that the blanks — when in three ranks — both fall in the centre rank, second and third file from the flank instead of both blanks being in the second file from the flank.

This would preclude the necessity for our lone soldier — covering off two blanks — from performing individual drill movements and endeavouring to anticipate the word of command when turning about whilst marching in line or when wheeling whilst turned to a flank. When in file or two ranks, nothing would be lost by allowing the lone soldier — in an uneven squad — to remain in a static position.

Summary

If this system — or a similar one — is adopted, we have achieved the following:

- Simplified procedures for both the instructor and the squad.
- Saved valuable training time by deleting the theory and confirmatory periods on this subject.
- Produced drill of a similar high standard — if not higher — by deleting word of command errors by the instructor and interpretation errors by the squad.
- Allowed our Officer and NCO candidates to concentrate their studies on aspects of military training which have a higher priority.

Conclusion

This period in our army is one of great change, expansion and progress. Let us search every facet of our service for 'dead wood' and unnecessary knowledge and prune it out, for no matter how deeply we may appreciate the traditions behind our present drill theory, let's face facts:

- It is uneconomical in terms of training time,
- It is too complicated for all except the constant user,
- It does *not* achieve the aim to any greater degree than a simpler system.

So why not a simpler system,



Guerilla begets Guerilla

*Brigadier R. C. Foot, OBE, MC,
British Army (Retired)*

MAJOR C. H. Ducker's excellent article in Australian Army Journal No. 227, April 1968, on 'Von Lettow Vorbeck in East Africa', ably sums up that campaign as 'a splendid example of how a small well-organized guerilla force can achieve a strategic aim'. Tactically, guerilla begets guerilla opposition, and in this campaign it is less well known that an Australian played a distinguished part in exploiting guerilla tactics against von Lettow Vorbeck with success.

This was Arnold Wienholt, born in Queensland in 1877, whose only service in an Australian Army unit was with the 4th Queensland Mounted Infantry, Imperial Bushmen Contingent in South Africa 1900/01 as a Trooper, and later Sergeant. There he learned mounted infantry tactics from the Boers, but also enjoyed the African scene so much that he returned there in 1913 for a lion hunting safari in South-West Africa. An encounter with a wounded lion then seemed fatal to his future prospects in the Army after 1914, for the lion chewed up much of his right arm and chest, and no serious medical inspection thereafter could ever have passed him fit for military service.

This grave injury did not prevent him, first, from working as a South African Police trooper on the Rhodesia/South-West Africa border in 1915; and then enlisting as a Trooper in East African Mounted Rifles at the beginning of 1916. During the rains, and in the Kilimanjaro area, his bushcraft got him picked out for Intelligence Duties and, as a Sergeant, and later Warrant Officer, he led a series of raids by small groups of Askaris into German held territory. One raid, in which he destroyed the loads of over 200 porters carrying much needed supplies to the German Headquarters at Tuliani, was particularly successful.

However, in July 1916, the Germans caught him near the Vami River; he managed to get his patrol clear but, acting as a solitary rear guard, was wounded and taken prisoner. He was taken to Tuliani and interrogated by von Lettow Vorbeck himself; and that General remarks in his *Reminiscences of East Africa* published in 1919 of Wienholt, that 'we could none of us help honestly admiring the excellent work of his patrol'.

The long trek from Tuliani to the POW camp at Liwale, twenty days of march, rail, boat, march, must have been tough going for a man with a new bullet wound in his leg; and before Christmas 1916 the POW camp was moved another fourteen days march south to the Luwego River. As he regained his physical fitness Wienholt

made steady preparations to escape; and in February he led three South African prisoners, none of whom was an experienced bushman, out of the camp, and for fifteen days through 100 miles of German held country till he reached British lines near Kilwa on the coast. But this remarkable feat put him in hospital for several months with blackwater fever.

Wienholt was commissioned in the field and awarded a Military Cross for this exploit; and by November 1917 he was leading harassing patrols again, on the heels of von Lettow Vorbeck's forces as they crossed south into Portuguese East Africa, then north again east of Lake Nyasa, and into Rhodesia at the time of the November 1918 armistice. During this period he was promoted Captain and awarded a DSO and a bar to his Military Cross. With the war over, he recorded that, from his advanced patrol position he had a march of nearly 300 miles to the coast at Pemba Bay with his twenty Askaris and as many porters; typically, he avoided the 'bustle, dust and nuisance' of other troops on main tracks and travelled across country for eighteen days, living off the land, and arriving in good order.

Much of this experience Wienholt detailed in his book *The Story of a Lion Hunt* (Andrew Melrose, London 1922, 252pp): by the time that was published he had been exchanging letters with von Lettow Vorbeck, had returned to his Queensland cattle-run, and become MHR for Moreton, Queensland, as an Independent supporting the Hughes Government. But he never forgot his guerilla fighting, practised it again briefly in Ethiopia in 1936 against the Italians; and met his death in 1940 at the hands of Italian-trained Ethiopian or Somali Askaris while leading part of Mission 101 to restore the Emperor Haile Selassie to his throne.

Wienholt often told the story of his only meeting with Smuts, the Boer General of 1900 — later a British Field Marshal — who commanded in East Africa in 1916. Late in 1914, with his lion wounds still unhealed, Wienholt went to Pretoria to offer his services as a leader of patrols on the South Africa/South-West Africa frontier. He made a good impression on the Military Intelligence Department and was taken to see Smuts, who was then South Africa's Minister of Defence. Smuts turned down his guerilla ideas in short order saying 'It's only a hunter's idea, and all hunters are mad; look at you, for instance, you've only just had your arm broken by a lion, and yet you don't seem to mind'. Smuts held the view that such patrols would quickly be caught and shot by the Germans or, if the Germans did not get them, be murdered by the natives. Fortunately for Wienholt, Smuts left the East African command in January 1917: then the counter-guerilla tactics encouraged by General Sheppard, CGS of East Africa Forces, gave Wienholt his chance of becoming Australia's first distinguished exponent of guerilla warfare methods. □

On Public Speaking and The Army's Public Image

*Major G. A. Fry,
Royal Australian Corps of Signals*

AT some time we have all felt uncomfortable when listening to a very poor speech given in honour of Anzac Day, Australia Day, or some other national occasion on which we have grown to expect a traditional eulogy. The speech, intended as an inspiration for the young and as a moving means of rededication for the not so young, came forth as rambling conservative dogma, perhaps lacking both coherence and form. In charity we felt the speaker's heart was in the right place; unfortunately he was not a good speaker. If invited to deliver that address, could we really do much better? My thesis is that although great orators are rare, little effort is required for most people to be able to copy at least some of the techniques of great orators, and therefore there is no reason for many speakers to bumble through their presentations.

Public speaking is an art based on the most common of our daily activities—speech. It is also the best medium for creating a favourable impression—a good public image. If only men would value their normal spoken language they would master the art of public speaking more easily. But as most men seem content with very ordinary speech in normal conversation, it is not surprising that we are quite regularly burdened with would be orators who, for their public speeches, grasp at forms of expression with which they feel ill at ease, and propound ideas which may not really be part of their comprehension.

Where can we find good examples of speechcraft to assist us? Although his accent may sometimes be the butt of Australian jokes, the educated Englishman's mastery of the spoken word is usually far superior to our own. His presentation of ideas is confident, unhurried and articulate. He uses the same language as we do. By not using the language equally as well, we are failing to accept part of our heritage. This is typical of our general failure to build traditions into our normal ways of life. We seem embarrassed when talking of tradition, so tend to store it for occasions on which we can be a little sentimental.

We also frequently fall into the error of making sweeping generalizations which close analysis can show to be inappropriate. Here again

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we could avoid the error by taking the Englishman as our mentor. Recall that his methods are sometimes called slow; that he does not always react to new situations as quickly as others. This comes largely from his method of reasoning, which is inductive, moving from the particular to the general. He deals with individual cases as they arise, until after a series of decisions he has created precedent upon which he is confident he can rely. We, as do the Americans, tend to be deductive taking broad theories and trying to fit them to the facts. Propaganda and psychological warfare may be the cause of this tendency. Later, when facts shatter our theories, we face the need for massive reappraisals. We harm our public image by suggesting or supporting doubtful theories which have not been reasoned through.

Australia is undergoing great changes; absorbing new ideas, new concepts and new techniques. All of these things are necessary. However we should not assume that all movement is progressive. For example, many new ideas are expressed in a modern jargon. One hears such amazing terms as 'high impact programmes'; and one finds things are no longer equal they are 'co-equal'. Some such phrases serve little purpose, and others are meaningless. They do nothing to aid reasoned thought. I, for one, hope we can keep to simple terms from traditional English which relies for its effect on simplicity, directness, conciseness and coherence.

Australia has a good army. We, its officers, have a fine language, but it is in danger of being swamped by 'high-impact' jargon. We, and the army as a body, are conscious of a need to gain and retain full professional status within the community. We probably have no better opportunities to demonstrate our status than when addressing Rotary and similar gatherings within the civilian community. When we speak, do we impress? Do we use our language well? And what do we say about the army? Recruiting propaganda is not very stimulating luncheon fare. What is our approach? Is it plain and dull, or is it interesting, even stimulating? On Anzac Day, more often than not, the presentation is sentimental, even eulogistic.

If we are to impress we must borrow some leaves from the books of a Menzies or a William Slim. We might try Sir William Slim's book, *Courage*, first. It has nearly two hundred fairly small pages of thoughts which fire the imagination, and which we could use on many occasions. The titles of his speech include 'Courage', 'Morale', 'Liberty and Discipline'. Another group gives his impressions of three armies—British, Indian, Australian. A third group describes 'The Officer', and 'The British Soldier', and there is another essentially non-military selection. From this book we can learn to explain freedom and discipline in simpler terms than are found elsewhere. It is an interesting book, complete with the human touch.

Sir Robert Menzies' *Speech is of Time* is another collection of speeches which may provide essential inspiration. It covers a broad canvas, including selections on 'The British Commonwealth', 'Some Great Men', and 'Problems of Democracy'.

The problem in preparing a speech is that of adapting ideas pertinent to our subject with flashes of the vision of a Menzies or a Slim. First we must design a framework for the speech in such a way that it has potential for audience-appeal. Supposing military leadership and army life were two subjects about which we feel we have something worthwhile to say. We might like them; but what subjects might our audience of businessmen prefer? Suppose their preferences are management and the functioning of modern political democracy. How can all four subjects be linked together? We can start by jotting down a few ideas at random, about all four subjects.

From our jottings we might next select sufficient points to build the framework of the speech. Thereafter the tasks are to select a title and to develop the theme along personal lines. Reading of Slim and Menzies can suggest a variety of themes and nuances suitable for development in an interesting address.

Enough said on conventional public speaking which is an accepted medium for discussion of army activities and policies. One wonders why the army seems to shun the more promising fields of television and radio—communications media which we could exploit to gain valuable prestige.

Quite often army activities are debated by academics, newspaper correspondents and members of the public on radio and television. Such debates sometimes tend to become confused because of the lack of genuine understanding of the activity; and the resulting incorrect impressions may at times damage the army's prestige. Those situations could be avoided if an army representative were included in the panel of debators. Quite apparently, army representation must be controlled. There must be some well-informed personable officers in, say the rank of lieutenant colonel, who are capable of holding their own in public debate. Two or three officers groomed for this role could be of tremendous value in improving the army's public image. They would certainly do equally as well as the unfortunate anonymous representatives, who, from time to time, must make difficult statements to correct some point of public confusion. Impressive service representation in discussions might prevent some of the embarrassing confusion from arising.

I have tried to stress that officers themselves, by their manner and actions, demonstrate whether or not they deserve full professional status. Speaking is one of the most important of army activities conducted in the public view, therefore we must do it properly. In that way, and perhaps only in that way, will we be able to convince the community that ours is a highly professional army. □

Excellence in The Military Profession

*Major D. H. Ralls,
United States Army*

OF all the officers in the United States Army, not more than five per cent emerge to be truly outstanding. Recognition is gained and reward is given because of their high personal standards, professional ability, and dominant qualities of excellence. Senior commanders covet the services of such men. Junior officers serving under these select few are developed in a manner that extracts higher standards of performance while building the junior's competence. Contemporaries of the outstanding officers are not normally resentful of such success, but tend to respect this achievement. What are the qualities necessary to make so few truly outstanding when contrasted with others of the same rank and length of service? A comparison of the outstanding officer's record with that of a contemporary may indicate career patterns which are almost identical in schooling and assignments. But only one excels. The aim of this essay is to examine the reasons why these few officers excel.

One reason for excelling is the possession of a mature, professional attitude. The military career has been accepted without qualification and is the calling to which outstanding officers devote their full energies. Such men know success in the military profession is the result of hard work and the ability to survive fierce competition for advancement. Because opportunity belongs to those who prepare for it, constant effort is devoted to broadening their professional knowledge and gaining the ability to assume more demanding tasks. Each assignment is handled in a way to ensure its completion in the best possible manner as each new experience adds to their store of professional knowledge. The aspect of maturity tempers such men and enhances their capacity to cope with problems that would appear well beyond the limits of their experience. Thus, outstanding officers know and accept the responsibilities of a military career and strive to maintain the highest possible degree of professional competence.

Extreme motivation is another factor included in the qualities of outstanding officers. All assignments are accepted as a challenge

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rather than an imposition, to be completed in the best possible manner, and to reflect with credit upon them. Such men are tenacious in their efforts and are willing to work long hours to achieve a desired result. Where others become frustrated or defeated, these rare men will continue on to find the means to successfully complete the task. Regardless of what the requirement may be or how undesirable it may seem, extreme motivation is the force that generates the compelling personal drive and positive attitude to match the task at hand. Consequently, the more demanding duties are normally placed in the hands of these high calibre officers.

Executive ability is also a cardinal quality required for excellence. These men understand all too well that subordinates form a team which must be co-ordinated and harmoniously directed toward the organization's goal. The strengths and weakness of subordinates are determined so tasks can be delegated in keeping with individual capabilities. Measures are taken to ensure the tasks they delegate are completely understood and provisions necessary for guidance and supervision are not lacking. Such men have an unusual talent for communicating with superiors or subordinates in simple, persuasive, and understandable terms when either speaking or writing. Executive ability includes the capacity to analyse organizational functions, ferret out inefficiency, and maintain a high degree of group coherence. Hence, outstanding officers know the principles of administration, organization, and supervision, and use these techniques to the maximum applicable degree in the performance of their duties.

Now consider the factor of objectivity. Officers who excel have mastered the ability to be objective in practically all matters. This trait allows control of emotional impulses and the application of logic to thought processes in the course of making decisions. When efforts to accomplish given responsibilities are not successful, reasons for failure, not excuses, are determined and steps are taken to preclude repeating the mistakes. They thrive on facts, are quick to reach the essentials of a situation or problem, and are highly intolerant of those attempting to avoid the true issue. Negation of emotional thinking allows mental flexibility to complement their strong wills and results in a mind that is receptive to change when warranted by cogent facts. An objective frame of mind is a major contributing asset in reaching sound decisions, imaginative thinking, minimizing the injection of personal bias, and eliminating preconceived ideas.

The old cliché of 'your reputation precedes you' holds not only truth, but is a reason directly related to outstanding performance. Good reputations are earned through the long process of having actions, methods, accomplishments, and personal characteristics recognized and approved by others. A spotless reputation can be blemished by one thoughtless act. Outstanding officers are keenly aware of this fact and know an established reputation is an asset

worthy of continuous protection. There is no attempt to create favorable impressions to the detriment of others or by using servile methods. Contrarily, their efforts are directed at building reputations of the highest quality and striving for its improvement through hard work. This factor is a paramount reason the services of such officers are in great demand and why their professional opinions weigh heavily in moments of decision. Without doubt, reputations of outstanding officers precede them and serve in their favor by making their good names known to others.

Reasons contained in the above discussion will, in part, explain dynamic success. To complete the answer, the factors of personality and adaptability must be added. These rare men have incorporated into their personalities positive and worthwhile traits gained through experience while effectively controlling the negative facets of their personalities. The result is the projection of a personality which greatly assists in influencing others. Because they are adaptable, new situations are faced with poise and confidence and cause them little concern. There is an inherent ability of easily 'fitting in' and not being burdened with the problems of adjustment that are common with new or changed situations which affect so many officers.

In conclusion, the *paramount* reasons for those few officers excelling rest in their possession of mature professional attitudes, extreme motivation, executive ability, objectivity, and foremost reputation. Interwoven in these essential elements are the intrinsic qualities of personality and adaptability. A detailed study of all officers reaching the pinnacle of performance would possibly provide additional points related to success. In the final analysis, outstanding officers are not a mysterious or inexplicable phenomenon; they are men much like their contemporaries. The difference rests in the fact that only a very few officers are willing to expend the time and energy required to develop their performance commensurate with their abilities. Officers who have ability coupled with the desire to excel are few and are outstanding.

'By wisdom is a house built, and by understanding is it established; by knowledge the rooms are filled with all precious and pleasant riches. A wise man is mightier than a strong man, and a man of knowledge than he who has strength; for by wise guidance you can wage your war, and in the abundance of counsellors there is victory.'

The Bible, Proverbs 24: 3-6. □

Oliver Cromwell—The General

*Lieutenant-Colonel A. E. Limburg, CVO,
Royal Australian Army Ordnance Corps.*

OLIVER CROMWELL has no grave. His dead body, dug up by the royalists after the king came back at the beginning of 1661, was hung and beheaded, and then thrown into a pit. As he has no grave, so, until recent times, he has had no memorial. It was not until 1899 that a statue was erected in his honour at Westminster, in the shadow of the Houses of Parliament.

About few other men in history have so many conflicting judgments been expressed. For close on 200 years the verdict of history was harsh—nothing was written in his defence. To royalists he was in the words of the Earl of Clarendon (1702) 'a brave, bad man'; to republicans he was a betrayer who 'sacrificed the public cause to the idol of his ambition'. As late as 1839 John Forster, the biographer of Charles Dickens, held it to be 'indisputably true' that Cromwell had 'lived a hypocrite and died a traitor'. It was Thomas Carlyle, in 1845, who began to correct the bias. 'Our poor Cromwell', he wrote, 'seems to hang yet on the gibbet and find no hearty apologist anywhere. Him neither saint, nor sinner will acquit of great wickedness'. Yet to Carlyle he became 'one of the greatest souls ever born of English kin'.

The history of Cromwell, the Statesman, is fascinating reading. This paper, however, will concentrate on Cromwell, the General, a truly great soldier.

The period

Oliver Cromwell was born in 1599 into a great age of transition in English life. The static feudal society of the Middle Ages was breaking up and the creation of a modern, competitive, fluid society was in the making. The trading classes and the gentry were advancing in wealth and power and, during the last decades of Elizabeth's reign, through the House of Commons were staking their claim to a say in government.

The essence of the social change was the growth of religious and economic individualism. The old concepts of a universal, catholic church and a united static society were being challenged by the growth of economic and religious radicalism. Throughout the reign of Elizabeth, the progressive classes—the improving landlords, speculators, manufacturers, traders and colonists—slowly began challenging

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the autonomy of the Crown in political life and consecrated their individualism by the profession of a radical, religious faith—puritanism.

With the strange irony of history these new social and political forces were to be met in the early years of the 17th century by the intransigent foolishness of two Stuart monarchs—James 1 and Charles 1. These two were bent on upholding the notion of the divine *right of King and people in parliament, and favouring a resolution of the uneasy Elizabethan, religious compromise by strengthening traditional, conservative, hierarchical structure and ritual of high anglicanism.*

Oliver Cromwell, by his brilliance in battle, was destined to resolve the inevitable conflict, to destroy the monarchy and to spend five tortured and difficult years trying to create an alternative form of government.

His early life

He was born on 25 April 1599 at Huntingdon, the son of an old yeoman family which traced kinship with Henry VIII's minister, Thomas Cromwell. His early education was at a small free school attached to the Hospital of St. John at Huntingdon. Here he was influenced by a schoolmaster, Dr Thomas Beard, who preached a Calvinistic view of a God to be feared, who neither overlooked nor forgave sin; and who regarded the Pope as anti-Christ.

In 1617 he went up to Sidney Sussex College, Cambridge, where, legend has it, he spent his time in drinking, wenching and playing football. Certainly he was keen on outdoor pursuits—hawking and hunting—and was not academically gifted. Again he came under the influence of a puritan mentor in Dr Samuel Ward. In 1620 he married Elizabeth Bourdier, the daughter of a wealthy London leather merchant, and by 1629 he had a family of six children. In 1628 he entered Parliament as member for Huntingdon, but played little or no active part in affairs. In 1630 he achieved prominence through his opposition to the terms of a new charter granted to the borough of Huntingdon, criticized the Mayor and was called before the Privy Council to explain himself. In this affair he displayed his impulsive nature and violent temper, which in later life he kept under tighter control.

In 1631, in a mood of melancholic conflict over the puritan leanings he felt and the high anglicanism practised around him, he left Huntingdon and settled into grazing land at St. Ives. In 1636, when he inherited the considerable estate of his maternal uncle, he moved again to Ely. At Ely he helped to defend the peasants and smallholders against encroachment through the draining and fencing of the Fens.

In 1637 the death of his eldest son, at 16, induced a profound spiritual crisis in his mind. He emerged from troubled mourning and great depression with a deep conversion to the puritan ethic, convinced he was 'saved', one of God's elect, and sustained by the certainty of success if he followed God's will.

Cromwell, at the age of 40, was about to embark upon the great adventure of his life. At this stage as an honest, independent, deeply convinced puritan, he had thus far lived a worthy, but obscure life. There was nothing yet to indicate he had the makings of a great General.

Military background

In order to assess the ability of army commanders about 300 years ago it is necessary to appreciate the problems that they faced.

At the start of any campaign their armies were woefully inadequate. All administration was done on a regimental basis and there were no central departments to support them. The Treasury arranged transport and supply matters and the Commissaries they provided were often useless. There were no schools for officers and NCOs and no adequate recruiting system. A protracted war soon exhausted the supply of recruits. Later intakes were mainly young, decrepit and half-witted types, often released from behind bars to serve as soldiers. Regimental agents handled pay. There were insufficient regiments and new ones had to be raised. Training was often haphazard.

It can be seen that a General had to make an army, as well as command it.

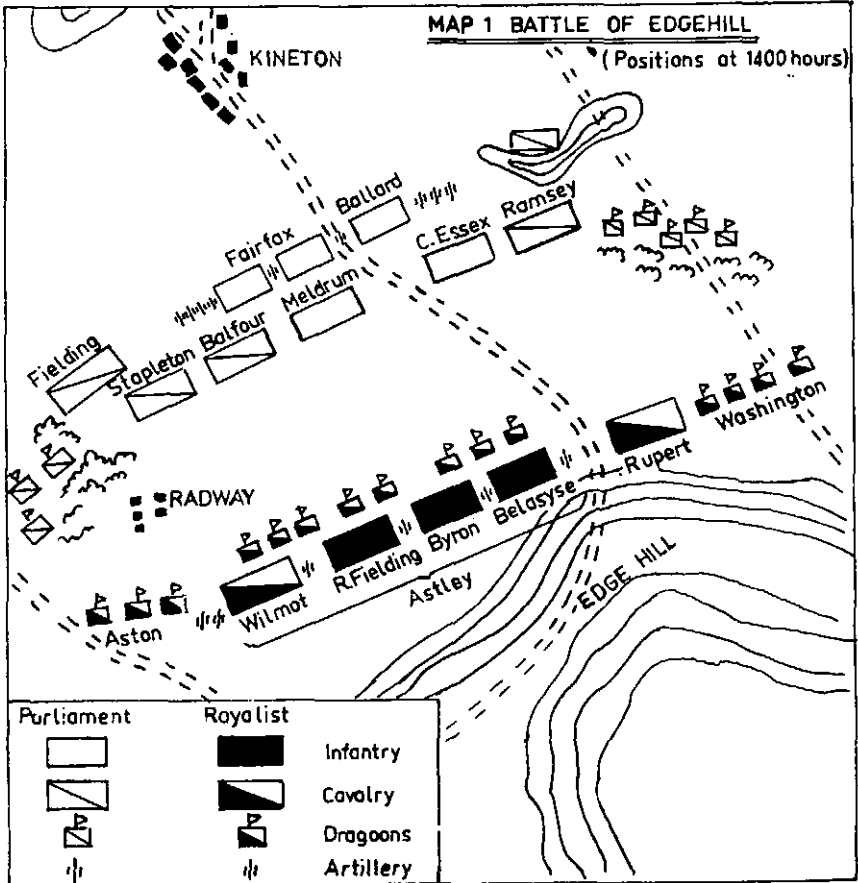
No central directorate existed in London to lay down military policy. This was particularly necessary when there were no railways, steamships, telegraph or wireless sets to provide timely intelligence and help rapid deployment. The Cabinets of the period proved most ineffective in this regard. A General often had to determine Government military policy as well as implement it. Typical of this was the commission given by Parliament to their first commander, Essex, in 1642. It stated that he was 'to rescue his Majesty's person, and the persons of the Prince and the Duke of York, out of the hands of those desperate persons who were then about him'. How would a modern General react to such a directive?

The building of an army and the determination of its aims under these conditions could be extremely difficult.

Military situation, 1642

The military machine hardly existed in 1642. What troops there were generally lacked both training and discipline and the militia of the day was worthless.

War had always been considered a risky, but profitable undertaking. Wanton destruction, pillage, ransom and plunder were essential ingredients. Movement of forces was very difficult owing to the lack of adequate roads. Armies were expected to live off the country. For twenty years Napoleon tried to do this without success.



Infantry, compared with cavalry, were not highly regarded, their weapons were fairly crude. Pikemen carried an 18-foot long pike and a sword which they seldom used. They engaged in hand-to-hand fighting, wore the heaviest armour and thus were normally the biggest soldiers. The weapon of the musketeer was mainly the matchlock. They wore no defensive armour, their only protection against cavalry being five feet long stakes which they stuck into the ground in front

of them. Their equipment was heavy, making their marching ability poor. They were unlikely to move more than twelve miles in one day.

Cavalry were regarded as the superior arm, their numbers were usually about half that of the infantry and they were paid about three times as much. They were either *harquebusiers*, wearing 'back and breasts' armour, or *dragoons*, with a light helmet, light cuirass or padded coat. The dragoons were employed as covering troops or on patrol missions. The weapons of the cavalry were pistols, carbines and swords.

The smallest artillery piece, called the 'drake' was a 3-pounder and the largest fired a ball of almost 20 pounds to a range of about 2,000 yards.

There was no uniformity of dress and troops wore distinguishing badges for recognition. Even in inclement weather troops were expected to sleep in the open, as tents were considered a luxury.

Emergence of Cromwell, the soldier

There were many officers on both sides who had served and trained abroad. On the parliamentary side they included Crawford, Essex, Waller, Ramsay, Skipper and Balfour, whilst on the royalists' side were Astley, Goring, Hopton, Gage and Lindsay.

None of these professionally trained officers was to make a victorious army. This task was to be undertaken by Oliver Cromwell, an almost unknown country squire, a harsh-voiced, large, coarse-featured man, with little regard for dress. At the age of 43 he was to begin his career as a great soldier, an example almost unique in British history.

Edgehill

He commenced his military career by raising a troop of horse (60 men) and on 21 October 1642 they went into battle at Edgehill.

The opposing forces were drawn up as shown on map 1. The parliamentary side, under Essex, comprised twelve infantry brigades and 42 troops of cavalry—a total of about 11,000 foot, 2,000 horse and slightly less than 1,000 dragoons. Against them the King had 9,000 foot, 2,500 cavalry and a little less than 1,500 dragoons.

This was a confused and indecisive battle, resulting from the accidental meeting of both sides. However, it was an important battle for educating Cromwell. He saw that his own side, with a superiority in men and guns, and with a just cause, was unable to emerge victorious. His mind quickly perceived that the shock action of cavalry, not their fire, was important. The horse, not the musket or the sword, was the real weapon. He saw that attack was the essence of success, but that it must be tightly controlled. But more important

even than these Cromwell saw the essential ingredient was fighting spirit. Afterwards he said to John Hampden—'Your troops are most of them decayed serving-men and tapsters; their troops are gentlemen's sons and persons of quality. Do you think the spirits of such base and mean fellows will ever be able to encounter gentlemen who have courage, honour and resolution in them? You must get men of a spirit that is likely to go as far as gentlemen will go, or you will be beaten still.'

Hampden said it was a good idea but not a practical one. Cromwell thought otherwise.

Development of his Regiment

At Edgehill he had a troop of 60 men, which he expanded to 80 by December 1642. On 26 January 1643 he became a colonel and by March 1643 had a regiment of 5 troops. By September, this grew to 10 troops and soon was a double regiment of 14 troops, with a strength of 11,000.

During this period he carefully enlisted men of good character and set them high moral standards. Like Napoleon who said that 'in war, moral force is to physical as four to one' he believed in the development of moral force—the sense of superiority that gives fighting men victory.

His standards were set high—he took strong measures to prevent plundering, swearing, drinking and impiety. His aim was to develop a highly inspired, disciplined force, sensitive to the spirit of its commander. In his own words he sought 'not theirs, but them and their welfare, and to stand with them for the liberty of the gospel and the laws of the land.'

In addition to carefully selecting his men he took especial pains in selecting his officers; unlike most senior officers of his day, he was not influenced by their social standing, saying 'I had rather have a plain, russet-coated captain who knows what he fights for and loves what he knows, than that which you call a gentleman and is nothing else. I honour a gentleman that is so indeed.'

He believed in rigid discipline. In May 1643 he wrote, 'No man swears but he pays his twelve pence; if he is in drink he is set in the stocks or worse; if one calls the other "Roundhead" he is cashiered; in so much that the countries where they come from, leap for the joy of them.'

He insisted on a high standard of training and constantly drilled his units. He soon developed a reputation for control of his cavalry once they were committed to battle. Clarendon said that though the King's cavalry were capable of only one charge, 'Cromwell's troops, if they prevailed, or thought they were beaten and routed, presently rallied again and stood in good order till they received new orders.'

He looked after his men, ensuring that they were well-clothed and fed, regularly paid (when possible) and gave very close attention to his horses which were bought, requisitioned, begged, borrowed and stolen.

He also developed a good information service. One would expect this of the man who later had the most efficient secret service in Europe.

It was thus that he laid the foundations of a new type of fighting force in England. In September 1643 he wrote 'My troops increase, I have a lovely company. You would respect them did you know them . . . they expect to be used as men.'

Military Actions

In May 1643 his troops defeated a force twice their size at Grantham. In July 1643 the King's force was advancing southwards and only Cromwell's force lay between it and London.

He advanced against the King's vanguard on 28 July and defeated it, together with its support and reserve. When he came upon the superior royalist main body, the parliamentary infantry ran away, but his horse, though weary from their earlier battle, stood fast. Without the loss of a single man Cromwell drew them off by alternate bodies, a tactic that did not appear in any of the contemporary textbooks. His delaying tactics saved London.

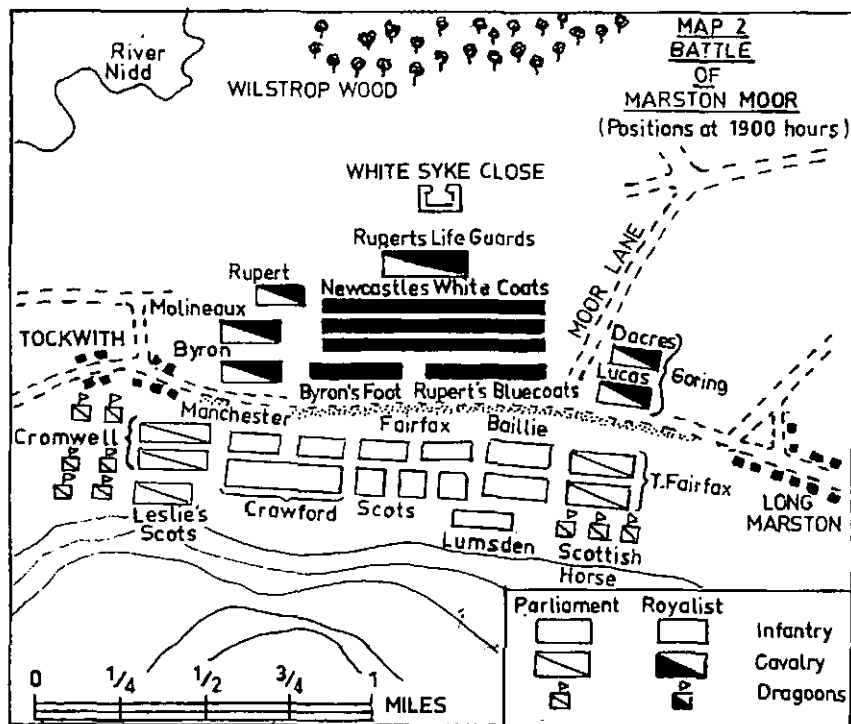
On 11 October 1643, at Winceby, his troopers won the day. In this action Cromwell, while at the head of his troops, had his horse shot from under him and nearly met his death at the hands of a royalist trooper.

Cromwell ended 1643 as the most successful of parliament's cavalry commanders. On 21 January 1644 he received his commission as a lieutenant-general. He was appointed a member of the War Cabinet one month later.

Marston Moor

On the morning of 1 July 1644 the two opposing forces formed up as shown on map 2. The parliamentary army numbered 27,000 men (20,000 infantry and the rest cavalry) whilst the royalist army was only 18,000 (11,000 foot and 7,000 horse). After waiting all day for some action Rupert, the royalist commander, decided none was forthcoming and let his soldiers relax and eat. Waiting for just such a moment, Cromwell's cavalry force came thundering in from Tockwith at 1900 hours, and after a fierce battle broke through Byron's lines. However, Rupert then threw his own and Molineaux's regiments against him, halting his first and second line. Cromwell was grazed on the neck by a pistol ball and blinded by the flash. The parliamentary cavalry were on the brink of utter rout. At this crucial

moment Leslie's 800 mounted Scots attacked Rupert's flank. Though dazed and blinded Cromwell managed to get his troops to renew the attack and finally caused the royalist cavalry to break. Cromwell then sent Leslie to press their retreat. But by 2030 hours the parliamentary situation elsewhere was almost hopeless, as shown on map 2. Manchester's foot had advanced, but Lord Fairfax's infantry and his Scottish reserve had been stopped, counter-attacked and routed. Sir



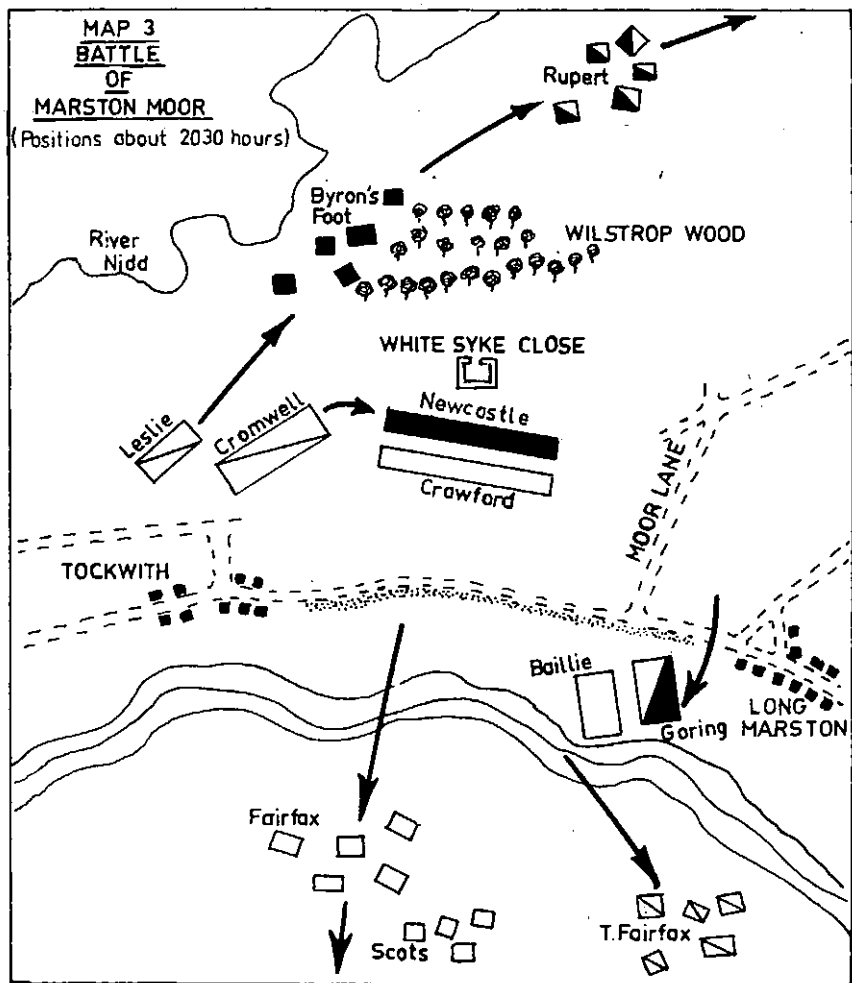
Thomas Fairfax's cavalry, on the right flank, had been scattered by the charge of Goring's horse. Baillie was thus exposed on both flanks and was in an almost hopeless position.

At this vital moment Cromwell, though still dazed, saw what had to be done. He first wheeled against Goring's victorious cavalry, (see map 3), disordered after their wild pursuit and scattered them. Then he flung his troops against Newcastle's infantry driving them to White Close, where they fell fighting.

In a period of 30 minutes the scene was transformed leaving the parliamentary side the victors. They had killed nearly 4,000 men, cap-

tured 1,500 prisoners and all the royalist guns. Newcastle's army was no more and Charles had lost northern England for good.

It was a decisive battle, but without Cromwell there would have been no victory. His name was on everyone's lips.



The New Model Army

Inspired by Cromwell's example Parliament now decided to form a permanent, disciplined, regularly paid army. This was to total 24,000 men comprising 12 regiments of foot (each of 10 companies

of 120 men), 11 regiments of horse (each of 6 troops of 100 men), one regiment of dragoons (each 10 companies of 100 mounted infantry) and two more regiments of infantry with firelocks, for attachment to the artillery train.

Cromwell joined it at Naseby on 13 June 1645, as second-in-command to Sir Thomas Fairfax. In the battle next day he commanded the right wing of horse and was mainly responsible for the parliamentary victory.

Shortly afterwards he directed the siege of Basing House, which had held out for almost three years. His force was successful in storming and sacking it from top to bottom.

The work of the army was practically finished by April 1646 and Cromwell was asked to return to London and receive Parliament's thanks. By the time that the first civil war was over, a couple of months later, the New Model Army had been moulded and disciplined into an efficient fighting machine.

The Army and Parliament

As so often happens in peacetime, Parliament was now anxious to disband the very efficient but expensive army. However, Parliament was less willing to pay the £330,000 it owed to the troops and alienated its officers by insult and negligence.

Finally the Army mutinied and Cromwell and Fairfax reluctantly led them in their march to London, where they forcibly ousted the hostile majority.

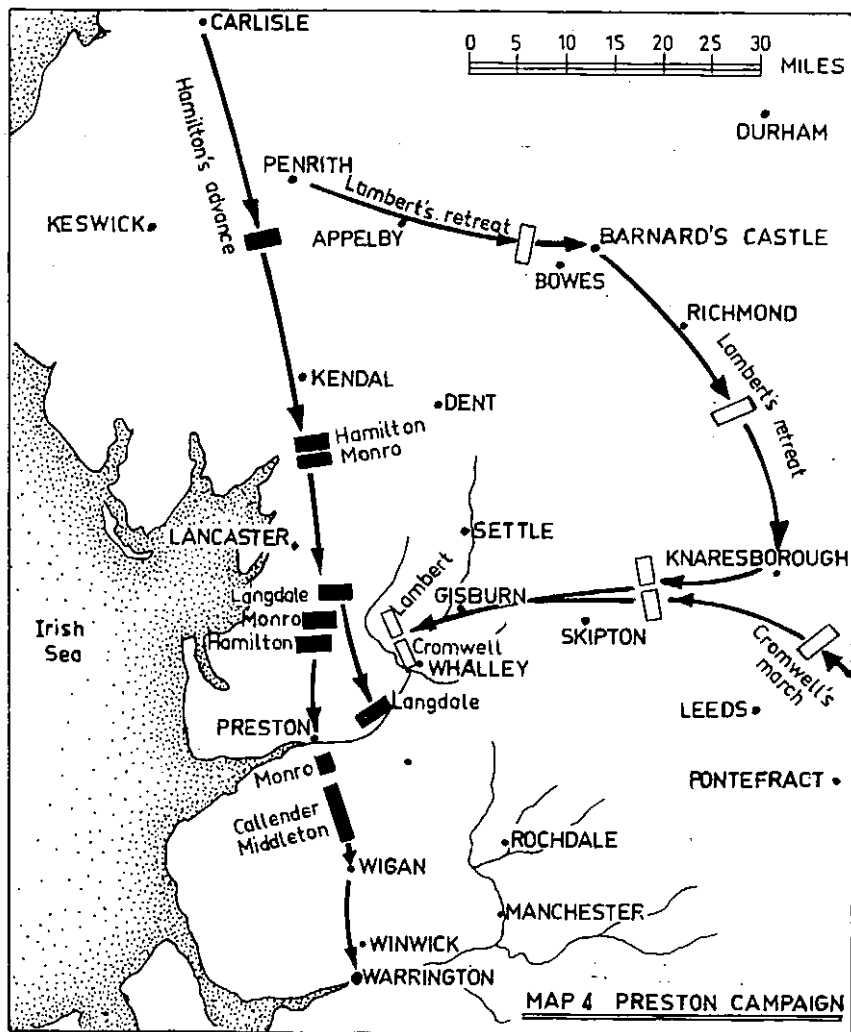
Preston

War broke out again in 1648 and on 8 July a Scottish Army crossed into England and occupied Carlisle.

While Lambert to the north brilliantly harried the enemy, Cromwell marched his force swiftly from Pembroke, starting on 14 July. It rained almost continuously making the roads impassable and most of the infantry were without shoes and stockings. But Cromwell forced them along.

On 13 August Cromwell joined Lambert at Knaresborough (see map 4). The Scottish force numbered about 20,000 men against which Cromwell could pit less than 9,000; Cromwell, however, decided he must attack immediately. Leaving his artillery behind for greater speed, he marched west. After three arduous days he arrived at the Ribble, north-east of Preston, on the evening of 16th. Rather than carry out a frontal attack and let the enemy escape, he decided to attack them from their rear. On 17th he struck savagely at Langdale. After a stubborn fight Langdale's troops were overcome and Cromwell wheeled towards the river to cut off the Scots there. The royalist

force began to flee southwards to Wigan. Leaving 4,000 troops at Preston, Cromwell hotly pursued them beyond Warrington, over 30 miles away, till the evening of 19th. As Cromwell's force was now exhausted, he directed Lambert to continue the pursuit.



'The Scots', he wrote, 'are so tired and in confusion that if my horse could but trot after them we should take them all, but we are so weary we can scarce be able to do more than walk after them . . .

My horse are miserably beaten out and we have ten thousand prisoners.' By 22 August the exhausted Scots surrendered.

In this campaign we see Cromwell maintaining strong discipline under very adverse conditions, moving rapidly, striking the enemy with a smaller force and emerging victorious. His decision to attack the enemy and cut off their line of retreat was a masterly one.

Typical of him was his order that any officer or man guilty of taking or demanding money, goods or victuals or 'abusing the people in any sort' should be tried by a Council of War and punished according to the articles of war, 'which punishment is death'.

After Preston he marched northwards and by October he was able to report that all enemy forces in Scotland were disbanded.

In January 1649 the King was tried and executed.

Ireland

After the King's death, the government of England was administered by a Council of State, both Fairfax and Cromwell being members.

Ireland was now a stronghold of royalism under the Duke of Ormonde, who had over 40,000 men under arms. Only two places—Londonderry and Dublin—held out for parliament and both of these were under siege.

Cromwell agreed to take a force to Ireland. Fourteen regiments of both foot and horse were to accompany him and lots were drawn for this task. Although the officers involved were content, agitators had been at work amongst the troops, preaching doctrines of equality. Dangerous mutinies broke out in London and the country. Cromwell personally addressed the London regiments in Hyde Park and convinced them that they should serve under him. He then took 400 soldiers prisoner and publicly shot a cornet and two corporals in a Burford churchyard. Cromwell showed he could pinpoint areas of conflict and deal with them sharply; and once again demonstrated his powers of command and leadership. Few military insurrections have been overcome so rapidly with so little bloodshed.

He then proceeded to Ireland as Lord-Lieutenant with full civil and military powers. His first act was to relieve the parliamentary force in besieged Dublin. He then issued proclamations prohibiting all pillage and ill-treatment, stating that all provisions obtained must be paid for by his forces.

The Irish campaign showed no signs of being an easy one. Famine had resulted from eight years of anarchy and he would not be able to obtain locally much food or fuel. Nearly all the supplies he needed must come from England. The fleet, under Admiral Ayscough, not

only had to maintain him throughout the period, but also had to ward off the royalist fleet under Prince Rupert.

Although no detailed references are available as to how Cromwell moved his troops and maintained them from the sea, it is evident that the detailed staff work involved was prompted by his appreciation of the vital part logistics would play in such a campaign. This is also evident in his insistence on issuing tents to his troops.

Drogheda

Leaving 5,000 troops at Dublin he now marched northwards with a force of 18,000 to the royalist garrison at Drogheda. When the garrison did not answer his call to surrender he ordered an attack, but it was driven back with heavy losses. Cromwell personally led the next attack which was successful. However, no quarter was given to the defenders and about 2,000 of them were put to the sword. Possibly this could be excused by a custom of war which stated that a garrison which rejected a summons could not complain if they were cut down to a man by successful assault.

But worse than this was the indiscriminate slaughter of women and friars and destruction of property. The storm of Drogheda may have injected terror into the hearts of the enemy, but the intense loathing it left exists even today. Feelings were by no means lessened when Cromwell blamed his men's behaviour on the spirit of God saying, 'I am persuaded that this is a judgment of God upon these barbarous wretches, who have imbrued their hands in so much innocent blood, and that it will tend to prevent the effusion of blood for the future.'

Wexford

Cromwell then marched southwards to Wexford. All royalist garrisons were abandoned as he approached. On 1 October 1649 he sent a summons to the Commandant of the Wexford garrison. On receiving no reply, the castle was attacked. Even though there was little resistance, 2,000 of the defenders were massacred for the loss of only twenty of his men. Cromwell charged his Maker with this act saying, 'We intended better to this place than so great a ruin . . . but God would not have it so.' However in his own heart he knew this was not so, that the fault lay with him, and it appears he was deeply chagrined.

Shortly afterwards the royalist forces at Cork and Yorghal surrendered. During this period adequate payment was made to all the local inhabitants who provided his army with provisions. But the campaign was a hard one and there was much sickness in his force during the winter. He himself became ill and he wrote, 'I scarce know one officer of forty among us that hath not been sick.'

He now put his troops into winter quarters in Cork, before resuming the campaign in February 1650. In March the Irish Headquarters at Kilkenny surrendered with the honours of war.

New dangers were arising in England and even though strongholds, such as Waterford, still held out, it was imperative that he return. Handing over command to Ireton he embarked in May 1650 for Bristol.

The Irish Campaign

On return to England Cromwell was received as a hero, the poet, Marville writing:

‘So much one man can do
That does both act and know.’

This praise was well deserved as Cromwell had carried out his task and destroyed most of the resistance in Ireland. In the face of all kinds of difficulty, inclement weather and sickness he had pitted a numerically inferior force against the Irish forces under Ormonde. Even so, with his small and shrinking army he had conquered Ireland in eight months. During the campaign he showed no special tactical brilliance, but he kept a tight control over the strategic elements. In spite of the adverse conditions, his qualities of leadership kept his army united. His appreciation of the vital role of logistics is shown in the way he handled supplies and transport, provided tents for his soldiers, and administered his force mainly from the sea.

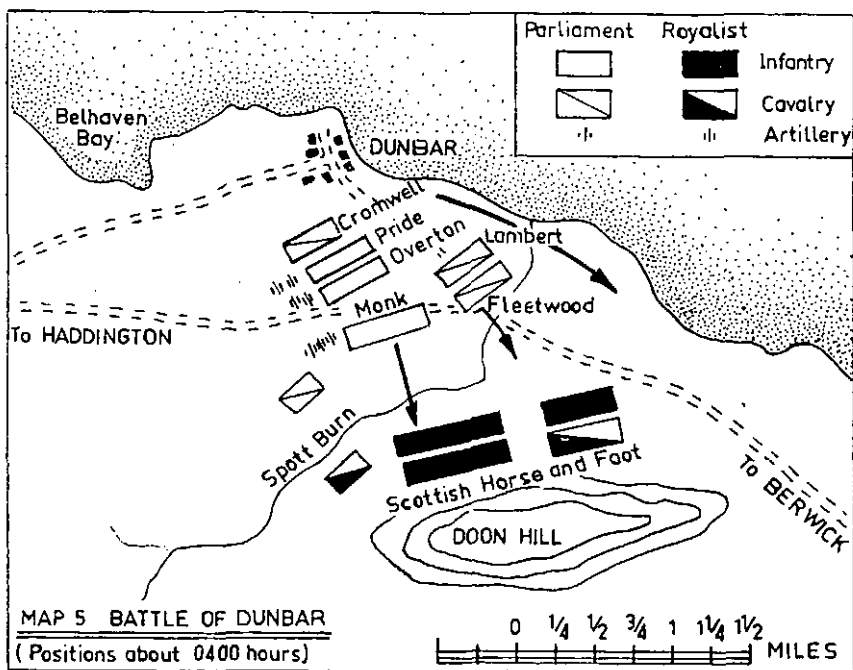
But against these achievements must be matched the actions at Drogheda and Wexford. Because of these his name in Ireland is eternally abhorred.

Dunbar

King Charles II was rallying Scots to his cause and invasion of England appeared imminent. When Fairfax resigned his commission, Cromwell was appointed Captain-General and Commander-in-Chief and on 26 June 1650 marched north to do battle. However things did not go well for him. His supplies failed, dysentery broke out among his troops and his forces were in no condition to fight. He was forced to fall back to Dunbar with his ‘poor, shattered, hungry, discouraged army’. Against his dispirited force of 11,000 troops was ranged the Scottish force of 20,000 men. Trapped in the peninsula his situation looked very grim.

On 2 September the two armies drew up opposite each other, as shown on map 5. Leslie, the Scottish commander, formed up in the centre with cavalry on either flank, and a burn to his front. Being 50 feet deep, it was impassable to his left front, but on his right extremity it levelled out and for half a mile was no obstacle. With his great cavalry superiority he intended to assault the English at this point.

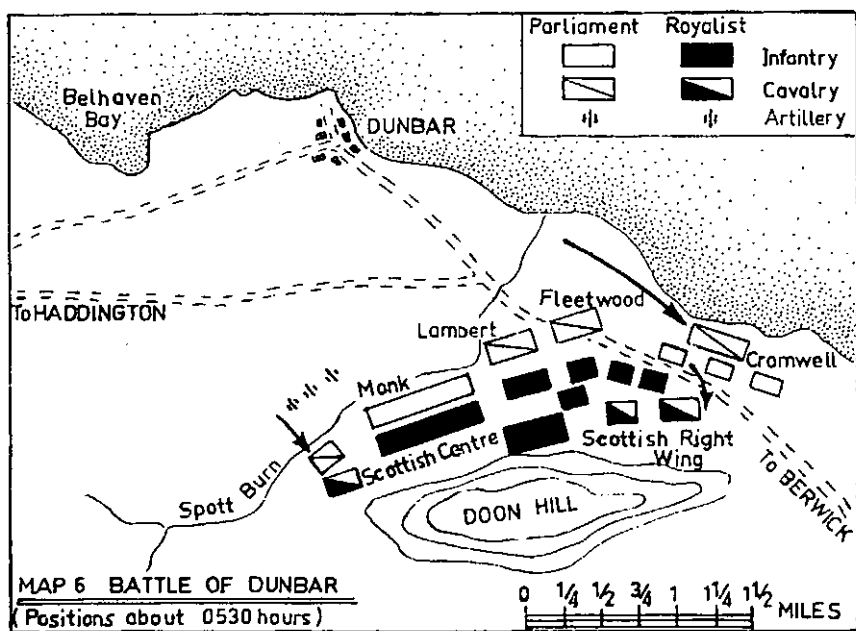
Cromwell closely watched Leslie forming up all day long and his keen, tactical brain soon showed him a weakness in Leslie's disposition. To his rear lay a great mass of steep hills with Doon Hill at their summit. His left flank was hemmed in by the hills and the deep burn to their front. Instead of placing all his infantry on his left flank and his cavalry on the right, where they would have had freedom to manoeuvre, he had jammed much of his cavalry on the left. Cromwell saw that provided he could tie down Leslie's left and centre with his own infantry and artillery and attack across the burn on Leslie's right, he could bottle up the force and destroy it.



At 0400 hours next morning Lambert, on Cromwell's orders, crossed the burn at its highest possible point with five regiments of cavalry to engage Leslie's right in a frontal assault. Cromwell, simultaneously, had moved his own regiment of horse and three regiments of infantry. He crossed the burn further down and assaulted Leslie's right flank. (See map 6). Though surprised, Leslie's centre and his right wing changed their front to their right. Lambert's attack was checked. Monk, who had moved to the rear of Lambert and assaulted Leslie's infantry with his own three battalions, could not advance.

Cromwell sent two of his battalions to Monk, to assist him, and directed his third in a wide movement against the flank of the Scottish infantry.

Monk's brigade rallied, Lambert's force advanced again and at the crucial moment Cromwell threw his third battalion against the flank of the Scottish centre and his own regiment of horse against Leslie's right wing of cavalry. 'They run, I profess, they run,' said Cromwell as he saw the Scots retreating. As the sun arose Cromwell was heard to cry, 'Now let God arise and let His enemies be scattered.' Fighting heroically the Scots were forced helplessly into the narrow area between the hills and the burn. Cromwell issued orders for a pursuit to Heddington of those of Leslie's cavalry who had fled.

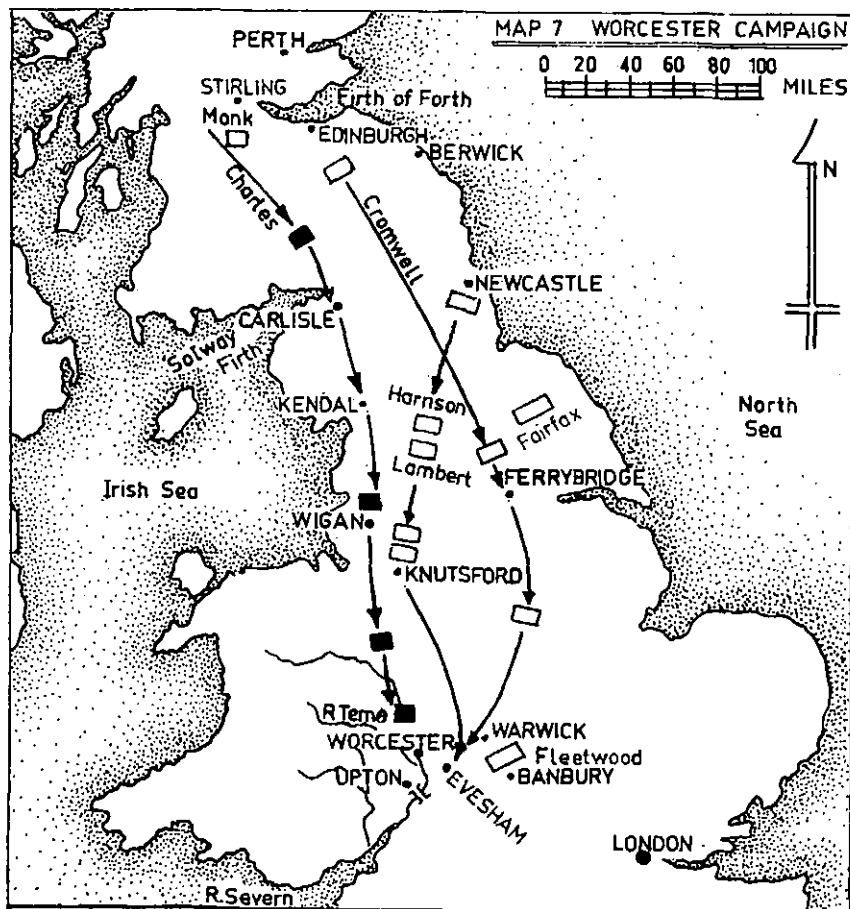


Cromwell had turned possible defeat into brilliant victory. His army had killed over 3,000 Scots and captured 10,000 men with all their guns, baggage and 200 colours. Leslie's army had ceased to exist.

Worcester

After Dunbar, Cromwell returned to Edinburgh and received the surrender of the castle. At this point operations for the year ended.

Meanwhile Leslie had assembled a new army in an impregnable position at Stirling. Thence King Charles II marched south for the invasion of England. It is now that we see Cromwell, the strategist. He had anticipated this move and his plans were well prepared. Acting on his orders, General Harrison, with 3,000 horse, had marched from Edinburgh to the border. Lambert, with another 3,000 horse, had been instructed to harass the enemy's rear. Cromwell called out



trained bands of troops in Yorkshire and Lancashire and sent a letter to the House of Commons, assuring them that all was well. Never had so many troops been concentrated in England.

Hoping to pick up recruits Charles was marching along the West coast. The movement of these forces can be seen on map 7.

After moving from Perth to Edinburgh, Cromwell commenced his march south on 6 August in two parallel columns. He wanted the maximum speed for his troops and arranged for their arms and coats to be carried by the country people. His soldiers, thus marching in shirt sleeves, moved at a rate of 20 miles a day.

Harrison and Lambert merely attempted to delay Charles at Warrington, then converged south-east towards Cromwell. Charles reached Worcester on 23 August, whilst Cromwell entered Coventry on 25 August after moving through Pontefract, Mansfield and Nottingham. Harrison and Lambert now joined Cromwell, as did General Fleetwood with his troops from London. On 28 August this force closed on Worcester. Meanwhile Cromwell had positioned Colonel Whalley at Bewdley bridge on the Severn, thus cutting this line of retreat. A few days were needed to collect boats for bridging the Teme, so that Fleetwood could attack Worcester from the south-west, and for crossing the Severn, thus maintaining communications between these two forces.

Cromwell was now ready. On the afternoon of 3 September Fleetwood crossed the Teme and attacked the royalist troops on the western bank of the Severn—see map 8. He was supported by Cromwell's Scots. Simultaneously Cromwell attacked along the eastern bank of the Severn.

Both forces then closed on the Scots, 28,000 against 16,000. Although the Scots fought desperately they were finally overcome at the northern end of the town. The war was ended at a blow; less than 2,000 of Charles' 16,000 men escaped.

At Worcester, Cromwell was to demonstrate the enveloping movement which later was to be made famous at the battle of Sedan. He also showed the techniques of re-grouping and river crossing. This was to be Cromwell's last campaign, though not the end of his military career.

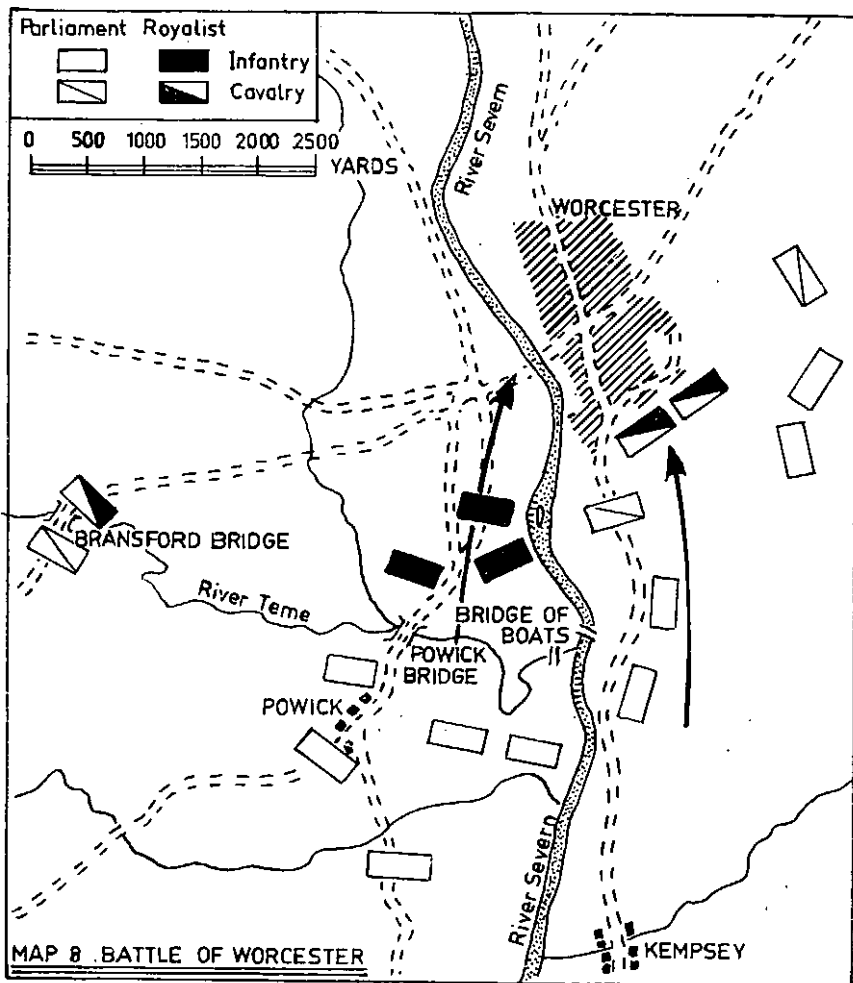
Cromwell the General

Since 1645 the Standing Army had grown steadily. It now amounted to 30 regiments of foot, 18 regiments of horse and one of dragoons, a total of almost 50,000 men, the most formidable fighting force in the whole of Europe.

In 1652 Cromwell was appointed Commander-in-Chief, the first in British history. He commanded not only it, but also all the forces in the three kingdoms.

This army, possibly the most remarkable one the world has seen, was chiefly made by Cromwell. He had shown how to train a troop, then a regiment, then many regiments and finally an army, and effectively to use these forces against the enemy.

Cromwell inspired the army with moral force and maintained it with a strong disciplinary code. The use of the lash and halter were common. He was not foolish enough to insist that his officers should have similar political or religious views to those of his own. 'Sir, the



State in choosing men for its service,' he said, 'takes no notice of their opinions. If they be willing faithfully to serve it, that satisfies.' It was his own powerful personality that was to so influence the moral standard of the army. As Commander-in-Chief his own powers were

immense and he issued all commissions, regulated all promotions and made all dismissals.

After the Worcester campaign there was never a shortage of recruits. In fact the Army offered a good career. Capable soldiers could rise to commissioned rank. Cromwell had proved to be a victorious leader and was highly regarded as such. But, in addition, he was trusted for his sound judgment, being able to recognize good soldiers, as well as discipline the bad. His soldiers in later life were conspicuous for their sober, orderly and diligent lives, a pattern that he, himself, had set. It is from the New Model Army that today's armies base their organization of regiments, with cadres of fixed strength, standard establishments for artillery and transport units, the historic scarlet uniform and all the administrative details that go with an organized fighting force.

Cromwell also set the pattern for British military discipline and the tradition that pillage and plunder have no place in an army. Like Caesar he had taken the field as an elderly politician, but, unlike Caesar, he had not had any earlier military training. He understood the feelings and aspirations of his countrymen and he had a mind capable of seeing quickly the essentials of a problem. In combat, he did not get flustered, but maintained an ice-cold brain, ever alert to opportunities that presented themselves. He gave his force a discipline and organization which the world had not seen since the Roman legions. He was a magnificent cavalry leader and evolved new techniques for their use. He quickly learned that once committed tight control was essential. He always kept a reserve available to deal with the unexpected as it arose and he was able to judge the crucial moment in any battle. His aim was always to destroy, not defeat, the enemy.

In later campaigns he revealed his capability as a strategist and understood the essential place of administration, with all that it entailed.

After Worcester, Parliament gave him the royal palace at Hampton Court and a generous extra pension. His name was a household word throughout England and, if he had wished it, he could have become the King.

His later political activities may leave much to be desired, but up to this time Oliver Cromwell had distinguished himself as one of the world's greatest generals. □