data received from the same individuals on previous occasions, and, if the comparison indicated the development of a pathological condition, would send out notices asking the persons in question to seek medical help. The same data-handling systems might be used to construct a giant "Index Medicus" which would help the physician to determine the pathological cause of any set of symptoms presented by a patient and to prescribe a cure for it.

New Appliances

RESUSCITATION APPARATUS

Dr. M. K. SYKES, Department of Anaesthesia, Postgraduate Medical School and Hammersmith Hospital, London, writes: The widespread use of more complicated diagnostic and therapeutic techniques has resulted in a higher incidence of cardiac arrest outside the operating theatre. This complication can be treated effectively only if adequate equipment is immediately available. Unfortunately, such apparatus is often lacking in departments where special procedures are performed. The trolley illustrated in Fig. 1 was designed to satisfy the need for a storage unit which will contain all the equipment required to initiate ventilation and cardiac massage. Since the total cost of the trolley and equipment is approximately £50, a number of such units can be installed to provide full cover for even the most scattered of hospital buildings.

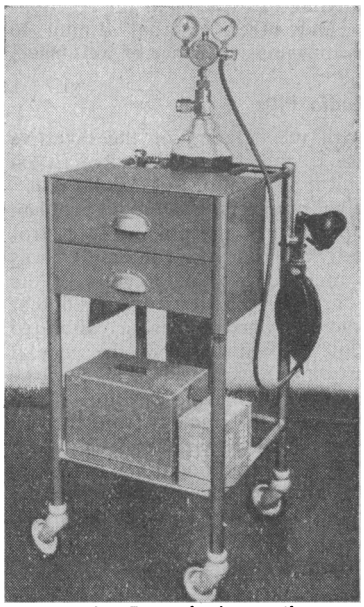


FIG. 1.—Resuscitation trolley.

Two means of ventilating the patient are supplied. The oxygen inflation unit is attached to a combined pressure gauge, reducing-valve, and flowmeter* situated on a 48-cubic-ft. (1.36-cubic-m.) oxygen cylinder. The latter stands within the wheel-base and is locked in position by a hinged bar at the rear. A cylinder key is chained to the stand. A Porton bellows resuscitator (Lucas and Whitcher, 1958) provides a reserve method for inflating the lungs with air.

The top drawer contains two scalpels (dry-heat-sterilized in test-tubes), sterile syringes and needles, and ampoules of 10% calcium chloride (5 ml.), 1/10,000 adrenaline (5 ml.),

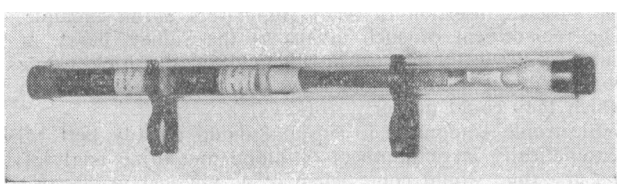


FIG. 2.—Perspex emergency pack.

and methylamphetamine (30 mg. in 1.5 ml.). The lower drawer contains pharyngeal airways and apparatus for intubation. The laryngoscope has blades for adults and children, and there is a full range of endotracheal tubes (sizes 00–5 plain, sizes 6–10 cuffed) and connexions. A mouth gag is included; this may be used as an emergency rib-spreader. A list of all the apparatus is attached to the stand for checking purposes.

Apparatus for the further treatment of the situation may be centralized to save expense. Defibrillators and a sterile drum of thoracotomy instruments should be situated within a few minutes' walk of any possible site of cardiac arrest.

Fig. 2 shows another item which may save vital seconds. It consists of a "perspex" tube 35 cm. (14 in.) long with an internal diameter of 19 mm. (¾ in.). It is closed at the ends with rubber bungs which project sufficiently to allow rapid removal. The tube contains a sterile scalpel and ampoules of calcium chloride and adrenaline as detailed above. Such a tube is fixed by Terry clips to the frame of every anaesthetic and analgesic machine in the hospital and ensures that there is no delay in the institution of effective cardiac massage.

I am grateful to Mr. R. G. Smith, instrument curator, and C. Thackray Limited, Leeds, who manufacture the trolley.

*Made by C. V. Bell Limited, Manchester.

REFERENCE

Lucas, B. G. B., and Whitcher, H. W. (1958). *Brit. med. J.*, **2**, 887.

HARNESS FOR CLIMBING PALM-TREES

Mr. P. H. NEWMAN and Dr. C. WILSON write: Eleven years ago a scheme was started by the Colonial Office to send specialists in medicine and surgery to Colonial territories. At the outset the Nuffield Foundation offered to help the Colonial Office in financing such a project, but after an arranged trial period of six years the funds expired, and it is interesting to note that the individual territorial Governments elected to continue the scheme at their own expense.

Under this scheme one of us (P. H. N.) visited Nigeria, Sierra Leone, and Gambia in the autumn of 1957 for the purpose of studying and reporting on the cause and treatment of accidents and orthopaedic conditions. During the tour many hospitals were visited, and it was estimated that between 10 and 12% of all beds were occupied by accident cases, which, divided into four main groups, gave these figures: road 46%, industrial 27.5%, domestic 18.5%, and sport 8%. It was surprising that more than a quarter of all accidents were industrial in territories depending so little on mechanized industry. The commonest and gravest form of accident at work was falling from a palm-tree. It was not possible to get exact figures, but it became evident that the number of cases admitted to hospital gave a very low estimate of the total, as fatalities were common and most of these accidents occurred in inaccessible places, leaving the injured to be accommodated in their own village.

The harvesting of the fruit from palm-trees is a most important matter in the economy of West Africa, and accidents due to falling from a tree often have the most serious results, immediate death being by no means rare. Broken neck or back is a frequent outcome often complicated by paraplegia, a most distressing state for the patient and presenting a major transport and nursing problem. The more fortunate victims reach hospital, but the others are left to endure agonies of distress in their own homes till death relieves them. Once in hospital the patient remains there, often to occupy a bed for a very long time.

Most tree-climbing in West Africa is done with the aid of an encircling vine cut from the bush. The girdle consists of one or more strands bound together with string or natural binding material in an apparently carefree manner. The ends of the girdle have to be separated each time, and once the tree is encircled the ends are bound together or knotted. Accidents happen for three main reasons: (1) breaking or giving way of the girdle; (2) severing the girdle with the cutlass which the native uses for cutting the fruit; and (3) a slip due to wet weather, foolhardiness, or fright from an animal, snake, or insect up the tree.

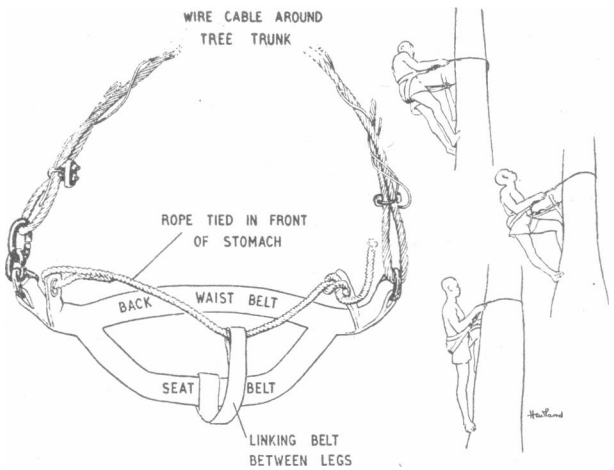
Though large plantations are now cultivating short types of tree which do not necessitate climbing by the harvester, the small farmers, who are greatly in the majority, still live by their tall palms, and will continue to do so for many years.

This apparent lack of interest on the part of climbers in their own personal security, the frequency of accidents, the suffering, and the wastage of valuable hospital beds were factors which obviously merited attention, and for that reason the problem of accidents resulting from tree-climbing was reported to the Ministry of Health of the Nigerian Federal Government in Lagos with a suggestion that a research project should be started into the safety of palm-tree climbing and the design of an efficient harness for this purpose.

The Ministry of Health responded promptly, and invited one of us (C. W.) as Chief Medical Officer of the Cameroons Development Corporation to make inquiries and to be responsible for further investigations.

The Cameroons Development Corporation readily gave its permission for the work, and what has resulted is largely due to the help which many of its staff gave most willingly—in fact, the prototype illustrated here is largely the work of Mr. Walkling, of the Shipping Division, who devised the harness as it now is and was instrumental in having it made. The main essentials of the harness are that it should be easily constructed, be made from materials readily obtainable in most parts of the tropics, and be acceptable to those who had to use it.

To satisfy the first two essentials, canvas is easily available in most places, and was therefore considered suitable for the body section of the apparatus, and wire cable, of which some is to be found almost anywhere, for the tree section. The difficulty was finding something suitable for the junction of these, as hooks with spring catches are not easily procurable and are apt to become unsafe if the spring rusts, as is more than likely in humid countries. Filed chain-links were thought to be most suitable, as used for the signal hoists of the Royal Navy. The harness consists essentially of two parts, the body belt and a loop to encompass the tree.



The idea of attaching the tree loop to a simple belt was investigated only to be discarded, as it did not place the fulcrum in quite the right place for the action required for the climb. Instead of that, trial was given to a pair of bulky canvas shorts with the tree loop attached where the top of the pockets would normally be inset. This, however, was somewhat uncomfortable, and eventually the body belt, which consisted of two canvas straps, was evolved. The straps were made of canvas folded on itself and sewn into position, joining each other at an angle of about 30 degrees, one being slightly shorter than the other. The shorter has attached to it a short, narrower strap with a loop at its distal end for use as a crutch strap.

The ends of the longer strap were fixed to a piece of reinforcing iron bent in a triangle and with one part of the chain link. The ends of the shorter strap were pierced to take a small piece of rope, which was spliced to one end, and, after passing through the loop of the crutch strap, was tied to the other end across the lower abdomen for adjusting the harness into place. We have used brass cringles for this piercing, but sewn buttonholes are just as good. The pierced strap is inside the other one, or the fixation rope would interfere with movements of the cable loop for going round the tree. The tree loop is made of wire cable with each end bent back on itself and fixed with a bulldog clip. Splicing was tried, but this allowed no adjustment for the individual or the girth of the tree.

One or two minor matters required attention. In the first place, the wire cable, which was 1-in. (2.5-cm.) cable, was too flexible. This was overcome by loosely winding around it some galvanized-iron wire. This gave it all the rigidity necessary. The other main trouble was that in the prototype, to save links, one end of the wire was attached direct to the harness triangle and a split link at one end only. This means that any user who has to walk any distance between climbs has to remove the whole harness or walk holding the wire loop in a clumsy position. If, however, split links are fixed to both ends of the loop it becomes detachable from the harness and the wearer becomes much more mobile. The cost of this apparatus should not be expensive to the individual, as every material used is reasonably available and little skill is required in making it up. On plantations with engineering facilities it should be very simple to produce, and the little expenditure involved will rapidly repay itself in fewer accidents and much less time spent in hospital or money paid in compensation. In practice it has been found that the apparatus is acceptable to practically all the harvesters, though with some it is not what "they were used to use" and therefore not acceptable at present.

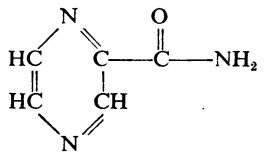
Our thanks are due to the Palms Division of the Cameroon Development Corporation for all the assistance and co-operation they gave, and to Miss E. Hewland for the illustration.

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Pyrazinamide (Merck Sharpe and Dohme).

Chemistry.—This is pyrazinoic acid amide, an analogue of nicotinamide, and has the following structural formula:



Pharmacology.—This antituberculous drug acts only on human tubercle bacilli, best at a pH of 5–5.5 *in vitro*. In mice, but less so in guinea-pigs, pyrazinamide alone has a moderate antituberculous effect, but this is greatly enhanced by adding isoniazid.

Therapy.—In man, resistance to pyrazinamide alone develops in four to six weeks, so that, except as a temporary addition for operative cover, this drug should always be given in combination. Pyrazinamide in a dose of 40–50 mg. per kg. body weight (1–1.5 g. b.d.) together with 100–150 mg. twice daily of isoniazid forms a most potent combination. The sputum may become negative by the fourth month in up to 93% of fresh cases,[1] often with radiological improvement. This regime is comparable in effect to P.A.S. with isoniazid.[2] Combination with daily streptomycin[3] or *para*-aminosalicylic acid[4] may produce equal results.

It follows that, when a patient's organisms are resistant to two of the three standard drugs, an effective combination with the remaining drug and pyrazinamide is possible, and probably is the most powerful therapy now available to the patient. Surgical treatment may be indicated later, since it is uncertain whether any of these combinations can ensure arrest.