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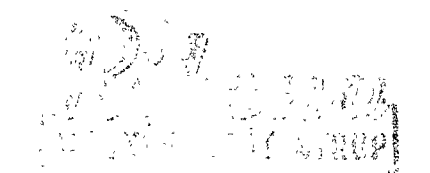
Enough

... lost ...
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... to day they are not so good. They
... But they make little mistakes here
... cause slight delays there - they're mis-
... sing fire without meaning to.

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
... it is interesting for the doctor
to be 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
... if vitamin-C
deficiency is diagnosed among in-
dustrial workers, or sections, of the
... in their charge.



INDUSTRIAL MEDICINE

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MARCH-APRIL 1947

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NEW SERIES VOL. IV No. 2



SOME MEDICAL PROBLEMS OF THE ASBESTOS CEMENT INDUSTRY

By J. N. HINDLEY-SMITH, M.R.C.S., L.R.C.P.

Part-time Industrial Medical Officer, Universal Asbestos Manufacturing Company, Watford (Herts.)

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: cold, 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 incidence case in my 5 years' experience. I have come across 2-3 long-standing chronic cases, but these date back 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. This 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 efficient safeguards which are employed during the "dangerous" 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 engaged in the process—is evidenced by the fact that, under these conditions, asbestosis does not occur in this industry 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 a heavy industry at the present time.

Accidental injury

As regards injuries, the greater proportion are of

on occasions, as must be expected in the handling of such material. In the old days such injuries were left to be left to Nature, with the result that they usually became septic and the victims required medical attention and hospital treatment outside the works. The worker now reports automatically to the factory, where the abrasion is disinfected and treated to prevent further work and dermal infection. At work the whole operation necessitating stops 10 minutes "off the job."

Rheumatism

Rheumatism, especially fibrositis, third on the list of absenteeism, has increased in the last few years as a disease of absenteeism, has increased in each successive year of the war and post-war period, presumably as a result of the lowering of resistance due to increasing fatigue and perhaps to the large amounts of carbohydrates.

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

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

Medium-term treatment.—This consists in a search for some infective focus. A considerable number of the patients have rotting teeth or obviously septic tonsils.

Long-term treatment.—As regards the treatment of chronic rheumatic patients, the use of anti-streptococcal vaccine in the factory.

The dosage is sub-protective (approximately 25,000,000 organisms) and does not in any way inconvenience the patient. It is, of course, given only on a voluntary basis, and is of interest to note that each year an increasing number of men are coming for this treatment. It is too early to arrive at a definite decision as to the prophylactic value of vaccine inoculation, but there is every indication that it is proving to be beneficial.

Respiratory infection

Upper respiratory tract infection is the principal cause of absenteeism during the first quarter of the year. There is no reason to suppose that there is any special cause of this in most industries during the winter, apart from the general principle of keeping the maximum degree of fitness, there is nothing to be done about it.

When pathological abnormality is evident in the nasopharynx, sinuses, and so forth, requiring sur-

gical 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 lozenges, sprays, tonics, and so on) at the factory. There is in which chronic catarrh, with or without recurrent colds and sore throats, is a factor. Stock anti-catarth vaccine inoculation is given (as in the case of catarrh, rheumatism) on a voluntary basis. It is my practice to give the standard dosage (two 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 decreasing 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 asked upon to clarify and regulate the following factors:

- (1) The cause which we do not fully understand and which is unable 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 increasing of knowledge obtained from many different branches of industry, before we can formulate a comprehensive medical policy.

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

Some individuals are in contact with such irritants 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, and an interval occurs, which may vary from a few months to a few years; but when the same work is resumed, dermatitis breaks out.

On the other hand, his disability is due to some defect of his own, such as (for example) rheumatism or neuritis; he comes under the operation of the General 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 or 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 indulging 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 purely 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

By GRAHAM WEDDELL, M.A., D.Sc.

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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 Pattie 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