Original Articles.

"COOLY ITCH."

A PURULENT FOLLICULITIS DUE TO THE TRICHOPHYTON VIOLACEUM VARIETY INDICUM.

By HUGH W. ACTON,
LIEUTENANT-COLONEL, I.M.S.,
Director, Calcutta School of Tropical Medicine and Hygiene,
and
C. McGUIRE, D.T.M.,
Under the Indian Research Fund Association.

THE term "cooly itch" has been used to designate a type of pustular folliculitis affecting the lower classes (Indians), viz., coolies, etc., and is seen commonly on the thigh and legs. Unfortunately the use of this term has been extended to any form of purulent dermatitis, including scabies, because few attempts have been made to find the causative organism. Castellani employs the term "cooly itch" in a more restricted sense to an extremely irritative dermatitis that commonly attacks the lower classes, and is rarely seen amongst Europeans. He has not been able to find any causative agent, either fungi or insect parasite, and suggested that these lesions might be caused by some insect parasite that only remains on the body for a short time, analogous to the mite (*Tyroglyphus longior* Gervais) causing copra itch. As far back as 1922, the senior author recognised this chronic pustular folliculitis as a separate entity, and noticed that in men the pustules occurred round the hair follicles of the legs and thighs, and in women around the hair follicles of the forearm. Besides the pustules round the hair follicles, there was a good deal of perifollicular induration and inflammation, which gave rise to a peculiar purple coloration round each inflamed follicle. The disease is very intractable, and resists every form of local treatment by the ordinary parasiticidal remedies. The disease could only be cured by depilating the hairs in the area by *x*-ray exposures, showing that the causative agent grew along the hair shafts. At that time, we had not seriously undertaken any research on the subject, and we could only recover staphylococci and very rarely streptococci, in the few attempts made to isolate the causative organism. At first we considered the main cause of the chronicity and intractability of the lesions was due to the continual cross rub of the infected *dhotie* (loin cloth) or *sari* during the act of walking, etc. We could not advise our patients to change their clothes repeatedly as the majority of them only possessed a single loin cloth, nor to adopt any other method of dress, such as trousers.

The Indian Research Fund Association in 1925 gave a liberal grant in aid of these investigations which has enabled us to extend our researches into the causation of the different skin diseases met with in Calcutta. One of us (C. McG.) has devoted his whole time during the past three years to the study of the various cryptogamic fungi that invade the skin and hair follicles.

We soon discovered that this type of persistent pustular folliculitis was due to a *Trichophyton* closely resembling *T. violaceum* (Bodin), previously described and cultivated by numerous other workers. The *Trichophyton violaceum* attacks the hair of the scalp and beard and more rarely the glabrous skin and nails; the variety we have isolated attacks the hair follicles of the thigh, leg, forearm, front of the chest, beard and the back of the neck. So far we have not observed it to attack the scalp hairs except by extension from the beard area to the hair margin of the scalp and back of the neck. This variety of *Trichophyton violaceum* we proposed to consider as a subvariety and name it *indicum*. It differs from the *Trichophyton violaceum* (Bodin) in cultural appearances, but not in morphology; we consider the difference in cultural appearance not significant enough to enable us to describe it as a new species.

The clinical recognition of this type of ringworm folliculitis is extremely easy for any one who has seen a few cases of the disease, or has studied our water colour paintings. The demonstration of the fungi from the lesions by cultivation is, however, a very different matter, as it is difficult to isolate this fungus in pure culture. The difficulty is due to various causes, (1) the fungi are found in the more recent pustules and are not numerous on the hairs, so that selected pustules have to be examined. (2) The concomitant staphylococcal colonies, which are much faster in growth, overrun and strangle the fungal colonies. (3) The minute fungal colonies with their penetrating roots may be seen after the first days of insemination, but one is unable to subculture the fungi from these roots. (4) Any method we used to kill the staphylococcus generally succeeded in killing the trichophyton as well. Thus out of the cases diagnosed clinically we have only been able to obtain successful cultures in one out of every three or four cases, in spite of the fact that in most of the attempts we have seen submerged roots of the fungus invading the media.

During the course of this research we tested various chemical and physical means to inhibit the growth of the staphylococcal colonies, we found that gentian violet in 1 : 25,000 solution not only inhibited the staphylococcus but also killed the trichophyton. There is no doubt that, if every case of sycosis were carefully examined by a competent mycologist, the clinical entity would disappear from dermatological nomenclature and be regarded as a clinical manifestation of trichophyton ringworms. We found clinically that although the cases were refractory to the ordinary

parasiticidal remedies such as chrysarobin, etc., they yielded readily to a solution of 1 : 20 gentian violet. There are certain objections to the treatment, the staining of the skin and clothes, but there is no doubt about its efficiency.

ÆTIOLOGY.

The disease is common amongst Indians of the lower classes in Calcutta, and is rare amongst Europeans. The few cases we have seen amongst the latter were mostly seafaring men, viz., officers of the mercantile marine, who are accustomed to walk about the decks in the early morning barefooted with their trousers tucked up above the knees. In Indians, the disease is seen largely amongst the cooly classes, and much more rarely amongst the middle and upper classes. The disease is more common amongst men than women; in men the lesions are seen round the hair follicles of the thighs and legs, and in women round the hairs on the forearm. Wrestlers are particularly liable to the disease, and hence the frequency amongst Indian policemen and *durwans* (gate keepers) who are keen wrestlers. In India the wrestling bouts take place on a small plot of land which is marked out and the earth well dug up to make the ground soft in order to lessen the impact of the throws. Preparatory to each bout, the combatants rub their bodies over with this soft earth to make themselves less greasy. During the contest, the whole of their bodies including the scalp gets well rubbed over with this earth. The fungus can live in the soil and thus gain an entrance into the hair follicle. In spite of this fact, only the hair follicles in the areas mentioned above get infected with this fungus.

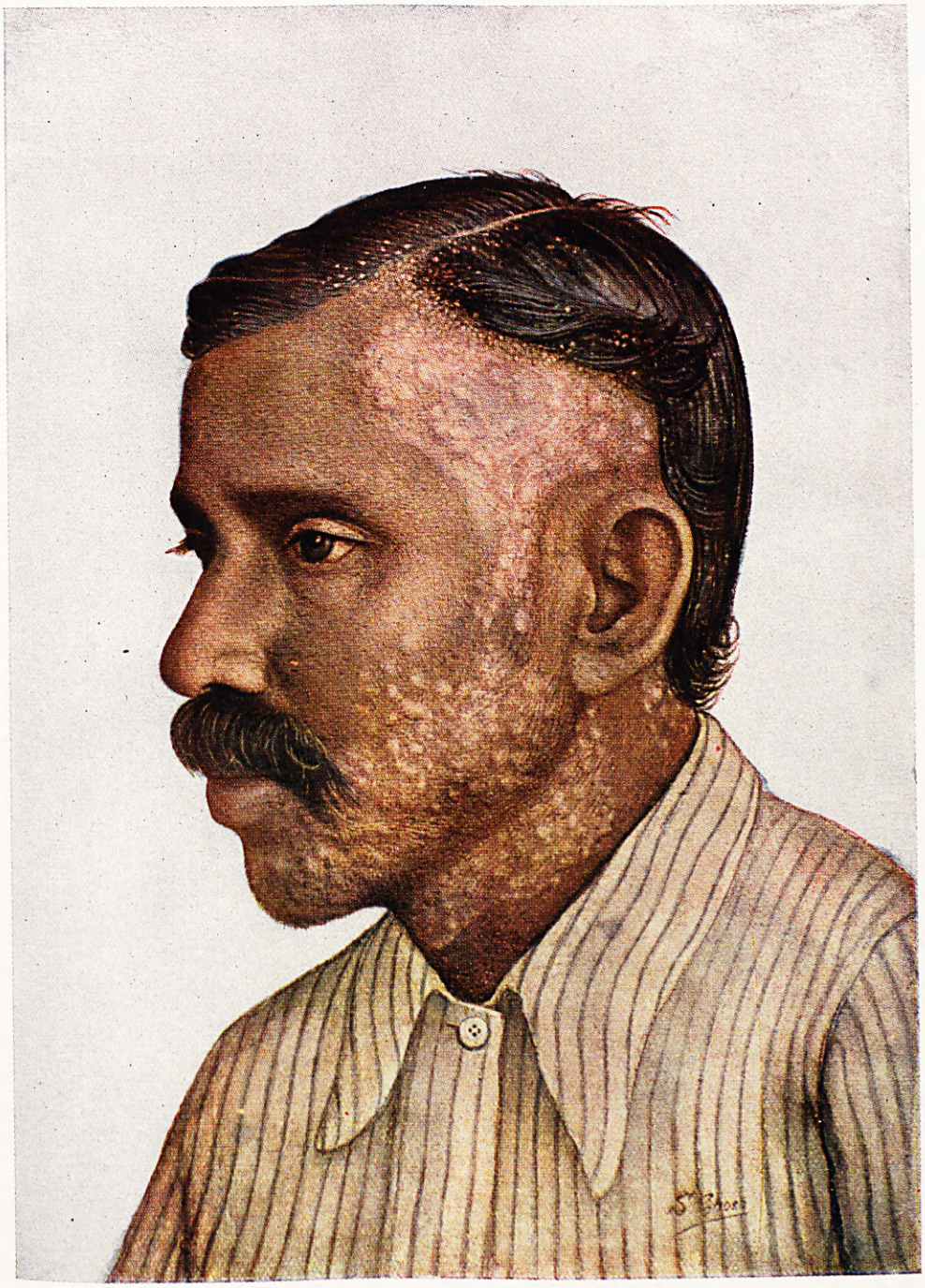
There is little doubt that the cross rub of the clothes—*dhotie* and *sari*—that occurs during walking, etc., plays a very important part in the spread of the ringworm as well as in the secondary staphylococcal infection. The poorer classes can rarely afford more than a single garment be it a *dhotie* or *sari* to cover their bodies, and these clothes cannot usually be washed properly in soap and water. The dirty clothes tend to increase the incidence of the disease amongst them, and when once infected help to spread the disease from one hair follicle to the next. In a previous paper on *Tinea cruris*, Acton and McGuire (1927) showed the importance of moisture and friction in this common ringworm and how infection took place from the damp infected ground on to the thin glabrous skin of the feet. In this trichophyton infection, the source is again from the ground when the soil is dry and greasy, and the fungus only invades the hair follicle by prolonged contact in those who are not clean about their personal habits of bathing, etc. Dryness and friction from the clothes are important factors in the spread of this ringworm from one follicle to the other.

SIGNS AND SYMPTOMS.

The subjective symptom is intense irritation, causing the patients to scratch, in order to open up the pustules or inflamed nodules and so relieve the inflammatory tension. The irritation becomes much more marked when the lesion has existed for some time and the induration has spread into the corium (*see* Plate IV, fig. 2). The typical lesion exhibits the following characters in the earliest stage when examined by a corneal lens of 10 magnifications. The hair shaft is surrounded by a tiny area of thickened epidermis, a greyish looking squame, which is not detached, and, where the epidermis is thinner, numerous fine dilated vessels are seen at the margin. Some of these areas go on to suppuration, a small pustule forming superficially round the entrance of the hair follicle so that the squame is lifted up and domed forming the upper boundary of the pustule; at first it is a greyish yellow colour and later on becomes a brighter yellow when pus has formed in it. The pustules are surrounded by a reddish purple zone of induration (inflammatory) which sometimes extends for some distance into the surrounding corium, producing nodular areas round each hair shaft. Many of these areas do not suppurate, and take a long time to break down. These reddish purple nodules round the hair follicles, some purulent and others not, are very characteristic of this ringworm infection (Plate I). In the beard area, the induration of the corium sometimes produces kerion, but on the legs the induration is more diffuse, so that the whole area of the skin becomes indurated and here and there pus points are seen round the hairs. At this stage, owing to the scratching and tearing of the skin, secondary infection by streptococci occurs; this only increases the induration (Plate IV, fig. 2) and changes the picture of the skin lesion to that of a weeping eczema (Plate IV, fig. 3).

The lesions are most commonly seen on the legs (Plate IV, fig. 1) starting on the outer side of the leg and extending along the hairs in this area. The induration extends into the corium (*see* Plate IV, fig. 2) and later may be followed by eczema (Plate IV, fig. 3). At other times it may start around the hairs of the thigh (*see* Plate IV, fig. 4), and in either case may become more widespread (Plate II), infecting almost every hair in the area. In women the lesions are more commonly seen on the extensor surface of the forearm (Plate III, fig. 1) where the hairs are more numerous and subjected to the cross rub of the *sari*. More rarely the hairs on the back of the hand (Plate III, fig. 3) may also be invaded by this fungus. The coarse hairs on the front of the chest are sometimes involved (Plate III, fig. 2) in an area which is frequently the site of acne as well, but the characteristic reddish purple colour of the nodules that have not as yet suppurated should prevent such a mistake being made by the physician. In men, the beard area is often attacked, giving rise to sycosis barbæ (Plate I), in this particular case as far as the temporal region. As a rule the scalp hairs are not attacked by the fungus, but the fine hairs on the back of the neck are sometimes invaded,

PLATE I.



Sycosis barbæ due to *Trychophyton violaceum* var. *indicum* with secondary staphylococcal folliculitis. Note the characteristic purple colour round the follicles.

PLATE II.

Extensive folliculitis of the hairs on the thigh and leg due to *Trichophyton violaceum* var. *indicum*.

PLATE III.

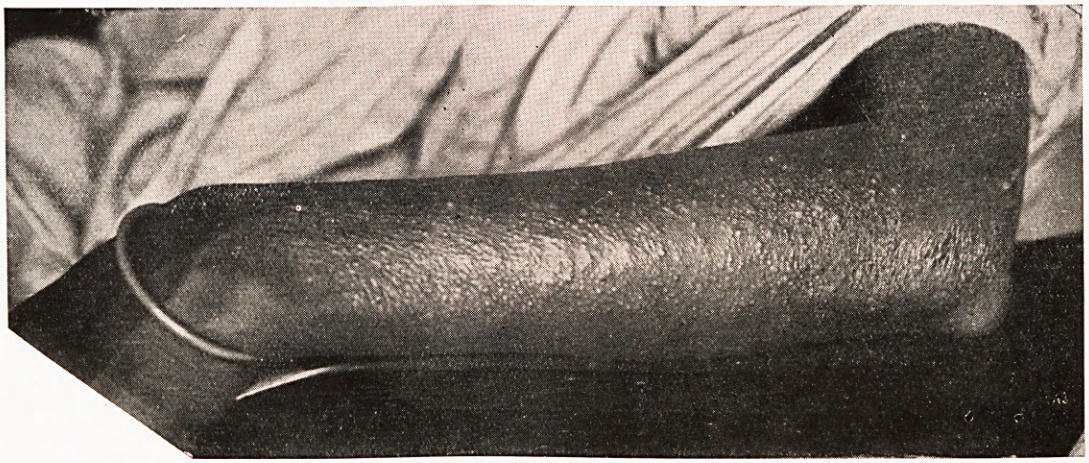


Fig. 1.—Trichophyton folliculitis on the forearm of a woman; note the effect of the cross rub of the *sari* in spreading the infection.

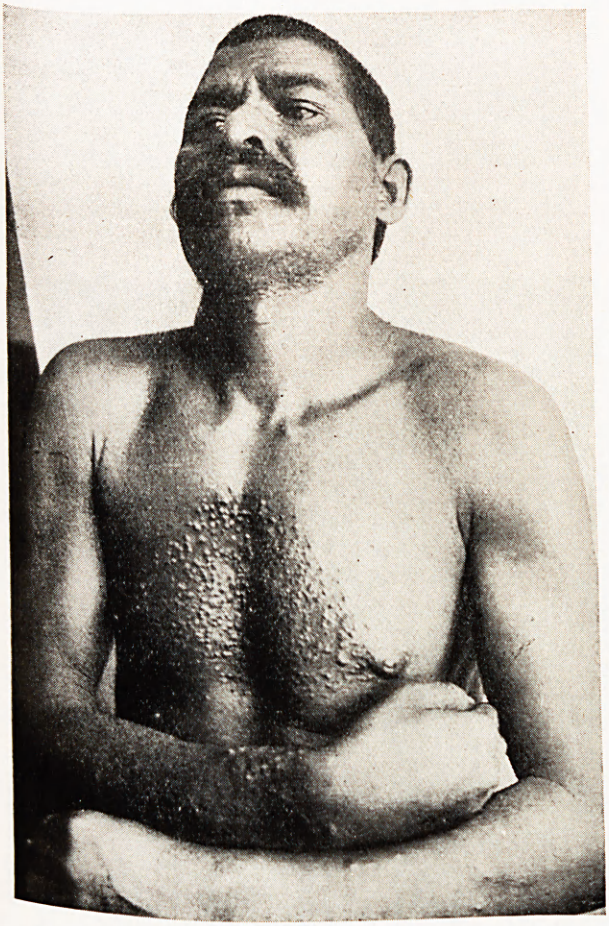


Fig. 2.—Trichophyton folliculitis of the hairs on the chest somewhat resembling acne.

Fig. 3.—Folliculitis due to the same cause on the back of the hand.

Fig. 1.—Early trichophyton folliculitis without much induration of the corium.

Fig. 2.—Trichophyton folliculitis with extensive induration of the corium.

Fig. 3.—Trichophyton folliculitis with secondary streptococcal dermatitis eczema.

Fig. 4.—Early trichophyton folliculitis of the hairs on the thigh.

particularly those subjected to the cross rub of the collar or coat.

MYCOLOGY.

The first essential is to describe *the method of cultivation* adopted by us. An inflamed hair follicle is selected from the edge of the lesion and it is better to select discrete follicles, where the pus formation is beginning to occur round the hair shaft. It is impossible to get pure cultures either from large ripe pustules round the hair follicles or when a good deal of secondary infection with involvement of the corium has occurred in the centre of the lesion. The area is selected and the skin surface sterilised with absolute alcohol, each pustule is opened with a sterile needle, and a small loopful of the pus taken up and inseminated into three tubes of Sabouraud's maltose agar. In this manner the contents of six small pustules are sown on 18 culture tubes. In only one out of every four attempts are cultures successful for secondary implantation, as the more rapidly growing staphylococcus colonies overrun the more slowly growing fungal mycelium. In these infected cultures, even when the tube is broken and only the roots of the fungus that have invaded the media are taken up free of staphylococci, these root mycelia will not grow into colonies as in the allied cryptogamic fungi. When the colonies are separated from the staphylococcal colonies, secondary cultures can easily be made from the surface growth on most laboratory media at room temperature, i.e., 25—27°C. At present, we have not been able to evolve a method of cultivation such that we can hinder the growth of the staphylococci and allow the fungus to grow in pure culture. In most cases we are able to see the roots of the fungi penetrating the media, but less commonly, i.e., in only 1 in 4 cases, can we get pure subcultures.

Cultural characters.—On Sabouraud's test maltose agar (Plate V) at the end of the first week the colony is about 8 mm. in diameter, circular in shape, and raised above the surface level of the media. The centre of the raised area exhibits spicular projections into the air—aerial hyphæ. The colony is violet coloured, and when looked at from the side, thick dense roots are seen penetrating deeply into the agar media. After one month, the growth is 13 mm. long, ovoid in shape and very much raised above the surface of the agar, it has now a velvety mole-coloured appearance, very much like the colour and texture of the fine fur of this animal. The roots have penetrated through the media to the glass of the test tube, and are difficult to see, as the agar is pigmented a dark red brown to almost black colour. The growth on Sabouraud's maltose agar in an Erlenmeyer's flask after two months' growth is depicted in Plate V.

A description will be given of the appearances of the growth on the other media, seen after one month, incubated at room temperature between 25—27°C. On Sabouraud's glucose agar, the growth is 12 mm. long, ovoid in shape, raised above the surface, and has a velvety mole-coloured appearance; the medium is pigmented a dark red brown colour. On blood serum the growth is poor, only 3 mm. in diameter, the serum is liquefied and a small pit is formed, at the bottom of which is an area of growth. On peptone agar the growth is 5 mm. in diameter, raised above the surface, of a light mole colour, the media being pigmented a red brown colour. On potato the growth is 12 mm. in diameter, raised, brown in colour, but not velvety in appearance, the potato being dark in colour. On carrot the growth is 9 mm. in diameter, chocolate coloured, non-velvety in appearance, slightly raised; the edge of the growth is crenated and the surface rugose. On 2 per cent. glycerine agar, the growth is only 2 mm. in diameter. On 4 per cent. honey agar there is no growth.

The growth on synthetic media.—We next carried out an elaborate series of experiments to test the different constituents of the media in order to see what effect they would have on the growth of the different ringworm fungi. Our object was to devise a stable synthetic medium which would not hinder the growth of these fungi, but at the same time prevent pleomorphism. The objections to Sabouraud's media are two-fold, as he insisted that the peptone and glucose should be derived from two sources, viz., Chassaing's peptone and Chanut's glucose. Neither of these two substances are simple chemical compounds; however carefully the peptone is prepared it must vary slightly in its mixture of protein-like bodies, whilst Chanut's glucose cannot be obtained, so we have to use Merck's glucose, which under the best conditions is a very unstable sugar. We therefore considered it necessary to test the effect of varying the quantities of Sabouraud's test media, as regards its pH, the salt content and the amount of agar to see what effect these alterations would have on the growth of these fungi. It would be out of place to give the details of these experiments, but it is sufficient for our purpose to say that the best results obtained on these test media were given when the media contained 2.5 per cent. agar, the sodium chloride content 0.5 per cent. and the pH about 7. An alteration in the pH from 5 to 10 had very little effect on the growth of these different fungi. We next eliminated the peptone from the test media, and tried the different amino-acids to see how they would act as a substitute for peptone. We found the following combination of amino-acids to give the best results; argenine nitrate, sodium aspartate and tryptophane. We had now a synthetic media containing 2.5 per cent. agar, sodium chloride 0.5 per cent., pH of 7 and the above-mentioned amino-acid. The different sugars had to be tested. We found that saccharose was not only the most stable sugar but also the most suitable for our media. We were therefore able to devise finally a synthetic medium for our secondary cultures;

it is stable, and can be obtained in a chemically pure state, it does not materially inhibit the growth of these fungi and prevents pleomorphism. The fungi are able to live in this medium for at least two months. All our primary cultures are made on Sabouraud's medium, and the subcultures next tested on the synthetic medium, in order to prevent pleomorphism, etc. The composition of the medium is as follows:—

Argenine nitras	..	0.1 grms.	Mercks.
Tryptophane	..	0.05 grms.	Mercks.
Sodium aspartate	..	0.5 grms.	Mercks.
Saccharose	..	0.4 grms.	
Agar	..	2.5 grms.	
Sodii chlor.	..	0.5 grms.	
Water	..	100 c.c.	

pH 7.

The growth after one month on this media is depicted in Plate V. The size is 15 mm. in diameter, the central portion is raised, black in colour, 10 mm. in diameter, around the raised area is a depression and outside this depression is a flat orange-coloured growth with fine radiating furrows. The medium is slightly pigmented. As a comparison in the same plate (Plate V) the appearances of *Trichophyton violaceum* are shown on Sabouraud's test medium and on our synthetic medium.

MORPHOLOGY.

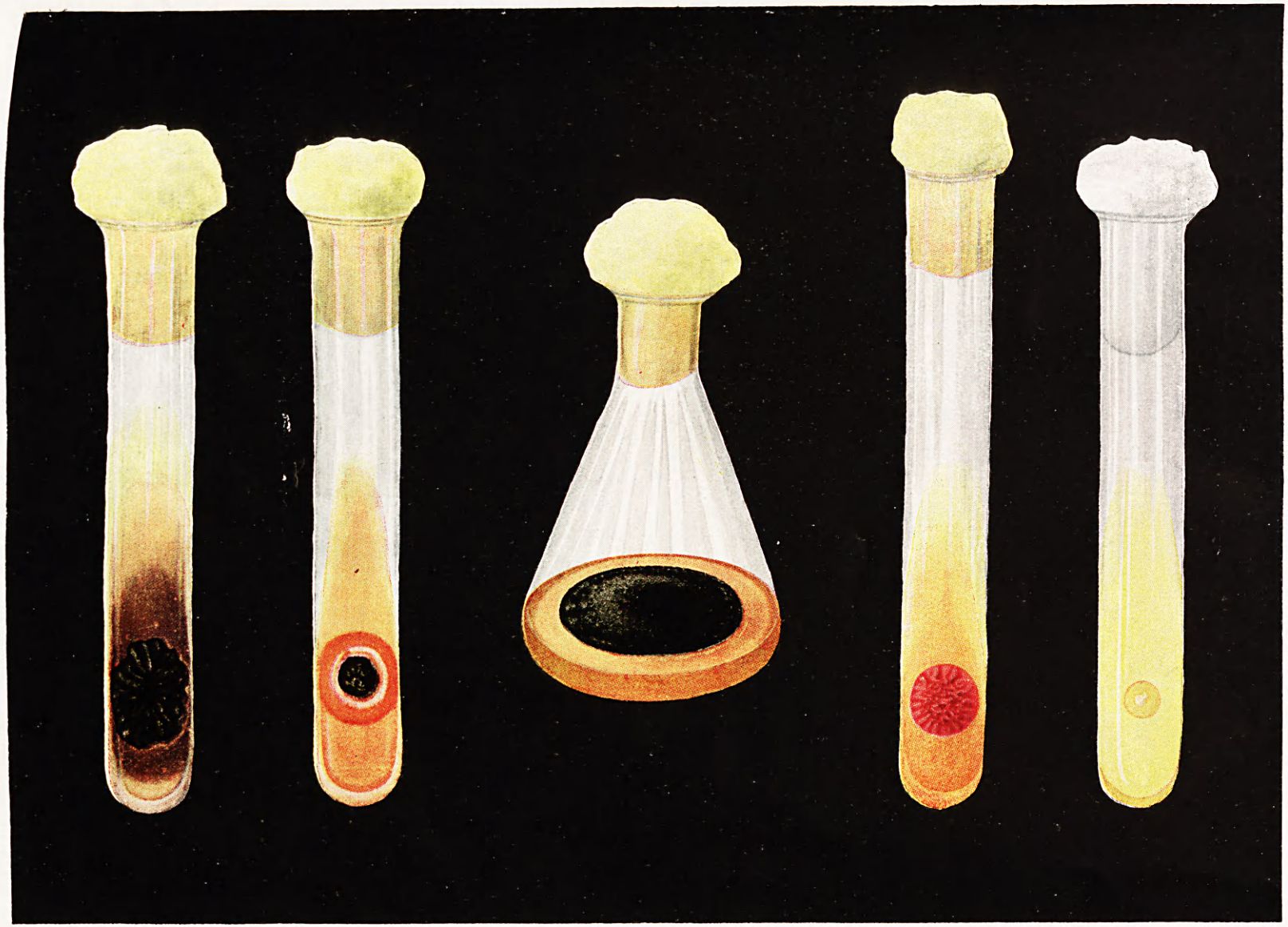
Plate VII, fig. 4, photomicrograph, 2|3rd inch objective No. 10 ocular, shows how the roots of the mycelium penetrate into Sabouraud's maltose agar after one month's growth. The sections were made as follows. The glass tube containing the culture was broken and freehand sections were made across the agar media by means of a Gillette blade. These sections are allowed to dry, fixed, and then stained with weak carbol fuchsin. The mycelium is seen to consist of three parts. There are a few aerial hyphæ carrying the end organs of fructification, most of which have been lost during section, drying, etc. A very thick felted mass of surface runners or surface hyphæ by means of which the growth of the mycelium extends over the surface of the medium by a centripetal spread producing the round appearance of the ringworm. From these surface runners or hyphæ, deep roots penetrate into the media and sometimes go as far as the glass on the other side of the test tube. When viewed laterally, these root hyphæ form solid masses, particularly if the medium has been broken and air allowed to enter the crevice.

In Plate VIII, fig. 5, photomicrograph of these root hyphæ, 1|6th inch objective, No. 10 ocular, the older roots are seen to be segmented and the younger roots non-segmented and more uniform in their staining. We have tried various methods to obtain the exact picture of the relationship of the aerial hyphæ in sections in the downy and non-downy portions of the mycelium, but we have so far failed in our object. So we have to describe the appearances seen in hanging drop culture on Sabouraud's media. Plate VIII, fig. 6, is a drawing made with an Abbé's camera lucida, the magnification being 1|6th inch objective and No. 10 ocular. A composite drawing gives a better idea than a photomicrograph as the aerial hyphæ are at different levels of focus. At the ends of the hyphæ are seen rounded uncoloured organs of reproduction, the chlamydospores. Along the hyphæ, thickenings of these elements will be seen as ovoid or rounded swellings, the intercalary chlamydospores. We have never observed any other variation in these aerial hyphæ except the two types of chlamydospores mentioned above.

In the pus taken from the recent pustules we have seen these end chlamydospores staining a deep purple with Manson's borax methylene blue and surrounded by a capsule.

Morbid histology of the pustules.—Plate VI, fig. 1, photomicrograph taken with the 2|3rd inch objective and No. 10 ocular, is a section made through an infected hair follicle with early pustulation. The abscess is seen forming at the top of the hair follicle and only extending half way down the follicle so as not to affect the hair roots. Thus in this type of ringworm there is no baldness. Infiltration of the surrounding corium is taking place which later on gives rise to induration. Plate VI, fig. 2, photomicrograph, 1|6th inch objective and No. 10 ocular, gives a magnified view of the pustule which is situated at the top of the hair follicle; whilst Plate VII, fig. 3, is a photomicrograph made with the same magnification as given above in Fig. 2. The inflammatory process extends as far down as the top of the hair bulb, but the hair bulb is not affected by it so that the growth of hair is not interfered with in any way.

The schematic position of the fungus.—Many observers might consider this species to be a new one and different from *Trichophyton violaceum*. The essential differences would be that one species attacks the hairs of the head and beard, the other those of the beard and body. In one the mycelium is violet in colour and in the other it has a mole-like velvety appearance. Now the classification of these ringworm fungi is based on the morphological appearances as seen in hanging drop preparations after one or two months' culture. In both of these fungi we have the same type of organs of fructification, i.e., end chlamydospores and intercalary chlamydospores, so that they appear to be similar in morphological appearances. We have next to decide (1) are these differences in colour or (2) is the situation of growth sufficiently distinctive to create different species? We have always observed in our studies that coloration of these fungal colonies is largely a question of media. This is seen in Plate V. The European variety of *Trichophyton violaceum* loses all its colour on our synthetic medium; this may be perhaps due to continual laboratory cultivation; whilst our cultures become less mole-like in appearance and approach the Sabouraud's cultures of *Trichophyton violaceum*. The growth of the fungi on different parts of the body is largely a question of suitability of soil and not a



Cultures of *Trichophyton violaceum*. One month old cultures—reading from left to right. Variety *indicum*, on Sabouraud's maltose agar, synthetic media, and on an Erlenmayer's flask of maltose agar. The European variety of *Trichophyton violaceum* on Sabouraud's maltose agar and on synthetic media.

PLATE VI.

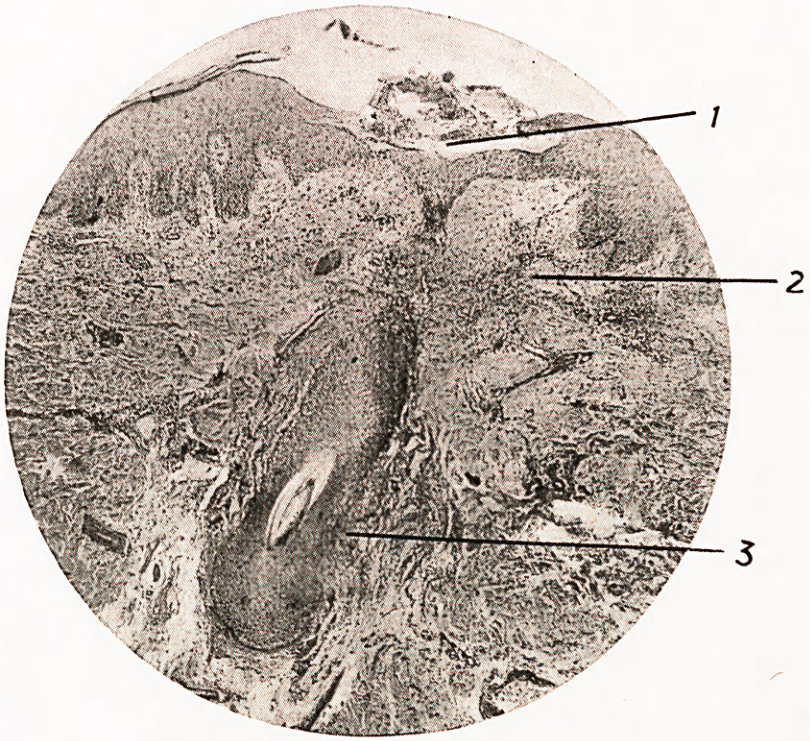


Fig. 1.—Section through an infected hair follicle: (1) Note the abscess at the upper part of the hair follicle; (2) infiltration of the corium; (3) hair root. (2|3rd Objective and No. 10 Ocular.)

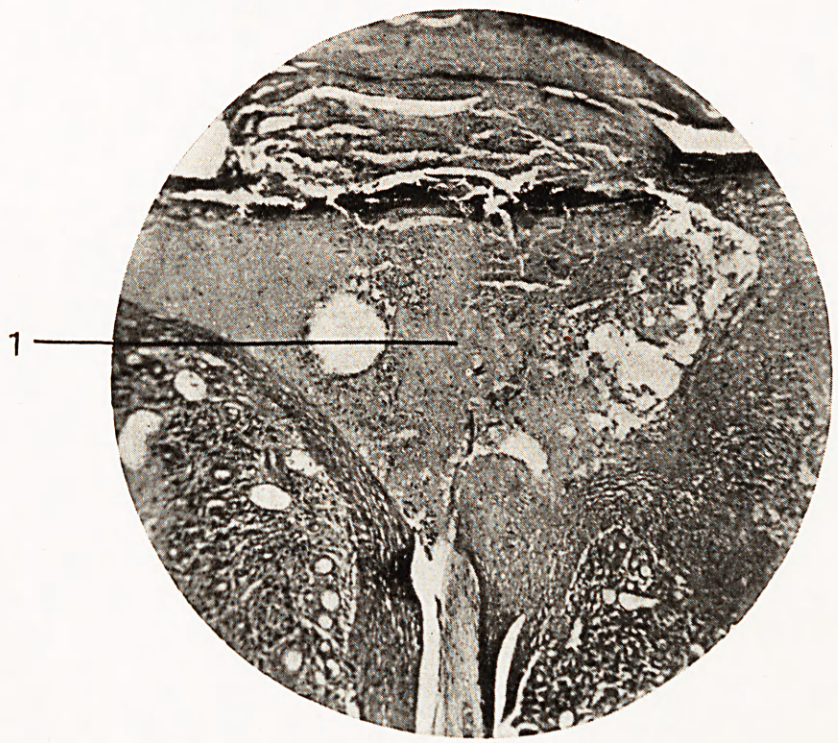


Fig. 2.—Magnified view of the pustule at the top of the hair follicle. (1|6th Objective and No. 10 Ocular.)

PLATE VII.

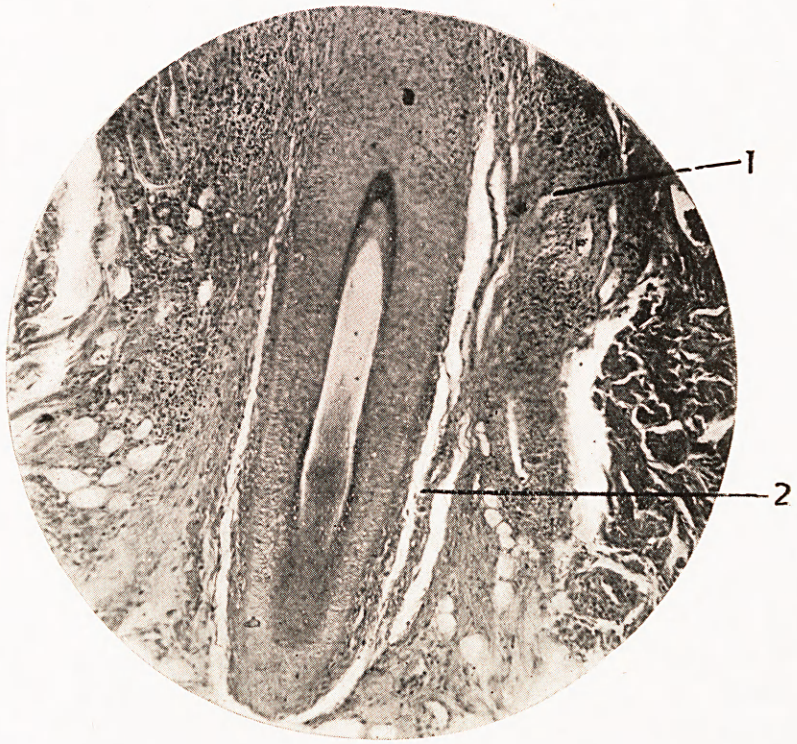


Fig. 3.—(1) Induration extending as far as the hair root; (2) hair root not affected by the inflammatory process. (1|6th Objective and No. 10 Ocular.)

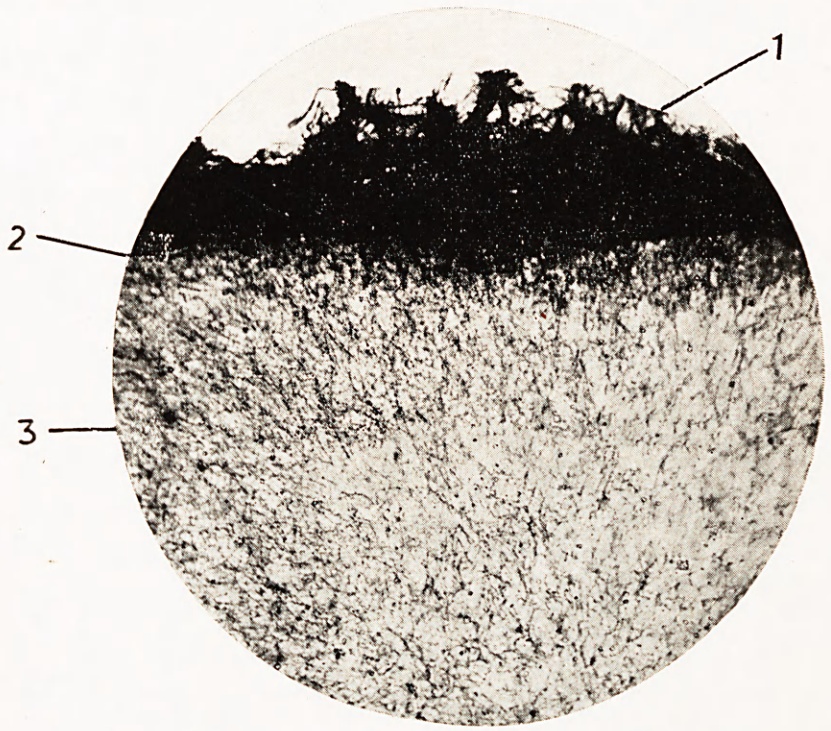


Fig. 4.—Section of the growth on maltose agar: (1) Aerial hyphæ; (2) surface runner; (3) roots. (2|3rd Objective and No. 10 Ocular.)

PLATE VIII.

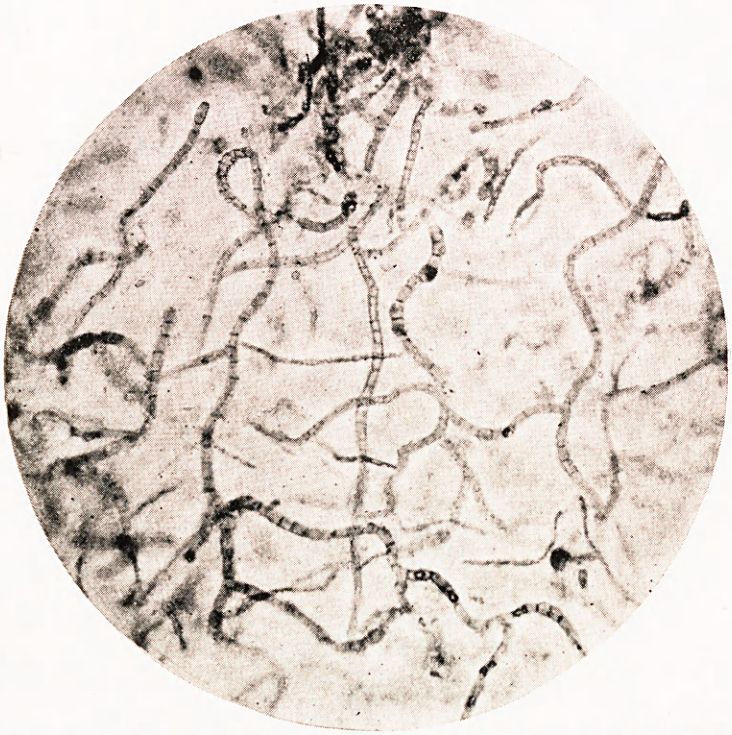


Fig. 5.—Roots more highly magnified, the older roots are segmented. (1|6th Objective and No. 10 Ocular.)

Fig. 6.—Hyphæ with intercalary and end chalamydospores. (1|6th Objective and No. 10 Ocular.)

species or generic character. We have found from time to time a typical species that only invades the hair, occasionally may attack the glabrous skin, and conversely we have also found a typical ringworm of the cruris type attack the hair of the head and produce kerion. As both these characteristics, i.e., colour of the growth and site of attack, are variant characters they cannot be significant of generic or species differentiation. We must fall back on the morphological characters and in both these fungi they are the same. We therefore regard the *Trichophyton* under investigation as a variant of *Trichophyton violaceum*, and we propose to call this subvariety *indicum*. As far as we are aware, most botanists do not consider colour variations in the flowers of plants to be distinctive enough to create a new species. The description of new species based on variant characters may gratify the personal vanity of some workers in seeing their names attached to species or even genera, but the multiplication of species is a nuisance to the student and teacher in these subjects.

TREATMENT.

At the commencement of our research when we had recognised the condition as a separate clinical entity we had not found out the cause. We thought at first that it was a chronic staphylococcal infection which was aggravated by the cross rub of the *dhotie* or *sari*. Vaccine therapy was given a very extensive trial, the vaccine used being a mixed one containing 1,000 millions of both *Staphylococci*, i.e., *aureus* and *albus* per c.c., and graduated doses were given every third day until a maximum dose of 1 c.c. was attained, and then the intervals between each serial injection was increased to once a week. The net result of this treatment was that the secondary staphylococcus infection was kept under control as long as the immunisation was continued, but the condition became as bad as ever a few weeks after the course was discontinued. Of all the local remedies, the best application was Lotio Calaminæ Extra B.P. which was used as an evaporating lotion and helped to keep down the inflammation and induration. Any strong parasiticidal agent as chrysarobin, etc., only increased the inflammation. When we had recognised the causation of the lesion to be a ringworm fungus, we next tried *x*-rays with very considerable success. We are indebted to Lt.-Col. J. A. Shorten, I.M.S., Honorary Radiologist to the hospital, for details of the technique which he employs in the *x*-ray department. The voltage is a current of 70,000 volts, Coolidge tube with radiator, and a resistance of 3 milliamperes. The distance from the target is 9 inches. Both unfiltered and filtered doses are used depending on the nature of the lesions. On the beard area, neck, usually ½-pastille doses are given, but on the legs a single-pastille dose is usually given. In extensive cases filtered doses are used through a 1-mm. aluminium filter; divided doses of ⅙-pastille doses are given twice weekly for six exposures or two ½-pastille doses at intervals of 3 days to each area. In all cases an interval of one month is allowed to elapse in order to allow the hairs to fall out and see if a cure has been established. Should a recurrence take place, owing to the difficulty of treating the whole area in extensive cases, the doses should be repeated with filtered or unfiltered rays. Although the *x*-ray treatment is very successful in its results, the number of cases that we were sending to this department put a considerable strain on the apparatus as well as keeping the operator busy from early morning to late in the evening. We are indebted to Lt.-Col. Shorten and Mr. Fleming for all the trouble and care they have expended on the treatment of these cases.

Whilst experimenting on the inhibition of the staphylococcus in obtaining pure cultures of this fungus we noticed the marked inhibitory effect of gentian violet on this fungus. We determined to give this dye a trial in the disease. During the last 18 months we have treated at least 60 cases with very satisfactory results. We used a 5 per cent. solution of gentian violet which is painted on the infected area three times a day; a cure usually takes place in three weeks. Any pustules that are seen round the hair follicles are opened up with a sterile needle, and a drop of the gentian violet lotion dropped into the opened pustule. We have used weaker solutions of the dye, such as 2 per cent., but it was too weak and the cures took longer to occur. The only objection to the treatment is the staining of the skin a deep blue colour; the dye also stains all the clothes in that area. The poorer classes raise no objection to these disadvantages, but with Europeans it means that they have to remain at home or come into hospital for treatment. In some intractable cases, in which the patient gave a history of having tried all the well-known parasiticides such as chrysarobin, during a period of 10 to 15 years without success, we have produced a cure in three weeks by painting the infected area with 5 per cent. gentian violet solution. We now rarely have to send any cases for *x*-ray treatment as the ordinary case is so easily cured by this dye. When there is marked induration round the hair follicles the dye cannot penetrate so deeply into the corium and it is necessary to use *x*-rays for treatment.

CONCLUSIONS.

(1) In India there is an intractable folliculitis attacking the upper part of the hair follicles of the beard area, neck, chest, arms and legs which is known as "cooly itch."

(2) The lesions are more commonly seen in men than women and chiefly amongst the poorest classes.

(3) The infection is due primarily to a ringworm fungus with secondary staphylococcal infection.

(4) The fungus is closely allied to the Achorions in its morphological characters.

(5) It differs slightly in cultural characters, etc., from the species now known as *Trichophyton*

violaceum, but not sufficiently to justify its description as a separate species.

(6) The disease can now be cured by the application of a 5 per cent. gentian violet solution painted on the area thrice daily for three weeks.

(7) When marked induration of the corium is present, epilation of the hairs by *x*-rays may be necessary to bring about a cure.

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A NOTE ON THE VALUE OF MEDICINAL TREATMENT IN CHOLERA.

By DR. J. WALKER TOMB, M.A., M.D., D.P.H., O.B.E.,
Asansol Mines Board of Health.

BELOW is given a table (Table I) recording the detailed analysis of the results of treatment by various specified methods in 723 cases of cholera in the Asansol Mining Settlement during the years 1927-28. The remedies commonly employed in the settlement in the treatment of cholera are carminative "cholera mixtures," generally containing chlorodyne or some similar preparation of opium, saline injections, homœopathy, and the essential oils' cholera mixture.

TABLE I.

Detailed analysis of the results of treatment by various methods of 723 cases of cholera in the Asansol Mining Settlement during the years 1927 and 1928.

Treatment.	NOT COLLAPSED before treatment was commenced.			COLLAPSED before treatment was commenced.		
	Cases.	Deaths.	Percentage case mortality.	Cases.	Deaths.	Percentage case mortality.
"Cholera Mixtures" ..	245	45	19·6	263	192	73·0
Saline Injections ..	11	2	18·2	51	24	47·1
Homœopathy	38	5	13·2	30	22	73·3
Essential Oils Mixture ..	41	3	7·3	44	21	47·7
Untreated ..	..	..	..	102	95	93·1

By the term "cholera" here is meant a disease exhibiting the four clinical symptoms of diarrhœa, vomiting, muscular cramps and suppression of urine. In a considerable number of the cases analysed the clinical diagnosis of the disease was supported by bacteriological examination, though this in my opinion is quite unimportant where the four clinical symptoms referred to above are present, more especially in endemic areas and during epidemic times. Cases of vomiting and diarrhœa only ("choleraic diarrhœa") which did not progress to the stage of cramps and suppression of urine are not included in the analysis, even though proved on bacteriological examination to be associated with the *Vibrio choleræ.* It will be observed that the mortality rate amongst the untreated in this series of cases (Table I) was 93 per cent., a rate which is closely in accord with the average mortality rate of 91 per cent. recorded in Table III of the larger series of 398 untreated cases over the period 1922—28.

From the detailed analysis of treatment submitted in Table I it will be observed that the mortality rate from treatment of non-collapsed cases of the fully established disease with ordinary carminative "cholera mixtures" is approximately 20 per cent., representing a saving of no less than 70 per cent. of lives as compared with untreated cases. Even amongst the cases which were collapsed before treatment with such "cholera mixtures" commenced, it will be seen that the mortality rate was only 73 per cent. compared with a mortality rate of 93 per cent. amongst untreated cases representing a saving of 20 per cent. of lives. The widely prevalent idea that medicinal treatment in cholera is of little or no value is therefore entirely erroneous and cannot be too strongly controverted.

It will be noted with some interest from Table III that homœopathic treatment in cholera is considerably better than no treatment at all, the mortality rate amongst 369 cases (both collapsed and non-collapsed) receiving homœopathic treatment, being 47 per cent. compared with a mortality rate of 91 per cent. in untreated cases. From the detailed analysis in Table I it will be observed that the mortality rate amongst 38 non-collapsed cases receiving homœopathic treatment was 13 per cent. and amongst 30 collapsed cases 73 per cent. This result may be due partly to suggestion—a factor common to all treatment—and partly to the fact that the common homœopathic remedy for cholera in the Mining Settlement consists of spirits of camphor, a valuable antispasmodic and carminative.

The mortality rate (7.3 per cent.) amongst the 41 non-collapsed cases treated with the essential oils' mixture in the series of cases analysed in Table I will be seen to compare most favourably with the mortality rates amongst the non-collapsed cases treated by other measures, and it is of great interest to note that even amongst the 44 cases in this series which were collapsed before treatment with the essential oils' mixture commenced the mortality rate was only 48 per cent.; proving that even in collapsed cases where saline injections are not available, as is so frequently the case in field work, recovery may take place in a considerable percentage of cases with appropriate medicinal treatment. Saline injections are however specifically indicated in all collapsed cases (in conjunction with approved