

labline

DENTAVANTGART

VOLUME VI ISSUE 01 SPRING 2016



INTERVIEW

DR. JAVIER VASQUEZ

AN 'ORDINARY' BUT VERY
PASSIONATE DENTIST/MASTER
CERAMIST

DR. JON GURREA

DEALING WITH THE UNEXPECTED

DR. JORDI MANAUTA &
DR. DAN LAZAR

TEXTURE

MAXIMUM PROTOCOL
SIMPLIFICATION

SUNG BIN IM, MDC, CDT, BS &
SOMKIAT AIMPLEE, DDS, MSC, FACP

ESTHETIC AND FUNCTION

FULL MOUTH REHABILITATION
WITH LITHIUM DISILICATE
CERAMIC

DDS. RAFAEL LAPLANA &
DDS., CDT. ANABELL BOLOGNA

A CHALLENGE OF SEVERE ATROPHY IN THE ANTERIOR ZONE

DR. MARCO MAIOLINO &
CDT. EMANUELE TARASCIO

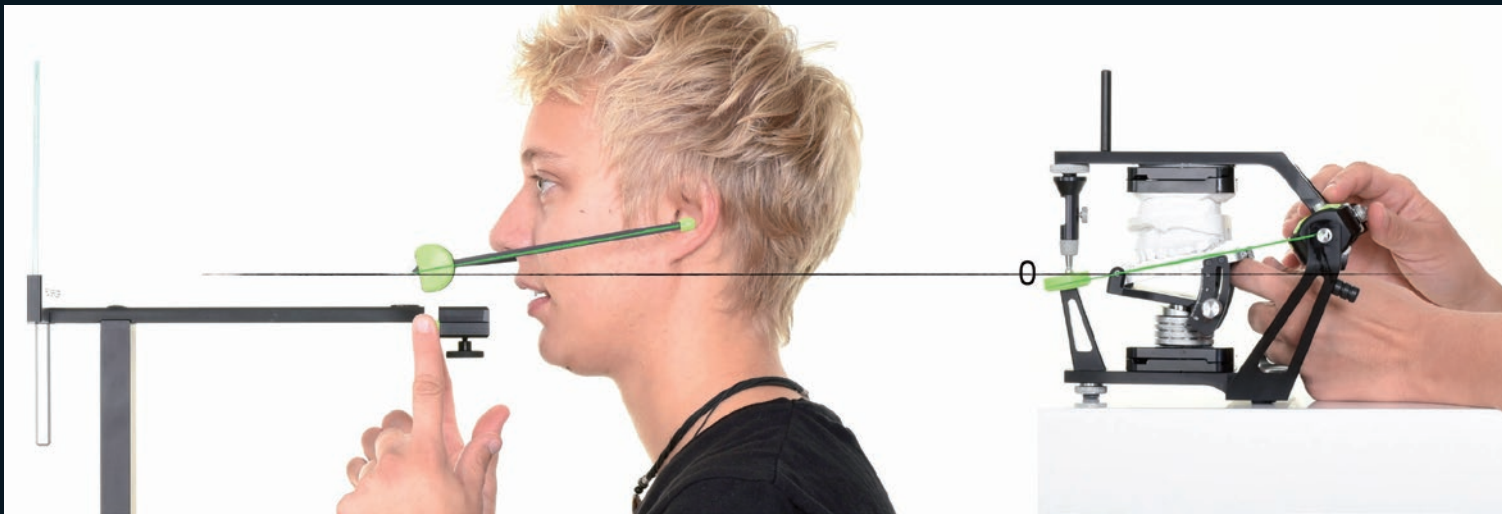
ADHESIVE DENTISTRY

WITH PARTIALLY
BONDED CERAMICS

Udo Plaster, MDT

SURVEYING THE PATIENT'S JAW

SPECIFIC STATIC AND DYNAMIC VALUES



The situation on an articulated cast and the actual patient situation will often exhibit differences. These differences become evident at the first try-in in different regions of the mouth in the form of an incorrect midline or incorrect planes or of interfering contacts. But what if we could reduce these differences – which occur as we transfer data from one medium to another – to a minimum, right from the outset? Where would we have to deviate from the usual procedure? And exactly what should we change? The carpenter next door who produces bespoke cabinetry every day would probably say: “If you want to work to measure, you must first obtain the correct measurements.”

The carpenter's insight is easy enough to understand. After all, one important thing that people, kitchens, bathrooms and wardrobes have in common is that they are all different. The difference, however, is in the details: When surveying people, we must take account of the fact that there are only a small number of horizontal planes and right angles that can be used to transform the measurements into a model. Facebow jaw registrations do not work with and do not yield such reproducible and accurately determined horizontal and vertical planes.

Rather, the Frankfurt horizontal plane, the patient's own horizontal and Camper's plane – and the endpoints of the axis of rotation – are based on certain anatomical landmarks on the skull. Inaccuracies arise from the fact that the skull invariably exhibits more or less pronounced asymmetries – and you can never rely on the planes always running horizontally, vertically or symmetrically. Yet even knowing more appropriate reference planes would not be sufficient for an accurate measurement. We need a specific method. And that is what will be briefly outlined below.

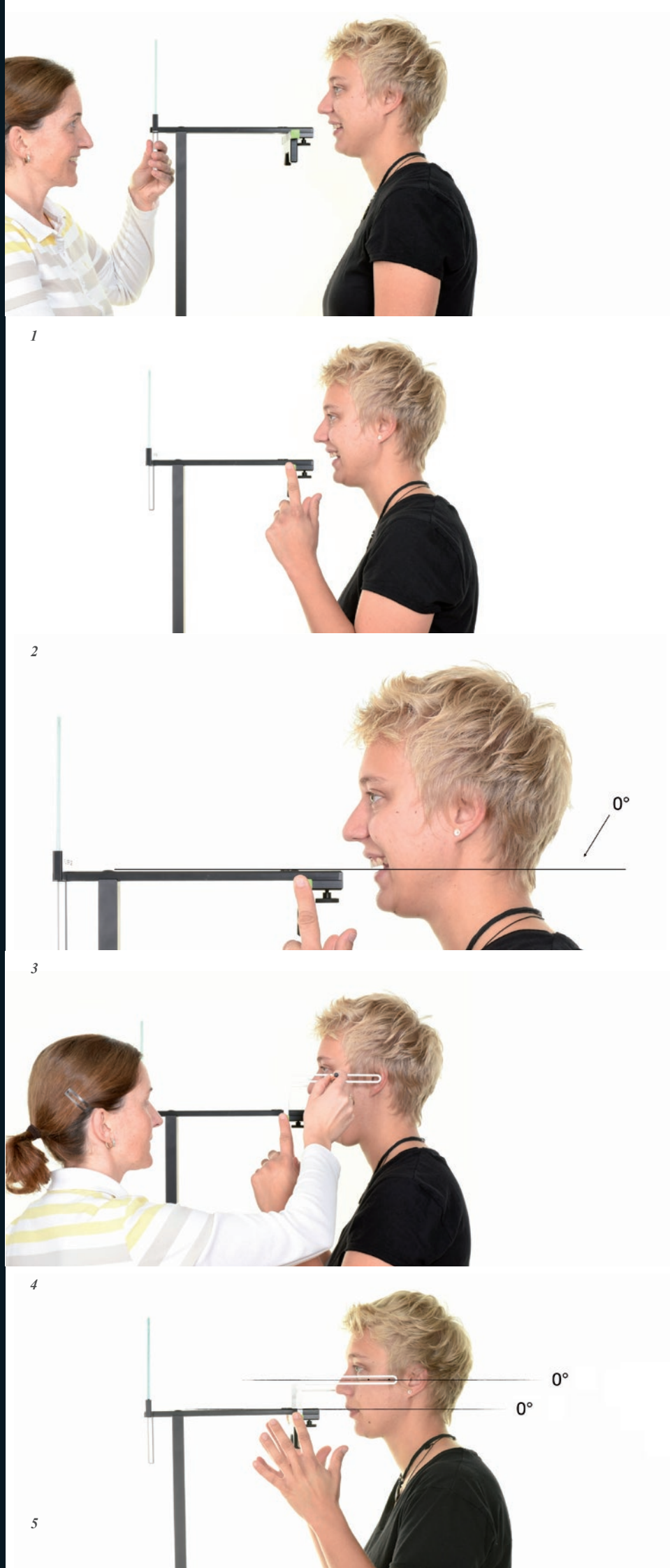
REFERENCE PLANE

To determine a reproducible reference plane, we can use an easy-to-handle instrument called PlaneFinder® (part of PlaneSystem® by Udo Plaster/Zirkonzahn). With this instrument at hand, dentists essentially perform the following steps: they align the PlaneFinder® horizontally, position the patient in front of the unit in an erect position, bring the device to the level of the patient's incisors (Fig. 1), have the patient look in a mirror (Fig. 2), extend the horizontal plane of the PlaneFinder® laterally on the patient (Fig. 3) and finally mark this horizontal line on the patient's face by two dots (Figs. 4 and 5).

IN WHAT WAY IS THIS REFERENCE PLANE REPRODUCIBLE?

We have the capability to return our head to a standard position in certain situations, such as when looking into a mirror, despite innate or acquired physical asymmetries (natural head position, NHP). This is why a horizontal plane can always be located and retrieved on the skull the very same position.

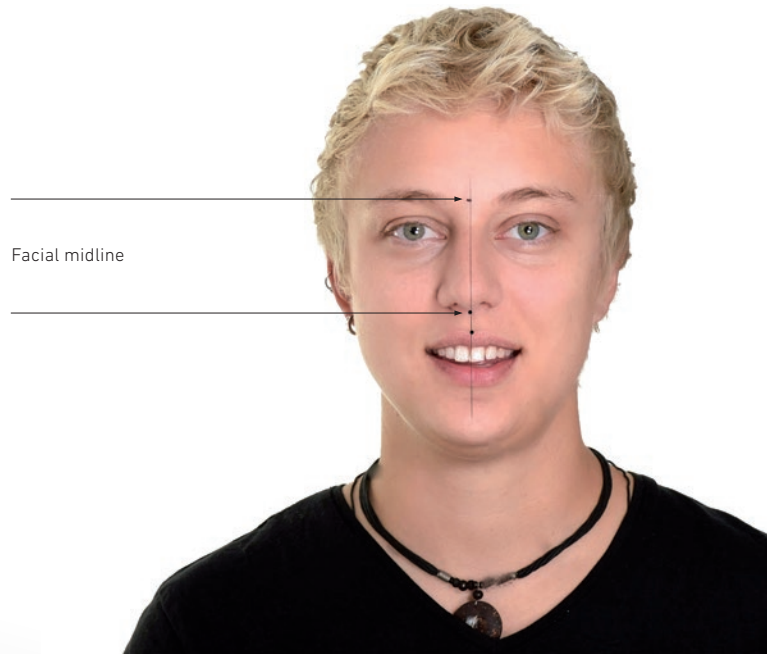
The advantage of the method described here is that asymmetries of the dental arch can be accurately detected. The patient will intuitively position his or her midline in NHP centrally and perpendicularly on the PlaneFinder®, which is the measuring device. This means that the asymmetries of the maxillary arch are automatically reflected on both sides of this vertical reference line, which are then encoded – registered – with registration material on a horizontal tray (Figs. 6 to 15).



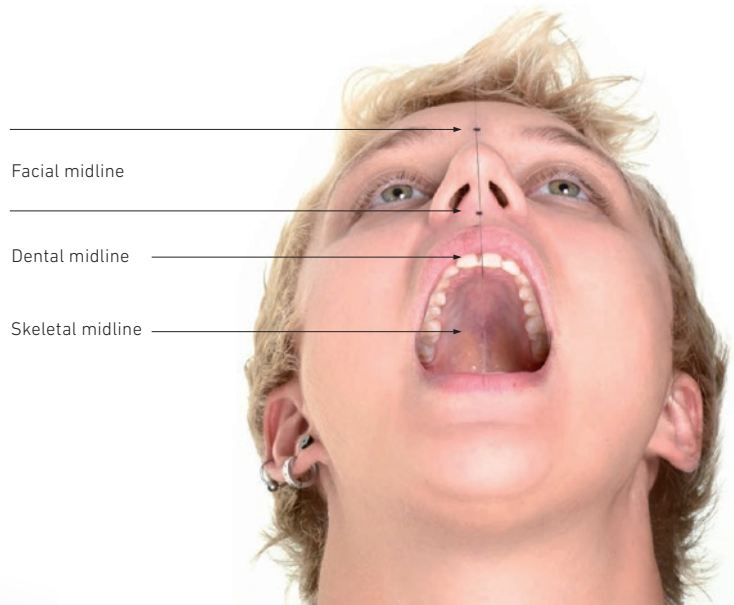
MAXILLARY POSITION AND OCCLUSAL PLANE



6, 7
The midline passes through the nasion and the subnasal point.



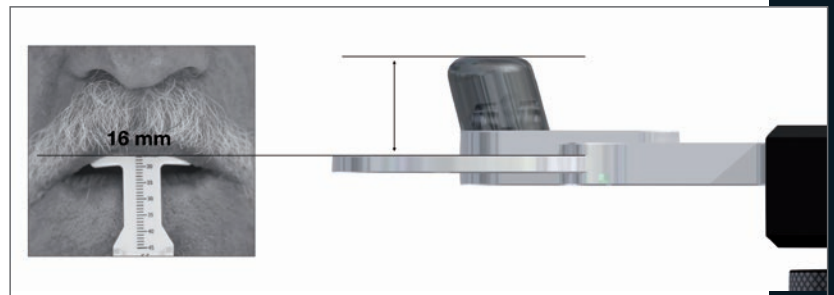
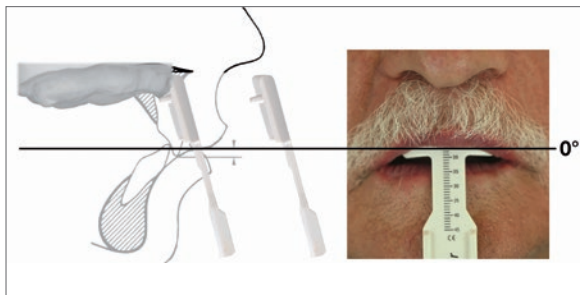
8, 9
The midline coincides with the skeletal midline that runs along the palatal suture starting from site 5. The figure shows that the dental midline does not coincide with the midline/skeletal midline.



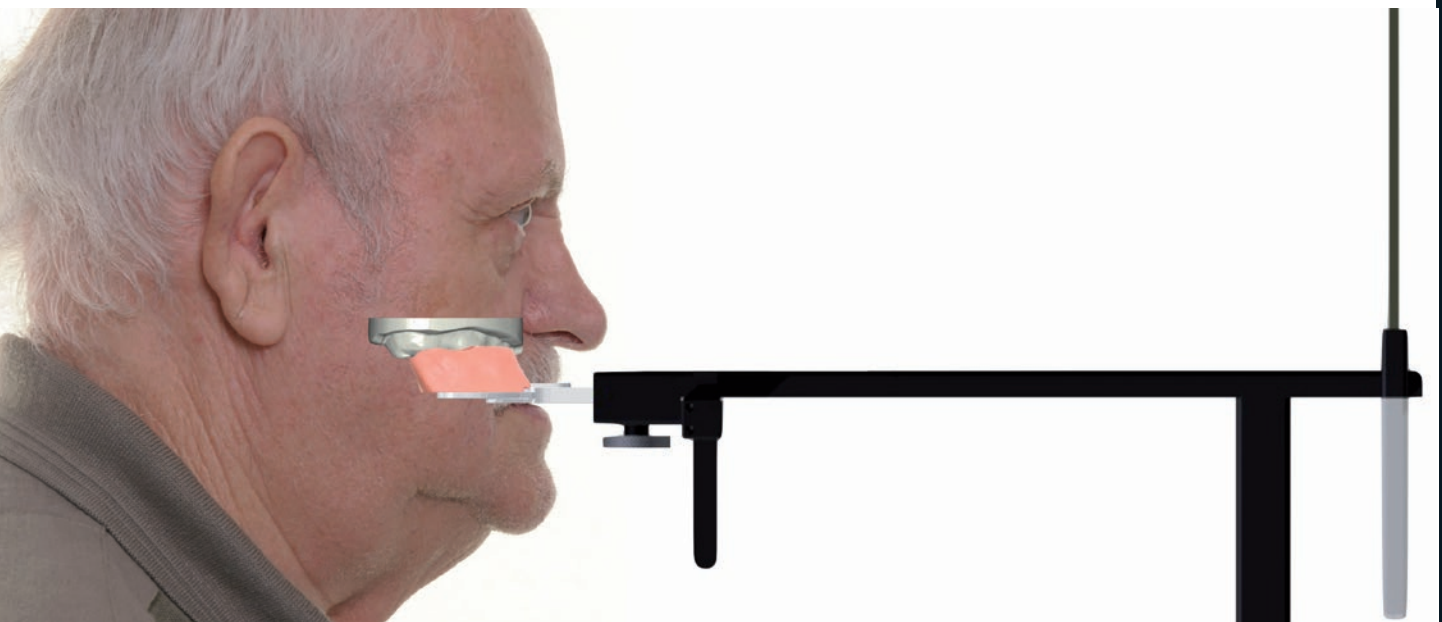
10
The patient will intuitively position his or her midline in NHP perpendicularly on the bite tray line of the PlaneFinder®. Here the same difference between dental midline and midline can be seen as when looking at the palate and the incisors.



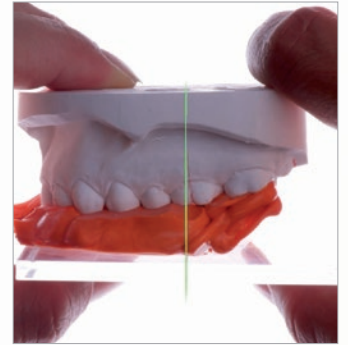
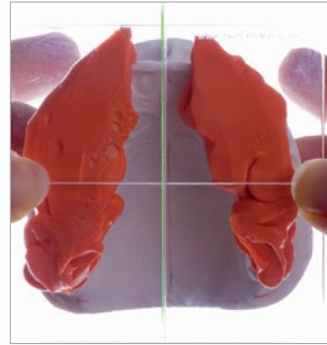
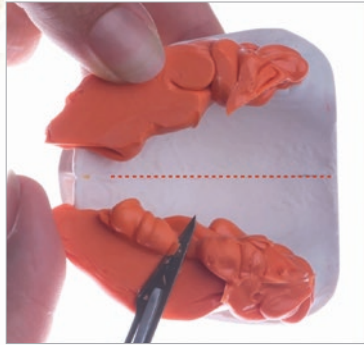
11
With the aid of the record these asymmetries can also be replicated in the PSI articulator (Fig. 16)



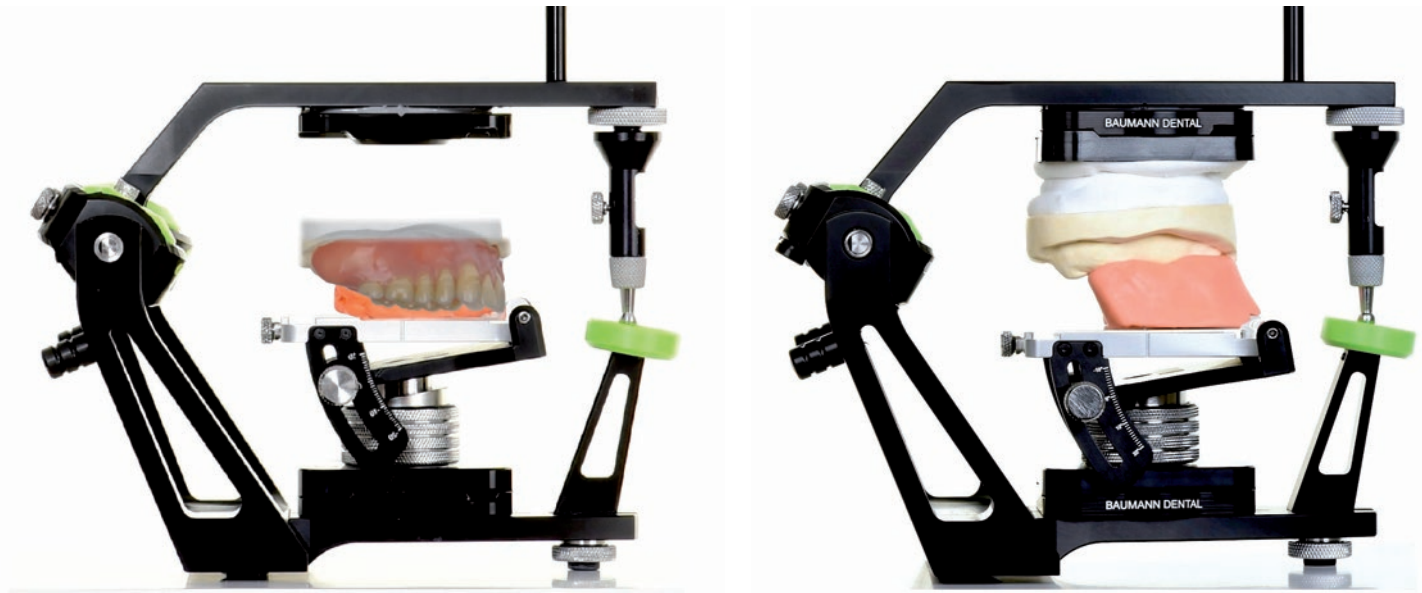
12–15
 When registering an edentulous maxilla, there are different possibilities for the definition of the height on the PlaneFinder®: either the distance between the lower edge of the incisors and the incisive papilla is measured using a papillameter and replicated with a support in a suitable size (developed in collaboration with Jürg Stuck) on the bite tray of the PlaneFinder® or the patient supports himself or herself with a bite record or denture on the bite tray.



This record, the bite record, is then positioned on a horizontal surface on the PSI articulator (PlaneSystem®) using the PlanePositioner® (device for the display of parameters registered with the PlaneFinder®), which means that any asymmetries will also be transferred to the model situation (Fig. 15). Once the position of the model around the vertical axis and the distance to the articulator's centre of rotation have been determined based on the skeletal middle and the masticatory centre, the maxillary model can be placed in the registration material and locked in place on the upper arm of the articulator with plaster (Figs. 16 to 20). This procedure differs from other articulators in that the maxillary position is transferred independently of predetermined articulator geometries.



16-21
How can the asymmetries, which have been captured with the PlaneFinder®, be transferred to the PS1 articulator?



22, 23

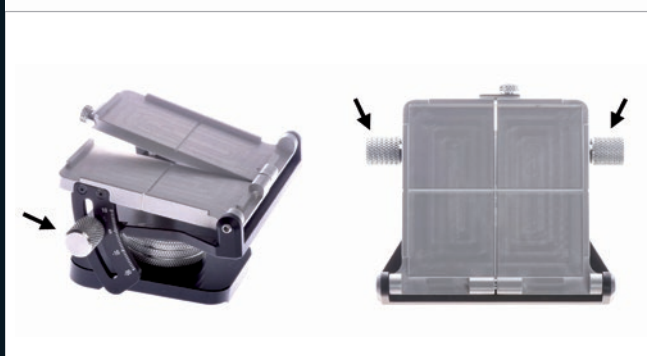
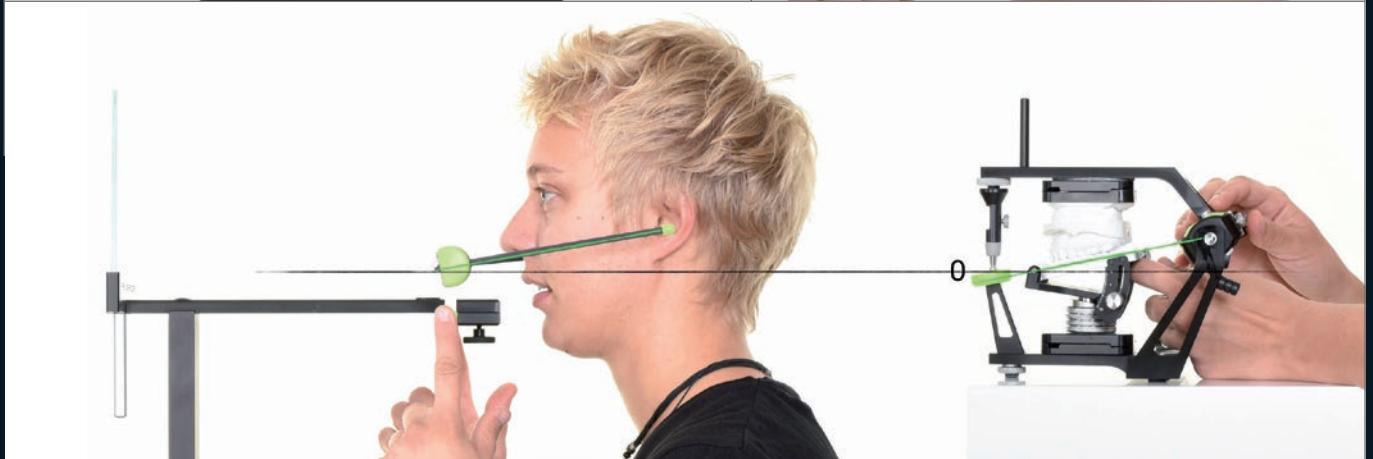
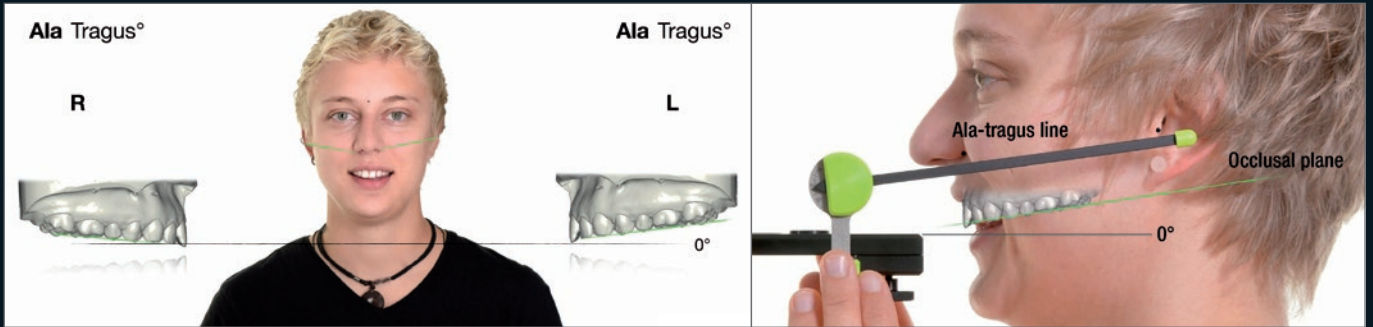
In the case of an edentulous maxilla the registration material, the registration material with a duplicate of the prosthesis or the bite record is positioned on the PlanePositioner®, depending on how the patient situation has been registered on the PlaneFinder®.



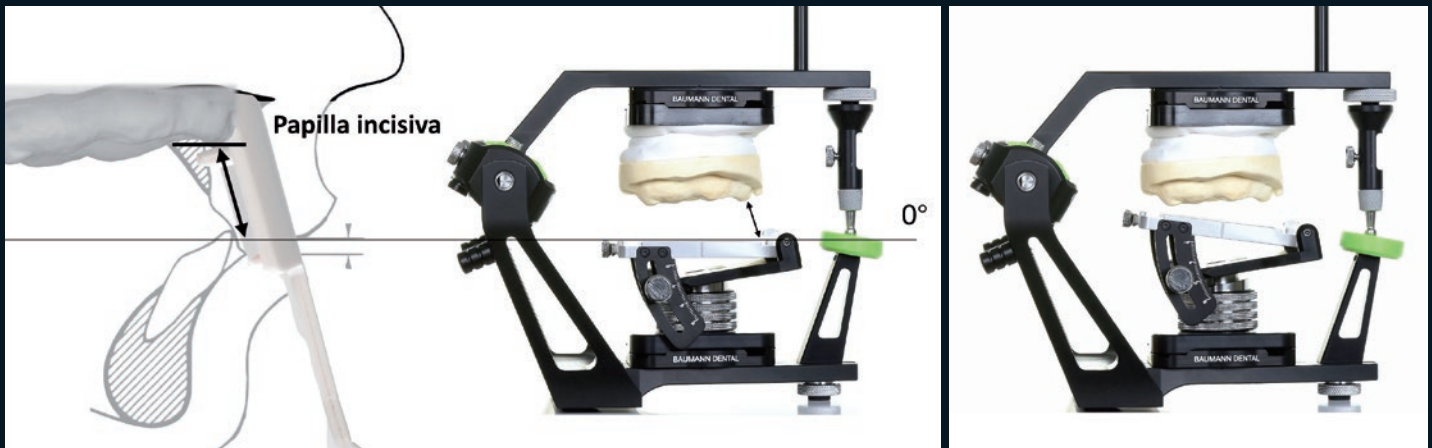
24, 26

The Camper's Plane passes through the ala nasi and the tragus.

While Camper's plane is used with this method, it does not serve to transfer the patient situation but to determine the individual course of the occlusal plane. This is made possible as soon as the patient assumes the NHP on the PlaneFinder® (Fig. 26). As Camper's plane will often show a more or less discernible inclination due to asymmetric bone growth, this will be reflected to the left and right of the vertically positioned midline (Fig. 27). Starting from the horizontal line, we can determine the inclination of Camper's plane bilaterally, on both sides of the face (Figs. 26). Since we can assume that this plane is parallel to the occlusal plane (Fig. 28), it is positioned at the height of the incisors on the PSI articulator (Fig. 29) and represented by the two flat swivelling surfaces on the PlanePositioner® (Figs. 30 to 32 and 34).



27-32
 How can the inclination of the Camper's Plane, which has been captured on the PlaneFinder®, be displayed in relation to the maxillary position in NHP.



33, 34

In the case of an edentulous maxilla the height of the PlanePositioner® is adjusted to the measured distance between incisive papilla and lip closure line.

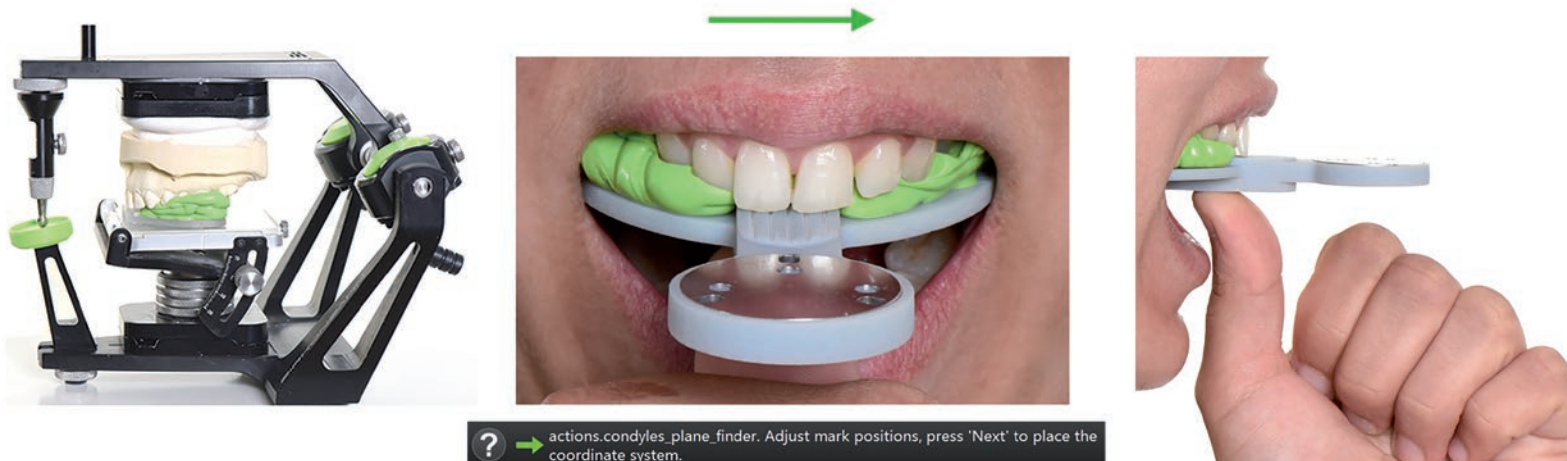


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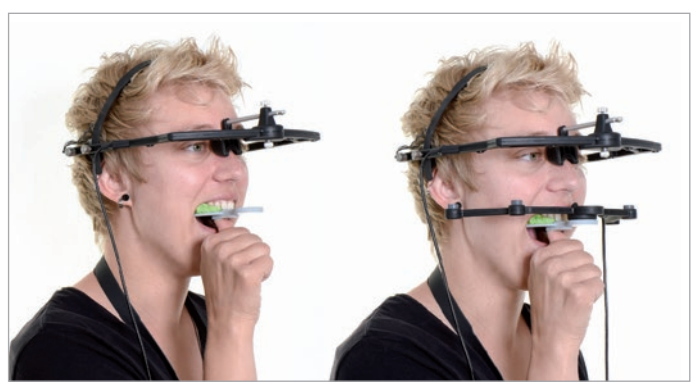
This means that both the maxillary situation and the individual profile of the occlusal plane are recorded using the vertical and horizontal reference planes. Specifically, these two parameters are represented individually on the PSI articulator in this manner, but still true to their actual spatial relationship. So when waxing up the restoration, we know precisely just where the occlusal plane must be positioned relative to the maxillary position at the NHP (Fig. 35). The static data thus obtained greatly facilitate accurate treatment planning in the maxilla, and similarly for the dynamic measurements of the jaw.

MAXILLARY POSITION AND JOINT MOVEMENTS

It has been possible to register temporomandibular movements for some time. If they are imitated in the PSI articulator, a three-dimensional display in the correct relation to the maxillary position is necessary. This means that the dynamic contact relationships of maxillary and mandibular teeth can be taken into account when planning a restoration. Dynamic premature contacts with the antagonist are clearly identified even before the try-in and they don't have to be corrected by finishing with a rotary instrument.



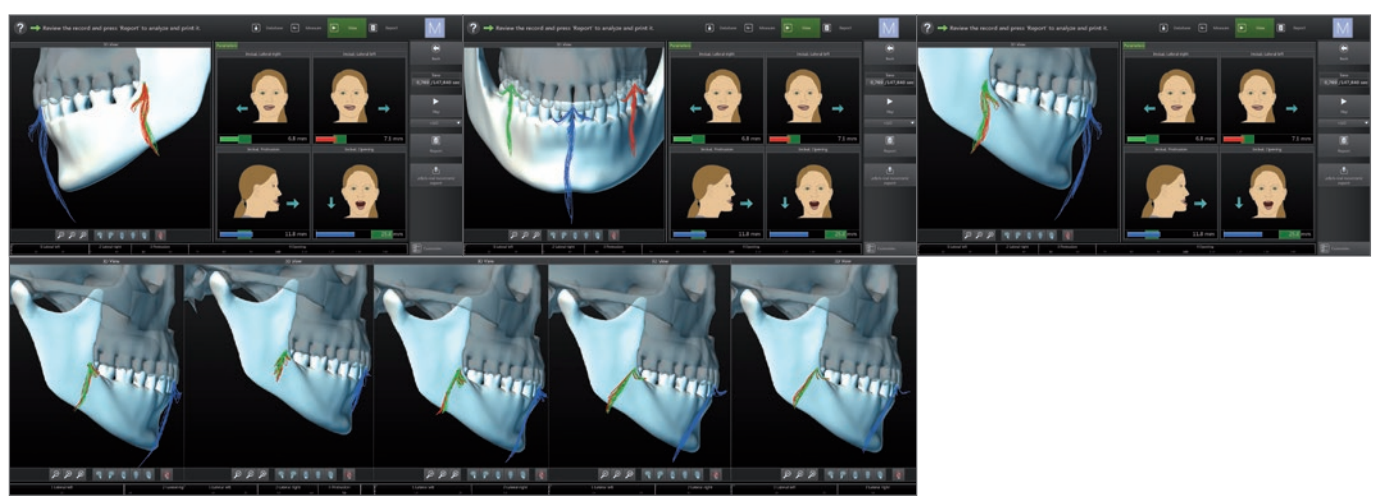
36 The maxillary position in NHP is transferred to the jaw measuring software with the aid of the PSI articulator.



37



38



39-41 42 Measurement: dynamic values of different jaws.

The advantage of transfers using the PlaneSystem® is that the horizontal and vertical reference planes make it possible to relate recorded three-dimensional data for mandibular movements to the position of the maxilla during every phase of the treatment with the help of appropriate measuring instruments (PlaneAnalyser/zebris) and software (JMA/zebris) (Figs 36 to 42). Mandibular movements can thus be individually measured, documented and represented on the PSI articulator under identical conditions, in every phase of treatment. To this end, the PSI articulator offers suitable adjustment facilities on its giant and its anterior guidance plate/pin (Fig. 43).



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FABRICATION OF FUNCTIONAL RESTORATIONS

Just like the carpenter fits a bespoke kitchen, the dental technician can now use the PSI articulator to fit the prosthetic restoration precisely in the occlusal function, taking static (maxillary) and dynamic (mandibular) survey measurements into account. This allows the maxillary teeth to be aligned with the natural occlusal plane and to recognize – and largely eliminate – dynamic interfering contacts even before the try-in. Occlusal splints designed to these individual measurements prepare the jaw for functionally designed restorations in a patient-specific manner. Temporomandibular dysfunction can be avoided or at least reduced as far as possible. The success of the treatment in functional terms can be gleaned from corresponding measurement protocols, then documented and communicated to the patient. For even if the maxillary situation changes, there will still be a stable reference plane with whose help a reproducible position of the maxilla in three-dimensional space can be obtained.

UDO PLASTER, MDT



*Born in Nuremberg, Germany
Languages: German and English*

Professional milestones:

- 2013 Development of the PlaneSystem® in cooperation with Zirkonzahn*
- 2011 Development of the VisualFunction*
- 1997 Graduated as dental technician at Düsseldorf (as an external student)*
Foundation of the laboratory Plaster Dental-Technik
- 1995 Takeover of his parents' laboratory*
- 1987 – 1990 Training as dental technician*

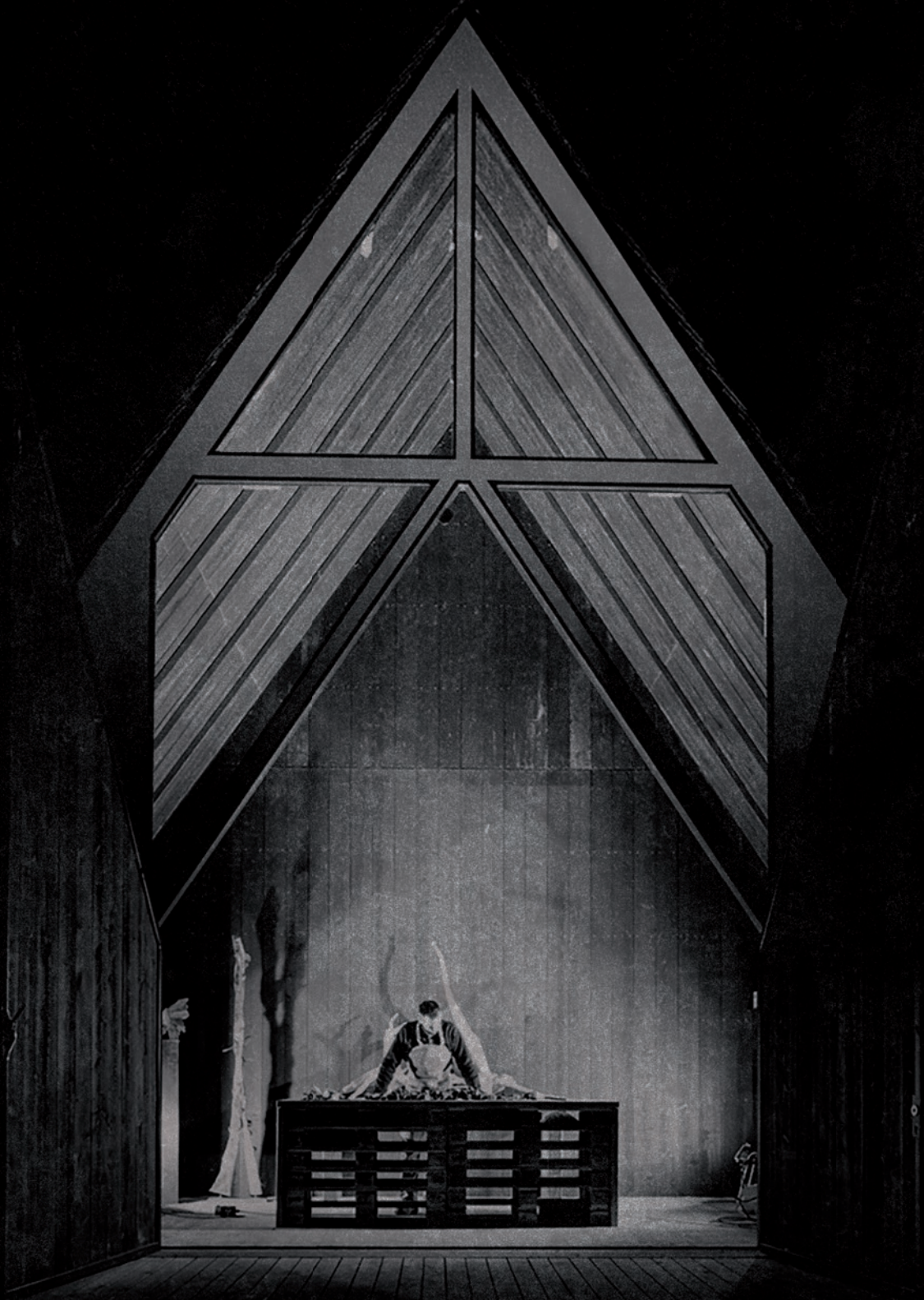
Area of expertise: aesthetic and functional dental prostheses, functional analysis, photographic documentation of facial expressions, implant restorations

National and international lectures

Perfection through perseverance

Zirkonzahn®

EDUCATED BY



DIE ZIRKONZAHN SCHULE