HEALTH IN THE ARMY

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[Continued from page 59, January issue]

PERSONAL HYGIENE

Under this heading will be discussed Health Education and all those factors which together form the soldier's environment. Lastly, but by no means least in importance, may be mentioned Dental Care, an essential contributor to good health of the individual.

HEALTH EDUCATION

During the period between the First and Second World Wars the Regular Army was a comparatively small force, stationed for the most part in well-ordered garrisons at home and abroad. Prospective recruits were required to have attained certain educational standards before enlistment, regimental esprit de corps was strong, and discipline, based on man management, was generally of a high order. Under these circumstances Health Education presented no great difficulty; the whole atmosphere of Service life—the ordered routine and the example of seniors—soon engendered in the recruit a wholesome, if often subconscious, realization of the benefits of a healthy life. Some formal instruction was also given: Regulations for the Medical Services of the Army prescribed that officers in medical charge of troops would deliver lectures to officers and men on hygiene and sanitation and on venereal disease [14].

The introduction of National Service in 1939 revealed amongst the conscripts a high proportion of illiterates, of whom the Army's share was greater than that of the Royal Navy and Royal Air Force which had prior choice on account of their more technical duties [15]. The vast expansion of the Army during the war, with its dispersal in small detachments throughout the country and overseas, and its dilution with men of all types suddenly removed from their native environment, necessitated a new approach to Health Education. Gradually an effective organization and system were developed. Early in the war all units were ordered to devote a minimum number of instructional periods to subjects of a general educational nature; talks were given and discussions conducted, sometimes by visiting lecturers, sometimes by regimental officers using Army Bureau of Current Affairs publications for their guidance. Subjects were of general interest and included such themes as "The Health of the Citizen," "Social Insurance," and kindred topics. Short films and cartoons were featured in ENSA programmes.
and articles on general health topics appeared in Forces newspapers and magazines.

More specialized Health Education was given by the Medical Service on such subjects as personal hygiene, prevention of scabies, care of the feet, venereal disease, malaria and tropical hygiene. Many methods were used to spread knowledge; amongst them may be mentioned lectures by medical officers, often accompanied by short films or cartoons, pamphlets in unit Information Rooms, posters in prominent places, appropriate films shown in troopships to all drafts proceeding overseas, and local education campaigns, especially in theatres abroad, organized by Field Hygiene Sections and Anti-malaria Units. In some areas inter-unit competitions were successfully used to stimulate interest in health matters [16]. The success which attended these efforts may be judged from the war-time health records of the Army; one striking result of intensive education allied with strengthening of discipline may be quoted here—namely, the fall in malaria incidence in South-East Asia from 391 per 1,000 in 1944 to 60 per 1,000 in 1945 [17].

At the present time the importance of Health Education at all levels of the Army is widely realized, the objective, as in the case of the modern Public Health Service, being the attainment of positive health. The method aims at the continuous inculcation of good habits into every soldier, supplemented by formal training especially during his early service. At his Basic Training Unit he receives four lectures with films or film strips on personal hygiene—the daily routine: washing, eating, sleeping, use of leisure; the structure and functions of the body; an explanation of the causes of disease and methods of avoidance; the value of immunization; and the relation to himself of the work of sanitary inspectors and other health workers. Then follow six lectures on communal hygiene, dealing with the relation of the individual to the community; Military Hygiene organization and its relation to the civilian Public Health Service; the spread of disease: droplet, insect-borne, parasitic, excremental and venereal, and individual preventive measures; individual methods for the protection of food and water; correct communal habits; elementary tropical hygiene, including malaria prevention; and elementary nutrition. Finally, he is exhorted to make use of the knowledge he has gained. These lectures are given by non-commissioned officer instructors, who have been carefully selected and trained at the Army School of Health, from standard précis prepared by the Army Medical Department in conjunction with medical training establishments. Short courses at the Army School of Health are also held for Commanding Officers and Seconds-in-Command of Training Centres, in an endeavour to stimulate, where necessary, the interest of these officers in health matters.

Officer cadets have already received the recruits' health training during their service in the ranks and so are ready for more advanced instruction. The objects of this training are impressed upon them—namely, that the junior officer should have better knowledge of health matters than the men under his command, and to make them aware of the special responsibilities of commanders in regard to the promotion of health and the prevention of disease [18]. At the
Royal Military Academy Sandhurst, where cadets are trained for Regular Commissions, twelve lectures and discussions are held, including the working of the hygiene services of the Army; officers' responsibility for their men; care of the soldier; mental health of the soldier; basic principles for the prevention of disease; more advanced instruction in nutrition and feeding of the soldier; and the importance of personnel selection and of wastage due to disease. At Officer Cadet Training Units, where cadets are trained for emergency commissions, six lectures are given, similar but with less detail on individual diseases, because the course is much shorter.

With regard to the enlightenment of more senior officers, Health Education is not neglected in the curriculum of the Army Staff College at Camberley. An indication of the importance attached to this subject is apparent in that the Director-General of Army Medical Services personally lectures on health discipline to each course of students.

Other specialized training is carried out at the Army School of Health and the Royal Army Medical College. Every medical officer attends a course in Army Health on first appointment, while more senior medical officers receive further instruction and must pass an examination before promotion to Lieutenant-Colonel. Every unit must have sanitary and water duty personnel, also one or more regimental officers trained in hygiene. This instruction is undertaken by the Army School of Health, as also is the training of Hygiene Assistants and the Tropical Hygiene training of sanitary personnel posted overseas, while courses for Army Health Specialists are held at both establishments.

The foregoing account deals with Health Education as affecting more particularly the life of the soldier during his service with the Colours. A further aspect now merits consideration. During and since the war a high proportion of the young—and not so young—men of this country have spent some period of their lives in the Armed Forces, the majority in the Army as being the largest Service. Undoubtedly there are many incorrigibles, but surely a great number must have derived some lasting benefits from their service and are continuing in civilian life to apply what they have learnt. If conscription has come to stay indefinitely, as at present seems likely, this process may well continue for many years: the majority of our men will spend a most impressionable period of their lives in one or other of the Forces, where they will be open to influences previously unencountered. It would seem, therefore, that the Army is now in a unique position, in a way hitherto unknown in this country, to make a major contribution to the health of the Nation. But the full exploitation in after-Service life of the advantages of this system is obviously outside the Army's province: here surely is the perfect opportunity for such bodies as the Central Council for Health Education to exert their influence, particularly on the type of man who would otherwise soon revert to his former squalor.

Environment

The environmental factors concerned in the health of the soldier are similar to those affecting all other people—namely, climate, accommodation, clothing,
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food, water, personal cleanliness, physical development, work and recreation. All of these factors, however, present additional aspects more or less peculiar to Service life. Some of these will now be considered.

Climate

The soldier may be called upon to serve in any kind of climate. The British Army has many years of experience of hot countries, and some, during the late war, of subarctic regions. Two basic factors contribute to the higher incidence of sickness in tropical than in temperate zones [19]:

A lower standard of general hygiene, due to physical difficulties of application, underdevelopment of the country and ignorance of the native inhabitants, leads to a greater incidence of communicable diseases such as enteric, dysentery, smallpox and specific tropical conditions; and

The climate itself is more or less directly responsible for such ailments as prickly heat, loss of energy and neuroses.

Spectacular advances in the control of the former group have been made in recent years, and the day may be confidently expected when the risk of contracting these diseases will be as small as in the temperate zones. The second group presents more intangible problems; undoubtedly the most realistic approach is the encouragement of a sound way of life, based on self-discipline acquired through enlightened Health Education.

Accommodation

Accommodation of the soldier differs radically from that of the average civilian in that provision must be made for the former to sleep, eat, work and play under one roof, as it were. In peace time he normally lives in barracks; if married he may be allotted a married quarter, which range from tenement-like dwellings of older construction to pleasant modern houses for the more fortunate. Barracks are of comparatively recent origin—another product of the Industrial Revolution, with its need for troops to quell possible disturbances in the rapidly growing towns; previously they had been quartered in civilian billets. The earlier barracks were drab, depressing, multiple-storeyed buildings, arranged usually in a hollow square. Improvements were gradually made until the "Sandhurst Block" was produced in 1933. This is a two-storeyed H-shaped building with barrack rooms, dining-hall, sanitary accommodation and drying rooms all under one roof. Later, numbers of single storey pavilion type barracks were built to house the intake of Militia in 1939. The present conception of a military camp is on the lines of a model village, well sited in the country but not too far from a town, and self-contained, with married quarters, recreation fields, shops, church, canteens and cinema [20]. Unfortunately, owing to present economic conditions, new building is severely limited for the Army as for the country as a whole, consequently many old barracks of obsolete pattern are still in occupation.

Overseas accommodation consists of permanent barracks, suitably con-
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Structed for the climate, or of semi-permanent camps, hutted or partially tented, according to the expected length of stay in the area. Improvements are constantly taking place, within the limits of the financial resources available, in the design and materials of buildings, huts, tents and equipment.

Clothing and Equipment

The clothing of the Army is also undergoing continuous evolution. The South African War saw the replacement of the famous red coat by khaki. After that war a Committee considering the physiological effects of food, clothing and training on the soldier emphasized the necessity for comfort of clothing and equipment for efficiency. The 1914-1918 war led to renewed demands for functional improvements. The eventual result was battledress, which proved basically sound in the last war. Some radical changes took place, not without misgivings in certain quarters; for instance, puttees were discarded to permit freer circulation in the legs, the hard cap was replaced by the forage cap and beret, and early in the war enlightened conceptions of the effects of heat led to the abolition of that symbol of service east of Suez—the sun helmet.

The soldier’s clothing must satisfy a number of requirements: it must be warm but at the same time permit gradual loss of excessive body heat; as light as possible because heavy loads have often to be carried over long distances; small in bulk for ease of packing and to hamper movement as little as possible; comfortable, uniform and hard-wearing. Moreover, it must be easily and cheaply produced from freely available materials in large quantities and a wide range of sizes. A smart appearance is important for ceremonial wear, while utility and inconspicuousness are essential for active service. In any future atomic war a low flash point will be an important requisite. Further requirements are protection of the body from injury by trauma, insects and snakes, prevention of skin afflictions, heat stroke and exhaustion in hot climates, and of frostbite and allied conditions in cold.

For general purposes in temperate and cold climates wool has proved the best material so far available—it retains heat, absorbs water rapidly and loses it slowly, thereby preventing sudden chilling. Irritation of sensitive skins is minimized by mixing a proportion of cotton with the wool of the Army shirt, while retention of heat and ventilation of the skin are further assisted by underwear of cellular mesh material. But present world demands for wool are exceeding supply, nor is it ideal from the point of view of weight and bulk, hence its use is likely to be partially superseded by such material as proofed gaberdine for active service garments, and eventually perhaps by synthetic materials for formal uniform. A new type of combat suit has, in fact, been designed, consisting of a proofed gaberdine smock based on that issued to airborne troops during the war, and trousers of similar material. This is claimed to meet many of the requirements mentioned above, but has not yet undergone sufficiently extensive trials for an opinion to be expressed.

In the design of tropical clothing a balance must be struck between such factors as short trousers and open-weave material for comfort and coolness on
the one hand, and long trousers and close-weave material for protection from injury and mosquitoes on the other. In this respect it is interesting to note that the British Army has worn short trousers in the tropics for many years, while the United States Army is resolute in its preference for long. Certainly, such afflictions as desert sores are more prevalent on unprotected skin, and medical opinion generally now seems to be in favour of the abolition of shorts altogether. Similarly, until anti-malarial protection can be assured by other means—by drugs, for instance—close-weave material would appear to be essential in malarious areas; in other words, in most tropical countries in which the British Army is serving today.

The soldier’s footwear is of prime importance. Little change has taken place for many years in the design of the Army boot, which, though satisfactory in many respects, is heavy, expensive and not permeable to moisture. Nor is the anklet entirely satisfactory. Suggestions have been made that the two should be combined in the form of a knee-boot, but this would be expensive and leather is scarce. Whatever form is eventually adopted will probably be of composition, having an impermeable sole and semi-permeable uppers to allow adequate ventilation of the feet.

Improvements have also taken place in the design of load-carrying equipment, the aim being to distribute the weight as equitably as possible with least hampering of physiological function, at the same time preserving a small silhouette. The chief disadvantage of previous patterns was the tight waist-belt which, with ammunition pouches in front of the chest, impeded full respiratory movement. A new pack has now been produced, of which most of the weight is carried on the hips, and the front of the chest is left free. Nevertheless, the total weight of a man’s load in full marching order is still as much as 78 lb. No reduction can be accepted by the Operational Staff in the variety and number of items carried, and so economies can only be effected by reductions in their weight. Thus steel and enamelled iron have now been replaced by aluminium for mess-tins and water-bottles, the steel helmet is being ousted by a lighter one made of a new plastic, while a still more fruitful field for investigation is the composition of ammunition casings, which are the heaviest individual items of the soldier’s load.

Food

At the beginning of this century the soldier’s ration consisted of bread and meat, with a cash allowance of threepence per day for other items [21]. Even this was often badly cooked and hence not fully consumed. No attempt was made to estimate the soldier’s nutritional requirements scientifically until 1909. By 1914 the daily ration theoretically yielded 4,500 calories, but the incidence of scurvy and beriberi overseas in 1913, and later in Gallipoli and Mesopotamia, are proof of its deficiencies. Extensive research on vitamin B1 at the Royal Army Medical College and the Lister Institute led to the issue of Marmite to troops overseas, and the same workers also discovered an efficient method of preserving the antiscorbutic properties of lemon juice. Cathcart and Orr, assisted by
officers of the Royal Army Medical Corps, carried out research into the energy expenditure of the soldier, while Plimmer painstakingly compiled his tables of food values. Thus in the post-war period adequate scientific data were available for the calculation of dietetic requirements, and knowledge of the vitamins was growing. The appointment of an inspector of Army Catering encouraged adequate cooking and attractive serving of food, and consequently greater consumption. Continued research between the wars led to an ample and varied ration in all theatres in 1939-1945, with almost complete absence of nutritional deficiency.

The essential requirements of an Army ration are the provision of the proximate principles in their correct proportions in sufficient amount to replace the energy expended by the soldier, including a sufficient supply of all items essential to health, which must be digestible, varied and properly cooked and served, having due regard to economic requirements and local availability [22]. The satisfactory fulfilment of these requirements presupposes a knowledge of "the energy expended by the soldier"; once this is known the remainder present no great difficulty. The relevant factors will now be briefly discussed.

The researches of Cathcart and Orr during the 1914-1918 war indicated a daily energy expenditure by adult British recruits in training of about 3,574 calories [23]. Since then the tempo of training has increased, with a proportionately higher expenditure. Furthermore, the bare replacement of energy expended allows no reserves to be built up, which may well be required under active service conditions. A joint report of the Ministry of Health and the British Medical Association Nutrition Committee in 1934 suggested that a man doing heavy work should receive 3,400 to 4,000 calories daily [24], while in 1941 the Committee on Food and Nutrition of the National Research Council, U.S.A., advocated an optimum intake standard of 4,500 calories for an adult man of average size doing hard or very hard work [25]. The minimum intake standard now advised by most authorities appears to be about 4,000 calories for an active occupation. It is difficult to arrive at an exact conclusion in the face of so many conflicting recommendations, but a minimum field service or training ration standard of 4,200 calories would appear to be a reasonable proposition, especially when it is remembered that half of the modern Army are under twenty years of age, and that the majority of recruits are young men in their teens, many of whom arrive in the Army in an undernourished state.

The present Home Service ration scale, owing to the general food shortage, falls far short of this requirement. It should be explained that the majority of the items are issued in kind, with a small per capita cash allowance to the Unit to provide variety—the purchasing power of which must decrease with the rising cost of living. Additional rations are issued to Training Units and certain other categories, but even these bring the total only to the optimum level for a sedentary worker. Moreover, the ration is calculated on the assumption that the soldier purchases privately about 300 calories daily—in other words, that he must spend over one shilling of his daily pay on essential food, an assumption which, it is submitted, is fundamentally unsound, as an obligation surely rests with the
State to provide a full and complete ration. Foreign Service rations are adequate; it is to be earnestly hoped that the Home Service scale will be brought into line as soon as conditions permit.

Water

The provision of an abundant safe water supply is, as in civil life, a responsibility of the Engineers, who are advised on quality by the Medical authorities. In this country, of course, the Army obtains its water almost entirely from local public mains; but in many areas overseas it has to make its own arrangements. The basic principles of clarification followed by sterilization are applied in all cases, from large static installations to individual methods for small isolated detachments. In the former case clarification is effected by large metal kieselguhr filters, delivering 12,000 gallons per hour, or by sand filters delivering up to 30,000 gallons per hour; chlorine gas is the sterilizing agent in both methods. Large-scale mobile equipments, such as the Elliott Mobile Water Purifier, employ chloramination, by electrolysis of a weak solution of sodium chloride to which an ammonium salt is added. The resulting ammonia-chlorine is more persistent than chlorine alone, tastes less and is barely deviated by organic matter in the water, but is slower in its action [26]. Field units are equipped with water trucks of up to 350 gallons capacity, in which, after clarification by Stellar or Meta filters, chlorination is effected by the addition of water sterilizing powder—bleaching powder incorporating quicklime for increased stability. The amount of powder to be added for effective sterilization can be estimated by means of a simple test, using cadmium iodide and starch indicator, devised by Sir William Horrocks in the First World War.

The necessary apparatus is carried in a small case on the water truck, and any moderately intelligent man can be quickly trained in its use. Small quantities of water, in situations where individual sterilization is the only feasible method, are filtered through the Millbank bag of chain-weave cloth impregnated with antimould composition. Superchlorination is then effected in individual water-bottles by adding Halazone tablets, which are followed after a suitable interval by sodium thiosulphate tablets to remove the chlorine taste.

It is apparent from the foregoing account that wherever water is available it can be made safe for human consumption; risk of contracting water-borne disease has been reduced to the minimum compatible with employment of the human element.

Personal Cleanliness

Little need be said under this heading, except that the maintenance of a high standard of personal cleanliness by any body of men depends upon

1. the provision of adequate facilities for bathing, ablution and laundry,

2. ensurance of their use by the men.

The former are usually available, though not always in such abundance as thought necessary by the hygiene specialist. With regard to the latter, there are two lines of approach to the problem. Ideally, the aim would be achieved through Health
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Education; in fact, expedience entails recourse to disciplinary measures—orders, parades, inspections—in the present absence of popular enlightenment. Advancement of knowledge will result in a correct balance being struck between the two.

Physical Development

The attainment of physical fitness is a sine qua non of positive health. It is achieved in the Army largely through physical training. Just as the soldier's food has progressed from bully beef and biscuits to the modern balanced ration, so also have up-to-date methods of physical education been adopted by the Army and modified to its special requirements. Gone are the days of "physical jerks," to be replaced by systematic scientific training designed to develop anatomical, physiological and psychological fitness in the recruit, and to maintain it in the trained soldier.

Three different types of physical training are at present in use. Basic training aims to improve the poor musculature of the average recruit, who spends about ten periods at each of six standard progressive lessons. About the middle of this course he undergoes the recruits' test to determine his progress; towards the end he takes the standard test. Battle training is a progression designed to fit the trained soldier to the physical duties of his Arm in battle, for which appropriate activities can be selected from a wide syllabus, culminating in battle physical efficiency tests. The third type, games training, is suitable for the trained soldier as an alternative to battle physical training in peace time. Either the standard or battle tests should be done annually by all trained soldiers, and every encouragement is given to all ranks to take part in games and sports. Organized games and physical training are directed and taught by the Army Physical Training Corps, in close liaison with Army Physical Medicine Specialists.

Working Conditions

Many of the trades of the modern Army—in workshops, bakehouses, Ordnance depots, and so on—are precisely similar to their civilian counterparts, and are subject to the same occupational hazards. In such establishments in the United Kingdom the requirements of the Factories Acts and other legislation governing working conditions—heating, lighting, ventilation, safety precautions, etc.—are carefully observed, but such cannot always be the case on active service. While this is accepted as an additional occupational hazard of the soldier's profession, it should be insured against as far as possible by building up the tradesman's fitness and bodily reserves by attention to physical training, feeding and other aspects of his environment. As for the ordinary soldier—infantryman or gunner, tankman or sapper—it must always be borne in mind that his normal duties and training necessarily involve much physical discomfort, and therefore it is important that his surroundings be made as congenial as conditions permit during his off-duty hours.

Recreation: Morale: Mental Health

These three factors are discussed under one heading because they are closely linked. High morale is a state of mind, a condition of physical, mental and
spiritual well-being, brought about in the individual by absence of frustration, freedom from worry, confidence in himself and his associates, awareness of his ability, a feeling of worth and being wanted. It may be acquired, in the Army, first, through skilful training—training until the man is at the peak of his form, both in physical fitness and in the mastership of his trade; secondly, through "man management," an ill-defined process compounded of leadership, discipline, savoir faire, power, understanding, coming naturally to the born leader, differentiating the good officer from the indifferent. The fruits of wise man management are exemplified by the conduct of the Brigade of Guards and the Airborne Divisions in many trying situations during the last war.

No troops, however, can be maintained indefinitely at the peak of their form without outside interests. Boredom creeps in, morale deteriorates, the tensions of frustration are discharged through undesirable channels, reflected by a rise in minor sickness, venereal disease and psychological illness rates. Hence the necessity for adequate recreational facilities and welfare amenities; playing fields, sports equipment, hobbies, clubs, canteens, cinemas. Welfare organizations, such as NAAFI and the many voluntary bodies, render valuable service in this respect. Even in this country military centres are frequently well away from towns of any size, while overseas the soldier is still further from his accustomed environment. Other important contributory factors are links with home in the form of regular mail, newspapers and wireless broadcasts, and, above all, leave. Finally, the spiritual aspect should not be overlooked: good chaplains have time and again proved their worth in uplifting individuals and group morale.

DENTAL CARE

The provision of efficient dental care is no less important for the promotion of health as for the treatment of oral complaints. The Army has for many years provided free treatment necessary to maintain the dental efficiency of soldiers, "of a conservative nature and mainly directed towards the prevention of the necessity for artificial dentures" [27]. Before the advent of the National Health Service the privilege was also extended to Regular soldiers' wives and families, but since then this commitment has been transferred to the civilian Service, except in the case of families overseas. It is laid down that Dental Officers will instruct soldiers in oral hygiene, both by lectures and by demonstrations to individuals when they come up for inspection or treatment, and that all soldiers will have an annual dental inspection [28]. The Royal Army Dental Corps, a branch of the Army Medical Services, operates centres at all military stations and Dental Departments in military hospitals. The dental condition of each recruit is recorded on his Medical History Sheet, and full particulars of periodic inspections and treatment are noted on a Dental Treatment Card which accompanies the soldier from one station to another throughout his service.

BIBLIOGRAPHY

14. "Regulations for the Medical Services of the Army" (1938), War Office 26/Reg/2101, p. 37.
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21. ibid., 240.
23. "Field Service Hygiene Notes—India" (1945), 93.
25. "Field Service Hygiene Notes—India" (1945), 91.
27. "Regulations for the Medical Services of the Army" (1938), 161.
28. ibid., 42, 160.

[To be continued]

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Journals Received