

PRINCIPLES OF FULL DENTURE PROSTHESIS

Fourth Edition

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by

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FOURTH EDITION — REVISED



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PREFACE

THIS BOOK was originally written because there seemed to be room for a reasoned inquiry into the principles which govern the stability of full dentures. The work was not a treatise on the technique of dental prosthesis, much less on the technique of dental mechanics, but sought to enunciate and classify systematically the scientific principles upon which any successful system of full denture technique must be based.

During the earlier years of the century a very fine literature had grown up round the problem of impression taking, so that the impression surface of a denture should not now present any great difficulty; however, some additional matter has been introduced into this edition as a practical guide to those who have not hitherto practised the more advanced methods. An equal amount of attention had been given in dental literature to the contour of the occlusal surface, without perhaps producing such valuable concrete results, but the curious fact emerges that the remaining surfaces which fit, or should fit, the cheek, the lips or the tongue, had hardly been dealt with at all. Yet it is the modelling of these surfaces, determined to a great extent by the position of the arch on the ridge, which harnesses the very considerable muscular power of the buccinator, orbicularis oris, tongue, and other muscles in stabilising the dentures.

It is due to an increasing realisation of the great importance of the shape of the 'polished' surfaces and the extent to which their form depends on the relationship of the arch to the ridge that this fourth edition has been revised and enlarged. It has not been found necessary to delete or make material alterations in what was already said of the principles involved, but the additions may, perhaps, clarify the original conceptions and provide a more direct method of solving the practical difficulties which lead to failure if they are not overcome.

One entirely new section deals with the principles governing the position of the artificial teeth in relation to the face and jaws both in the newly edentulous patient and in the older patient where resorption has destroyed many of the landmarks. This chapter includes a practical survey of the difficult problem of remodelling old dentures which have ceased to function properly

and raises the significant question of leaving a cavity of sufficient size and appropriate shape to accommodate the tongue. A number of new practical suggestions have been included, and it is hoped that they will serve to facilitate the application of these new principles and of the old ones which were laid down in the earlier editions.

The basic principle, that provided all the surfaces of a denture are correctly modelled, that denture will be the most stable appliance for that particular patient, remains the theme of this edition as it was of the earlier ones.

I have pleasure in acknowledging my indebtedness to Miss Eleanor Dale for preparing most of the drawings illustrating this work, to Mr. William Periera for some of the photographs, and to Mr. Charles Phillimore, and to Mr. Derek Cudlip for their enthusiastic co-operation in the practical side of this subject.

My thanks are also due to Professor H. A. Harris, and to Dr. David Stewart for their help and interest in the anatomical side of the work, and to Professor D. T. Harris for his help with the physical problems involved.

Finally, I wish to express my keen appreciation of the way the earlier editions have been received, and of the courtesy of the publishers in carrying out their share of the work in producing this volume. They have at all times shown the utmost patience and skill.

34, *Weymouth Street*,
1947.

E. W. F.

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Chapter I

GENERAL PRINCIPLES

THE FUNDAMENTAL principle in the construction of full dentures is that *every part of every surface* of the denture shall be modelled to fit some part of the patient's tissues, or some part of the other denture.

So far as the 'impression surface' is concerned this statement is one of which the truth will be readily conceded; for it is clearly necessary that the impression surface of a denture shall fit the tissues upon which it rests. No less effort is expended to ensure that the occlusal surface shall articulate accurately with the opposing teeth, and a careful craftsman should not as a rule find it difficult to achieve a reasonable standard of accuracy in carrying out the necessary technical steps to secure a good result in this direction too.

Where, however, there is room for the exercise of great judgment and discrimination, a knowledge of anatomy and physiology, an appreciation of form and a true sense of proportion, is in elaborating the design of the dentures so that their remaining surfaces are adapted accurately to the muscles of the cheeks, lips, and tongue, and are of such a shape that forces brought into play by the movement of these muscles upon them will tend to stabilise rather than disturb the dentures.

From this statement it seems reasonable to regard a denture as exhibiting three surfaces, and the present discussion of the principles of denture construction is based upon an appreciation of the functions and shape of these surfaces. They may be defined as follows:—

(1) THE IMPRESSION SURFACE, as its name implies, is derived from the impression and is in contact with the alveolus as far as the reflection of the mucous membrane. In the upper denture it is also in contact with the hard palate. Upon its shape depends what is normally called the 'fit' of the denture, but it will be shown that the stability of a denture depends upon the shape of the other surfaces just as much as upon the shape of this one; a point which will be readily appreciated from the fact that a patient

often says a denture does not 'fit,' although it may exhibit quite exceptional suction.

The stabilising forces which depend on this surface for their successful application to a denture are *adhesion* and *atmospheric pressure*.

(2) THE OCCLUSAL SURFACE is the part of a denture which is in articulation with the teeth – natural or artificial – of the opposite jaw. For present purposes it is necessary to limit the term to the surfaces of the teeth which actually come into contact with the opposing teeth. The labial, buccal and lingual surfaces of the teeth form part of the third or 'polished' surface.

A full practical discussion of the occlusal surface would embrace a consideration of the curves of Spee and Monson, balanced occlusion, the condyle path, the angles of the cusps, anatomical articulators and face bows, but an attempt is made in a later chapter to enunciate the underlying principles which govern the shape of this surface, whatever system of articulation is used, and these principles may be incorporated in any form of technique. They will not prove incompatible, whether a plain line articulator or the latest adjustable anatomical model is used.

The stabilising or unstabilising force which depends on this surface for its application to the denture is the *muscular power of the muscles of mastication*.

(3) THE POLISHED SURFACE is the whole of that area which is normally brought to a high polish on the lathe, and also includes the labial, buccal and lingual surfaces of the teeth. It is, therefore, the surface of the denture which, at rest, is in contact with the tongue or cheeks or lips. The shape and position of this composite surface determines to a very great degree whether the patient will feel 'at home' straight away with the dentures, and its contour is largely dependent upon the bucco-lingual position of the teeth in relation to the ridge and upon the 'waxing up' of the cases. The height of the bite, the extension of the base, and the width of the posterior teeth also affect the shape of the polished surface.

The stabilising or unstabilising force which depends on this surface for its application to the denture is the *muscular power of the tongue, buccinators, orbicularis oris, and other muscles of the cheeks and lips*. It is the shape of this complex surface as a whole, far more than the outline of the 'muscle-trimmed' edge of the denture, which determines whether muscle movements will dislodge the piece; while

if, on the other hand, the polished surface is properly modelled, the grip which the buccinators and tongue muscles can exert on the plates will make them wearable long after resorption has occurred and they have ceased to 'fit' the impression surface in the ordinary sense of the term.

There are certain advantages in dividing up the surfaces of a denture in this way. It will be readily appreciated that the whole problem of denture construction is simply the correct modelling of these three surfaces and the selection of the material of which the denture is made.

The material is of no importance to the stability of the denture except in so far as it is capable of being worked in such a way as to fulfil the conditions which will be laid down as essential for success in modelling the three surfaces; or perhaps its weight may affect the stability of the denture to some extent, but both these considerations belong to the realm of dental mechanics, and have been worked out very thoroughly elsewhere, so that they need not concern us here.

It follows then that apart from such mechanical considerations which no longer present any real difficulties, the success of the denture depends entirely upon the shape of its surfaces, while failure, if it occurs, must necessarily be due to a fault in one or other of them.

The classification of the surfaces in this particular way is determined by their function, and each of these three surfaces has a separate and distinct function to perform. The impression surface gives the denture a firm seating on the tissues, and exhibits adhesion and suction. The occlusal surface, by virtue of its contact with the opposing teeth, communicates the force of the muscles of mastication to the denture. The polished surface harnesses the muscles of the cheeks, lips and tongue to the denture so that as these organs move in talking and eating they may enfold the plates and hold them in place. It is only when all three surfaces are properly modelled to fulfil their respective functions that the dentures are completely stable, and it becomes a routine once the principles of stability as applied to these surfaces are mastered, to run over them all and check the accuracy of the denture as a whole when it is tried or finished.

At first sight it might appear better to divide the denture up into its base, and the fourteen separate teeth which go to build it up, but the teeth have no individual function, they are merely part of