to attempt to tackle a big dental problem at the age of 18 at high pressure and at contract rates. Such a scheme as I have tried to outline is only made possible by engaging the whole-time services of one or more dental surgeons for the school children. It is distinctly not one for the haphazard kindness of local care committees, who must often be hampered for want of money, and would be unable to find a private practitioner who would systematically do the work. They might even be driven to employing those who had no qualification for the work except that they cost little.

Now that the Education Department has received a grant from the Imperial Exchequer to be used to reimburse the local authorities in their expenditure in this matter of teeth, surely it is a short-sighted policy not to tackle this question in "an Imperial and patriotic spirit."

Vast numbers of youths are unable to enter the public services year by year because of dental caries and the attendant consequences. The law now says the County Councils are responsible for the hygiene and the health of the children. On the health of the children depends the very existence of England as a first-rate Power. Do the public realize these things?

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Report.

XVIIth INTERNATIONAL CONGRESS OF MEDICINE,
SECTION XX, NAVAL AND MILITARY MEDICINE.

BY MAJOR C. E. POLLOCK.
Royal Army Medical Corps.

This Section met at the Royal Army Medical College, under the Presidency of Sir Launcelotte Gubbins, Director-General, Army Medical Service.

The following note gives a brief résumé of the main features of the discussions in the Sections of Naval and Military Medicine.

The first meeting of the Section was held on Wednesday afternoon, August 6. The Director-General, A.M.S., President of the Section, opened the proceedings with a brief address of welcome to the delegates of foreign countries, in which he also drew attention to the fact that at the last Congress held in London the Section of Military Medicine and Surgery, as it was then called, was mainly occupied in discussing the application of antiseptics to wounds in war.

The Transport of Wounded in Hill Warfare.

This discussion was opened by Colonel Skinner, who read the paper presented by the D.M.S. India. This gave a historical review of the
various methods of transport used in the campaigns on the frontier of India. These are described in R.A.M.C. training. Dr. Nieuhaus, of the Swiss Army, then gave a description of the methods employed by the Swiss Mountain Medical Units. He strongly advocated the use of a stretcher supported on a sleigh with wooden runners; the sleigh can be guided and its pace regulated by ropes held by two men walking behind it. He also spoke well of a folding wheeled stretcher. Médecin-Major Eybert, of the French Army, presented a paper in which he advocated the transport of wounded on men's backs, and also spoke favourably of the use of "luges" on grassy or snowy slopes. He claimed many advantages for the stretcher which he has invented, the essential feature of which is that the canvas is attached to the end of the poles but not to the middle; it forms a kind of hammock in which the man can maintain a semi-reclining position, and in this way be carried on the back of a single bearer, or by attaching longer poles the stretcher can be used as a travois.

**Hospital Ships and Transport of Wounded.**

This subject was introduced by Surgeon-Inspector I. Nishi, Imperial Japanese Navy, who gave a minute description of the hospital ships used by the Japanese in the Russo-Japanese War. The arrangement of the ship and the equipment provided seemed to be as nearly perfect as it is possible to make them. He also showed a number of photographs of wards, &c., and of the Japanese bamboo screen stretcher for use on board ship.

Fleet-Surgeon McNabb, R.N., gave a short sketch of the requirements of a hospital ship, based on the experience gained while in charge of the British hospital ship "Maine."

Generale Medico Commendatore Calcagno spoke of the Italian hospital ships employed during the Tripolitan campaign; he showed a number of photographs bearing on the subject.

**Water Supplies in the Field.**

Surgeon-Major Dr. Zoltan v. Ajkay, Hungarian Army, gave an exhaustive summary of all the different means which have been employed for purifying drinking water on field service. He concluded by advocating the use of heat up to 105°C as the only reliable means of ensuring a germ-free supply.

Lieutenant-Colonel E. Jennings, I.M.S., discussed the water supply of troops in the field mainly from the aspect of active service in tropical countries. He advocated the organization of a water supply corps specially trained for the purpose, and described the equipment it should have. He would allow two mules for each company, one to carry the filtering apparatus and one to carry 100 pints of filtered drinking water. He preferred a rapid filter, which will remove most of the germs, and
suggests one made of aluminium in which a filtering medium is used in addition to candles.

Colonel Horrocks pointed out that a temperature of 80°C is sufficient for all practical purposes, and that for technical reasons heat sterilizing apparatus are only suitable for use in stationary posts. In the field clarification by rapid filtration, with, when possible, the addition of 1 in 1,000,000 parts of chlorine, is a more satisfactory method of purifying water.

**Antityphoid Inoculation.**

On Friday, August 8, a discussion on antityphoid inoculation was opened by Médecin-Principal Vincent, in charge of the antityphoid vaccine laboratory at the Val de Grâce Hospital, Paris. He uses a polyvalent strain of typhoid and sterilizes the culture by the addition of ether, which after twelve hours' contact is allowed to evaporate. He prefers to give five injections at intervals of a week. Some very striking results were obtained in Morocco and in the garrison of Avignon, where an epidemic of typhoid fever was cut short by the inoculation of all troops in garrison.

Major F. Russell, Medical Corps, U.S.A., presented a paper showing the results obtained in the U.S. Army. He pointed out that in 1898 sanitary precautions alone failed to prevent a very severe epidemic of enteric fever in the camps in the Southern States. Taking one of the 1898 camps he showed that among 10,759 men there were 1,729 cases of enteric fever and 248 deaths. In 1911, among twice the number of troops encamped under similar conditions, but who in addition were protected by inoculation, there were only two mild cases of typhoid fever.

Sir William Leishman then gave a brief review of antityphoid work in the British Army. After a short description of the preparation, technique of administration, and certain technical problems connected with the subject, he showed by curves the very great reduction which had taken place in the incidence and mortality from enteric fever among British troops in India since the adoption of antityphoid inoculation and other preventive measures. In 1912 there were only 118 cases with twenty-six deaths, as against 2,375 cases with 657 deaths in 1898; the admission ratio for 1912 was 1.7 per one thousand of strength, that for 1898 was 36.3.

Professor Rodet, of Montpellier, then spoke of his serum in the treatment of typhoid fever, and claimed that it had reduced the mortality from 7.4 per cent to 4.7 per cent in cases in which the treatment was begun before the ninth day of the disease.

Tenente-Generale Medico L. di Cavallerleone said that on the outbreak of the late war with Turkey he was convinced of the protection which antityphoid vaccination would confer on the troops, and attempted to have this carried out. Unfortunately the pressure of mobilization rendered this procedure impossible.

Professor Reynès, of Montpellier, said that in the south-east of France...
the vaccine prepared by Ranque and Sénéz was generally employed. This vaccine is standardized and then sterilized by the addition of a solution of iodine and iodide of potassium; after an exposure of half an hour the iodine is neutralized by the addition of hyposulphite of soda. He claims that the immunizing power of the vaccine is not interfered with and that the reaction is very mild; also that among 2,000 persons inoculated with this vaccine not one developed enteric fever, although a severe epidemic was present at the time.

Dr. W. Broughton Alcock, of the Pasteur Institute, Paris, called attention to Besredka's vaccine sensibilisé (living bacilli exposed for varying periods to immune serum). He quoted a number of cases in which this vaccine had been employed with satisfactory results.

Generale Medico Calcagno, Italian Navy, gave a brief account of the antityphoid inoculation employed for the naval forces landed at Tobruk. Two vaccines were employed, one prepared at the Serological Institute of Milan according to Wright's technique; this vaccine caused a marked local reaction and was objected to by the men. The other vaccine, a polyvalent one prepared by Professor Sclavo according to Shiga's formula, did not cause any definite reaction. No cases of enteric fever developed among the inoculated men.

Professor Netter concurred in the value of antityphoid vaccination and said that the particular form of vaccine employed appeared to be immaterial.

**Sanitary Organization in the Tropics.**

This discussion was opened by Sir Ronald Ross, who in a very able paper demanded the unification of all the departments which are concerned in sanitation, taking sanitation in its widest sense as covering every department concerned in the care of the public health. He pointed out that at present the medical and sanitary departments are generally independent of each other, or the sanitary branch is subordinated to the medical. Sanitary engineering, research and statistics, should also be controlled by the chief sanitary authority. The sanitary authority in tropical colonies is generally a board of laymen, ignorant of the subject and more interested in local politics and their own personal affairs than in looking after the public health. Financial means are rarely sufficient to carry out the work properly. The head of the sanitary department should be represented on the supreme governing body of the colony.

Stabsarzt Dr. Hintze gave a sketch of the existing medical and sanitary organization of the German colonies.

Colonel P. Hehir, I.M.S., gave a summary of the sanitary organization of the Army in India, and said that the instruction of the officers and men in the principles of hygiene had exercised a most beneficial effect on the health of the Army.
Professor Wasilewsy spoke of the use of rabbits for maintaining a virulent strain of vaccine lymph in the Tropics.

Professor Agramonte said that in Cuba all the reforms advocated by Ross had already been introduced.

Dr. E. Black said that the Public Health Service of Western Australia embodied the best features to be found in the British, French and German colonies. The principle adopted was to place all matters which concerned the population as a whole under the Central Government, and to allow local bodies to manage their own affairs.

Dr. Sandwith said that in Egypt most of Ross’s reforms had been adopted already. He laid stress on the fact that in Oriental countries the success of sanitation lay with the village authorities and not with the governing body.

Dr. Harford, of Livingstone College, spoke of the good work done by missionaries as pioneers of sanitation among the native population. He referred to the danger of alcoholizing the natives of West Africa.

Dr. Olpp, of Tübingen, agreed with the preceding remarks.

Dr. Anderson said that all officials in the Colonial Civil Service, but especially the Governor, should have some elementary knowledge of the diseases prevalent in the country, and that only picked men should be appointed to any position in the sanitary service.

Dr. Andrew Balfour (Khartoum) said that the sanitary inspectors in colonies should be trained in tropical hygiene; the Sudan Government had recognized the value of such a training by giving higher pay to those so qualified.

The Treatment of Syphilis with Salvarsan and Allied Substances.

This important subject was discussed in conjunction with Section XIII, the meeting being held at St. Thomas’s Hospital under the joint Chairmanship of Surgeon-General Sir Launcelotte Gubbins and Sir Malcolm Morris, Presidents of the XXth and XIIIth Sections respectively; it was very largely attended.

The discussion was opened by WGR Professor Ehrlich, who described briefly the composition of salvarsan, and said that it acted by anchoring the toxins of the spirochetes. He then proceeded to enumerate a number of experiments on animals undertaken to determine the safe maximum dose of the drug for man. He stated that salvarsan has no affinity for the nervous tissues, and is not found in the brain in cases which have died after the administration of the drug. He maintained that the febrile reaction which so often followed the intravenous injection of salvarsan was caused by the rapid lysis of large numbers of spirochetes; when intramuscular injection is employed the salvarsan is more slowly absorbed, hence the spirochetes are only destroyed
gradually and do not cause any marked reaction. Ehrlich says that idiosyncrasy to salvarsan is very rare, but he recommends that the administration should be begun with a small trial dose of, say, 0·1 grm., followed after a few days by a slightly larger dose of about 0·3 grm.; in this way it should be possible to detect any idiosyncrasy before injecting a dangerously large dose and also to minimize the severity of reactions. Salvarsan must not be given to persons suffering from nephritis, Addison's disease, arterio-sclerosis, or the status lymphaticus. Ehrlich also paid a generous tribute to the excellent work done at Rochester Row Hospital, which he said had not only been of the greatest help to himself but had also rendered world-wide service to the therapy of salvarsan.

The report by Lieutenant-Colonel Gibbard and Major Harrison was next read. They stated that as the result of three years' experience spent in careful trials and observations they had adopted the following treatment of syphilis. As soon as a diagnosis is made they give one injection of 0·6 grm. salvarsan and then nine weekly injections, each containing 1 gr. of mercury, and finally a second injection of 0·6 grm. of salvarsan. This plan has not only given better results than any other they have tried, but it appears to hold out a reasonable prospect of curing the disease, for in 100 cases treated in this way and kept under constant observation for the following twelve months, there were only 5 per cent of clinical relapses and 18 per cent of Wassermann relapses. When treatment was begun in the primary stage there were only 11·4 per cent of total relapses; when treatment was not begun until the secondary stage had set in the percentage of relapses was 33·8.

These officers have given over 3,000 injections of salvarsan without the occurrence of any serious complication or fatality. Idiosyncrasy to the drug must be extremely rare, but its administration should only be entrusted to persons thoroughly acquainted with its technique and risks.

Professor Wassermann said that he spoke not as an expert on the treatment of syphilis but merely as a serologist. Before the introduction of salvarsan almost all the serums sent to his laboratory to be tested, after the completion of treatment, gave a positive reaction; the serum of patients treated with salvarsan mostly gave a negative reaction. In cases in which the treatment is begun soon after the infection takes place the reaction can be converted from positive to negative fairly easily; in neglected cases of some duration the positive reaction tends to persist most obstinately in spite of energetic treatment. The fate of every syphilitic is decided within the first two years following the infection; neglect of treatment during this period cannot be made good afterwards. The reaction of the cerebrospinal fluid is quite independent of that given by the blood serum. A positive reaction in the cerebrospinal fluid indicates that the central nervous system is being attacked. In addition to having his blood serum tested, the cerebrospinal fluid of every syphilitic should
be tested at the end of the first year when treatment has been com-
pleted.

Seventeen other distinguished syphilologists took part in the discus-
sion, and although certain reservations were made, in the main they
favoured the employment of salvarsan in the treatment of syphilis.

Caisson Disease.

Staff-Surgeon Stewart read a paper in which he discussed the
physiology of diving. Recent experiments and observations have demon-
strated the fact that when divers suffer from discomfort while working
at great depths, the distress is not due to the pressure but to the excess
of carbonic acid gas in the air they are breathing; to prevent this occur-
ing the man must be supplied with the same volume of air while at work
below water as he requires when on the surface, that is with not less
than 1.5 cubic foot per minute.

Caisson disease itself is caused by a too rapid ascent, the sudden
diminution of pressure leading to the formation of bubbles of gas in
the blood-vessels. The only effective treatment is rapid recompression
either by immediately sending the man down again or by the use of a
compression chamber. Tables showing the time limits for work at various
depths and the rate of ascent have been prepared by the Admiralty for the
guidance of those in charge of diving operations.

The Physiology of Physical Training and Marching.

Captain G. A. D. Harvey read a very good paper on this subject
embodying the results of a number of experiments and observations
carried out to investigate the physiology of marching. He pointed out
that the human body resembles an internal combustion machine in that
when at work it generates heat. Provided this does not lead to a rise in
the body temperature of more than 2.2° F., it is beneficial, but beyond
this it rapidly becomes serious, and if a temperature of 103° F. is main-
tained for any length of time symptoms resembling those of heat-stroke
begin to make their appearance.

The body temperature is regulated by the production and dissipation
of heat. The production of heat is increased by increased work, which in
turn is caused by accelerating the pace of marching, by carrying a load,
especially if badly balanced, and by any physical discomfort which pre-
vents a man from working at his economical rate. The dissipation of
heat is mainly due to evaporation, and this is favoured by a cool, dry
atmosphere, especially by one in motion, and by wearing light loose
clothing with an absence of any constricting straps. In order to permit
evaporation to take place a free supply of water is absolutely necessary.

Major Jarvis, United States Army, said that in well-trained soldiers
marching became an automatic action which did not make any call on
the man's voluntary effort.
Surgeon-General W. May, Director-General of the Naval Medical Service, quoted his experiences when marching across the desert to the relief of Khartoum; he said that although all the conditions were most unfavourable each man was only allowed three tumblerfuls of water a day, and yet no one suffered any injury from the want of it.

Marine Oberstabsarzt Buchinger presented a paper in which he gave an exhaustive review of the physiology of physical training. He maintained that every man ought to be either a sportsman, gymnast, or a soldier. Whichever he elected to be, he must endeavour to cultivate his physical development. Buchinger strongly recommends a vegetarian diet and total abstinence from alcohol.

INDEPENDENT PAPERS.

Stabsarzt Dr. Georg Mayer presented a paper on epidemic food poisoning, in which he classified all the epidemics reported in Europe, during the last forty years, according to the causative agents, i.e., chemical poisons, bacteria and their toxins, and trichina. At the end of the paper a summary of all epidemics was shown on the screen in tabular form. At the present time the commonest form of epidemic food poisoning is that caused by eating unwholesome meat. In some instances the animal has been suffering from disease at the time it was slaughtered, but in the majority of epidemics the meat has been contaminated by the B. paratyphosus, B. enteritidis (Gaertner), or B. proteus vulgaris, subsequent to the animal being slaughtered. The paper is worth studying in detail by those interested in food supplies.

The same officer described a rapid means of disinfecting clothing and equipment by the use of steam and formaldehyde vapour in a so-called vacuum chamber. The pressure is reduced to 0.2 of an atmosphere by means of an air pump, which also keeps the temperature down to 45° C. Spores are killed in a quarter of an hour without damage to any material.

Marine Oberstabsarzt Dr. Staby discussed the medical arrangements of landing parties and pointed out how these differed from similar expeditions carried out by detachments from land forces.

The Director of Medical Services, India, presented two papers; one dealt with medical organization in the field and the other with the training of medical personnel for field service.

Captain Chambers, I.M.S., presented a note on prophylactic inoculation against enteric fever amongst Indians, in which he advocated the extension of this form of protection to the Indian Army.

Staff-Surgeon Hirano presented a paper on the sanitation of the Japanese Navy in the wars of 1895 and of 1904-5.

Tenente-Generale Medico L. di Cavallerleone read a paper on a portable "X" ray apparatus which he had invented for use in the field.