possessed marked immunising properties, showed only slight local reaction against a large dose of Haffkine's *virus fort* (half tube). This, again, tends to show that the view of the distinct kinds of poisons should not be taken too narrow.

The above-mentioned serum experiments are possibly of some importance if Klemperer's law of the specificity of immunising serum holds good for all cases. The Klemperers insist on the truth of this law, and Behring²⁹ agrees with them. According to this law the serum of an animal immunised by inoculations with the bacillus prodigiosus would immunise against this bacillus only, and not against any other infection; and similarly the serum of an animal immunised against "cholera" should not immunise against an infection with the bacillus prodigiosus. This question has also been touched upon; it will, however, require further careful and critical examination, because fallacies may easily be introduced by reason of the fact that the sera also of naturally immune animals have more or less marked immunising properties.³⁰

We have found, in accordance with Klemperer's law, that the serum of one of us treated by Haffkine's method will not protect guinea-pigs against intraperitoneal injections of "prodigiosus and pyocyaneus agar emulsions." So far too few experiments have been performed, but if our results be confirmed and Klemperer's experiments with the serum of cholera patients taken into consideration,³¹ it would bring us a step nearer the elucidation of the etiology of Asiatic cholera. Judging from Klein's theory of the intracellular poison and from his unequivocal results, we might have expected that the serum obtained from a person treated by Haffkine's method would protect animals against intraperitoneal injections of both "prodigiosus and pyocyaneus agar emulsions," but it was found that such serum will protect against any form of intraperitoneal injection of cholera bacilli only.

Without laying undue stress on the experiments just mentioned, we are led to the following conclusions after a survey of our own observations and those of others. As far as the cholera bacillus is concerned, (1) any one mode of immunisation will protect an animal against an infection by any other form of inoculation used; (2) the serum of an animal immunised by any one method also protects guinea-pigs against an infection by any one of the various forms of inoculation mentioned; (3) the distinction between an "intracellular" and a "metabolic" poison in their relation to artificial immunity must not be made too narrow.

We do not deny that an actual distinction between the metabolic and the protoplasmic poisons exists. Buchner's "proteins" apparently are what Klein calls the intracellular poison, and it is well known, from the researches of Buchner, Römer, and others, that the "proteins" produce reactions often different from those produced by the bacilli and their metabolic substances. Here, also, we must not be too exclusive. Whether Koch's tuberculin belongs to the proteins, as Buchner asserts, seems somewhat doubtful after the careful chemical studies of Hunter,³² but, on the other hand, it is almost certain that it does not contain the specific toxin, at least not in a potent form. Now Vissmann³³ has shown that after injecting dead tubercle bacilli scraped off agar agar into the ear vein of rabbits typical tubercles appear in the lungs and liver, which, however, show no inclination towards caseation, but rather towards cicatrization. Unfortunately, Vissmann has omitted to investigate the influence of such intravenous injections on immunity. If, however, as Klein and Buchner assume, tuberculin be the intracellular poison, then Kitasato³⁴ has shown that by inoculations with this poison it is possible to protect guinea-pigs against a tuberculous infection—a result which confirms our own conclusion that the "intracellular" poison protects against the bacillus and its specific toxin.

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THE PRESENT POSITION OF THE SURGERY OF THE HYPERTROPHIED PROSTATE.

Abstract of an Address delivered before the American Surgical Association.

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PROFESSOR WHITE alluded to the admirable papers in which Harrison,¹ McGill,² Belfield,³ and Moullin⁴ had so thoroughly reviewed this subject, and acknowledged his indebtedness to them for the basis of the address.⁵ The main practical points in reference to enlargement of the prostate are to be classified as follows: 1. The nature and chief varieties of the prostatic enlargement and their relation to the vesical changes found associated with them. 2. The symptoms in relation to diagnosis and prognosis, (*a*) subjective, (*b*) objective. 3. The indications for (*a*) non-interference, (*b*) medical treatment, (*c*) palliative treatment, (*d*) operative treatment. 4. The choice of operation. 5. The methods of operation.

1. As to the nature of the enlargement, he rejects the view which assigns prostatic hypertrophy to the class of disseminated arterial sclerosis (Guyon); and that which makes it secondary to vesical changes (Harrison), and thinks we are warranted in believing the function of the gland to be chiefly sexual, and in provisionally accepting the theory which recognises that the growth or growths which make up the enlargement in prostatic hypertrophy are analogous to those fibromyomata so frequently found in the uterus. This, if true, could scarcely be said to be a full explanation of their occurrence, but by allying them to a well-known group of tumours would certainly bring us a step nearer to their comprehension. The importance of the conclusion lies in its effect upon prognosis and treatment. If the condition is merely a part of a general or constitutional state, or if it is secondary to changes in the vesical walls themselves, it is obvious that comparatively little is to be expected from treatment, operative or otherwise. If, on the other hand, it is a local condition, dependent on causes at present unknown, but which may be said to be inherent in the structure or in the functional condition of the gland itself, and if the changes in the bladder walls and the accumulation of residual urine are the result of the precedent prostatic disease, treatment of the latter, if early and judicious, offers much more prospect of success.

The changes in the bladder are occasioned by (1) the mechanical obstruction which the enlarged prostate offers to the ready and complete evacuation of its contents, (2) by the circulatory disturbance incident to pressure on the prostatic veins into which the blood from the vesical veins passes, and (3) to septic infection. Septic infection of a healthy mucous membrane by the pyogenic microbes of acute or chronic cystitis is not possible, even though such bacteria are present in the urine; when, however, the vesical mucous membrane is congested in consequence of obstruction to venous return, and by distension and frequently recurring contractions of the detrusor muscles, it offers but slight resistance to the microbic invasion. The pyogenic microbes are generally carried to the bladder by dirty instruments, or, if these are rendered sterile, through failure to cleanse the anterior urethra before the instrument is introduced into the bladder. Often cystitis develops independently of the use of instruments, probably as a result of infection conveyed by way of the urethral mucous membrane.

The pathogenic microbes usually found are the bacillus coli communis and the staphylococcus pyogenes aureus. These cause vesical lesion either by direct action or indirectly through their ptomaines, and, acting upon the urea, produce ammoniacal decomposition. The ammoniacal urine, in its turn, acts as a powerful irritant to the bladder walls; but is the effect not the cause of the cystitis?

[The subjective and objective symptoms of enlarged prostate were considered in detail.]

As to diagnosis: symptoms of obstruction to the free passage of the urine, associated with symptoms of cystitis when occurring in a man over 40 years of age, are generally due to enlarged prostate. If, on physical examination, there is no obstruction within seven inches of the meatus; if rectal examination shows that the prostate is enlarged; if the urethra is markedly lengthened; if soft or *coudé* instruments pass when Thompson's sounds are arrested, and if there is residual urine, the diagnosis is rendered nearly positive.

Cystitis with atony, vesical calculus, and urethral stricture cannot be confounded with enlarged prostate after careful examination, though all of these conditions may be co-existent; indeed, the first two are very commonly associated with prostatic hypertrophy. Cancer and tuberculous prostatitis may at first exactly simulate prostatic hypertrophy, but pursue an essentially different clinical course.

The classification of cases of hypertrophy of the prostate may be made from various standpoints, but he says that the following factors are most worthy of mention as having direct bearing upon treatment, and should be taken into account in deciding upon the management of any particular case:

(1) The predominant character of the growth, whether soft, indicating excess of glandular and muscular elements, or hard, showing advanced fibroid change; (2) the seat of the growth; (3) the presence or absence of general sclerosis; and (4) infection of the vesical mucosa.

TREATMENT.

1. A purely expectant treatment is proper only in those in which enlargement has produced no symptoms, and catheterism is easy and shows no residual urine. Such cases would include chiefly those in which the prostatic condition is recognised during a rectal examination instituted for other purposes. They are not infrequent. They often occur in comparatively young men.

2. As regards medical treatment: Ergot is the only drug which offers any prospect of usefulness, and it must be admitted, first, that it is indicated in only a small proportion of cases, and, next, that it is far from demonstrated that it has any distinct effect even then.

3. Palliative treatment consists (a) in the systematic use of steel sounds for purposes of dilatation; or (b) in the employment of the catheter, and is of the greatest value in a very large number of cases. (a) *Dilatation*. A patient who presents the symptoms of the prostatic-vesical congestion of the early stages of hypertrophy, who is disturbed once or twice at night, who has an enlargement of moderate density, appreciable through the rectum, but not offering much resistance to the introduction of an ordinary catheter, and who has but little residual urine, is likely to derive great benefit from the systematic introduction of full-sized steel sounds. (b) *Catheterism* should be systematically employed in cases in which the quantity of residual urine is 3 or 4 ounces or more, and in which the introduction of the instrument is easy and painless, and the urine is sterile. The frequency should be proportionate to the amount and character of the residual urine.

The objections to habitual catheterism in prostatics are (1) the risk of vesical infection; (2) the production of vesical atony.

1. In what cases should some operative procedure be recommended? It may be said at once that in those patients with but moderate obstruction, or with a high grade of compensatory hypertrophy of the bladder, with a small amount of residual urine which remains sterile, and in whom catheterism is easy and painless, operation is not to be thought of. The time may come when, by perfecting our methods of diagnosis and our operative *technique*, this class of prostatics

may be benefited by active surgical interference, but it has not yet arrived. Dilatation and catheterism, as above described, at present represent the best therapeutics, and, if the rigid observance of details of antisepsis is never lost sight of, will in a fair proportion of instances see the patient comfortably through his life.

But it must be said with equal positiveness that in the great majority of cases it is at the termination of this stage, when the approaching "breakdown" in catheter life first begins to manifest itself, when instrumentation becomes more difficult, more painful, or more frequent, when the urine shows fermentative change and the vesical congestion merges into a true cystitis, that the most valuable time is lost to both patient and surgeon. It is just then that, on the one hand, operation is for the first time clearly indicated and justified, and, on the other, that it promises most.

In the absence of evidence of advanced and threatening renal disease of an infective character, but few prostatics, no matter how marked their local symptoms, should at the present day be denied the chance of relief afforded by operation. In this statement are included not only the cases with pronounced vesical asepis, but also those with atony; with more or less complete retention; with general sclerosis, rigid vessels, polyuria and hyaline casts; with even the toxæmia above alluded to. The evidence already presented to the profession seems to warrant this opinion, in spite of the unfavourable views as to operative interference formed and expressed by such excellent and experienced observers as Socin, Guyon, and Sir Henry Thompson.

As to the choice of operation, we are limited to the following methods, which are mentioned in the order of their gravity, as estimated by their probable risk, or by their mortality as determined by existing statistics, (1) overstretching of the prostatic urethra, (2) perineal prostatotomy, (3) perineal prostatectomy, (4) suprapubic prostatectomy, which is the operation to be preferred in all those cases in which, palliative treatment having failed, there are unmistakable indications that the local conditions are growing worse, the general health remaining as yet unaffected. The best possible period is that before the development of marked and continuous cystitis, while some power still remains in the vesical walls, and the bladder is neither thinned and dilated, nor rigid and contracted. Under these circumstances, in the presence of a patient who reports that he is disturbed at night with increasing frequency, that he is obliged to use the catheter oftener, and not only does so with greater discomfort but with less relief in the interval, that the urine is occasionally turbid and offensive, that he has recently had one or more attacks of complete retention, and that he is beginning to lose flesh and appetite, the indications for operative interferences are unmistakable, and the suprapubic method is obviously the one to be selected.

Professor White concluded his address as follows: I have one further thought which I have decided to mention to this Association, although I do so with a reluctance born of the fear of being considered illogical or impracticable—or perhaps both. It occurred to me some time ago that possibly, if the analogy between uterine fibromyomata and prostatic overgrowth was a real one, castration might have the same effect upon the latter that oöphorectomy does upon the former, and cause a shrinkage or atrophy which would result in the practical disappearance of the obstruction. At the time I had never heard or read of the alleged prostatic atrophy in eunuchs, geldings, etc., which I have already mentioned. While I was unaware that any allusion even had been made in medical literature to this subject, I instituted a series of experiments which were carried on for me by Dr. E. R. Kirby, of the University of Pennsylvania, and the results of which are subjoined. The microscopic specimens are here for examination by the members of the Association. In the experimental work dogs were used partly for convenience, partly because it is known that in this animal the prostate occasionally undergoes changes similar to those which are found in the human prostate. The literature was carefully looked up, and no reference as to the average or normal weight of the prostate in dogs could be found. For control experiments thirty-five dogs and their prostates were weighed, and their average weight taken as a standard. The average weight of the prostate was found to

be 15.3748 grammes. The relative weight of the prostate to the weight of the dog was also taken into consideration, and is given in each case. The dogs were castrated and killed at different intervals. The prostates were hardened in alcohol, cut by the freezing colloidin method, stained with borax carmine, and mounted in Canada balsam.

No. 19. Weight of dog, 15 kilos.; average weight of prostate in dogs weighing from 14 to 16 kilos. inclusive, 15 g. Dog killed at the end of seventeen days; weight of prostate, 5.420 g. In this specimen the normal relation of the different structures seems to exist; no change noted.

No. 21. Weight of dog, 14 kilos.; average weight of prostate in dogs weighing from 13 to 15 kilos. inclusive, 13 g. Dog killed at the end of twenty-one days; weight of prostate, 5.700 g. In this specimen commencing changes in the glandular structure are seen. The muscle fibres show but little change. From this it would seem probable that the glandular elements are the first to undergo atrophy.

No. 20. Weight of dog, 14 kilos.; thirty days; weight of prostate, 2.600 g. The glandular structure shows well the beginning atrophy. The glands are irregular in outline, smaller than normal, and separated from each other by considerable connective tissue. Very few muscular fibres are to be seen.

No. 4. Weight of dog, 20 kilos.; average weight of prostate in dogs weighing from 19 to 21 kilos. inclusive, 19 g.; thirty-two days; weight of prostate, 2.620 g. The picture is here about the same as that seen in No. 21.

No. 16. Weight of dog, 15 kilos.; average weight of prostate in dogs weighing from 14 to 16 kilos. inclusive, 14 g.; forty-one days; weight of prostate, 5.700 g. In this specimen the glandular elements are but slightly atrophied, especially in some places. Many muscular fibres can be seen, all, however, atrophied.

No. 13. Weight of dog, 31 kilos.; average weight in dogs weighing from 29 kilos. upwards, 30 g.; fifty-four days; weight of prostate, 4.420 g. Atrophic changes well marked; the connective tissue elements predominating.

No. 14. Weight of dog, 23 kilos.; average weight in dogs weighing from 22 to 24 kilos. inclusive, 21 g.; 54 days; weight of prostate, 2.700 g. The glands show somewhat better in this specimen, but are widely separated from each other by bundles of connective tissue. The muscular fibres cannot be distinguished from connective fibres, and the longitudinal stripes are well marked.

No. 24. Weight of dog, 15 kilos.; 60 days; weight of prostate, 1.500 g. Presents practically same picture as No. 13.

No. 9. Weight of dog, 22 kilos.; average weight of prostate in dogs weighing from 21 to 23 kilos., 21 g.; 61 days; weight of prostate, 4.000 g. Here and there in this specimen may be seen masses of closely packed cells evidently the remains of the glands. Few muscular fibres can be made out. Longitudinal stripes well marked. No nuclei to be seen.

No. 8. Weight of dog 25 kilos.; average weight of prostate in dogs weighing from 21 to 29 kilos., 21 g.; 65 days; weight of prostate, 61.500 g. There is considerable atrophy of both the glandular and muscular elements, connective tissue predominating.

No. 5. Weight of dog 26 kilos.; 72 days; weight of prostate, 3.920 g. In this specimen but little of the glandular structure remains. What gland acini can be seen are very small and irregular in outline. There are but few muscular fibres to be seen, and their outline is not sharply defined. No nuclei can be seen.

These results, which I believe may be relied upon, place beyond all peradventure the influence of castration (in the dog at least) upon the condition of the prostate, and show clearly that that operation is followed invariably, and with a promptness which I must confess was to me surprising, by atrophy first of the glandular and then of the muscular elements, and by a coincident reduction in both bulk and weight. Since instituting them I have become familiar with Griffiths's admirable papers,⁶ and have learned from them the following corroborative facts:

John Hunter observed that in the mole the prostate gland in winter was "hardly discernible, but in the spring becomes very large and filled with mucus." Owen confirms this, and adds that "the prostate gland in the mole begins to increase in February, and acquires an enormous size, and conceals the urinary bladder towards the end of March." Owen found similar changes in the prostate of the hedgehog. Griffiths examined for himself the generative organs of the mole and the hedgehog in and out of the rutting season, and found the above observations to be correct. He made a number of sections of the gland in the quiescent state and others during the period of sexual activity. During the former period he found it composed of a few tubules lined by flattened and small epithelial cells, undoubtedly functionless as regards the production of any secretion, but possessing the power of reproducing glandular epithelial cells at the appropriate period. Precisely similar phenomena were observed in the seminiferous tubules of the testicle, and in both the changes were preceded by an increased vascularity of the whole tract, determining an increased growth of all the glands and parts concerned in generation. As to the effects of castration, Hunter again was the first to note⁷ that while the prostate of the perfect bull is soft and bulky, that of the castrated animal is "small, flabby, tough, and ligamentous."

Griffiths contributes four observations of his own, two in the dog and two in the cat, the castration having been performed for other reasons years before, in all of which the prostate had been transformed into a mass of fibrous connective tissue containing the remains of the once active gland tubules with a small number of atrophied muscle fibres. He also examined the generative organs of the pig, bullock, sheep, and horse after castration, and found that in each case like changes had supervened.

I learned further that Gruber⁹ had observed marked atrophy of the prostate in a man aged 65 who had been castrated in early youth; that Bilharz, in a thesis on the *Anatomy of the Genital Organs of Two Ethiopian Eunuchs* (Berlin, 1859), confirmed Gruber's observations; and that Pelican, in a book devoted to the study of a peculiar sect in Russia¹⁰, says that the prostates in eunuchs are about the size of those found in children.

Furthermore, Civile has noted the fact that in doing a lithotomy on a man who had undergone complete castration for the cure of a double hernia, he found that the prostate had practically disappeared.¹¹

In a case of arrested growth of the external genitals, including the penis, scrotum, and testicles, so that in a man aged 33 they were only of the size of those of a boy of 6 or 7 years, rectal examination showed that nothing more than a transverse ridge could be felt in the position of the prostate. Micturition was normal.¹² In cases of sterility in the male, it has been noted by Harrison that the prostate was atrophied.¹³

Let me now briefly marshal the facts which bear upon the affirmative side of this question.

The uterus and the prostatic vesicle originate from allied portions of the embryonic structures, the Mullerian ducts, and the urogenital sinus, the glandular portion of the prostate itself springing from the mucous membrane of the latter.

I am not arguing for absolute homology between the prostate as a whole and the uterus. This is denied by most modern authorities on apparently good embryological grounds. The important point to establish is that the prostate is essentially an appendage of the genital and not of the urinary apparatus, and this is demonstrated by its origin, its absence in the female, the facts of comparative anatomy, and the observations above quoted.

As to its gross anatomy and pathology it is certainly made up largely of the same tissue as the uterus, and is subject to the same varieties of morbid growths occurring at parallel periods in the life of the individual.

The uterine tumours do not appear after the menopause, or, if present already, undergo atrophy. After a certain period of life there is no increase in the tendency to enlargement of the prostate, but rather the reverse.¹⁴

In the female oöphorectomy causes a disappearance of these growths and an atrophy of the uterus itself. Castration almost certainly has the same effect upon the normal prostate in our species, and I have experimentally demonstrated that it has such an effect in dogs.

It remains to ask: (1) Does this evidence warrant us in believing that castration in cases of hypertrophied prostate would be followed by a disappearance or diminution of the growth? (2) If so, is it likely that the fact can ever be taken advantage of as a therapeutic measure?

In answer to the first question it may be said that one important piece of evidence is lacking, the absence of which renders incomplete the parallelism between the uterine and prostatic growths.

We have no recorded instances of the spontaneous shrinking of a hypertrophied prostate after the patient has reached a certain age.

In reply, however, it may be stated that there is no definite or fixed period in the male at which the sexual life culminates and begins to wane, and after which procreation becomes impossible; and further, that we have no knowledge whatever of the relation of cases of prostatic enlargement to the sexual function. That it may cause erection, or unnatural sexual excitability, on the one hand, or may be associated with a form of impotence or of sterility on the other is of course recognised, but the true relation of the growth to the period of functional activity—the secretory life of the testicles—is absolutely and entirely unknown.

Moreover, what may be called the accidental concomitants of the condition (accidental in the sense of being due to anatomical propinquity)—the vesical and renal changes—usually cause death in the very cases which might otherwise demonstrate the truth of the theory, those subjects whose advanced years might of themselves, through sexual failure, prove curative.

An examination of Messer's tables, founded on a dissection of 100 prostates in men over 60 years of age,¹³ discloses one interesting fact in this connection. Assuming arbitrarily that 80 may be taken as the age at which, in the great majority of men, the sexual life is absolutely and finally ended, we find that, among those subjects whose prostates weighed over 6 drachms, the percentage of octogenarians or their elders was only 22.8. While among those whose prostates weighed less than 6 drachms (many of them less than normal) the percentage was 35.3, more than half again as great.

This is not only confirmatory of Desnos's observation already mentioned, that after a certain period in life the frequency of notable hypertrophy diminishes, but it suggests the possibility that in many of these cases physiological atrophy had already begun. The subjects were not selected from among patients but just as they happened to come within reach of the investigator.

The uncertainty as to the exact duration of sexual life in the male also weakens the force of the statement that the condition does not manifest itself until after the period of life when it should occur, if it were truly homologous with the uterine growth. In addition it may be said that there is accumulating evidence that prostatic hypertrophy begins much more frequently than was formerly supposed during middle life, and that the statistics on which we have been accustomed to rely, based on museum specimens and on the experience of surgeons to whom the patients apply only when distinct subjective symptoms have developed, are, to an extent, unreliable.

I do not desire to be understood as insisting upon the truth or even upon the probability of the above hypothesis. I have simply, with much hesitation, determined to follow out publicly a line of thought that had occupied my mind at odd times, and to submit it to your criticism.

As to the second question, the possibility of employing castration as a therapeutic method in prostatic hypertrophy, I imagine that the final answer must be left to our patients. Of one thing I am convinced, however, that if we ever reach a point in certainty of knowledge in this direction comparable to that already attained in regard to oöphorectomy in relation to uterine fibroids, and can promise equivalent results, there will be no lack of cases willing to submit to an operation almost painless, with a low mortality, and followed by no such unpleasant conditions as accompany persistent fistulous tracts either suprapubic or perineal, even although the operation carries with it the certainty of sacrificing whatever sexual power has survived the excessive, and often intolerable, sufferings of such patients.

I might admit, finally, that I have not had the courage of my convictions, and have never seriously sought to recommend the operation, but it would be truer to say that I have as yet no definite convictions, and that I am simply seeking enough light upon the subject to convince me either that it is worth pursuing further, or, on the other hand, that it offers no possibility of practical usefulness.

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MR. R. JULYAN GEORGE, M.B., C.M., of Port Isaac, has been awarded the grant for successful vaccination in the No. 1 District of the Bodmin Union.

MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

SCARLET FEVER IN A MAN AGED 79.

On August 1st I saw a hale old man of 79 with sore throat; the soft palate, fauces, and pharynx were intensely red, with some small white patches on one tonsil, but no prominence of the tonsils. The pulse was 84, and the highest temperature 100. I looked for a rash, but all that I could find was a slightly reddened prominence of the cutis at the points of emergence of the hairs on the skin of the legs over the tibialis anticus muscle—there and nowhere else—a mere accentuation of the natural condition. His daughter said the legs were always like that, and, as he had not been from home for a long time and I could not connect the case with any previous case of scarlet fever, I did not notify him, although we spoke of scarlet fever. The drains were in a most offensive state, and I set it down as one of these indefinite sore throats due to the effluvia from bad drains.

The case did well, but I was summoned to see him again on August 18th, as "there was something the matter with his hands." I found them peeling freely. There was no albumen in the urine.

I may add that some weeks previously I had a case of scarlet fever in a man of 52, the children in the house afterwards taking it. He was seven miles from the man of 79, but the interesting point is that the rash was well marked, but discrete, on the same parts of the legs, and there only. The temperature was 102 with slight delirium, and that case I at once notified as scarlet fever.

Westbury, Salop.

ALEX. HOWIE.

A CASE OF POISONING BY CHLORIDE OF ZINC: RECOVERY.

THE following notes of a case of poisoning by chloride of zinc are interesting on account of the comparatively few recorded cases of poisoning by this agent:

July 8th, 1893. At 3.30 this afternoon S. H., aged 15 months, a robust male child, about five minutes after a meal of bread and milk, swallowed by mistake a teaspoonful of chloride of zinc soldering fluid. [This fluid is prepared by adding strips of metallic zinc to undiluted HCl till H ceases to be liberated.] Vomiting occurred immediately after, and was repeated every two or three minutes till my arrival at the patient's home at 3.45. On learning the facts of the case, I gave at once ʒij of fluid magnesia—which was the most convenient antidote—and, on hurried examination, observed that his face was pale, his body limp in his mother's arms and his pulse 140 per minute, very feeble, and scarcely regular. Chalk and milk were at once procured and given freely after each act of vomiting. 4.35 P.M. Face flushed, with short intervals of pallor, the latter being the precursors of vomiting, which still continues, though not so frequently. Vomited matters consist of tough mucus along with the milk and chalk. Bowels up till now have moved three times, the motions being yellow and fluid. Pulse less irregular. 7.45 P.M. Face still flushed, with decided look of exhaustion. Great thirst; drinks large quantities of milk. Bowels have moved three times since last note, the motions now being white, and consisting chiefly of curdled milk and chalk. Pulse 164, weak, and again more irregular. Temperature 101° F. 10 P.M. Very pale and still more exhausted in appearance. Lies limp in his mother's arms, with occasional tossing of his arms or extension of his body and crying, as if pained in the abdomen. Still very thirsty. Vomiting now ceased. Abdomen soft, not tympanitic, with no apparent tenderness on palpation. Sweating profusely. Pulse 168, very feeble. Temperature, 102.8°. Got 1½ tinct. opii.

July 9th. 10.30 A.M. Passed a restless night, with occasional sleeps of five minutes' duration. Twitching at angles of mouth during sleep. Skin dry. Still very thirsty, and swallowing first mouthful of a draught seems painful. Excoriations are visible on lips and gums. Mucous membrane of fauces and pharynx red and swollen. Tongue dry, covered with white fur (chiefly milk and chalk) on dorsum