

Oxford University Cave Club Cuvicente Expedition 1987

CAVER - HEAL THYSELF !

A guide to the medicines herein

WARNING - A lot of the stuff in this box is powerful juju indeed. Refer to the "Drugs - how to use them" sheet **Before** taking anything other than aspirin! Items marked ** are quite drastic and should only be taken in dire emergency, after consulting a doctor. If it's that bad, maybe you should be in hospital.

<u>AILMENT</u>	<u>DRUG</u>
SHITS	Codeine Phosphate Lomotil Rehidrat (replaces lost fluid)
PAIN	Aspirin Paracetamol (Panadol)
Watch it ! Aspirin causes gut bleeding and overdose of Paracetamol is very nasty indeed.	Codeine Phosphate (?) Feldene **
FESTERS	Try Savlon FIRST Daktarin **
RASHES	Try Savlon FIRST Eurax
BURNS	Cold water, use burn bags, or leave exposed to harden. Keep clean (Savlon).
NASTY EYES	Polyfax
HAY FEVER	Piriton Phenergan
ANTIBIOTICS	None of these to be used trivially. Bactrim Dalacin ** Flagyl ** Floaxapen ** Hismanal **
ECZEMA	Betnovate ** (see Dan if no Doc.)
CAN'T SLEEP	Alcohol ? Oh, all right, try Mogadon
DRU	

Oxford University Cave Club

Cuvicente Expedition 1987

DRUGS - HOW TO USE THEM

- 1,2 BACTRIM For Cystitis. One tablet twice daily, for five to seven days. Two tabs for bad goes.
- 3 BETNOVATE, BETNOVATE-C Powerful steroid ointment. Do not use except under qualified supervision. Do not use for rashes. Do not use for burns.
- 1,3 CODEINE PHOSPHATE For shits. As Lomotil.
Also - it's a good painkiller - better than aspirin / paracetamol (but it bungs you up!).
- 1,2,3 DAKTARIN For athletes foot. Wash feet thoroughly and dust with powder or cream with cream.
- REHIDRAT For the shits. Make up and drink to replace lost fluid.
If you run out, make your own:
1 litre boiled water
1 tablespoon sugar
1 teaspoon salt
Cheers!
- ERYTHROMYCIN For really bad sore throats. One tablet 3x /day for five days.
- 2 EURAX Use for itchy rashes, NOT if they're oozing or blistered.
- 2,3 FELDENE For severe pain. Take one per day.
- 1,2,3 FLOXAPEN Anti-microbial. For infected wounds and boils. One capsule 4x /day. If infection is not better after three days go onto Bactrim.
- 1 FLAGYL Specialised antibiotic, qualified use only. One tablet 3x /day, for 7-10 days. **NO ALCOHOL.**
For:- certain types of diarrhoea or vaginitis (thrush).
- 1 HISMANAL An antihistamine. One tablet /day.
- 1,2,3 LOMOTIL For shits, if it's really inconvenient. If you've got the shits, something in there wants to come out. Use with caution and not for long periods (ie. more than a few days).
- 1,2,3 PIRITON, PHENERGAN Antihistamines (for hay fever).
Use piriton first, then (if it doesn't work) phenergan.
Phenergan is also good for a night's sleep, if you don't mind sleeping the day after as well.
DO NOT MIX WITH DRINKING OR DRIVING
- 2,3 POLYFAX Eye ointment. Apply to inside of eyelids 3x /day.
- 1,2 POLYCROL FORTE For indigestion. Take one.
- 1,3 MOGADON Sleeping pills. Take a half or one and not before driving!

90
87

87
30
2810

NEEDS, SUPPLIES AND PRECAUTIONS

In a temperate climate the average adult needs a minimum intake of 2,500 ml of fluid per day. In the tropics the basic requirements of water may easily rise to 10 pints per man per 24 hours, plus one extra pint per man for each hour's work. Arduous work in extreme heat and high humidity may require 25 pints per man per 24 hours. This may double with very hard work. The best indication of the urgent need to drink more water is a sudden loss of weight after sweating. The first week in intense heat is often the most dangerous and you must make yourself drink even if you do not feel the urge to do so, and you must add kitchen salt to your food.

All water for drinking, cooking and teeth cleaning; indeed any water that passes your lips, must be sterilized. Approach to this problem will depend on the size of your expedition. For the small expedition sterilization can be best and most effectively done by bringing water to the boil and keeping it boiling for 5 minutes at sea level. Add one minute for each thousand feet above sea level.

WATER PURIFIERS. Most tablets available in Britain rely for their effect on the liberation of free chlorine. If the water to which you add the tablets has much sediment in it, and in particular protein, chlorine will be mopped up by the foreign matter and will not be effective. If your water therefore is full of dirt you must filter it first, for instance through fine gauze, or if you have nothing else, through a handkerchief. On a small scale, water can also be sterilized by filtering through a Millbank bag (though many find these bags a d. nuisance. The RGS including J-J among them). These bags can be obtained through Johnson-Progress Ltd., Carpenters Road, Stretford, London E15 2DF. Sterotabs 12 per gallon, or Puritabs 12 per jerrycan, or one per litre, or Puritabs Maxi one per 25 litres will sterilize the water. It should be remembered that chlorine tablets on their own will not rid the water of giardia or amoeba. Iodine is a more effective disinfectant. The water, however, must be at least

20°C (68°F) for chemical methods of purification to be effective. Two drops of 2% tincture of iodine per quart will sterilize. It is a nuisance to have to carry tincture of iodine around. An alternative is to have an ounce bottle filled with iodine crystals. If this bottle is filled with water and allowed to stand, a saturated solution of iodine will be made, and if the supernatant is added to a quart of water and allowed to stand for half-an-hour that water will be sterile. It is, however, imperative to make sure that the crystals do not fall out of the bottle, for the crystals in an ounce bottle, if taken at once, represent a lethal dose. In practice, pouring the supernatant through a filter into the water to be purified makes sense. Tablets of tetraglycine hydroperiodide are safer and more practical. They are not easily available in this country.

FILTERS. Reliable filters which allow a water supply for four to five people a day, if kept up, can be obtained from Portacell Ltd., Cannon Lane, Tonbridge, Kent TN9 1PP. Telephone no. 0732-364-411. Large expeditions may have to rely on complicated methods for cleaning their water. For instance, the RGS Kora expedition in 1983 had its only water supply from the Tana River, the sewer of Kenya. We pumped water from the river into a thousand gallon sedimentation tank, and the supernatant from that was again pumped into a smaller 200 gallon tank for further sedimentation. The thousand gallon tank provided water for showers and washing of people and clothes. From the 200 gallon tank we drew off water which was put through ceramic filters, and the resulting fluid was treated with Puritabs. The sterilized water is pretty unpalatable, but for the faint-hearted there are fruit flavours that can be added to take the sting out of it.

Despite the nasty taste, there is little doubt that if the water can be drunk cold, much of the unpleasantness goes out of it. It is therefore, in a hot climate, essential to have water bags. They are usually made of stout canvas and there is a slow oozing of water through the wall of the bag, and evaporation keeps the contents deliciously cold. The Army has a splendid large

bag, and if you can obtain an ex-Army bag so much the better. Canvas bags can usually be bought in most hot countries for tying on the front or on the side of your landrover. Remember to allow at least a week's supply of water for each member of the expedition, as well as water for your landrover, or your beasts, if any. Make sure that every member has his own personal water-bottle. This should preferably be a litre (2 pints) aluminium bottle, covered with felt or similar material. This cover is not there to make it more beautiful, or to disguise it, but so that it can be soaked in water and the contents be kept at an acceptable temperature on the same principle as the contents of the water-bag is kept cold. If you travel by landrover, do not have one enormous tank, but preferably many large jerrycans, say each holding 4½ gallons. If you rely on a single large tank and it is holed, all may be lost. Before you set out you must clean all the containers thoroughly with boiling water. Make sure that every member of the expedition has his own beaker. This should preferably be of aluminium or similar metal and not a plastic beaker, which has a nasty habit of breaking. Plastic water-bottles get brittle in intense heat and if dropped they crack very easily.

Throughout tropical and sub-tropical areas of the world, in the far-East, in the Indian sub-continent, in the Middle East, in Africa, in South and Central America North of Rio there is a risk of schistosomiasis. In the far-East this is caused by S. japonicum, whereas S. haematobium (the cause of Bilharzia) and S. mansoni are prevalent in the Middle East, Africa and the Americas. These worms live in a host, a snail, and all fresh water should be looked at with suspicion, unless it is very fast flowing or unless it is alkaline and there is no vegetation, and so no snails. Sea-bathing, which has other hazards such as stings from venomous creatures and sharks, presents no risk of schistosomiasis. Do not wash your clothes in schistosome infested water. If you discover that you accidentally have bathed or paddled in infested water, go to your doctor after your return and ask him to carry out a blood test for the presence of schistosomiasis. If you pass blood in your urine, you should go urgently so that

it can be looked at for the presence of eggs of bilharzia. If at the time you went swimming developed "swimmer's itch", it is also important that you go because some people develop an itchy spot where the worm goes through the intact skin. A blood test may show the presence of the worm in you before you fall ill, and treatment is now very effective.

SALT . For the first week or two after arrival in a hot climate one or two teaspoonfuls of salt per day extra to home needs are required for acclimatization. In hot countries always take some salt at all meals. Take ordinary table salt. Avoid salt tablets which are costly and usually pass through the gut without being absorbed. Take it in fruit juice or add it to the first course. Apart from this, after acclimatization it is only necessary to add two level teaspoonfuls of salt to each gallon of drinking water following sterilization, immediately if feeling exhausted, when thirst requires ten to twelve pints of water per twenty-four hours to be quenched, or if you get diarrhoea. The salt should be foregone if there is not sufficient water to match it.

REPEAT: Do not use salt tablets or emplets

Dioralyte and / ^{Rehidrat} are commercially available salt and glucose mixtures that in the right proportions will replace the salt you may lose if you develop diarrhoea. If you have not got any of these two preparations, a tablespoonful of sugar to each teaspoonful of kitchen salt is an acceptable alternative.

FOOD AND DRINK Expeditions are advised to take all the food with them they can, especially protein, i.e. meat, soup, and dried tinned milk, because such foods are scarce, often infected, and expensive in hot countries. The importance of an adequate protein intake cannot be overstressed. If you take a lot of physical exercise and do not eat sufficient meat, you will break down your own muscles, lose weight and end up weak and inefficient. You may get intractable diarrhoea. Pack some supplies to make occasional attractive meals: they are great morale boosters.

All local meat, whether flesh, fowl, or fish, and all local vegetables should be carefully chosen and prepared, and thoroughly cooked.

The pressure cooker kills all germs and makes tough meat more easily swallowed. Fresh fruit should be chosen with great care and lettuces avoided. Dates, grapes, etc., have fragile skins and are easily infected. All fruit should be washed in sterilized or boiled water, wiped and peeled. Fruit from trees should also be carefully washed to remove any possible pesticide. Tea, coffee and soup are excellent in hot countries. They are clean, and soup can be well salted and remain palatable. Local milk, ice cream and fruit juices should be avoided. Bottled soft drinks with metal caps (but not those with corks) are safe, though the necks should be rubbed well after the tops have been removed and before drinks are consumed. When cooling a drink, place the ice outside and not inside the container. Alcohol, if consumed, should be taken only after sundown. Those who take, buy and prepare their own food are far less likely to get ill than those who dine out. If dining out is unavoidable, well-cooked, hot foods should be chosen and salads and ice cream rigorously avoided. Wash the hands with soap impregnated with antiseptic (such as Derl) before preparing or consuming food. Those who get 'dysentery' should not cook food. It is often a good plan to engage a cook locally. He will advise where to get food. If you decide to eat local food, eat it as the locals do, do not try to "improve on it" by using parts the locals reject. (Cassava juice may literally be lethal, for instance, for it contains cyanide). Do not, however, expect everything to be "sanitized for your protection" as our American cousins have it. You can offend by refusing hospitality, and a little bit of dirt never did anybody much harm. Most of us have a little free hydrochloric acid in our stomach. This will kill a few very nasty germs, but if you eat too many, some will get through to the gut and do you in. It therefore stands to reason that you are likely to get away with eating a pound of tomatoes or cucumber

salad, because the surface of those vegetables is relatively small, whereas a pound of lettuce, watercress or the like, has a two to five hundred times greater surface and therefore potentially two to five hundred times more unpleasant pathogenic organisms on them.

Remember that most vegetables in third world countries are egged on with human dung.

SUN It is wise to keep your head covered in blazing sun. Many people find that an old-fashioned white floppy sunhat is pleasant. There is certainly no need to have a Victorian cork helmet. It should be left to Colonel Blashford-Snell to wear one for identification purposes.

In very strong sunlight, and particularly at high altitude where there is a lot of ultraviolet light, or by the seaside, or in arctic or antarctic parts, it is wise to have a piece of cloth hanging down over your neck from your hat or you may find that your skin gets terribly burnt.

In hot climates light cotton clothes are best; white clothing has been shown to reduce the solar heat load by half, so choose white or nearly white clothes to reflect the sun and keep you cool. Ex-army surplus stores often have amazing bargains. Do not, however, buy clothing that looks too military. You could be mistaken for a guerilla. Only some can tolerate nylon, terylene, or other manmade fibres, because they tend to cause heat rash. They also become extremely smelly and nasty very quickly. You should consider wearing the local garments. When local people wear shammias, dish-dashas, gabis, or similar white wraps, buy one and wear it. They are cheap and effective. In tropical countries and scrub country long trousers are obligatory, not least to prevent cuts and scratches which so easily get infected, but also to reduce the risk if you were unlucky enough to get bitten by a snake. You ought to have good sunglasses in hot countries or where there is a lot of sun and ultraviolet light in deserts or in snow. Two pairs of sun glasses are needed for mountaineering, tinted goggles for deserts. Make sure that you buy decent sunglasses; they must be able to keep out ultraviolet rays.

Chance's guaranteed Crookes British glass is what you want. In England you

may like to wear skin-tight jeans. In a hot climate this is fatal. Wear trousers that are generous at the bottoms and clothes that are generally full and loose. During the first week or so of your stay in a place with a lot of sun, keep everything covered except your face and hands until you are acclimatized. (Remember that if you shave a camel of its hair its water loss doubles!). If the climate is hot and wet, short sleeved shirts and shorts are best.

In any event tan slowly on every trip, especially early on. Uvistat cream or RoC total sunblock cream should be used every four hours on all exposed parts. It is important to use Uvistat lip promade for lips crack very easily when there is a lot of ultraviolet light about. Remember that wearing long sleeves and long trousers are useful against flying insects after dusk and it cannot be repeated too often that injuries to the skin in scrub country and jungle should be avoided at all costs.

LEECHES. If you are going to a rainforest where there is likely to be a lot of leeches, have a small bottle of industrial spirit. Dab the leech with this and it will fall off. Do not pull it off or you may leave the head behind and the wound will get infected. Do not try and kill with a burning cigarette.

Women should pack trousers in the kit. Give your vehicles a tropical roof, i.e. two roofs, one two inches above the other, with air, which is an excellent non-conductor, between, to keep the heat out, and paint the top a glossy white. Do not drive too quickly into the heat, halt several times on the way to get acclimatized. All climates are possible without heat illness for resting man, it is work in hot or humid climates that does him in. So avoid exercise, including vehicle maintenance, in the heat of the day, and avoid hard work for the first week in the heat while acclimatizing.

FOOTWEAR. Boots - well-fitting leather boots with corrugated rubber soles are unbeatable for comfort in any kind of rough terrain. Take a pair of light canvas shoes for wear in camp.

HEATSTROKE This is an emergency. The sufferer is usually very hot (some individuals sweat little and are particularly apt to get heat stroke unless

precautions as outlined are taken) with a fast thready pulse. They may be delirious or even unconscious. Get their temperature down quickly. Immersion (not drowning) in a stream or cold tub is ideal. Otherwise wrap in wet newspapers and keep pouring water on them. Evaporation will lower the temperature. Give plenty of fruit juice or water with one or two teaspoonsful of salt to the pint, for these people are usually very dehydrated. Get back to base and if in doubt seek medical help as soon as possible.

August 1985

Bent Juel-Jensen
University of Oxford

STINGS AND BITES BY VENOMOUS CREATURES

by David Warrell, Tropical Medicine Unit, University of Oxford.

Rabies

Rabies or hydrophobia (literally fear of water) is a virus disease of mammal's which is usually transmitted to man by a dog bite. Although dogs are the most important source of human rabies worldwide, each country has its own particular vector species, such as cats, wolves, foxes, skunks, mongooses, vampire bats (Caribbean and South America only) and insectivorous bats. Rabies occurs in almost every country: the fortunate exceptions unclude Antarctica, Australia, Scandinavian countries (except Denmark), Malaysia, New Zealand, Japan, Britain and some smaller islands. It is especially common in parts of South America, The Indian subcontinent, Thailand and the Philippines. The disease probably causes at least 15,000 human deaths each year.

Rabies virus can enter the body in a number of ways. Virus in the animal's saliva can penetrate skin that has been broken by a bite or graze; and can penetrate unbroken mucous membranes, such as those covering the eye and lining the mouth and nose. Very rarely the virus has been inhaled; for example, from the atmosphere in bat-infested caves. Transmission of rabies from human to human must be excessively rare, but recently four patients developed rabies after receiving infected corneal grafts. After the virus has entered the body, one of two things may happen. The virus may be killed by antiseptics or immune mechanisms before it does any harm; or, it may spread along the nerves to reach the brain where it multiplies and causes an inflammation (encephalitis) which is almost invariably fatal. The incubation period (interval between the bite and the first symptoms of encephalitis) is usually about two months but can vary from four days to many years. The earliest symptom is itching or tingling at the site of the healed bite. Later the patient may develop headache, fever, confusion, hallucinations, and hydrophobia. Attempts to drink water induce spasm of the muscles of breathing and swallowing associated with an indescribable terror. Death supervenes after a few days of these terrible symptoms. In a rarer form of rabies there is spreading paralysis without excitement or hydrophobia. There have been only three known survivors from rabies encephalitis: they were treated with intensive care.

Since the outlook for victims of rabies encephalitis is so hopeless, prevention is of paramount importance. People involved in high risk occupations such as cave exploring, animal collecting and veterinary medicine can be protected by pre-exposure vaccination with human diploid cell strain vaccine (HDCSV). At least two injections one month apart and yearly boosters are required. Stroking stray dogs, keeping wild carnivores as pets, and other unnecessary contact with mammals should be assiduously avoided in areas where rabies is endemic. Irrespective of the risk of rabies, mammal (including human) bites and scratches and licks on mucous membranes or broken skin should be cleaned immediately. First scrub with soap and water under a running tap for at least five minutes. The best antiseptics are 40-70% alcohol (gin and whisky contain more than 40% alcohol) and tincture of iodine. Mammal bites are frequently contaminated by a variety of micro organisms other than rabies virus, so a doctor should be consulted. Immediate thorough cleaning of the wound is of the utmost importance in preventing infection. Secondly, rabies should be considered if it is known to occur in the area. The decision whether or not to give post exposure vaccination and rabies immune serum is made by a doctor. Ideally, it is based on examination of the bitten animal; but usually this is not possible. The species of animal; its behaviour; the circumstances of the bite; and, in the case of a domestic animal, when it was last vaccinated; are useful pieces of information. This decision must be made as soon as possible by a doctor working in the area where the bite occurred. On no account should it be delayed until the patient returns to his own country. Recently developed vaccines such as HDCSV are potent and safe. They require fewer injections than the older type of nervous tissue vaccine which was given on at least 21 consecutive days under the skin of the abdomen. The old "Semple" vaccine deservedly earned a reputation for being dangerous; HDCSV carries none of these risks. Timely cleaning of the bite wound combined with vaccination and use of immune serum has proved very effective in preventing rabies.

Note on attacks by large animals

Large animals, wild and domestic, should be treated with respect; they may

not be as tame as they look. Lions, leopards, hyenas, domestic dogs, elephants, hippopotamuses, buffaloes, domestic cattle and domestic and in particular wild pigs and even rams have been responsible for occasional human deaths. The health hazard posed by sharks has been well publicised recently. Crocodiles claim many human lives. It is extremely foolhardy for travellers to bathe in rivers regarded as dangerous by the local inhabitants. A Peace Corps worker in Ethiopia did this in 1967 and was promptly killed and eaten by the resident crocodile.

Bites and stings by venomous animals

Travellers in tropical countries usually have an exaggerated fear of snakes, scorpions and other venomous animals. Certainly most parts of the world, especially the tropical regions, harbour animals with potentially lethal venoms. But local farmers and children, rather than travellers suffer. Thus snake bite is a major cause of death amongst some tribes of the Ecuadorian and Brazilian jungles, and among the inhabitants of some parts of Burma; and many children die of scorpion stings in parts of Mexico and Algeria. Yet the author knows of no case of a European traveller being killed by a venomous bite or sting.

Before travelling to a tropical country it is worth finding out about local venomous species, and trying to discover if there is a national centre for antivenom production, supply and treatment. The use of antivenom (also called antivenin, antivenene, or anti-snake-bite serum) requires medical training. If an expedition is going to an extremely remote and snake infested area it might be wise to collect some antivenom from the regional centre, provided you have facilities for keeping the antivenom cool and that there is someone in the party who has been trained to use it safely. Otherwise rely on local medical services; but enquire about them in advance. Before buying antivenoms manufactured in Europe, seek expert advice about their effectiveness against tropical species.

Snake bite

Snakes never attack man without provocation and so the risk of snake bite can be reduced as follows. Avoid snakes and snake charmers. Do not disturb, corner or attack snakes and never handle them, even if they are said to be harmless or appear to be dead. Even a severed head can bite! If you corner a snake by mistake, keep absolutely still until it has slithered away: snakes strike at movements. Never walk in undergrowth or deep sand without boots, socks and long trousers; and at night always carry a light. Never collect firewood or dislodge logs and boulders with your bare hands, and never put your hand or push sticks into burrows or holes. Avoid climbing trees or rocks which are covered with dense foliage, and do not put your hand on sun-baked ledges you cannot see when climbing. Never swim in rivers matted with vegetation.

Treatment of snake bite.

(a) First aid - to be given by the man-on-the-spot

1. Reassure the patient who may be terrified by the thought of sudden death. The basis for reassurance is that only a small minority of snake species are dangerously-venomous to man. Even the most notorious species, such as cobras, often bite without injecting enough venom to be harmful. The risk and speed of death from snake bite has been greatly exaggerated. Lethal doses of venom usually take hours (cobras, mambas, seasnakes etc.) or days (vipers, rattlesnakes and other pit vipers etc.) to kill a man - not seconds or minutes as is commonly believed. Correct treatment is very effective.
2. Treat pain (and anxiety) with paracetamol tablets in doses of 0.5-1.0 g for adults.
3. Immobilise the bitten limb with a splint and arrange immediate transport to hospital, dispensary or to the expedition medical officer.
4. If the snake has been killed take it along with you: it is useful clinical evidence, but must not be handled with the bare hands even if it appears to be dead.

5. Avoid traditional "boy scout" remedies which do more harm than good.

DO NOT apply a tourniquet (ligature or tight band) unless you are absolutely certain that the snake is one whose venom contains a dangerous neurotoxin (for example cobra, krait, mamba, coral snake, Australian snake). If a tourniquet is used it must be tightly applied above the bite - around the upper arm or thigh. To avoid gangrene it must be released after thirty minutes.

DO NOT suck at the wound, cut it with a razor blade, introduce potassium permanganate crystals or interfere in any other way.

DO NOT give aspirin which may cause bleeding.

DO NOT give antivenom which can be dangerous and should be administered only by a doctor, nurse or dispenser with emergency drugs available to deal with serum reactions should they occur.

If you have your own supply of antivenom take it with you to hospital where the doctor or other trained staff can give it.

(b) Medical treatment of snake bite: advice for the expedition medical officer

Absence of local swelling four hours after a bite by a viper, rattlesnake or other pit viper suggests that no venom was injected and that no further treatment is necessary; but bites by snakes with neurotoxic venoms (mambas, kraits, cobras, seasnakes etc.) may not cause any local swelling.

Indications for antivenom treatment

1. Bleeding from gums, nose, alimentary tract or any other site distant from the bite itself, which started spontaneously after the bite.
2. Failure of the patient's blood to clot if placed in a clean, dry glass tube and left undisturbed for 30 minutes.
3. Massive swelling involving more than half the bitten limb.
4. Signs of nervous system involvement such as extreme drowsiness or unconsciousness, drooping eyelids, difficulty in swallowing and breathing, and pain, stiffness and paralysis of skeletal muscles.

5. Signs of heart involvement such as low or falling blood pressure, unusually slow pulse rate or irregular rhythm and an abnormal electrocardiogram (if such a luxury is available).

N.B. ANTIVENOM SHOULD NEVER BE GIVEN UNLESS AT LEAST ONE OF THESE FIVE SIGNS IS DEFINITELY PRESENT.

Slight local swelling alone is not an indication for antivenom.

Never give antivenom unless you have adrenaline (1 in 1000 solution, dose 0.5 ml by subcutaneous injection) available to treat severe reactions to the antivenom.

Choice of appropriate antivenom

Before giving antivenom make sure that its range of specificity includes the snake that has bitten your patient. A grasp of Latin scientific names is useful e.g. Naja - cobra, Dendroaspis - mamba, Bungarus - krait, Bitis - giant African vipers, Echis - carpet viper, Crotalus - rattlesnake. It may have been possible to identify the biting snake; or its venom may have produced a diagnostic clinical sign, such as incoagulable blood caused by the carpet viper in Africa. Otherwise, a polyspecific antivenom with activity against the principal venomous species of the region is used.

CAUTION Do not give antivenom that is opaque: the change from a clear to cloudy solution indicates loss of activity and increased danger of reactions. Expiry dates can be ignored provided that the solution is crystal clear. Manufacturer's instructions included in packs of antivenom are often highly misleading!

How to give antivenom

For maximum effect, antivenom should be given directly into a vein. Slow intravenous infusion (2 ml per minute) has been successfully employed, but the safest method is probably a slow intravenous infusion of venom diluted approximately 50/50 in sterile isotonic saline. The initial dose depends on the type of antivenom, species of snake involved and severity of symptoms, but a typical starting dose is four or five 10 ml ampoules. This is repeated after a few hours if the life-

threatening condition such as bleeding or weakness of the breathing muscles is not cured. Start the infusion at the rate of about one drop per second watching for signs of an antivenom reaction: namely, fever, itching, skin rash, vomiting, breathlessness and wheezing, increase in pulse rate and fall in blood pressure. If this happens, stop the infusion and give 0.5 ml of 0.1% adrenaline by subcutaneous injection: this can be repeated after about ten minutes if it is not effective. After the patient has recovered from the reaction, reassess the severity of the signs of envenoming. If these are still serious continue antivenom slowly. If there is no reaction aim to complete the infusion in 30-60 minutes. Reactions are likely to be particularly severe in those who suffer from asthma, eczema and other allergic disorders.

Only in extreme circumstances should medically unqualified people give antivenom. Intramuscular injection into the upper outer quadrant of the buttock can then be used, but antivenom is less than 1/10 as effective when given by this route. Firm pressure should be applied to the site of injection to prevent bleeding.

(c) Treatment of complications

1. Massive external bleeding or leakage of blood and tissue fluid into a swollen limb may leave the patient with an inadequate circulating volume. Transfusion with whole blood or plasma expanders may be needed.
2. Respiratory paralysis may require mouth-to-mouth or more sophisticated forms of artificial ventilation.
3. Secondary infection may be introduced by local surgery at the bite site. Patients with infected wounds and those with local gangrene should be treated with antibiotics and a tetanus toxoid booster. Gangrenous tissue should be excised surgically and the skin defect covered immediately with split skin grafts.

Note on spitting cobras

In Africa and parts of South East Asia there are populations of cobras which can spray their venom forward from the fang tips for a distance of

several metres. This is a defensive reaction. Venom entering the eyes or landing on other mucous membranes may cause severe local pain and watering and can result in ulceration of the cornea. Treatment is the same as for any chemical injury to the eye. The eye should be irrigated with generous volumes of any bland fluid available (water, milk or even urine!). Pain-killing drugs such as aspirin can be given by mouth. Ideally, the eye should be examined by a doctor, antibiotics such as chloramphenicol or tetracycline eye ointment instilled for several days and the eye closed with a dressing pad.

Venomous marine animals

Sea snakes are encountered mainly by fishermen in the tropical waters of South East Asia. The principal symptoms of envenoming are drooping eyelids, "lockjaw", pains, stiffness, tenderness and paralysis of skeletal muscles, passing of dark urine (myoglobinuria) and cardiac complications related to hyperkalaemia. Treatment is as described above.

Venomous fish

Many species of fish have venomous spines on their gills, fins or tail. Stings occur when the fish are handled by fishermen or are trodden on by bathers. Some species attack swimmers and scubadivers around coral reefs. There is immediate severe pain and swelling at the site of the sting. Severe systemic effects may follow: these include vomiting, diarrhoea, sweating, irregular heart beat, fall in blood pressure, spasm or paralysis of muscles including respiratory muscles, and fits.

Treatment

Forewarned is forearmed. If your expedition has an extensive programme say on coral reefs, try to get maximum information about dangerous species locally. The venomous spine, which is often barbed, should be removed. Local symptoms are rapidly relieved by immersing the stung limb in water, as hot as can be borne by the patient. Alternatively, 1% lignocaine or some other local anaesthetic

can be injected, for example as a ring block in the case of stung digits. Specific antivenom for some of the most dangerous species is available in some parts of the world. Patients may require mouth-to-mouth respiration and external cardiac massage. Atropine (0.6 mg. by subcutaneous injection) should be given if there is a very slow pulse rate and low blood pressure.

Jellyfish, Portuguese men-of-war and other coelenterates

Contact with the tentacles produces lines of very painful blisters. The venom of some species, such as the notorious sea wasps or box jellyfish of tropical waters can cause severe systemic effects, including heart failure.

Treatment

Adherent fragments of tentacles must be removed before more of their venomous nematocysts can discharge. Vinegar effectively inactivates the penetrating nematocysts, whereas many of the remedies that have been recommended in the past, such as methylated spirits and other alcohols actually stimulate massive discharge of nematocysts embedded in the patient. Antivenom is available in some of the worst affected areas such as Australia. Severe cases may require mouth-to-mouth respiration and cardiac massage. The venomous spines and grapples of some sea urchins can produce similar effects and may become deeply embedded in the skin. Ordinary sea urchin prickles are absorbed quite rapidly provided they are broken into small pieces in the skin. Only if they have penetrated into a joint or if there is evidence of infection is surgical removal necessary.

Poisoning from ingestion of fish and shellfish

Extensive feelings of "pins and needles", paralysis, itching, diarrhoea, vomiting and shock can follow a few minutes or hours after eating various molluscs and fish. A very large number of species in many parts of the world can cause these symptoms at various seasons of the year. Famous examples are pufferfish, barracuda, tuna and mackerel. Treatment attempts to eliminate the toxic material from the gut by promoting vomiting and diarrhoea with emetics and purges. Some symptoms may respond to antihistamine drugs and bronchodilators,

but in severe cases assisted ventilation will be required until paralysis of the breathing muscles has worn off.

Venomous Arthropods

Stings by bees, wasps and hornets (Hymenoptera)

In normal people many stings, probably hundreds, would be required to introduce enough venom to cause death. A man in Rhodesia survived more than 2,000 stings. But about 1% of the population is hypersensitive and could be killed by a single sting. The development of hypersensitivity is suggested if there are progressively severe local reactions to successive stings; or systemic symptoms such as tingling, skin rashes, swelling of the lips, flushing, dizziness, collapse, wheezing and unconsciousness within half an hour of the sting.

Prevention and Treatment

In future, it may be possible to confirm hypersensitivity and desensitize the patients using purified venom. People who know or suspect that they are hypersensitive should be taught how to give themselves a subcutaneous injection of 0.5 ml of 0.1% adrenaline and should carry this with them. Alternatively, they can use a Medihaler epi two puffs. They should wear a Medic-Alert tag in case they are found unconscious (Medic-Alert Foundation, 9 Hanover Street, London. W1R 9HF. Tel: 01-499-2261).

In tropical countries, especially Africa, rock climbers and other travellers have occasionally been attacked by large swarms of angry bees, and some fatal falls have resulted. Some of these accidents could have been prevented by making local enquiries. Thundery weather is known to upset bees. In the face of an attack, the best tried method of evasion seems to be immersion to water. The climber should appreciate that a fall is probably the greater danger. After securing himself he will have to rely on protection afforded by anorak, haversack or tent. The principal effect of multiple stings in the non-hypersensitive subject is histamine overdose; so the use of antihistamines

such as chlorpheniramine maleate ("Piriton") is appropriate.

Ants, Beetles and Caterpillars (especially the brightly coloured hairy ones) can cause local pain, inflammation, nettlerash or blistering on contact.

Spider Bites

Potentially dangerous spider bites occur mainly in the Americas, Africa, the Mediterranean region, and Australia. The most notorious genera are *Latrodectus* (black widow spiders) and *Loxosceles*. These spiders are brown or black and have bodies about 1 cm long. *Latrodectus* venom affects nerves, muscles and heart producing cramping pains, weakness, sweating, salivation, fever, nausea, vomiting and convulsions. *Loxosceles* causes severe local necrosis, dark urine (haemoglobinuria), blood clotting disturbances and kidney failure. Deaths are unusual except amongst children. Bites usually occur when the victim lies on a spider which has crept into his bedding. Antivenoms are manufactured in countries such as South Africa, Australia and Brazil where spider bite is an important medical problem.

Scorpion Stings

Dangerous scorpions occur particularly in North Africa, the Middle East, Mexico and South America. The fatal cases are usually children. Most stings are not life-threatening but cause excruciating pain with little swelling. Powerful neurotoxins in the venoms of dangerous species have an action on the autonomic nervous system and muscles including the heart.

The severe local pain is treated by injecting 1-2% Lignocaine, but a powerful analgesic such as pethidine injection may be required. Severe systemic symptoms should be treated with antivenom.

Other Venomous Invertebrates

Bites by some tropical centipedes can be dangerous as well as painful, while some millipedes can squirt irritating defensive secretions. There is no specific treatment for either of these menaces. Many species of soft and hard ticks can inject a paralysing toxin while they suck your blood. If a member of your party becomes progressively weak it is important to search for

the tick in hairy areas and to detach it as soon as possible: the symptoms should then subside.

Invasive arthropods

Various tropical flies have larvae which invade human tissues or are merely blood sucking.

Larvae of the Congo floor maggot (Auchmeronyia luteola) live in the floor of huts. They attack humans who sleep on the ground and suck their blood, exciting local swelling and itching. Larvae of the human bot fly of Southern America are deposited on human skin through which they burrow causing a boil.

The Tumbu fly (Cordylobia anthropophaga) occurs in most parts of Africa. Eggs are laid on the ground, or on soiled clothing. The larvae penetrate human skin producing a small boil.

Gravid females of the tiny jigger flea (Tunga penetrans) burrow into the feet; especially around the nail beds, soles, and interdigital clefts; and produce small discharging abscesses with local swelling and inflammation. These fleas occur in the Americas, Africa and India.

Treatment

Involves asphyxiating the intruder by covering the skin with paraffin, killing it with Lysol or chloroform and squeezing or winking it out with a needle. Apart from discomfort, the danger of these invasions is secondary infection, and even tetanus. The traveller can help to prevent these problems by being circumspect in his choice of sleeping places; wearing shoes; and, in the case of Tumba fly, by thoroughly washing and ironing dirty clothes.

OXFORD UNIVERSITY EXPEDITIONS

IMPORTANT INSTRUCTIONS

DIARRHOEA. Much of the diarrhoea encountered in foreign parts is due to change of diet. Some is due to infection. Prevention is important and half the battle is won by taking simple precautions. Travellers often show a remarkable lack of common sense. Spanish pears may be luscious, but if a Spaniard eats 8 large Spanish pears he will get diarrhoea, so eat fruit in moderation. If you do eat fresh vegetables or fruit make sure that these are washed in water purified with Sterotabs (or Puritabs). Salads that include green lettuce are particularly hazardous. Vegetables are often manured with human dung, and those with a large surface (such as lettuce) are particularly dangerous. You have a little free acid in your stomach, it will cope with a few nasty germs, but not with a lot. Cucumber and tomato salads are relatively safe. If you get diarrhoea, take codeine phosphate, two 30 mg tablets every 4 hours until the diarrhoea has stopped, or take Lomotil, 4 tablets at once, and then 2 tablets four hourly until the diarrhoea has stopped. You may have been given Imodium (loperamide): take two capsules at once, and then one every time you have a motion until you seize up. If none of these stop the diarrhoea and you are feeling ill, and particularly if you are passing stools with blood and mucus, take Septrin or Bactrim (cotrimoxazole) two tablets twice a day for five days. You may have been given trimethoprim instead of cotrimoxazole. You should take 200 mg twice a day. You may have been given Amoxil (amoxicillin) 250 mg capsules. Take two, four times a day for five days. If this does not clear the diarrhoea you must seek medical help. Septrin or Bactrim should not be taken by people that are hypersensitive to sulphonamide. Amoxil should not be taken by people who are hypersensitive to penicillin.

OTHER INFECTIONS. Do not use antimicrobials recklessly. If you have boils and a raised temperature, or infected wounds, or you think you have pneumonia or bronchitis it is reasonable to take a drug. For boils and infected wounds use first clindamycin. The capsules are 150 mg. Take one capsule four times a day. If you are no better at the end of 72 hours, take Septrin (or Bactrim) two tablets (or capsules) twice a day for five days. (Remember that the latter must not be given to people who are hypersensitive to sulpha drugs). Do not give both drugs at once. If you are in doubt you must seek medical advice.

Some of you may be given flucloxacillin (Floxapen). This is also useful for infected wounds and boils. Take one capsule (250 mg) four times a day. If the infection is not better after three days go on to Septrin or Bactrim as above.

HEAT EXHAUSTION AND SUNSTROKE. Keep your water and salt requirements in balance (see other sheet).

ANTI-HISTAMINES. These drugs suppress allergic reactions of various sorts and are useful in suppressing nettle-rash, itchy skin conditions, hay fever, and to some extent mild asthmatic wheeze. Remember that they all, but to a varying extent, tend to make you sleepy. Do not drive if you are at all drowsy. You may have two drugs, Pro-Actadil and Phenergan. Each tablet of the former is of 10 mg, the latter 10 mg or 25 mg. Some may be given Piriton, *Hismanal 1/day*

1 - 4 times/day
PRO-ACTADIL is suitable for use in the day time. One once a day may be adequate but one may be taken at night and morning if necessary.

PHENERGAN the most powerful antihistamine, is likely to make you sleepy, so take preferably at night. Do not take if you are driving. The 25 mg tablet is very potent. *1 per time*

PIRITON 4 mg tablets. A useful drug for moderate allergy. Take one every four to six hours.

ECZEMA. With irritating skin conditions, use Betnovate cream locally or Euras, Vioform and hydrocortisone cream. Both contain steroid and an antiseptic.

DISINFECTANTS. For cuts and scratches use tincture of iodine unless you are hypersensitive to iodine. Bigger cuts may be washed out with Savlon. A sachet of Savlon concentrate will make a pint of disinfectant ready for use.

MOTION SICKNESS. Marzine tablets, 1 every two to four hours, or Dramamine tablets, 1 every two to four hours, help most people.

SORE THROATS. Most are not due to bacteria and a soothing gargle with some soluble Aspirin (Disprin) usually takes the worst agony away. If the throat is dark red and very sore it is possible you may have a bacterial infection and if you have a fever, take clindamycin (150 mg capsule) or erythromycin 1 ~~hour~~ times a day for five days.

3

SLEEPING TABLETS. You have been given Mogadon (nitrazepan) 5 mg or Rohypnol (flunitrazepam) 1 mg. ^(1/2) One will send the average adult off to sleep. If one does not work you can safely take two or even three.

N.B. Keep these tablets safely and ensure that they do not fall into the hands of children or irresponsible people.

HEADACHES AND OTHER PAINS AND ACHES. You have been given paracetamol tablets. Take one or two tablets every four hours.

As an alternative use soluble aspirin, 2 tablets, which may be taken every four hours. Cut the dose if you get ringing in the ears.

For severe pain: take Feldene (piroxicam) one a day.

INDIGESTION. Use Gaviscon tablets, chew or suck one or two as often as necessary. Polycril Forte (one)

SUNBURN. Avoid going into blazing sunshine or working by the sea unless you have used Uvistat ointment on the exposed part of your body, and pomade (lipscreen) on your lips.

MOSQUITOES AND FLIES. If you are in an area where there are tsetse flies, black flies (simulium damnosum), or a lot of anopheles or aedes, you must use a mosquito net. Both in the Tropics and Arctic and Antarctic mosquitoes can be a nuisance. They will descend in their millions from nowhere and you should have a good mosquito repellent. The best is a mixture of 2-ethyl-1-3-hexandiol (94 G/l), 56.4 ml and N, N-diethyl-m-tolamide (99.7 G/l) 6.3 ml and industrial methylated spirit 66 O.P. to 1 litres. It can be bought in America and Sweden. The Swedish variety is known as Djungel Olja 3 x 6. Do not put it in the eyes or in the mouth.

In some parts of the Arctic tiny flies can be a great nuisance, crawling into the ears, eyes, mouth and nose. Insect repellent does not work on them, but the local population usually will be able to advise you. In Greenland you should go to the Royal Greenland Trading Company (KGH) and buy a very fine mesh shopping bag, put it over your head and wear mittens. This works. Do not put a polythene bag over your head: you stand a reasonable chance of asphyxiating very rapidly.

TYPHUS. If you are going to areas where you are likely to encounter rickettsial disease (epidemic typhus, tick typhus, scrub typhus, Rocky Mountain spotted fever) you may be given a supply of tetracycline. If you get a fever (particularly following a tick bite) take two, 4 times a day for a week, and then one, 4 times a day for a further week.

INFECTED OR RED EYES are usually due to a conjunctivitis caused by a bacterium. Optrex is not very useful. Use Polyfax or tetracycline eye ointment 3 or 4 times a day. Put a little snake of cream on the turned down lower eyelid. Put the upper eyelid over it and massage gently. This should clear the infection in the course of a couple of days.

ATHLETES FOOT. This can be particularly tiresome if you have sweaty feet. Wash your feet thoroughly and dust the feet and socks with Mycil or Daktarin or some similar antifungal dusting powder.

FLEAS AND LICE. Dust your clothes and sleeping bag with flea powder (kills pests on pets and undergraduates!). Go to the nearest pet shop and ask for dog flea powder. Hunt for fleas and lice on you. If badly bitten use Betnovate or Synalar cream or Eurax cream.

TAPEWORMS AND ROUNDWORMS. For tapeworm take Yomesan (niclomaside 500 mg) four tablets, chew well and wash down with water. A cascara tablet should be taken as a purgative. For roundworm take Vermox (mebendazole 100 mg) one night and morning for three days.

AMOEBIASIS. If you think you have got amoebiasis (bloody diarrhoea) take tinidazole 2 gms (four tablets) every morning for three days and then Furamide, one tablet (of 500 mgs) three times a day for five days, or Flagyl (metronidazole) 800 mg three times a day for four days instead of tinidazole. AVOID MILK AND MILK PRODUCTS FOR SIX WEEKS. No alcohol whilst you are taking tinidazole or metronidazole.

HIGH ALTITUDE. Note that above 8-10,000 feet the contents of full tubes of ointment will shoot out under pressure. Unscrew cap with care. You may be given Diamox 500 mg twice a day to counteract mountain sickness.

GENERAL NOTE.

It is important that drugs not used are handed in to me for use of future expeditions, or burnt. They could be dangerous particularly for children and in foreign parts any expedition refuse is often avidly collected by the locals. If you have a deserving local medical centre, by all means give remaining drugs to them. We want the drug cases back.

Bent Juel-Jensen.
University of Oxford.
Trinity 1986.