Table showing Incidence of Influenza among (a) Navy (a Patrol Base of average strength of 1,350); (b) Army (a Battalion of average strength of 1,050); (c) Gas Workers (Nine Gasworks, employing 148 men).

Epidemic.	(a) Navy.	(b) Army.	(c) Gas Workers.
July ...	321 = 23 %	100 = 9.5 %	5 = 3.3 %
Autumn...	125 = 9.2 %	110 = 10.4 %	5 = 3.3 %
Total ...	446 = 40 %	210 = 20 %	10 = 6.7 %

(d) At a National Cordite Factory.

The total number of employees, men and women, may be divided into the following classes:

Class A. Not working in fumes	...	732
Class B. Working in HNO ₃ fumes, full time	...	70
Class C. Working in HNO ₃ fumes, part time	...	230
Classes B and C	...	300
Class D. Working in acetone recovery stoves	...	18
Classes B, C, and D	...	318

Number of Cases according to Class and the Percentage.

Epidemic.	Class A.	Class B.	Class C.	Classes B and C.	Class D.	Classes B, C, and D.
July ...	121=16.5%	7= 4.9%	2=0.86%	9= 3%	0	9=2.7%
Oct. 16-29 ..	100=13.6%	4= 2.8%	2=0.86%	6=2%	0	6=1.8%
Total ...	221=30.1%	11=15.7%	4=1.7%	15=5%		15=4.7%

(e) Tin Workers.

The total number employed in the mine was 50. This number may be divided into Class A, workers underground, numbering 23, and Class B, workers in dressing plant who are working more or less in fumes of SO₂, numbering 27.

The ore is crushed in the stamps and passed over the water concentrators. The concentrate is roasted in ovens to get rid of the sulphur, and thus a large amount of SO₂ fumes is discharged into the building.

Number of Cases in the Autumn Epidemic according to Class, and the Percentage.

Class A	...	14 = 60.8 per cent.
Class B	...	3 = 11.1 "

The burning-house of this mine lies in a valley, and there are seven cottages, all situated within two hundred yards of the stack from which the SO₂ fumes are discharged. Under certain atmospheric conditions the fumes lie heavily on these houses. They have twenty-seven inhabitants, and only one case of "influenza" occurred among them, and he was one of the underground workers in the mine. A small village lies about a quarter of a mile distant, and quite outside the radius of the fumes. Here the cases were numerous.

(f) Other Classes of the Civil Population.

As influenza is not a notifiable disease it is impossible to get exact statistics of the number of victims. But taking into account the evidence we have, such as the death-rate, the number laid aside from work in the public civil services, the largely diminished attendances at the schools throughout the country, resulting in many places in closure, we are justified in saying that the case incidence must have been high. Then again, though the figures are much too small to warrant any definite conclusion, the numbers affected among the non-fume workers in the cordite factory may be taken as some indication of what happened among the general community. On the other hand, apart from the smallness of the numbers, it would be manifestly unfair to draw any conclusions from the cases occurring among the underground tin workers, as the conditions under which they labour lead to the easy diffusion of any infection. The conditions under which the men of a naval patrol base live are such as tend to the spread of infection also, and this accounts for the high incidence rate among them.

Percentage Summary of Case Incidence.

Navy ...	...	40.0
Army ...	...	20.0
Cordite workers not in fumes	...	30.1
Cordite workers in fumes	...	4.7
Gas workers	...	6.7
Tin mine workers not in fumes (one epidemic)	...	60.8
Tin mine workers in fumes (one epidemic)	...	11.1

Notwithstanding the diversity of occupation, a comparative study of the above figures gives a remarkable picture of the immunity of workers in certain chemical fumes to a certain disease. This is clearly brought out when the figures for the cordite factory are studied. Here a certain number of men and women not only work but also live in their own homes under exactly similar conditions in every respect, except for the one fact that some are more or less exposed to fumes during their working hours, others are not. In one gasworks which came under review there were twenty-five employees, twenty-four of whom worked more or less in fumes. There was only one case, and he never worked in fumes. He was a cinema hall attendant in the evening.

Therefore, from the epidemiological evidence, though it does not cover a large number of people, it would seem that the popular belief in the cure of "colds in the head" by fumes has some foundation of truth.

TREATMENT OF WOUNDS BY PARAFFIN.

BY

CAPTAIN E. F. PRATT, R.A.M.C.(V.).

THE question of the treatment of wounds has been one of absorbing interest ever since Lister revolutionized surgery. One by one various treatments have held sway, and hosts of antiseptics have been acclaimed by their various supporters in turn as the most rational and effective agent to use as a dressing.

In the BRITISH MEDICAL JOURNAL for January 13th, 1917, was an interesting article by Lieut.-Colonel A. T. Hull on the treatment of burns by paraffin, and again in the issue of August 24th, 1918, there was another interesting article by Major William Haig on the treatment of wounds by soft paraffin. The latter points out the value of ordinary soft paraffin in the treatment of lacerated wounds.

The cases I mention in this short paper are especially interesting, inasmuch as not only is the effect of the first dressing shown, but I have been able to give the history of the majority of the cases from start to finish.

As certifying factory surgeon for East Newcastle-on-Tyne, and as surgeon to Newcastle Corporation Tramways, and more particularly as medical referee under the Workmen's Compensation Act to Messrs. Hawthorn, Leslie, and Co., St. Peter's Works, it is my fortune to come into contact with great numbers of burns and accidents every year.

Only the minor accidents come under my notice, as the major ones are taken straight from the works to the infirmary to be there treated. I have been struck over and over again by the long-drawn-out process of healing of burns and lacerated wounds when subjected to the hitherto orthodox treatment, and when I read of the excellent results obtained by the treatment of burns by soft paraffin (or ambrine) I could not help thinking that it would be worth while to try the experiment of treating wounds in a similar way.

During the early summer of last year I treated several cases of lacerated wounds, and was so struck by the results that I asked for and was readily given permission to treat systematically lacerated wounds and burns occurring at the works of Messrs. Hawthorn, Leslie, and Co.

The results, to my mind, are convincing, and I know of no other treatment in which the constitutional symptoms so quickly disappear, in which the pain so rapidly subsides, and in which healing is so uninterrupted as in wounds and burns treated by soft paraffin. In some cases I used ambrine and in others No. 7 paraffin, and I cannot say that I have any preference for one medium over the other, as in both the results could not have been more gratifying.

Method of Procedure.

The wound or burn is first thoroughly cleansed with sterilized water; the paraffin is then melted and either sprayed by a special spray or painted by a sterilized brush over the affected area. One layer of gauze is then placed over the injured part, and then another layer of melted paraffin is either sprayed or painted over the gauze. On the top of this a cotton-wool pad is placed, and then

the part is bandaged. The dressing is left undisturbed for twenty-four hours, when it is removed and a fresh application made. A third dressing is applied in ordinary cases the next day, and, when necessary, a fourth dressing two days after that.

I have used this method of treatment in more than thirty cases, and in no instance has there been failure to relieve pain immediately, to prevent or remove sepsis, nor failure to produce healing in a few dressings, five being the greatest number in any one case, and that in only two instances.

I am correct in saying therefore that every burn and every wound treated by me, by paraffin, healed up in a week, and the injured persons were able to return to their work—a very important consideration both from the point of view of the injured one and also from that of the employer.

I append here summaries of some of the cases in question.

1. Boy. Burn on wrist and skin broken. Healed in three dressings.

2. Boy. Burn on fingers, skin unbroken. No blisters formed; healed in two dressings.

3. Boy. Burnt hand. Pain disappeared immediately on application of dressing; no blister present on following day when a second dressing was put on as a safeguard.

4. Youth and man. Both burned on face and arm by a hot chemical liquid,* blisters forming when cases first seen. All pain disappeared immediately on application of dressing. When dressing was removed next day there was no blister, but only dry dead skin which peeled off three days later, leaving a perfectly healed surface.

5. Two boys. Burn in palm of hand with small blister. Pain relieved immediately by dressing; blister was same size next day and was then cut and dried with sterilized wool. Paraffin reapplied, and again on the two following days. On removing dressing two days afterwards healing was complete.

6. Four boys. Burns. No pain after dressing; no blisters formed; healing after the second dressing.

7. Boy. Burn on leg, skin unbroken. Pain relieved immediately; no blister formed.

8. Woman. Lacerated fingers. Completely healed after four dressings.

9. Boy. Blow from hammer on end of finger, laceration near the root of the nail. Pain disappeared on application of dressing. On redressing next day the boy reported that he had had no trouble with the finger, and he did not return for any further dressing, but went back to work.

10. Boy. Skin scraped off leg. Pain relieved immediately; next day the wound was dry, clean, and healed.

11. Boy. Incised wound of finger. Healed after three dressings.

12. Boy. Came to ambulance room with an old wound on finger-joint which kept reopening. Completely healed after two dressings.

13. Boy. Lacerated thumb. Healed after three dressings.

14. Boy. Lacerated wound of fingers. Healed with three dressings.

15. Boy. Lacerated wound of fingers. Healed with two dressings.

16. Boy. Septic wound of finger. Wound was washed and dressed; pain disappeared immediately and the wound was clean next day. Completely healed after two more dressings.

In face of such results I need no apology for urging the claim of soft paraffin as a dressing, and I feel sure that what has been found to be so good in minor injuries has every chance of being equally good in major cases.

It seems to me that this is an appropriate place to refer to the now famous bipp treatment of wounds. I have read the fascinating little book by Professor Rutherford Morison, and I am not ashamed to confess that I could not put the book down until I had finished it. After reading it, I asked myself a question which I often asked in the old days of lengthy prescriptions—namely, which ingredient is it that is effective? In the case of bipp, is it the bismuth, the iodoform, or the paraffin, or is it all three combined?

With some hesitation, as I am not in a position to speak so positively as an operating surgeon could, I throw out the suggestion that the paraffin is the most important of the three ingredients. Iodoform alone has been used for many years, and almost discarded partly because of its smell, partly because cases of poisoning have occurred, and partly because results were not universally successful. Of bismuth alone I have had no experience, but paraffin alone I have tried and with the remarkable results already given in this paper.

* I have been unable to ascertain the exact nature of this substance, but it appears to be a mixture with a melting point of 213° C. At the time of the accident it would be about 250° C. (482° F.).

I take it that the three objections to bipp are, first, expense; secondly, the risk of toxic symptoms; and thirdly, the possibility of some interference with x-ray examinations. Where the result means the saving of a limb or of life, or merely the shortening of the healing process, expense cannot be considered. In the case of paraffin, however, the expense is reduced to a minimum, there is no risk of any toxic symptom, nor is there any interference with x-ray examination.

A suggestion that antiseptic paraffin retards the process of healing by destroying the saprophytic action of bacteria is, in my opinion, unsound, and without foundation in experience.

My thanks are due to Lieutenant H. S. Crace for his very great help in the conduct of the experiment, and to Mr. Renwick, the ambulance room attendant at St. Peter's Works, for the very careful way in which he has carried out the treatment, and for his kindness in compiling a record of the cases.

ACRIFLAVINE EMULSION AS A WOUND DRESSING.

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AND SURGEON TO THE LEY AND NUNSMERE AUXILIARY
RED CROSS HOSPITALS.

HAVING used flavine from the time when supplies first became available—formerly in military hospitals in France and latterly in both civil and military hospitals in this country—I have shared the disappointment which many surgeons have experienced in the results gained from using a 1 in 1,000 solution in normal saline. I believe that on this account many surgeons have ceased using flavine. By publishing the formula of an emulsified preparation of the dye, together with a few specimen cases showing its effect, I venture to hope that I may do something to restore confidence in what I believe to be our most powerful weapon against wound infection.

The value of purified paraffin as a wound dressing is well recognized, and I sought a combination of paraffin and flavine which would combine the known advantages of the former with those claimed for the latter, and I am much indebted to Mr. Griffiths Humphreys, M.P.S., of High Street, Northwich, for the patience and skill with which he has worked out a stable emulsion the droplets of which, when examined microscopically, are seen to be similar in size to those in a good emulsion of cod-liver oil, and which has given clinical results that I had not dared to hope for.

Mr. Humphreys's Formula.

Acridlavine	...	...	...	...	0.1
Thymol	...	...	...	...	0.005
White wax	...	...	...	...	4.0
Liquid paraffin	...	...	...	...	76.0
Distilled water	...	...	...	...	20.0

A good deal of skill and care is necessary in the dispensing of this emulsion in a sterile condition. It is put up in small sterile bottles, stoppered and sealed. The addition of the thymol has given better results in cases of mixed infection, and its presence has not prejudiced the results in the simpler cases.

In dealing with broken down tuberculous glands, after scraping, I have followed the practice of introducing a small quantity of the emulsion before closing the wound. The following case is, I think, a fairly severe test.

CASE I.

A. M., female, aged 18. Broken down tuberculous glands in the anterior triangle of the neck along the upper half of the sterno-mastoid muscle. Mixed infection, and a three weeks' old sinus. The tissues involved in the inflammatory process (which included the internal jugular vein) were removed piecemeal, and soiling of the newly cut tissues was inevitable. There was considerable oozing, which I was unable to control otherwise than by packing with gauze, after introducing a small quantity of the emulsion into the wound. Stitches were then inserted, but not tied. In twenty-four hours I removed the packing, and filled the cavity (about the size of a pigeon's egg) with the emulsion. Primary union ensued in seven days with a small linear scar.

It has been my custom for some years, when operating for acute infective abdominal conditions, whenever possible completely to close the peritoneum and trust to the visceral