3. At this stage no antiseptic whatever is recommended. The denuded area should be swabbed over with cotton-wool soaked in normal saline at about 100° F. until all debris has been removed.

4. When the general toilet of the area has been completed it is swabbed over with a 2 per cent. aqueous solution of mercurochrome. The surface is then dried with the assistance of an electric hair drier, an ordinary electric radiator, or an electric cradle, provided the last-named has ventilation holes along the top. Desiccation takes place rapidly.

The following routine treatment is recommended: first day, four applications; second day, three applications; third day, two applications. The area is dried off after each application, and is always kept exposed to the atmosphere. In some cases where a large area is involved the patient is forced to lie on a portion of the burnt surface and the crust is likely to disintegrate. This feature is not associated in any way with the drug used, but in our opinion is the result of inadequate evaporation from the surface. The patient should therefore be frequently turned and the freest ventilation possible provided. Should there be any local collection of pus—and diagnosis of this is facilitated by the thinness and semi-transparency of the crust—the crust should be freely removed from the area, the area swabbed up with normal saline as before, and the mercurochrome treatment reapplied.

A very brief account of a recently treated case is given below.

F. B., aged 32, European, an electrical engineer, was admitted to hospital on the morning of August 19th, 1935, suffering from burns sustained by coming in contact with an electric arc at a voltage of 33,000. It is assumed that all the burns were caused by the actual flame of the arc.

The following were the areas and degrees of the burns sustained. *First degree.*—A large area of the chest above the nipples and the back of the neck. *Second degree.*—The entire face and front of the neck as far back on each side as the mastoid process; the left forearm; an area about three and a half inches in diameter over the left patella. *Third degree.*—The back of the left hand; the right thenar eminence; an area on the chest from left clavicle to the fourth interspace. There was also superficial burn of the lower half of both corneae.

The eyes were treated with cocaine, atropine, and liquid paraffin, and cleared up in thirty-six hours. The burnt areas were treated by the routine mercurochrome method. The patient's temperature was normal from the fourth day onwards. By the twelfth day the burns had cleared up, though the scab had not yet separated from the back of the left hand. There was no scarring, and the patient was able to shave on the eleventh day.

Conclusion

Our results have been most encouraging. The rapidity and reliability with which desiccation has taken place have been eminently satisfactory, and with adequate preliminary treatment we have been able to reduce sepsis to a minimum. On a general survey of our cases it would appear that patients treated with mercurochrome have less general reaction during convalescence than those treated with other agents, while the amount of pain and discomfort compare well with any other method. On no occasion have we seen any toxic effects following the use of this drug.

I wish to express my thanks to Dr. E. Jamieson, chief medical officer of the Anglo-Iranian Oil Company, for permission to publish this article.

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A NOTE ON CUTANEOUS CANCER IN COTTON MULE-SPINNERS

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Dr. A. E. Somerford, in his interesting paper published in the *British Medical Journal* of June 29th, 1935 (p. 1305), concludes that non-scrotal cancer in cotton mule-spinners is not occupational in origin, and supports the view that the causal factor in the development of scrotal cancer in these workers is not exposure to mineral oil, but continued friction at this site.

A Local Inquiry

In 1930 I made an inquiry into the occupational incidence of cutaneous cancer in men in the Blackburn Registration District,¹ the census figures for which give the number at risk in the different occupations, this, of course, being of the greatest importance in the consideration of occupational diseases.

Details of patients suffering from this disease and who lived in this area were extracted from the death registers from 1837 and from the in-patient and out-patient registers of the hospitals serving the area (from 1865). The cases not ascertained by this means must be few in number. The cotton trade is the principal industry, employing almost all of the textile workers in the district, and many of the other industries are associated with, and to a great extent dependent on, it.

In all 625 cases were traced, 246 occurring in men engaged in the cotton trade. In addition, there were twenty-five* of epithelioma or cancer of the groin and groin glands, almost certainly secondary to cancer of a skin site (scrotum, penis, or leg), and a further twenty-five† of "epithelioma," the site of which was not stated. As further information about these cases was not available they have not been included in the following table, which summarizes the findings and shows the numbers employed in the different occupations as stated in the 1921 census for the district.

Occupation as described in Registers	Number of Men Employed (Census 1921)	Cases of Skin Cancer Traced									
		Rodent Ulcer	Squamous Epithelioma					Total Non-scrotal	Scrotal Epithelioma	Total	Percentage Non-scrotal
			Head and Neck	Lip	Penis	Others Non-scrotal					
Cotton mule-spinners	1,502	19	9	—	3	8	39	94	133	29.3	
Cotton weavers	10,917	13	13	7	7	8	48	3	51	94.1	
Other textile workers	10,050	18	21	4	6	7	56	6	62	90.3	
Others	52,621	64	105	85	44	44	343	36	379	90.5	
All occupied males	75,100	114	149	96	60	67	486	139	625	77.7	

The following table is intended to show the relative incidence of cutaneous cancer among spinners and other sections of the employed male population.

Occupation	Number of Cases traced per 1,000 Employed in 1921	
	Non-scrotal	Scrotal
Cotton mule-spinners ...	26.0	62.6
Cotton weavers ...	4.4	0.3
Other textile workers ...	5.6	0.6
Others ...	6.5	0.7
All occupied males ...	6.5	1.8

* Spinners 8, weaver 1, other textile workers 5, others 11.

† Spinner 1, weaver 1, other textile worker 1, others 22.

The spinning and other sections of the cotton industry have in this area developed *pari passu* during the period under review, but since spinning of cotton by the "mule" declined in the area from about the year 1900 (due to the introduction of spinning by ring frames, on which mainly females are employed) the proportion of cotton mule-spinners to other workers in 1921 was less than it had been during preceding years. On the other hand, inquiries made in sampling the cases have shown that while practically all those described in hospital or death registers as cotton mule-spinners proved to have been always such, some of those otherwise described—for example, as bobbin carriers, caretakers, etc.—were found to be really ex-spinners, with a subsequent short period of other occupation. These have been classified in the tables according to their description in the registers, and this neutralizes to a very considerable extent the error involved in using the 1921 census figures as indicative of the relative states of the different occupations in regard to the numbers employed over the period under review. It is therefore reasonable to conclude that the table does give a fair picture of the relative frequency of cutaneous cancer in spinners as compared with that in men engaged in other occupations.

Commentary

It is quite clear from the results of my inquiries that in this area cotton mule-spinners have shown an incidence of skin cancer, not only of the scrotum, but also of non-scrotal sites, very markedly in excess of other cotton operatives or other workers generally.

Sixteen men in the series suffered from more than one primary cutaneous cancer; twelve were cotton mule-spinners, and in eight of these at least one of the sites was non-scrotal. A bobbin carrier, a chimneysweep (both of whom proved to be formerly spinners), a fireman, and a maker of wall paint (both formerly cotton weavers) had all suffered from a scrotal and a non-scrotal primary skin cancer. This surely provides striking evidence in regard to the occupational influence of cotton mule-spinning causing skin cancer of even non-scrotal sites.

Additional evidence of the excessive incidence of non-scrotal skin cancer in cotton mule-spinners is available from the Registrar-General's observations: first, that during the period 1921-3, in cotton spinners, the number of deaths from non-scrotal skin epithelioma was 23 per cent. of the total number of deaths from epithelioma of all cutaneous sites²; and, secondly, the comparative mortality figure for skin cancer during the three years 1920-2 was in cotton spinners sixteen times that in the general occupied and retired male population.³

The occupational character of scrotal cancer in cotton mule-spinners is now generally admitted. The excessive incidence of non-scrotal skin cancer in spinners seems to me significant, as indicative of some occupational factor being causal; and there can be no doubt that the mineral oil that has been used in cotton-spinning processes is carcinogenic. It seems highly improbable that friction alone, in the absence of exposure to mineral oil, would cause scrotal cancer in spinners. Certainly the disease occurred in these workers before the introduction of coloured and stiffened overalls. It may be that while exposure to mineral oil is the main factor in the initiation of skin cancer in such workers, some other factor, such as continued friction, an injury, a burn, or local anatomic peculiarities, etc., may determine the site of the growth or may hasten its appearance.

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- ² Report of Departmental Committee on Occurrence of Epitheliomatous Ulceration in Spinners, 1926, p. 9. H.M. Stationery Office, London.
- ³ Registrar-General's Decennial Supplement (England and Wales), 1921, Part II, Table V, p. 28.

Clinical Memoranda

Retinitis Treated by Protein Shock

This case may be of some interest as it demonstrates the success of non-specific treatment in a disease which often has very serious results on the vision.

The patient was a cobbler, aged 70. He first attended the Bristol Eye Dispensary out-patient department on October 1st, 1933, complaining that vision had been gradually failing for the previous two months, and was now very poor. He had no pain, and did not complain of photophobia.

On testing his visual acuity the vision of each eye was found to be the same—namely, less than 6/60. The addition of his proper correction (+2 D, R. and L.), made little improvement, his vision still remaining less than 6/60. Externally there was no defect or disease visible, and the pupils reacted normally to light and accommodation. The fundi, however, showed congestion and swelling around each disk, extending to the macula, around which were numerous small dots of exudate. The remainder of the retina looked faintly congested, but not pathologically so. The blood pressure was normal for his age, and the blood vessels appeared to be less sclerotic than one might expect in a man of the patient's years. The field was found to be uncontracted, but there was a central scotoma. Colours were not distinguished.

The case was at first treated along the ordinary lines, a search being made for septic foci. Although apparently not bad, his few remaining teeth were extracted, his nose and throat examined by a throat and nose surgeon and found to be without blemish. He enjoyed good health, ate well, had no stomach trouble, and did not suffer from constipation. His Wassermann reaction was negative. Although not a heavy smoker, he was cut off tobacco. He was put on pot. iod., 5 grains t.d.s.

He was seen fortnightly until July, 1934, when it was decided to give him a series of T.A.B. injections, as there had been no improvement. His vision and the fundi appeared unchanged. It must be noted that although his vision was no better at least it was no worse. The material used was the ordinary series prepared by the pathological department of the Bristol General Hospital, and was of dosages: first injection 10 millions, second 25 millions, third 50 millions.

He was admitted as an in-patient on July 9th, and was given the first injection intravenously. The temperature rose steadily, reached a peak of 103.4° F. in about two hours, and gradually declined, passing off altogether in about nine hours. During this time he sweated profusely, and after it was all over said he felt weak, but otherwise normal. A detailed description of each injection is hardly necessary, as the effects of protein shock are of course well known.

The second injection was given on July 11th, and the third on July 13th. He was discharged on July 15th. Seen again a fortnight later it was noticed that some of the congestion had disappeared, and his visual acuity with glasses was now 6/60. On September 2nd it was 6/24, and it gradually improved until by December 2nd it was 6/6 in the left eye and 6/9 in the right with glasses. All congestion and exudate had by then disappeared from the retinae, although there was slight scarring around each macula where the exudate had been. Doubtless this will be permanent. When last seen, on June 14th, 1935, he had maintained his improved vision, and it is to be hoped this will remain so.

Although it is obviously unsafe to draw any definite conclusion from a single case, yet taking into consideration the well-known beneficial effects of protein therapy it is not unreasonable to attribute its beneficial effect in this case to its influence on some hidden focus.

One fact stands out clearly, be the explanation what it may—that whereas no ordinary treatment resulted in any improvement over a period of eight months, very marked improvement followed the use of T.A.B.

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