and when the diagnosis is plain and the case a typical one such as textbooks describe, treatment is too often of no avail. It is not very uncommon to find a case of this disease in an advanced stage but able to read $\frac{5}{6}$ and 1 J., but when one examines the field of vision one finds it contracted to very small limits. This is, of course, because the intraocular pressure operates first on the periphery of the retina, where the vascular supply is more easily compressed than it is in the central portion.

It is difficult to give any "tip" for the diagnosis of chronic glaucoma. It always attacks both eyes, I think, but not together, so that if one eye has been lost from it you may expect it in the other. If you can make out that the tension is increased, you are safe in diagnosing it; but you are not safe in saying that a case is not chronic glaucoma because there is no increase of tension, because the tension varies a great deal in some cases, though it is probably increased at times in all. Nothing less than a careful routine examination of the eye and its functional power will suffice for making a diagnosis in an early stage.

Cataract.

There is one silly little mistake which I have made dozens of times, but have not communicated to the patient, in diagnosing cataract by focal (or side) illumination only. In some elderly people the hardened lens reflects the light in such a way as to give the pupil a milky appearance, which is not unlike the pearly reflection of a mature cataract. There is not necessarily cataract present in such a case, and the diagnosis is not good unless you can confirm it with the ophthalmoscope. With a plane mirror at the usual distance for indirect examination throw a light through the pupil on to the fundus. If cataract is present in the pupil you will see the red reflex interrupted by black streaks or dots or spots; or, better still, scrutinize the lens by the direct and close method, and with a +25 D. lens in your ophthalmoscope. That will show you the most minute traces of lens opacity, but requires some expertness. The former method is quite sufficient for all practical purposes, and extremely simple.

CONCLUSION.

I have not exhausted the category of mistakes, and I have not mentioned the question of fundus conditions which cannot well be discussed until they have been demonstrated.

It was not my purpose to deal with the rarer conditions of disease or traumatism, or to exhaust the possibilities of the eye as a field for making mistakes in. I have contented myself, and I expect tired you, with the common mistakes in ophthalmic practice.

THE VALUE OF SOME LACTIC ACID FERMENT PREPARATIONS FOR INTESTINAL THERAPY.

BY

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DURING the course of an investigation upon faecal organisms it was found necessary to determine the inhibitory action of certain types of lactic acid bacilli. Some of the bacilli were isolated from ten commercial lactic acid ferments, and it was suggested to us that a statement of our observations might be of interest to those who use these ferments in everyday practice.

The majority of these ferments are sold in the form of dry tablets, obtained by inoculating the milk with an organism, evaporating, and then compressing the residue, or by mixing a dried culture of the organism with a suitable excipient. These tablets are directed to be added to milk which has been boiled for a short time and then allowed to cool; the milk is then to be kept at blood heat for six to eight hours. After this period of incubation the milk is said to be sufficiently "soured" for therapeutic uses. In a few cases it is advised to dissolve the tablets

in sweetened water before consumption. The object of these procedures is the introduction of lactic acid bacilli into the ileum and colon in order to inhibit the action of putrefactive bacteria.

The results of the simple experiments we have carried out tend to show that the ferments at present on the market do not achieve the end in view, and they suggest that until there is a decided improvement in the processes of manufacture the dangers attendant upon the use of these tablets outweigh their benefits. Whenever the treatment is specifically indicated it would be well to obtain young, active, and specially adapted (aërobic and anaërobic) cultures in a fluid medium from local public health or other laboratories, and to determine the efficacy of the organism by bacteriological examinations of the faeces. With suitable media and precautions, such a proceeding need not involve more than the outlay of a few shillings, and the ultimate expense will be considerably less than that occasioned by the longer haphazard medication with inert or inefficacious material.

Development of Acidity.

Since the ferments are used in connexion with milk, we first determined the acidity developed in raw, pasteurized, and sterilized milk during incubation at blood heat. It will be seen from Table I that in pasteurized and sterilized milk a considerable amount of acid is formed, and that it is necessary to sterilize the milk on two successive days in order entirely to free the milk from micro-organisms.

TABLE I.—The Acidity Developed in 25 c.cm. of Milk during Incubation in Sterile Flasks at 37° C. (98.5° F.).

	Acidity when received. Deci-normal Alkali.	24 hours. Deci-normal Alkali.	72 hours. Deci-normal Alkali.	96 hours. Deci-normal Alkali.
Raw milk	12	25.0	96.0	—
Pasteurized milk	6	11.5	19.5	21.0
Pasteurized milk, the acid produced each 24 hours being neutralized	6	11.4	30.9	63.4
Pasteurized milk heated to 100° C. for 1 hour	6	13.0	29.0	36.5
Pasteurized milk heated to 100° C. for 1 hour on two successive days	6	—	—	—

These figures emphasize the observations of Robertson and Muir,¹ who found that:

Milk pasteurized at 70° C. for 30 minutes killed off cocci, lactic acid *coli*, *proteus*, and ordinary pathogenic bacilli.
Milk heated to 100° C. for 1 to 1½ hours killed off anaërobic spore-bearing bacilli, including *Bacillus enteritidis*.
Milk heated to 100° C. for 2 hours killed off *subtilis* group and aërobic spore-bearing bacilli responsible for summer diarrhoea.

As it rarely happens that the domestic heating of milk ensures complete sterilization, it is obvious that the addition of "ferments" to milk partly sterilized induces considerable antagonism between the added bacilli and the unkilld organisms, which, freed from the restraint of the ordinary milk bacteria, are multiplying more rapidly than usual. In summer time some of these resistant organisms possess pathogenic properties, and their free growth is not without danger. If this form of treatment demands the "souring" of milk, it is obvious that the process should be carried out with new milk collected under cleanly conditions. The slight bactericidal properties of fresh milk may then act upon undesirable organisms and the lactic acid bacilli outgrow other bacteria. As this, however, requires several days for completion, we are forced to the conclusion that the conditions of the collection and sale of milk in this country make it an untrustworthy vehicle for the administration of this medicament. It is better, apparently, to discard milk and to administer the cultures in a liquid sugar medium.

I.—The Acid Contents of the Tablets.

It appeared to be worth while to determine the acidity of each tablet in order to ascertain the activity of the medium from which the tablet was prepared. The figures

obtained show considerable variation (vide Table II). The smaller amounts are from those tablets which consist of a mixture of dried bacilli and sugar only.

TABLE II.—*The Acidity Obtained by Dissolving the Tablets in 25 c.cm. Distilled Water in Terms of Decinormal Alkali.*

Sample No.	7*	...	...	...	...	c.cm.
Sample No. 7*	...	...	...	...	...	0.5
" No. 4	...	...	...	...	...	0.4
" No. 6	...	...	...	...	...	0.05
" No. 8	...	...	...	...	...	0.2
" No. 5	...	...	...	...	...	1.8
" No. 1	...	...	...	...	...	0.5

*The numerals are adopted for convenience only. They have no relation to the order in which the preparations are cited.

Morphologically the appearances of the organisms differ widely. Some tablets contain bacilli which accord with Metchnikoff's classic descriptions: in other preparations diplococci, sporulating bacteria, and streptobacilli, or yeasts are also present.

Speaking generally, there is no growth on McConkey's medium, but luxuriant cultures are obtained in peptone broth, nutrient broth, dextrin, glucose, saccharose, lactose, salicin, glycerine, and raffinose, and on nutrient agar. Sorbite, galactose, maltose, inulin, dulcitol, and malachite green broth rarely act as suitable media. Nitrates are only reduced by one or two types and indol reactions are not obtained.

II.—Variations in the Power of the Tablets in Each Sample.

The power of the tablets may be ascertained by incubating measured quantities in a 1 per cent. lactose solution. Their activity should be determined by incubation in a lactose solution to which carbonate of lime is added in excess. The capacity of multiplication is another factor for estimation, and from our standpoint one which is of prime importance. These factors often show considerable variations, so that they must be severally investigated.

In Table III are recorded the "powers" of the tablets. It will be seen that there are pronounced differences between the samples examined, and between individual tablets from the same batch. This may to some extent account for the complaints of irregular "souring." In some instances the acidity developed after twenty-four hours is not greater than when the original tablet is dissolved in distilled water.

TABLE III.—*Variations in the Power of the Tablets of Each Sample. Estimations of the Acidity Produced in Milk by adding One Tablet to 25 c.cm. of Sterilized Milk or 1 per cent. Lactose Solution free from Carbonate of Lime (in Terms of Decinormal Alkali). Incubation Period, 48 Hours at 37° C.*

	Tablet 1	Tablet 2	Tablet 3	Tablet 4	Tablet 5	Tablet 6
Sample No. 5	2.0	0.5	0.6	0.4	0.4	0.2
" No. 1	7.1	6.1	4.2	2.8	2.8	1.8
" No. 8	0.3	0.3	0.2	0.2	0.2	0.2
" No. 4	4.0	3.6	3.6	3.4	2.8	2.8
" No. 6	0.4	0.3	0.3	0.2	0.2	0.2
" No. 7	0.7	0.6	0.6	0.6	0.6	0.6
" No. 2	3.5	3.2	2.6	2.6	2.4	2.1
" No. 3	0.7	0.6	0.5	0.5	0.5	0.4

It may be well, however, to point out that the best acidifiers are by no means the best multipliers and that the amount of curd is not an index of the capacity of the organism to pass through the alimentary canal.

III.—The Activity of the Ferments in Pasteurized, Partly and Fully Sterilized Milk, and in Lactose Solution.

The figures given in Table IV represent the activity of the ferments. It will be seen that pasteurized milk

without the addition of a tablet yields approximately the same amount of acid as that produced after the addition of the ferment. From Table V it appears that the ferments possess more power than the proliferating organisms of pasteurized milk. During the first twenty-four hours only three of the samples show any marked acidity; the others are not more acid than the pasteurized milk. Some of the ferments inhibit the action of the normal acidifying organisms.

TABLE IV.—*The Acidity Produced in 25 c.cm. of Pasteurized Milk by the Lactic Acid Bacilli after Daily Neutralization of the Acid Produced, and Incubation at 37° C.*

	24 Hours. Decinormal Alkali.	48 Hours. Decinormal Alkali.	72 Hours. Decinormal Alkali.
Pasteurized milk without addition of organisms	5.4	30.9	63.4
Sample No. 9 added to milk...	5.4	33.4	84.4
" No. 7 " " "	5.6	27.1	72.1
" No. 8 " " "	6.6	31.7	70.7
" No. 6 " " "	5.6	26.1	64.1

TABLE V.—*The Acidity Produced in 25 c.cm. of Pasteurized Milk by the Lactic Acid Bacilli without Daily Neutralization. Incubation at 37° C.*

	24 Hours. Decinormal Alkali.	72 Hours. Decinormal Alkali.	96 Hours. Decinormal Alkali.
Pasteurized milk without addition of organisms incubated at 37° C.	5.5	13.5	15.0
<i>B. lactis aerogenes</i> ...	15.0	24.4	32.5
Sample No. 9 ...	5.4	28.0	51.0
" No. 7 ...	5.6	21.5	45.0
" No. 6 ...	5.6	20.5	38.0
" No. 8 ...	6.6	25.5	38.0
" No. 4 ...	12.0	20.2	26.8
" No. 2 ...	8.5	24.2	25.9
" No. 5 ...	12.5	14.0	14.5
<i>B. coli communis</i> ...	7.0	10.5	14.0
Sample No. 1 ...	5.0	13.3	13.2
" No. 3 ...	14.0	5.2	4.2

The manufacturers do not advise the use of pasteurized milk. According to the directions it is necessary to bring the milk to the boil—some go so far as to recommend the difficult task of keeping it on the boil for one hour—then to cool it, and after adding the tablets to keep it at blood heat for six to eight hours. In Table VI the results of an attempt to follow the instructions given are recorded, and they represent what would be obtained by a nurse or housewife. The figures show that the unkilld organisms are able to grow rapidly in the milk, and that the introduction of the lactic acid bacilli produces an antagonism leading to a minimal growth of both types of organism and a small amount of acidity. When inert, or almost inert, tablets are added to the milk, it is evident that the spore-bearing organisms of the milk have it all their own way, and as such bacteria sometimes act as intestinal irritants, the process cannot be considered as a safe one. Were it possible, however, for the "souring" to be obtained within six to eight hours this danger would be only trifling; but this time is far too short for the hibernating bacilli to regain their normal activity, and upwards of sixteen to twenty-four hours is the average period necessary. Table VII shows the conditions when the spores are all destroyed, and the tablets exhibit their maximal characters.

TABLE VI.—*The Acidity Developed in 25 c.cm. Pasteurized Milk Heated to 100° C. for One Hour and then Incubated at 37° C. after the Addition of Comparative Quantities of Various Lactic Acid Ferments.*

	24 Hours. Deci-normal Alkali.	96 Hours. Deci-normal Alkali.
Milk alone	13.0	36.5
Sample No. 6 added to milk ...	17.0	43.0
„ No. 7	13.5	46.0
„ No. 2	12.0	55.5
„ No. 9	12.0	50.5
„ No. 10	8.5	46.0
„ No. 1	6.0	63.0
„ No. 8	4.0	16.0

TABLE VII.—*The Acidity Produced by Lactic Acid Bacilli in 25 c.cm. Milk Sterilized at 120° C. for Fifteen Minutes on Two Successive Days. Incubation at 37° C.*

	24 Hours. Deci-normal Alkali.	72 Hours. Deci-normal Alkali.
Sterilized milk alone	—	—
Sample No. 4 added to milk ...	24.1	99.2
„ No. 2	23.0	53.2
„ No. 7	21.4	45.7
„ No. 9	10.5	21.6
„ No. 6	8.9	15.4
„ No. 8	10.4	14.6

IV.—*The Inhibiting and Antagonizing Action of the other Organisms present in Milk.*

We have already remarked upon the inhibitory action of the milk organisms upon the lactic acid bacilli. The following table points the moral. When *B. coli* are present in milk they reduce the activity of any added lactic acid bacilli. In this instance comparative quantities of *B. coli* and *B. acidi lactici* were added to a sterile lactose solution, and in many cases the acidity produced was less than that produced by the lactic ferments alone. We may fairly assume that with the ordinary "souring" of milk the conditions are more complex, and that it is too much to expect the dried bacilli to attain their dominating characters until the other organisms have developed a strong antagonism.

TABLE VIII.—*The Activity of the Lactic Acid Ferments in 1 per cent. Lactose Solution, and the Inhibiting and Antagonising Action of other Organisms.*

To 25 c.cm. of a 1 per cent. freshly prepared lactose solution $\frac{1}{2}$ c.cm. of a twenty-four hours' growth of the organism in nutrient peptone was added. The mixture was then incubated at 37° C. (98.5° F.).

	24 Hours. Decinormal Alkali.	48 Hours. Decinormal Alkali.
<i>Bacilli coli communis</i>	0.1	6.0
Sample No. 2	3.0	21.5
„ No. 2 + <i>B. coli communis</i> ...	6.3	9.7
„ No. 5	0.60	4.0
„ No. 5 + <i>B. coli communis</i> ...	1.0	5.8
„ No. 1	0.3	12.0
„ No. 1 + <i>B. coli communis</i> ...	0.1	9.5
„ No. 3	0.3	4.5
„ No. 3 + <i>B. coli communis</i> ...	0.1	4.3
„ No. 4	0.2	10.1
„ No. 4 + <i>B. coli communis</i> ...	0.2	8.0

V.—*The Multiplication of the Lactic Acid Bacilli.*

During the passage of the lactic acid ferments into sugar and other media a good growth was invariably obtained in peptone water. Fournier² points out that with certain true lactic ferments the lactic acid output may exceed 100 per cent. in the presence of peptone, and this without giving rise to any simplified nitrogenous product, or to any putrefactive one particularly. It is evident, therefore, that peptone water is essential for the multiplication of the bacilli. Crithari³ has recently observed that the lactic acid bacilli grow best in an acid medium, and Cohendy devised a medium composed of lacmus milk containing 3.5 grams lactic acid per litre. Palier,⁴ however, working lately in Boas's laboratory, finds that gastric juice kills bacteria with ease, and considers that the lactic ferments are devitalized before they reach the intestine.

As the lactic acid treatment aims at intestinal therapy it seemed advisable to subject the tablets to the action of an artificial gastric juice. After some preliminary failures a medium was found which was comparable with gastric juice and yet contained stimulating pabulum. This medium later proved to be a very useful means of isolating the organisms from the dejecta, and a valuable form of enrichment. Table IX shows that a proportion of the tablets did not survive this test. The small amount of acid contained in these tablets (vide Table II) suggests that the organisms were not prepared from a very acid medium, and that, in order to safely navigate the gastric sea, the bacilli should be trained to appreciate an acid medium; in other words, the medicament should be a culture grown and administered in an acid broth.

TABLE IX.—*The Growth of Comparative Quantities of Lactic Acid Ferments in an Artificial Gastric Juice Media.*

Samples No. 9, 6, 10, 3, 2 ...	...	Good growth
„ No. 7, 5, 4 ...	...	Poor growth
„ No. 1, 8 ...	...	No growth

VI.—*The Action of Aërobic and Anaërobic Faecal Bacteria upon the Lactic Acid Bacilli.*

Tables X and XI contain the results of the interaction of normal and pathogenic bacteria and the lactic ferments. It shows that very few of the preparations are sufficiently active to overcome the faecal bacteria, and that an acid medium is an important factor in the process.

TABLE X.—*Activity of the Lactic Ferments in Presence of Aërobic and Anaërobic Faecal Organisms.*

Measured quantities of the organisms and of an emulsion of faeces were mixed together and incubated at 37° C. for varying periods. Cultures were then made in acid and neutral broth, and the organisms plated on agar and McConkey's medium.

Sample No. 6.	48 Hours.		96 Hours.		5 Days.	
	Number of Colonies.	Types of Colonies.	Number of Colonies.	Types of Colonies.	Number of Colonies.	Types of Colonies.
<i>Acid Broth.</i>						
Nutrient agar	24	2	25	1	38	1*
McConkey's medium...	5	1	0	0	0	0
<i>Neutral Broth.</i>						
Nutrient agar	20	3	1	1	0	0
McConkey's medium...	26	2	0	0	0	0

* Sample No. 6.

Sample No. 2.—Three colonies (one type) after 5 days in acid broth.

„ No. 1.—No colonies after 5 days in either broth.

„ No. 8.—No colonies after 5 days in either broth.

VII.—*The Passage of Lactic Acid Ferments through the Alimentary Canal.*

It is a generally accepted statement that the lactic acid bacilli appear in the faeces about five days after being taken by the mouth, and that the total amount of faecal

bacilli is at once diminished, the lactic acid bacilli being easily demonstrable in the dejecta for some time afterwards. We find, however, that with suitable doses of enriched cultures accustomed to live under anaërobic conditions, and administered in a specific acid medium, there is no difficulty in demonstrating the presence of the bacilli in the stool passed the following morning.

It is not an easy matter to recognize the various lactic acid bacilli in the faeces, and only when we adopted the acid "gastric" medium referred to did we find the procedure at all simplified. By this means, however, the recognition is neither difficult nor tardy, and the practitioner is assured of a practical demonstration of the object he aims at.

These lactic acid bacilli are not in their natural habitat when transferred to the colon, and it is curious that their life in the intestine is about the same as it is in artificial media—namely, about five to seven days. This seems to be the period when another dose is indicated. The fact suggests that we must not expect these bacilli to become acclimatized to the intestine easily, and must regard them rather as temporary interlopers, our object being to allow the normal flora to regain their sway as soon as the objectionable putrefactive anaërobies are overcome.

Passage of Lactic Acid Ferments through the Alimentary Canal.

Tablets from the various preparations were taken by the mouth. When the organism appeared in the faeces the ingestion was stopped, and the faeces examined daily until the lactic acid ferment could no longer be isolated.

TABLE XI.

Period of Ingestion.	First Appearance in Faeces.	Disappearance from Faeces.
Tablet (1), Feb. 1st to 10th	No appearance	—
Tablet (6), Jan. 30th to Feb. 3rd	No appearance	—
Tablet (3), Jan. 30th to Feb. 1st.	February 1st	February 4th
Culture, Feb. 1st to 2nd	February 2nd	February 8th
Culture (6), Feb. 3rd to 4th	February 4th	February 10th

It only remains to make the deduction that even the best present commercial preparations are not sufficiently and regularly active for routine use, and that freshly prepared fluid cultures should be employed when lactic acid therapy is indicated. The activity and power of the organisms in producing acids cannot be taken as an index of their multiplication and inhibitory action upon other organisms, and it is probable that no one organism can be regarded as efficacious in every case. When an organism fails to produce the desired result, certain laboratory tests may indicate the selection of bacilli possessing other characteristics. It should also be borne in mind that the lactic acid therapy is only indicated when the putrefactive anaërobic organisms are present in the faeces in excess, and that without such a guide this form of medication may aggravate rather than ameliorate the intestinal conditions.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, vol. i, 1904. ² Fournier, *Coombe's Intestinal Auto-intoxication*, p. 444, Rebman, London, 1909. ³ Crithari, *Comp. Rend. de Soc. Biologie*, 1908, p. 818. ⁴ Palier, *Boas's Archiv*, 1908, Bd. 14, p. 312.

MESSRS. HARVEY FROST, who are well known as the manufacturers of a very useful portable tyre vulcanizer, have issued a pamphlet, which they will present to persons interested, containing certain particulars of various motor tyres upon the market. No opinions are expressed upon their relative merits, but it contains some useful hints as to the management and repair of tyres. Specimens of all those mentioned can be seen at Messrs. Harvey Frost's, 27, Charing Cross Road, where they are not on sale, and therefore can be inspected and compared without any order being expected.

An Address ON MINING ACCIDENTS:

WITH
AN ACCOUNT OF THE USE OF OXYGEN IN A
COALPIT ACCIDENT.

DELIVERED TO THE STIRLING BRANCH OF THE BRITISH
MEDICAL ASSOCIATION

By JAMES ROBERTSON, M.B., C.M.,

CLACKMANNAN; PRESIDENT.

GENTLEMEN,—I accept it as an honour to have been asked to address you, and I hope that what I have singled out of my scrapbook may be of interest.

COMPLETE DISLOCATION OF KNEE-JOINT.

In the following case there are three points to which I desire to call particular attention:

1. The free mobility of the limb at the knee-joint. One of the classical signs of a dislocation is no movement where there ought to be movement; in dislocation of knee-joint there is increased mobility, and mobility in every direction.

2. The floating patella, which simulated a patella in a case of acute synovitis with effusion; the difference being that upon comparison with the other limb the patella was 3 in. higher.

3. Was the entire absence of pain due to the amount of crushing and local stunning of tissue and nerves from the violence of the wrench?

J. M., a drawer, aged 20, was brought home from his work injured on February 19th. He stated that a hutch containing a load of coal—total weight 15 cwt.—was proceeding down an incline when it left the rail. He went in front to replace it, and when he had done so it ran away, catching his foot between the hutch and a sleeper, the toe of his boot being caught by the sleeper, his heel by the hutch; the hutch, moving on, carried his foot to extreme flexion, when the hutch broke and tilted upon his leg. He became helpless and was removed home.

Condition on Examination.

The limb was shortened and the region of the knee-joint enlarged; there were several bruises between the knee and ankle on the posterior aspect of the leg; the limb was freely movable in any direction at the knee-joint; neither crepitus nor any other sound elicited; there was no pain. Posteriorly the entire articular surface of the femur was felt, the rounded condyles and the notch between them. Anteriorly the patella was freely movable in any direction, and could be pressed down upon the anterior aspect of the femur. The rectus femoris was raised from the femur, and could be grasped easily with the fingers upon displacing the patella; the entire articular surface of the tibia could be felt; the cup-shaped depressions, with the spinous processes; the crucial ligaments could be felt torn; no pulsation could be felt in the tibial arteries at the ankle-joint.

Treatment.

I administered chloroform and set the joint by grasping the ankle with my right hand, placing the femur near the knee on my left thigh, and combining extension with flexion, the joint replaced itself with a loud snap. I again examined, and found the parts normal so far as the bones were concerned, the patella gliding normally over the condylar surfaces, and the replaced joint moving normally and without pain. The limb was wrapped in wadding and a posterior splint applied.

On the day after the accident the patient complained of severe pain round the ankle, and described it like a rope tied tightly there. He had been restless all night. The knee-joint was greatly swollen, and the patella floating, owing to great effusion into the joint; there was no pain, except upon pressure. The foot was bluish and cold, and superficial sensation was lost; deep sensation was present, but feeble; several patches of skin on the leg were ecchymosed, and there were three small blebs, containing dark serum, in the popliteal space. These I pricked and dressed; the foot was rolled up in flannel, and a hot iron, also rolled in flannel, kept at it; a saline purge was given.

On the third day the swelling in the joint was greatly reduced, the bowels had moved, and he had had a good night, but complained of sharp shooting pains occasionally passing up the leg from the foot.

On the fourth day the knee was normal in size and looking well; the dressings were removed, and movement begun. Dry gangrene was starting in the toes; all sensation in the foot was lost, but there was hyperaesthesia round the ankle-joint. The gangrene gradually extended from the toes to the foot, until the patient was removed to the Victoria Hospital, Glasgow, for operation seven days after the accident—February 26th.