

**The growth of analgesia, antisepsis, conservation and prophylaxis in general and dental surgery : a paper read before the Sheffield Association of Licenciates in Dental Surgery / by R.J. Pye-Smith.**

**Contributors**

Pye-Smith, R. J.  
University of Leeds. Library

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E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
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# The Growth of Analgesia, Antisepsis, Conservation and Prophylaxis in General and Dental Surgery

A PAPER READ BEFORE THE SHEFFIELD ASSOCIATION OF  
LICENTIATES IN DENTAL SURGERY

BY

R. J. PYE-SMITH, F.R.C.S.

*Senior Surgeon to the Sheffield Royal Hospital*

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## Growth of Analgesia, Antisepsis, Conservation and Prophylaxis in General and Dental Surgery.

BY R. J. PYE-SMITH, F.R.C.S.

SENIOR SURGEON TO THE SHEFFIELD ROYAL HOSPITAL.

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MR. PRESIDENT AND GENTLEMEN,—I thank you for the honour you have done me in inviting me to address you at the commencement of another session. I accepted the invitation with diffidence, but I assure you it is a real pleasure to meet you on such an occasion.

Dentistry is a branch of general surgery, and to those engaged in the practice of that branch the changes and advances in general surgery cannot fail to be of interest and significance.

I propose this evening to speak of some of those changes which have taken place within my memory, or, at all events, during my lifetime.

Among them the increasing means of mitigating or preventing pain stands out prominently. The introduction of nitrous oxide, of ether and of chloroform, as agents of general anæsthesia, had but recently occurred when I was born, and even when I was a medical student they were used with much less frequency than at the present time, whilst local anæsthesia, by means of ether spray, was but seldom employed. The greatly improved modern substitutes for ether spray, in the form of chloride of ethyl, chloride of methyl, and various modifications and combinations of such liquids, which are now in such general use, were then unknown, and any

such local anæsthetic agent as cocaine was, perhaps, hardly dreamt of. The changes, however, which have taken place within my own observation in respect to the mitigation of pain have not been wholly due to the introduction of fresh anæsthetic agents, nor to the better knowledge which we now possess of the preparation and administration of the older ones. They are rather, I think, to be attributed to the greater readiness of the surgeon to save his patient from serious pain whenever possible. And this readiness on the part of the surgeon is doubtless in great part the reflex of the increasing unwillingness on the part of the patient to undergo any physical suffering from which he can be saved.

There are dangers in either extreme. A difficult tooth extraction, or the removal at once of a considerable number of stumps, will in many cases not only justify but even demand the employment of a safe general anæsthetic, and I think it is a desideratum, which the use of cocaine, as at present practised, does not seem to meet, to find some safe and convenient means of mitigating the prolonged torture (as I think it may often be, not unfairly, designated) occasioned by some of the necessary processes in the proper treatment of carious teeth. On the other hand, however, the danger is still more grave of failing to do what is essential in the preparation of a cavity for filling, from fear of causing pain to the patient. Whilst sympathising deeply with tender children and delicate women, I consider it a grievous thing that the present generation should be so much afraid of bearing pain where some important object is to be gained by its endurance, either for themselves or for others. I fear there is nothing of the Spartan in the modern Englishman.

Still greater changes than have taken place in regard to the question of pain have been effected by the introduction and almost universal adoption of the theory and practice of antisepsis. Certainly to this, far more than to anything else within any personal experience, are due the immense strides that have been made during the last thirty years, both in the treatment of what were at that time regarded as surgical diseases and conditions, and in the application of surgical methods of treatment to much that was then considered to be within the exclusive domain of the physician. The rise and progress of the science of bacteriology has been

attended with constant accessions to the list of those diseased conditions which could not exist without certain specific, living micro-organisms, and the great extension of operative surgery has been made possible by the adoption of means for preventing the access to the tissues of these producers of poison and inflammation. Among such diseases, those of the mouth and teeth have an important place, and the etiology of dental caries is certainly not complete without consideration of the microphytes which are constantly to be found associated with it. I am not aware, however, that as yet any specific bacterium or micrococcus of caries has been established on the recognised basis of being (1) distinguishable from all others, by size, form, staining properties, mode of growth and cultivation, &c.; (2) demonstrable in every case of the disease; (3) undemonstrable where the disease is not present; and (4) capable, after being isolated by a pure cultivation, of reproducing the disease when suitably inoculated. If in the case of caries these conditions can be fulfilled by any form of micro-zyne, its *contagium vivum* would be demonstrated, for I think we may take it that caries is already quite definable and recognisable as a clinical disease. Much valuable work has recently been done in this direction, but the difficulties to be overcome are very great.

In general surgery there is a tendency to rely less and less on extraneous antiseptic agents, and to trust more and more to absolute cleanliness or asepsis. I am decidedly of opinion, however, that the risks of accidental contamination are greater where no chemical antiseptics are employed than where they are rigorously used. A serious objection to the practice of aseptic surgery, as distinguished from antiseptic surgery, is found also in the difficulty and cost involved in its proper fulfilment, as compared with the greater ease and inexpensiveness of antiseptic practice. Thus, whilst the condition of the atmosphere appears to be but very rarely so foul as to be a source of danger and to need disinfecting, it is much more difficult to render the site of operation and the hands of the operator innocuous without the use of chemical antiseptic agents than with their aid. And the costliness of such tables, cupboards, and all sorts of appliances as are essential to aseptic, but not quite essential to antiseptic, surgery, is very great. In the aseptic system

cleanliness is pushed to the mechanical exclusion of all germs. In the antiseptic system cleanliness is supplemented by the chemical destruction or restraint of such germs as may, in spite of our care, have gained access to the parts concerned. To the dental surgeon simple asepsis can scarcely be practicable, since the cavity of the mouth is habitually infested by many kinds of microphytes, and the teeth which require operation are, for the most part, already invaded by certain of them. How far it is necessary, in dealing with a tissue so hard and non-vascular as dentine, to disinfect the burs and other instruments used in the preparation of cavities for filling, I cannot say; nor, if necessary, what are the best means to adopt—friction, heat, or the action of chemical germicides. But one point is clear, namely, that every care should be taken, by efficient cleansing of hands and instruments immediately after use, to prevent the possibility of conveying from one mouth to another such poisons as those of syphilis and of certain forms of suppuration. Gags and props, forceps and elevators, mirrors and probes, syphons and rubber dams, the face pieces of inhalers and supplemental bags—are specially, I suppose, to be remembered in this connection.

The third great change that I have witnessed in surgery is the growth of the practice of conservation. This in general surgery has shown itself, perhaps mainly, in the substitution of such operations as erosions and excisions of joints, for the amputations of limbs which were so frequently practised when I was a student. Probably no better illustrations of this important principle of progress could be found than in the field of dentistry. The perfection with which gold fillings are now made, the success with which necrosis of the pulp is treated, and the beautiful crown work which seems to raise dead stumps to life and work again, are instances with which I am personally familiar, and only examples of what you are doubtless all daily witnessing and effecting.

The fourth, and last, change to which I shall refer, is the earnest endeavour to spread the practice of prevention in surgery as well as in medicine. Prophylaxis is the highest aim of the healing art, and in surgery it receives exemplification in the endeavour to remove, by early operation or otherwise, the sources from which the dangers of local

inflammation, of blood poisoning, or of cancer, are so liable to spring. The mouth is one of the most fertile fields in which the prophylaxis of cancer may be attempted, and the dentist must often see the early stages of epithelioma or of carcinoma of lip, cheek, gum or tongue, whose early recognition and efficient removal is of such vital importance to the patient.

It is, however, especially in relation to caries that prophylaxis concerns and is, to a great extent, in the hands of the dentist. I say "to a great extent," but I am well aware that it is not in his hands to the extent that his knowledge and disinterested desire make it highly important that it should be. I fear that the general medical practitioner has hitherto largely failed in his duty towards the rising generations of his patients by ignoring, almost entirely, the urgent need that exists to inculcate habits of rational personal attention, as well as of skilled professional attention, to the teeth, from the period of their earliest eruption.

Writing of dental caries 120 years ago, John Hunter said, "We have not as yet found any means of preventing this disease or of curing it. All that can be done is to fill the hole with lead, which prevents the pain and retards the decay."\* This happily is not still true. The hole can now be filled with something better than lead, and in a way that may not simply "retard the decay," but cure it, provided the case is treated sufficiently early.

And have we not an efficient means of prevention in the systematic use of the toothbrush? I do not deny that the teeth of some persons are intrinsically more liable to caries than those of others. Defects of structure and of nutrition of the teeth themselves cannot but act as predisposing causes, to say nothing of the influence of unhealthy conditions of the mucous membrane and glands of the mouth. But the exciting, if not the efficient, cause of caries is almost certainly the growth of certain microbes, whose invasion of the dentine can be effected only by the aid of the decalcifying influence of acids generated chiefly by the decomposition of particles of food, this decomposition being itself the result of the growth of microbes in farinaceous and other kinds of food *débris* in

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\* "Natural History of the Human Teeth," by John Hunter, F.R.S., 2nd edition. 1778.

the mouth. Nature's mode of prevention (as seen in the lower animals and in uncivilised races of men) appears to consist of efficient friction during the mastication of foods that are not too soft, together with an abundant flow of alkaline saliva, often followed by a draught of water and the searching attentions of the tip of the tongue. But now-a-days—as in ancient times, too, among many highly civilised races—food is so luxuriously prepared that it is swallowed with but little mastication, and consequently the teeth get but little friction and the flow of saliva is not freely stimulated, whilst particles of most easily decomposable foods are lazily left to breed disease in the mouth. Children, too, are pampered with sweets and other luxuries between their meals, and do not then generally get water to wash the remnants away. Now, provided that well-formed teeth are present in a healthy mouth, it would seem easy to prevent the conditions which are necessary for the development of caries, by efficient cleansing of the mouth and teeth *immediately after every meal*. That this is habitually somewhat irksome is no doubt true, as also that it is frequently inconvenient and occasionally impossible; but I am convinced that it ought to be aimed at, and the nearer the ideal regularity is approached the less troublesome will it become and the less will it have to be supplemented by the much more unpleasant process of filling.

A tooth brush seems to be the most effective and convenient implement to assist in this process of cleansing. Tooth powders are probably generally unnecessary, but the detergent property of ordinary good soap is too valuable to be wisely dispensed with. Antiseptics are perhaps not more needed than powders, but I think it is a point of some importance to use an appropriate antiseptic solution for the brush after use, and probably also for rinsing the mouth. In circumstances where the use of a tooth brush is impossible, other mechanical means may be advantageously employed, such as the careful use of a tooth-pick, of a handkerchief, of water, and of the tongue. Were this careful and sufficiently frequent use of the tooth brush duly inculcated and enforced in families and schools it would, surely, do much to check the terrible ravages of dental caries from infancy to adult life. But it is obvious that it must be followed up by pretty frequent periodical inspections of the mouth by a competent

dentist, and that again, and immediately, by efficient treatment, whether of early caries, of irregularity, or of any other unhealthy condition of the teeth. Procrastination is the thief, not only of time, but of comfort, of health, and of hope. As applied to the case of the teeth, it turns dirt into caries, caries into necrosis, necrosis into abscess, and abscess into premature loss. It entails pain, indigestion, disfigurement, and an amount of inconvenience, which alone far outweighs any burden which the use of the brush *ter die post cibos* for life could entail.

These four principles, analgesia, antiseptis, conservation, and prophylaxis, stand out, as I have said, in my memory and observation of surgery, and I am convinced that they have received also a large share of attention at the hands of those who have been working so well in the branch of dentistry. What subjects will receive most attention in the near future will depend, to some extent, on you whom I have the honour to address.

The Sheffield Association of Licentiates in Dental Surgery, though a small body, is one that has life and *esprit de corps*. It will grow in size by the process of time, and I trust it will grow in influence for good at a still more rapid rate. It is my belief that most of the mistakes made by well educated medical men are due to a lack of sufficiently thorough examination of the case in hand. I have little doubt it is the same with you. Even in a limited speciality it is, I feel sure, of the greatest value and importance to obtain a correct history of each case, to make a full examination, and to record on paper your diagnosis and prognosis. The time is not, I trust, far distant when such detailed methods of note-taking will be made at once imperative and easy by the realisation of the hopes which you have long entertained of having, in Sheffield, a Dental Hospital or Department and a School of Dental Surgery.





