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.

REFERENCES

- ¹ Irvine, E. D. • Cancer of Skin in Males in Blackburn Registration District, 1837-1929. Thesis, Liverpool University, 1931.
- 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.

D. SIMPSON, B.Sc., M.B., Ch.B.,
Honorary Surgeon, Bristol Eye
Dispensary.