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Their spirit is willing, but—and there it is unwise for us to generalise. One man's guess might be another man's misfortune. But in making his diagnosis it is interesting for the doctor to bear in mind that in one carefully organised test, the blame was pointed in no uncertain manner at vitamin-C deficiency.

Ribena Blackcurrant Syrup provides a valuable supplementary supply of the vitamin together with its naturally associated factors. It is palatable, digestible and is particularly suitable where vitamin-C deficiency is linked with the restricted dietary of ulceration.

Ribena is available on Prescription and Doctors are invited to write to our Medical Department if vitamin-C deficiency is diagnosed among individual members, or sections, of the public in their charge.

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SOME MEDICAL PROBLEMS OF THE ASBESTOS CEMENT INDUSTRY

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Approximately five years ago I was asked to take over the medical supervision of an asbestos cement factory, situated in one of the Home Counties, and of one of its associated branches.

Having no previous experience of this industry I went fully into the matter beforehand, and learned that the manufacture of asbestos cement products was scheduled as a "heavy industry" (in the sense that almost all the manufacturing processes required a maximum output of hard manual labour) and also as a "dangerous industry", because of the special risk of "asbestosis" encountered by those employed in this work.

Previous to my appointment the medical arrangements mainly consisted of a Red Cross first-aid outfit in a black japanned box, placed in the charge of a timekeeper who had a practical working knowledge of Red Cross and St. John's Ambulance first aid. Minor accidents were treated and dressed by him on the spot, and more serious cases dispatched as quickly as possible to the local hospital.

On my arrival I was given by the management every facility and a free hand to order anything that I considered to be necessary. In due course a fully equipped surgery-dispensary was established in the canteen block, adjacent to which was added a solarium with ultra-violet and radiant-heat lamps. An office desk, files and so forth, necessary to cope with forms and certificates, were added, and a full-time State-registered nurse was engaged to take charge of the Factory Clinic.

Prevention of absenteeism

I conceived it to be my primary objective to reduce absenteeism from health reasons to a minimum. In this respect I was the friend of all concerned—Government, management and working man alike.

It took several months for the majority of those employed at the works to find out that their troubles could be dealt with effectively on the spot during working hours, instead of the long hours of waiting often necessary in their off-time in the surgeries of overworked panel doctors. Moreover, it soon became evident that the special knowledge of the various hazards and stresses of the work which we acquired was of considerable advantage in both treatment and prophylaxis.

After five years of record-keeping, it has become possible to take a constructive view of the most common of the diseases which we have to combat in the battle against absenteeism.

These, in their order or priority, are as follows:

(1) Dermatitis.
(2) Infections of the upper respiratory tract: colds, influenza, bronchitis, pharyngitis, and so forth.
(3) Rheumatism, particularly fibrositis and neuritis.
(4) Accidental injury, including strains, sprains, cuts, abrasions, bruising and crush injuries.
(5) Infectious diseases: tonsillitis, meningitis, mumps and so forth.
(6) Specific industrial disease, in this case asbestosis.

It will simplify matters to consider the above in their reverse order.

Asbestosis

Although the asbestos cement industry is scheduled as "dangerous", owing to the possible incidence of asbestosis, I have not encountered a single incipient case in my 5 years' experience. I have come across 2-3 long-standing chronic cases, but these date back to long before my time and evidently are static.

The reason for this state of affairs is obvious. The danger of asbestosis arises from the inhalation of the airborne "fluff" of the material, which, in the dry state, resembles flocculent cotton-wool. There is only one stage of the process of the manufacture of asbestos cement in which this danger can occur, and that is in the process which takes place between the opening of the bale, in which the raw asbestos arrives at the factory, and its mixture with cement and water to form the moist inert mass from which the factory products are made. The efficiency of the safeguards which are employed during the "danger stage"—such as the total enclosure of the dry asbestos in a special chamber, suction ventilation which draws all the loose particles in the air into conveyors, and the wearing of respirators by those employed in the process—is evidenced by the fact that, under present conditions, asbestosis does not occur in this factory, at any rate within the scope of my experience.

Infectious diseases

As regards infectious diseases, little more need be said than that these are well within the low average to be expected from a vigorous section of the community between the ages of 16 and 60 years, living under the best conditions of diet and housing obtainable in heavy industry at the present time.

Accidental injury

As regards injuries, the greater proportion are of

[illegible] abrasions, as must be expected in the handling [illegible] material. In the old days such injuries were [illegible] to be left to Nature, with the result that they [illegible] became septic and the victims required medical attention and hospital treatment outside the works. The worker now reports automatically to [illegible], where the abrasion is disinfected [illegible] to prevent further sepsis and [illegible] at work, the whole operation necessitating [illegible] 10 minutes "off the job."

Rheumatism

Rheumatism, especially fibrositis, third on the list [illegible] as a cause of absenteeism, has increased [illegible] each successive year of the war and post-war [illegible], presumably as a result of the lowering of [illegible] due to increasing fatigue and perhaps [illegible] of fats and carbohydrates.

[illegible] the past, if a man suffered from rheumatic pains [illegible] went on working as long as he could and then, [illegible] he could go on no longer, retired to bed for [illegible] days until the pain was gone. Now at the [illegible] a diagnosis is made of the type of pain, [illegible], fibrositis, neuritis, and so forth), and treatment [illegible] given accordingly. The treatment of rheumatic [illegible] in the Factory Clinic is designed primarily [illegible] overcome the condition whilst enabling the man to [illegible] at work, and is divided into short-term, medium-[illegible] and long-term phases.

Short-term treatment.—This consists mainly of [illegible] heat and massage, given by the factory nurse, [illegible] or three times weekly, at an hour which fits best [illegible] the patient's work schedule.

Medium-term treatment. [illegible] in a search [illegible] some infective foci. A considerable number of [illegible] patients [illegible] rotting teeth or obviously septic [illegible].

Long-term treatment. As regards the [illegible], all chronic rheumatic patients [illegible] anti-streptococcal vaccine in the [illegible] dosage is sub-reactive (approximately 25,0[illegible] [illegible] organisms) and does not in any way inconvenience the patient. It is, of course, given [illegible] on a voluntary basis, and I am interested to [illegible] each year an increasing number of men are [illegible] for this treatment. It is too early to arrive [illegible] definite decision as to the prophylactic value of [illegible] inoculation, but there is every indication [illegible] is proving to be beneficial.

[illegible] Respiratory infection

[illegible] respiratory tract infection is the principal [illegible] of absenteeism during the first quarter of the [illegible]. There is no reason to suppose that there is [illegible] than is found in most industries during [illegible], and, apart from the general principle of [illegible], the maximum degree of fitness, there is [illegible] to be done about it.

[illegible] pathological abnormality is evident in the [illegible] pharynx, sinuses, and so forth, requiring surgical intervention, the patient is sent off for appropriate treatment to the local hospital. Otherwise medical treatment is given or dispensed (gargles, expectorant mixtures, nasal drops, throat paints, sprays, tonics, and so on) at the surgery. [illegible] in which chronic catarrh, with or without recurrent colds and sore throats, is a factor, stock anticatarrhal vaccine inoculation is given (as in the case of chronic rheumatism) on a voluntary basis. It is my practice to [illegible] the standard dosage into small weekly injections, starting at approximately 50,000 and rising to 1,000,000 or 5,000,000 organisms, depending upon the patient and his reactions. The vaccine is given in the early autumn before the general incidence of colds and influenza, and in most cases the course is completed before mid-November. Here again it is difficult to say what the final result of this inoculation against colds and chronic catarrh will be; but the men are presenting themselves in increasing numbers, and it is hoped that a progressive degree of immunity will be obtained throughout the factory.

Industrial dermatitis

This condition, which, because of its importance I leave to the last, provides more trouble than all the other diseases put together. It is a source of tribulation in the office, with regard to Workmen's Compensation, and in the works, where jobs have to be changed and teams rearranged. In the matter of treatment there is no other condition which involves so much expenditure of time and material.

In dealing with industrial dermatitis the medical officer is called upon to clarify and regulate the following factors:

(1) [illegible] disease which we do not fully understand and [illegible] amenable to control.
(2) The attitude of the patient towards it.
(3) The attitude of the management towards it.
(4) The present position of the Workmen's Compensation Act in relation to it.

The nature of dermatitis

As regards the disease itself, it is evident that wider experience of the clinical aspect is required, by the pooling of knowledge obtained from many different branches of industry, before we can formulate a constructive medical policy.

Theoretically, we regard dermatitis as being [illegible] reaction [illegible] the deeper layers of the skin against long-continued irritation, but unfortunately, although this is a reasonably sound generalization, there is nothing constant about it.

Some individuals are in contact with such [illegible] irritant all their lives and show no signs of the disease; others contract dermatitis within a few weeks of contact. Another group may work in contact with the irritant for many years without a sign of trouble, until an interval occurs, which may vary from a few months to a few years; but when the same work is resumed, dermatitis breaks out

other hand, his disability is due to some defect of his own constitution (for example rheumatism or asthma), he comes under the operation of the National Health Insurance Act, whatever are the circumstances of his employment.

With the vast majority of diseases encountered in industry, it is not difficult to decide under which category the disease should be listed. Industrial dermatitis, however, presents something of a problem, having many special difficulties of its own. It is, for instance, almost impossible to prevent carelessness or neglect on the part of the employee to take full advantage of the precautions provided. It is almost impossible to make any prognosis regarding the probable duration of an attack, which may vary from a few days to many years. In many cases it is extremely difficult to decide just when to regard a particular attack as being cured and the employee fit to return to work.

In view of all these uncertainties, it is evident that there is a wide field for exploitation, varying from concealment on the one hand to malingering on the other. When we add to all this the vexed question of compensation, the difficulties of the situation become obvious.

At the present time industrial dermatitis is held to be the responsibility of the employer and comes under the Workmen's Compensation Act.

If the disease is truly constitutional (as I believe it to be), an employee might be "dermatitis-prone", or might actually be suffering from dermatitis, when he was taken into employment. Under existing regulations there is nothing to prevent him from becoming a liability upon the firm for the rest of his life, if he can establish the claim that the dermatitis started after his employment began.

In view of these facts, one is compelled to conclude that industrial dermatitis as a disease is in urgent need of close investigation by the Medical Research Council, first to establish a system of procedure for the guidance of industrial medical officers, and secondly to reconsider the position with regard to the question of compensation, particularly in respect of the "dermatitis-prone" employee.

ELECTROMYOGRAPHY

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IN 1851 Schiff noticed that denervated voluntary muscle was in a constant state of surface agitation due to minute isolated contractions. This condition he described as *fibrillation*. In 1938 Denny-Brown and Pennybacker recorded electrical activity from denervated human muscles and found that it differed in character from that occurring in normal human muscles. In 1941 Eccles showed that the electrical activity recorded from denervated muscle is the result of the contraction of single muscle fibres.

Apparatus used

In 1944 Weddell, Feinstein and Pattle studied the electrical activity of muscles from the time of denervation to complete re-innervation in man and in experimental animals. They showed that a concentric needle electrode, coupled to a high-gain amplifier with a short-time constant driving a loud-speaker and cathode-ray oscilloscope, can be adapted for clinical purposes without any difficulty. Surface electrodes can also be used, although, in the majority of observations reported by Weddell, co-axial electrodes were used. For permanent records, photographs of cathode-ray tube traces or sound recordings have to be made; the latter are the more useful. Ink writers are unsatisfactory for recording the electrical activity from denervated muscles, for the potentials are of too short duration.

Action potentials in contracting muscle

The electrical activity occurring in a normal contracting human muscle takes the form of so-called motor-unit action potentials. They appear as monophasic and diphasic spikes, but occasionally they are more complicated in form. In amplitude they vary from 100 microvolts to 1 millivolt and in duration they last from 5 to 10 milliseconds. Both the frequency of repetition of each action potential and the number of different action potentials recorded vary according to the strength of the contraction. They are heard as low-pitched sounds. It has been observed that, in man, no action potentials can be recorded from a normal relaxed voluntary muscle, although they are aroused momentarily during the insertion of the needle.

Fibrillation potentials in denervated muscles

The electrical activity occurring in denervated human muscle, on the other hand, takes the form of a series of so-called fibrillation action potentials. These are of two types: (1) those aroused by the insertion of the needle electrode, and (2) spontaneous