

THE
VEGETATIVE FOUNDATIONS
OF DENTOGENOUS
FOCUS DISEASE

by

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FOREWORD

The paper describes the cause-and-effect mechanism between tooth and jaw foci and the under certain conditions resulting distant disturbances in the entire organism. This detailed treatise is doubly justified since many obscure and wrong views are held in this area not only in general medicine, but also among dentists. Consequently, this topic; including the entire focus theory, has been seen as an "unwelcome subject" in medicine. This need not be. The focus theory does exist and I would like to refer to H. Mathis and W. Winkler in Zahnheilkunde und Innere Medizin (1956). My explanations are based on documented findings in modern medicine which could be scientifically verified, especially concerning evidence in connective tissue theory, which was obtained through electron microscopy. We understand under the term "dentogenous" all distant events of various **types caused** by the presence of foci, resp. neural disturbances in the tooth and jaw area--the mastication system. Such connections, the causal nexus, do indeed exist and their presence is beyond debate. Before delving into the subject, I would like to define several basic terms used in focus theory, thereby preventing misunderstandings in nomenclature. The naming of terms for our discussion was done in accordance with the Nomenclature Commission of the Deutschen Arbeitsgemeinschaft fuer Berdforschung und Berdbekaempfung (DAB), session of Aug. 31, 1958 (see also ref. ALTMANN, 1958).

DEFINITION OF TERMS

We understand by "event" or "focus" all irregular local changes in the organism which cause pathological distant effects, such as dyscrasias or vegetative disturbances or distant disturbances of the local type exemplified by arthritides or neuritides. I would like to state here emphatically that "caused," but not "may be caused," is a term which belongs unconditionally to a distant effect which has shown itself to be clinically manifest. If **such** is lacking, then eventual existing local pathologic tissue changes do not represent genuine or active foci, but instead are silent or potential foci that, due to the interplay of other events, may become active at any time. Called "field of disturbance" or "burdening field," the changed sphere of the connective tissue apparatus is the carrier of peripheral nonspecific regulations of a focus over which pathological functions follow, constituting general and local distant effects. A basic comment may be appropriate here: seen from a histological view, each focus and each field of disturbance as well as each **dentogenous** focus lies in so-called soft interstitial connective tissue which is distributed throughout the body "wherever it may be anatomically found" (PISCHINGER, 1967), and is marked by changes in this area. A focus, respectively a field of disturbance, becomes effective only when the local defense is breached, thereby developing untoward reactions of the "vegetative basic system" (PISCHINGER, 1969) We

understand under "focus disease" the response of the organism to a distant effect of a focus or field of disturbance. A "focus disease" is due to the focus-caused secondary disease, while a "focal event" is a superimposed term signifying a pathophysiology of the involved events and connections in focal disease. This includes the phenomenon that healing of disease symptoms, even if caused by different events, can be impaired if there are concurrent foci or fields of disturbance. This is a fact of utmost practical significance, although given too little consideration, even today. At any event, here is the key to an understanding of many therapy-resistant, exogenous, not focus-caused cases of disease.

This can be briefly illustrated by means of two examples: A 28-year-old woman suffering from cavernous tuberculosis of the right upper lung, was treated for one year in a lung sanatorium near Vienna, although without success. She was sent to me for a search of possible foci during which I discovered two necrosed teeth (pulp amputated molars) in the left upper jaw, while the remaining teeth were vital. After an extraction performed by me, the until then plum-sized lung cavity healed within two weeks during which the usual therapeutic measures were continued (RAAB, 1961).

Another pertinent demonstration, for example, shows us the structural change of taut connective tissues in the presence of foci or fields of disturbance (PISCHINGER, 1961). The fibers of these "hard" connective tissues are most sensitive to changes of electric cell potential, depending anew on the condition of the

vegetative basic situation of the whole organism. As already mentioned above, this vegetative basic situation occurs especially during the existence of foci or fields of disturbance and undergoes morbid changes, thereby causing an altered state of the electric tissue potential. Due to the sensitivity potential, the fibers of the taut connective tissue suffer , resulting in swelling or elongated shapes; in such cases we may see a static insufficiency as for instance, in case of a flatfoot or a pulposus hernia. Although seeming paradox, such problems can also be vegetatively influenced and can now and then only be orthopedically healed once the organism is "defecated," causing the railed vegetative basic situation to become normalized again.

On principle we have to add the following comment to both examples: A tooth defecation in chronic diseases which are not due to foci but are perhaps influenced by it, is not dentogenous focal therapy! We can only speak of focal therapy if a dentogenous field of disturbance is involved which, however, does not apply **here**. In such cases, defocization will merely be basic therapy which by itself will be inadequate because in the large majority of patients, we cannot expect lasting influence in chronic diseases. Basic therapy, however, constitutes the condition for success in the various subsequent special treatments. The decisive point in defocization used as basic therapy is the one and only hereby possible "restoration of normal unspecific vegetative defense efforts {adaptions) of the entire organism" (RAAB, 1963).

THE "VEGETATIVE QUOTIENT"

This factual experience leads us now to pose a question which is of greatest practical experience for the expert *in* dentistry, the family practitioner as well as the internist and orthopedist, etc., and that is the question of jaw defecation when we are not dealing with focus-caused chronic disease while taking into consideration the so-called "vegetative quotient. " In a previous paper (RAAB, 1963), I provided a detailed explanation of this view, but for comprehensive reasons I would like to go into the matter once more. When considering a general plan of therapy, the question arises frequently in the practice of a general physician as well as in the dental practice when a total defecation of the teeth is indicated and when not. This is a question which cannot be answered solely by the dentist. If we are dealing with genuine focus-caused complaints such as a primary chronic polyarthrititis, etc., where the existence of a focal event has been clinically documented without doubt, then our decision will be easy because we know from experience that the course of the disease can only be positively influenced by means of a radical and total defecation followed by subsequent desensitization; however, how are we to proceed *in* cases of degenerative rheumatic diseases which are not focus-caused? Can we really ask a patient with arthrosis or disc hernia to have all his devitalized teeth extracted -- for which he probably spent a great deal of his money and where the abutments were treated

Immaculately? When can our request be justified -- and when does this need not arise?

Obviously the commonly used focus-related tests cannot give us a precise answer since **they** are employed only in combination with an exact anamnesis and a thorough overall examination before arriving at a clinical verification of a focal event. Chronic degenerative .rheumatic diseases -- to mention just the largest group -- are not based on focal events, they are not conditioned on and due to foci, although they may be sometimes influenced by them. This circumstance forces us to look for the answer somewhere else to our question, namely, to the condition of the prevalent vegetative basic situation of the whole organism.

The problem can be stated as follows: Can the vegetative basic situation be changed by illness if there are no foci in chronic diseases while at the same time potential dentogenous foci or fields of disturbance exist -- excluding foci in other areas of the body? In other words, is the organism in such cases still able to regulate a nonspecific defense system steered by the vegetativum, or did some minor or major characteristic derailments already occur?

The fundamental issue here is to understand the vegetative basic situation, i.e., the so-called "vegetative quotient" of the whole organism as a reflection of the existing defense situation. As already discussed, the existing conventional focus-based probes will not help by giving us definite information. However, there exist two methods which I would like to describe as "comprehensive

tests,"and which are able to do this . The first test can determine the blood criteria (Elpimed reaction) according to F. PERGER (1963), while the second is called iodometry (iodine binding reaction) according to A. PISCHINGER (1966). To describe both, the vegetative basic concepts are briefly illuminated.

As regards the blood criteria determination it must be said that the basis for these examinations is investigation of the normal defense ability of a healthy organism (H. SELYE, 1953, F. HOFF, 1962, H. SIEDEK, and others). The normal defense ability of the vegetativum to insults of whatever type occurs in three phases, **i.e.**, consisting of a shock phase, an anti-shock phase, and a phase of adjustment. This reflects itself in the blood criteria: In the shock phase there is a sinking of ca- and cholesterine levels and a reduction in the quantity of eosinophilic leukocytes, but a rise in the mg-level. The anti-shock phase in comparison shows relatively high ca- and cholesterine values and an increase of eosinophiles, but a reduction of mg-values. The phase of adjustment is identified by a backsliding of all described changes towards normal values. PERGER was able to show that existing defense regulations could be changed within one hour, resulting in a significant increase of ca-values in the serum; when 1 ccm Elpimed was given subcutaneously, a further increase was seen in the hours following, resulting therefore in a reaction with which the organism attempts to **escape** from a **vegetative** shock condition: a picture of an anti-shock **phase** develops. **However, in patients** in which the vegetativum is burdened with active fields of disturbance, the **same** Elpimed

dose showed an initial rise of ca-values after one hour which dropped to a characteristic retrogression of these numbers, meaning that these patients despite the "electrifying" Elpimed effect -- due to the derailment of their defense mechanisms -- **remain** incarcerated in the shock phase. This test result is proof that in such cases the vegetative basic situation has deteriorated to a morbid state and is unable to cope with normal defense efforts.

Iodometry according to PISCHINGER touches the humoral sphere of the vegetativum. This technique is based upon the reflection that each focus and distant event is located in the soft interstitial connective tissue. This *is* also valid for all dentogenous foci, since the small HAVERSSCHEN channels of parodontal bone as well in the gingiva and tooth pulp contain the elements of mesenchymal connective tissue. The effects of a focus or distant field are mainly relayed to the interstitial system, respectively the "vegetative basic system," according to PISCHINGER (1969). If we consider the entirety of this system where micro-fine fibers are spread throughout the body and even reach to the organ cells, it is clear that a focus-caused field of disturbance can influence the entire vegetative basic system; if the disturbance is sufficiently strong it can breach the local defense around the field of disturbance and thereby transgress the local sphere. In this event, we will see a characteristic change of the entire vegetative basic situation in the body such as a continuous derailment of the nonspecific connective tissue and mainly humeral, i.e., oxydoreductive systems ("redox matter) steered defensive regulations, its

existence on one hand permitting not only focus-caused distant **ef** facts, but on the other hand effecting therapy of resisting exogen, not focus-caused illnesses. Based on the fundamental perception that the vegetative defense regulations can be influenced lastly by reagible oxydoreductive complexes -- which anew can be influenced by foci and fields of disturbance -- rests the method of standardized iodine-binding reactions, as perfected by A. PISCHINGER and his coworkers G. DRACZYNSKI and G. KELLNER. Being able to determine iodine consumption in de-proteinized blood serum allows us for the first time a quantitative comprehension of the humoral action complexes as the principal regulators of basic function of life, which is rooted *in* the vegetativum. During the discussion of the "vegetativum" I will refer to the area regulation in detail. More particulars can be found in A. PISCHINGER; Krebsarzt, 5, 21, pp. 297-311 (1966). The point is that we are dealing basically with a transformation of elemental iodine into iodione, where the norm represents a median value of 81.3 mg%. An increased consumption of iodine via this norm value in the normal adaptive - - while taking into consideration certain climatic and seasonally dependent fluctuations speaks for a reductive condition, **respect ively** for the existence of derailed vegetative defense regulations and therefore for a morbidly changed vegetative basic situation of the whole organism.

Both of these methods enable us to evaluate with certainty the currently prevailing "vegetative quotient" of the entire body, whereby the iodometric method as compared to the blood criteria

determination can be considered as the more subtle approach. I am aware, of course, that the application of these tests will encounter certain difficulties in a dental practice; these tests are not the task of a dentist but instead belong to the realm of a general practitioner or internist, who may see the patient first and must suggest a plan of therapy. Above considerations should therefore not only be seen as a hint as to the diagnostic possibilities that can result and which will be of value especially for the general practitioner, but following this indicated approach will enable him to transfer the patient to a dental practice for implementation of required dental interventions and allows informing the stomatologist about the vegetative basic condition of his patient. Is this the case, then there is but conclusion for the dental practice which I formulated as follows: "Normal functioning vegetative defense, even when "focation" of the jaw is present, does not require radical dental intervention; however, derailed defense reactions require total and radical defecation as a necessary precondition for the body to return to a normal adaption mechanism" (RAAB, 1963).

THE DEHTOGEHOUS POSSIBILITIES OF A POCUS

Before continuing with my explanations, in order to understand the subject it will be mandatory to show a compilation of all local pathological changes in the jaw area which, under certain conditions, could become a focus. Similar enumerations were compiled

several **times** by other authors, the last one in brief form by H. MBHNERT (1968). We identify such changes as potential dentogenous foci. Based on this list (Table 1), I would like to describe all indicated terms in numerical order and in detail:

Table 1 : Potential dental foci.(From H.Raab, Die vegetativen Grundlagen dentogener Herderkrankungen, Maudrich-Verlag, Wien, 1972)

Changes	Likely effects of the focus
1. Devitalised teeth, regardless of whether they have root treatment or not.	General increase in sensitivity and tendency to become allergic.
2. Conditions following a tooth becoming devitalised .	
a) So-called „dead space" in cases of incomplete root filling.	Detritus, protein decomposition.
b) Periapical, localised ostitis (= "granuloma")	Chronic inflammation .
c) Diffuse periapical ostitis.	Chronic inflammation .
d) Root cysts.	Chronic inflammation .
e) Antral inflammation due to teeth roots, in some cases, empyema of the maxillary antrum.	Chronic inflammation .
f) Pathological changes in the submaxillary lymph nodes.	Chronic inflammation .
3. Changes occurring in the edentulous:	
a) Impacted teeth with or without follicular cysts.	Neural interference fields.
b) Remains of teeth, scars.	Neural interference fields.
c) Restostitis.	Chronic inflammation .
d) Remains of roots which have begun to grow again.	Non-absorbable material.
e) Sclerosis of the bones.	Non-absorbable material.
f) Foreign bodies, such as vestiges of metal (shell splinters), remains of metal or cement fillings, guttapercha points, detached nerve roots, drills, levers, parts of forceps, etc.	Non-absorbable material.
4. Gingivitis, peridontitis, peridontosis, dentitis difficilis, pocket formation, ostitis.	Autonomic reactivity (increase of) and chronic inflammation.
5. Corrosion of dental metals.	Sensitization due to the formation of protein metal complexes in the gums, neural interference fields also.
6. Bi-metals dental metals which are dissimilar, i.e. silver and gold, etc.	Sensitization due to currents (measured in milli-amps) in the mouth. Neural interference fields.
7. Living but unhealthy teeth.	Sensitization of the entire body.

DISCUSSION OF TABLE 1

re 1) Devitalized Teeth

It has been established that among the clinical or X-ray diagnosed dentogenous foci we find the devitalized tooth in foremost position -- regardless whether quantitatively or qualitatively. It does not matter if the tooth is root canal treated or not since it is well known that devitalized teeth broadcast sensibility-promoting substances. In this connection I speak intentionally of "devitalized" and not, as is still common custom, of "dead" teeth, simply because the devitalized tooth, seen from a biological viewpoint, is not a dead structure such as a sequestration would represent, but is still organically connected through its root fibers of the periodontal space with the living parodontal tissue and its lymph flow; should this not be the case, i.e., if the tooth **were** actually dead it would act as a foreign body and be expelled. However, this occurs only when the tooth, such as in very advanced parodontosis, has lost its organic connection with its live surroundings. This is why there exists the possibility even in the case of an excellently root canal treated tooth, whether from the main canal or in the case of teeth with multiple roots with their cross connections in the tooth interior thus from the pulp-dentine-cementum-parodont and via the foramina apicalia we may **see the** possibility of digestive assimilation disturbance products brought forth from time to time, acting

X/I.

as sensitization-causing substances, respectively antigenes transmitted to the body. From that, given sufficient leeway for the necessary time required, arises the cause for allergic events. It does not matter in the least whether the root canal contains bacteria or not. We have to consider the focal event primarily from an allergic but not a bacteriologic viewpoint, although the latter may play a role in some cases.

With increasing improvements in treatment therapies and their most careful application, root canal treatment, when seen as a strictly bacteriological problem should be solvable; this is shown by the success of immaculate root fillings performed by some of the masters of our profession. X-rays show a normalization of previously changed bone structure in the periapical area, documented by repeated X-ray controls. However, I have to state fundamentally (which I also emphasized somewhere else) that: If alluded to such cases by fervent proponents of root canal therapy (cases which I personally have never doubted) in the *frame of denrogenous focus rtherapy* and if they speak of a "focus sanitation," this is a conceptual error (RAAB, 1964). This error is based on a nomenclatural misunderstanding in so far as these authors only understand by a "focus" the X-ray visible change (= the granuloma), whereas our interpretation encompasses the entire devitalized tooth which, of course, remains as an "intradental" focus in the mouth, perceptible as a strictly morphological sanitation of the accompanying periapical ostitis. This is essentially the reason why we reject root tip amputation as dentogenous focal therapy. The accuracy of

this concept is affirmed by the picture of the illness as a primary chronic polyarthritiis. Its course, according to the experiences of ALTMANN and others, can never be influenced in a positive manner by the sole elimination of periapical processes, but can only be corrected by the removal of all devitalized teeth. Seen from this perspective, the common expression of "focated" or "not focated" teeth does not seem valid. It would be better if we were to speak only of devitalized teeth with or without periapical changes. It is our belief that even the most careful bacteria-proof filling of the root canals -- this constitutes the central P.Oint of the focal **events** -- is unable to change its allergic components. Root canal therapy is less of a problem regarding canal treatment only as it is a question of cross connections of the tooth interior with the parodont.

The relations at the dentine-cementum border have been the object of multiple histological inquiries ever since scientific dental science was established. Special attention was given to the link between cementum and dentine, i.e. the cross connection between pulpal tissue-periodontium; not least because of considerations relating to the practical significance of such a cross connection for root therapy. The assumption prevailed for a considerable period of time that that there was no connection across the dentine-cementum border and that there existed an impenetrable barrier. However, more recent histological findings on thin polishings and on sections of human and animal teeth by W. PRITZ (1964) allow us to recognize that the small dentine channels

reach up to the dentine-cementum border and do not end blindly beforehand. Characteristic is the intimate growing together of hard tooth substances of both dentine and cementum in these preparations through cone-shaped indentations of the cementum into the dentine, spaced along almost equal distances on the dentine-cementum border. In the cell-containing cementum area and locations of resorption which reached into the dentine, were found anastomoses between small dentine channels and cementum lakunes. These anastomoses show the character of a genuine union and not just a mere close stratification. Above are important findings for root canal therapy. As concluded by PRITZ: the dentine-cementum border is not an impenetrable barrier, as formerly commonly believed, but rather it has been proved that a cross connection of pulpal tissue-periodontium must play a special role in the allergy genesis of a focal disease.

Based on the results of histologic investigations by PRITZ we can state, therefore, as follows: If one should be doubtful as to whether the antigens appear in a still functioning manner after successful root therapy, we must be reminded that the allergy problem is not so much quantitative as rather qualitative and that, furthermore, the quantity of antigens, for instance, which remains in wine after filtration through a fish bladder, is sufficient to cause an attack of asthma bronchiale in a patient of **such** a disposition (ALTMANN). This is why a perfectly filled tooth with its main channel can function as a contributor of sensitizing agents, more so with certainty because even after root canal

therapy is carried out lege artis, organic material will remain let us think of the total of necrotic odontoblast processes in the small dentine channels -- whose protein decomposition products reach via diffusion through dentine and cementum into the capillary system of the parodontal tissue, thereby causing allergic processes in the general organism which again will result in a pathological change of the vegetative defense regulation, preparing the soil for fields of disturbance in the body.

In this connection it will be of interest to report a pertinent observation made by ROTHBAUER. He described a 45-year-old female patient with a silicate-gangrene on the left upper incisor who otherwise had 27 vital teeth on both closed rows of teeth. After trepanation, 16 days later this tooth was finally filled. The tooth remained without reaction; however, on the second day the patient complained about lumbago-like troubles, which she had never experienced previously. Since anti-rheumatic pharmaceuticals were shown to be without effect, the root canal filling was removed 5 days later, resulting in an almost immediate disappearance of her back pains. After the tooth remained open for 5 days, the root canal filling was repeated with a different preparation. This resulted in a recurrence of the same rheumatic complaints. The process was repeated in the same sequence once more when finally after the third root filling using anti-allergic premedication, the tooth extraction led to a permanent resolve of her complaints. The tooth itself did not cause the reactions and as long as the tooth remained open there were no symptoms; however,

TABLE 2.

Num ber of Patients	Teeth Checked	Alive	De-vitalized	X-Ray Changes	Root Treated	X-Ray Changes
760	13,546	10,829	2,717 = 20%	1,887 = 69.4%	1,836 = 65%	1,194

(from W. FR ITZ: I nvestigations on the Frequency of Odontogenous Foci and the Prospects of R oot Canal Therapy, in Oesterr. Zschr. Stomat., 53, 3, 1956).

TABLE 3

Results of the Histamine-Conjunctiva Test according to R EMKY

No. of Patients	Rheumatic Disease	Positive Test Res.	Percent	Negative Test Res.	Percent
500	500	436	87.2	64	12.8

(from H. RMB: The Root Therapy as Focal Burden of the Vegetativum, in: Der Praktische Arzt, XV, 167, 225-237, 1961).

the closing of the tooth by the filling material resulted in the remote effect (ROTHBAUER, 1964).

By means of above explanations I have attempted to pinpoint the position of the devitalized tooth, respectively the root-canal treated tooth, as sensitization factor in the frame of the vegetativum. The large role played by the root-treated tooth in the focal burdening of the vegetativum, not only on a qualitative but also on a quantitative basis, can be set forth by means of a series of investigations conducted by PRITZ:

PRITZ (1956) went to the trouble of evaluating 1,000 case histories of hospital patients which were sent to the dental station of ALTMANN in Vienna-Lainz in 1952. The number of patients constituted obviously a typical average profile which would accurately reveal the state of the dental situation in the population as a whole. Of these, 160 patients had received a full clinical and X-ray examination of the tooth and jaw area. Clinical patient examination and X-rays of altogether 13,546 teeth showed 2,111, i.e. 20 percent, of devitalized teeth, or 3.6 teeth per patient. Of the 2,111 devitalized teeth in this patient series there were 1,881, **i.e.** 69.4 percent, which showed X-ray changes. Root canal therapy was seen in 1,836 teeth in the devitalized teeth group, 1,194 of these, or 65 percent, documented visible changes as seen on X-rays (**see** Table 2).

Regarding the high percentages of numerical visible changes seen on the X-rays as discussed by PRITZ, he not only found among these the well-known changes of a chronic apical osteitis, but also

incontestable widening of the periodontal split, especially when limited to the apical part of the root: as pointed out by F. PROELL, the majority of these teeth must be regarded as infected. Widening of the periodontal split in cases of devitalized single standing teeth and teeth at the end of the row, if not limited to the apical third of the root, must be considered a result of a changed strain situation: however, changes of this type were not counted.

PRITZ concluded from this inquiry that carriers of devitalized teeth with and without X-ray traceable changes were subject to an increased rate of morbidity.

I myself arrived at the very same conclusion because of another series of case histories which I conducted on patients sent to my dental station of the Pensions-Versicherungs-Anstalt der Arbeiter, Landesstelle Vienna. I evaluated the results in 500 patients employing a histamine-conjunctiva test according to REMKY, a test I use in all cases if no contraindications are present (iritis, conjunctivitis), to determine the so-called position value (GLASER) of root-canal treated teeth (RAAB, 1961).

This test is based on the fact that if foci are present, i.e. fields of disturbance in the head or face areas signifying teeth or jaw sections-are expressed as a disturbance of the vegetativum, resulting in an increased response of the eyeball conjunctiva in the same irradiation segment (trigeminal area) to diluted histamine solutions. A positive test response will result in a reddening of an otherwise clear eye.

Only patients were used with the most varied affections in the rheumatic sphere, in particular only these who, with the exception of roentgenologically visible root-canal filled teeth, did not show other potential dentogenous foci, **i.e.** no rhinological foci either. This limitation appeared appropriate to me so as not to reduce the force of the results. The test results of my investigations were in so far remarkable as of the 500 tested patients of the selected collective 436, thus an overwhelming majority, namely 87.2percent, showed a positive reaction, whereas the test indicated a negative response in only 64 cases, or 12.8 percent (see Table 3). This proves that in the overwhelming majority of root-canal treated patients only a very small additional burden is needed for the local defense system around the potential dentogenous focus to break through, and in this way the general susceptibility to **disease** is increased. To guard against possible misunderstandings it must be added that the positive outcome of this test series does not give us the right to speak of a so-called "scattering" of the existing devitalized teeth. The test results merely show us that at the pertinent area of the vegetativum the local defense was breached for a moment because of the employed burden. Should an additional stress be added of a general or local nature to an already focus-stressed vegetativum, an up to this time latent insufficiency in the **area** of the nonspecificum will clinically manifest itself.

In conclusion of the previous discussion as regards the shady position of devitalized, especially root-canal treated teeth in

focal events, this teaches us the following for the dental practice :

Root canal therapy is justifiable, of course, in a healthy person and perhaps even allowable in a so-called "healthy" carrier of a focus (sit venia verbo). In no case, however, is root canal therapy indicated in an ill patient or a person already affected by a focus in whom the vegetative total defense of the body has already failed: so far it has not been possible to develop a method of root canal therapy which would prevent a dentogenous-caused focus disease or to influence an event already in progress in a favorable manner. Consideration must be given to the fact that the pathogenetic principle of a devitalized tooth exists via the sensitization and allergization of the body through albumen reduction respectively decomposition products, which can in even the best root canal filling find a path over the cross connections from tooth interior to paradont and thereby into the entire body (PRITZ, 1964, RAAB, 1964).

re 2) Consequences of Devitalized Teeth

a} The so-called "dead spaces" (PAESSLER) of the root canals in incomplete fillings of the root can become an effective focus because they usually contain masses of detritus which will lead to decomposition of protein. causing, in turn, the formation of sensitizing substances able to effect allergic reactions when reaching the capillary system of live parodontal tissue in an organism.

The changes described under b), c), d), e), and f), that is, periapical circumscribed osteitis, granuloma, periapical diffuse osteitis (which can usually not even be identified in a roentgenogram), root cysts, dentogenous conditioned antrum changes as well as pathological changes of regional, respective submaxillary lymphatic knots, are local pathological tissue alterations whose focal operative factor rests on more or less completed chronic inflammation. If the local defense around these chronic, in lymphatic knots usually by lymphocytic and plasma cellular infiltrations identified foci of infections is breached, distant disturbances can be the result. The decisive factor is always the respective defense situation of the total organism. RICCABONA pointed out that in dentogenous caused antrum alterations, it is odd that empyemas are involved to a lesser degree, whereas indurating and sometimes polypos·e chronic inflammatory alterations of the mucous membrane on the floor of the maxillary sinus are a causative factor in the **release**. of distant effects. There is another point (f) to which I would like to draw special attention: The pathological alterations of the regional respectively submaxillary lymphatic knots should not be confused with the existence of jugular **pressure** points, which were previously described by H. LANGER (1952). In **more** than half of the **cases** of dentogenous focus disease, LANGER was the first who noticed pressure **sensitive** places in the submandibular area and on the foremost edge of the m. sternocleidomastoideus. He referred this sensitivity to pressure not to a infiltration of the lymphatic glands but rather to a latent

endophlebitis of the vena jugularis, an assumption which was later shown to be correct by other authors (SIEGMUND, MEYER). We are **dealing here** not with a basic cause but rather the consequences of a clinically **manifest** dentogenous focus **disease**.

re 3) Changes in the Empty Jaw (Table 1, a-f}

Under the term "Empty Jaw" we understand in the field of dental science all external jaw segments which appear to have no teeth. In such areas we find occasionally retained or impacted teeth, as for instance the upper and lower wisdom teeth, upper and lower canine teeth, also molars with or without follicle cysts, furthermore teeth rudiments, restosteitic precincts, apparently more or less well healed root remnants, sclerosis of bone, but also genuine foreign objects such as for instance metal parts (granate shell splinters, bullet fragments (an anamnesis which frequently occurred after the Second World War}, as well as amalgam or cement residues which splintered off during an extraction of larger fillings and escaped into an empty alveolar space or were sliding into the submucous depth and **remained** there: also cement fillings which during meticulous root fillings were deposited in the spongiosa or antrum, or segments of guttapercha tips which extended beyond the foramen apicale and tore off during tooth extractions, less frequently also implants such as parts of nerve- or Kerr needles, broken-off lever tips or ends of Blackspoons, broken off drills, sometimes even broken off parts of forceps jaws. Granate

shell splinters as a focus event were discussed by M. HERRMAN (1952).

It is obvious that alterations of this type can only be discovered by **means** of a complete X-ray status including all **empty** jaw photographs. If we suspect a focus event, it will be mandatory to ask for such, even from a total-denture patient. An extra-oral general view X-ray is not sufficient. It must also be pointed out that not each intra-oral dental X-ray film will show visible foreign objects--and which do not necessarily have to be in the dental ridge (E. SCHO); it may also be in the cheek. Anamnesis and palpation provide us usually with **a degree** of certainty and we thus avoid a pointless opening up of the supposed jaw area.

The pathogenetic factor of such formations found in the empty jaw deserves further clarification. Retained respectively impacted teeth and teeth rudiments (a, b), are neural fields of disturbance (F. HUNEKE, P. DOSCH, and others). This is provable by the possible triggering--if fields of disturbance exist--of Huneke's lightning reaction phenomenon (see below). A. ROST has emphasized the importance of retained teeth as regards dentogenous focal events by **saying** that such alterations represent vegetative fields of disturbance and can cause distant effects in patients who are older than thirty years. I too have collected relevant observations and would like to mention one characteristic example:

The matter concerns a 38-year-old woman who was sent to me for a dentogenous search because of a cervical irritating syndrome from which she had suffered for many years. The clinical picture of the

disease was marked by obstinate headaches in the back of the head, as well as pains in the area of the cervical vertebra radiating into both upper **arms** down to the elbow joints. Complaints of the tooth system were not mentioned. A vitality test was conducted and **showed** all remaining incomplete teeth to be normal with the exception of both molars in the left lower jaw which were crowned by metal and totally root filled. However, the complete intra-oral tooth X-ray status showed two molars in the left lower jaw within the bone at the end of the horizontal and in the beginning portion of the rising branch, fully developed but not broken through, whose longitudinal axis represented a slanting vertical line from below to above, upon which the vertical crowns appeared spaced apart by only a small gap. Here we had the typical, although in this form fairly rare picture of a retention of two molars, one of which probably was the wisdom tooth. In an effort to discover a dentogenous field of disturbance as the cause of the above mentioned clinical problems of the patient, I injected impletol buccally and lingually around the area of the root apex of both devitalized left lower molars, but with no results. However, one in the same session conducted injection with impletol into and around the external toothless octagonal area of the left lower jaw resulted in a typical lightning-fast reaction according to HUNEKE, insofar as the existing headache pains disappeared in a flash, returning only after two days. This event was reproducible. With this, the connecting diagnosis between the tooth retention as a neural field of disturbance and the headache was established (RAAB, 1964).

The restosteitis (c) in the empty jaw, where the focal effective factor results in a self-contained chronic inflammation, requires a separate discussion. We are dealing here with a circumscribed chronic inflammation in the toothless jaw; this was named "paradental osteitis" and described for the first time by MELCHIOR (1925). One finds these changes isolated in the jaw bone and also as residues of root fillings or amalgam fillings which remained behind when teeth were extracted. The diagnosis of restosteitis is usually made on a coincidental basis during X-ray examination of the toothless jaw segments; it shows itself as a more or less well visible rounded brightening. According to experience however, such small changes are often overlooked during the analysis of toothless jaw segments or, if seen at all, ignored and its importance misunderstood. Several little known causes of why restosteitis comes into being were pointed out by PRITZ (1968): After extraction of a tooth, the absence of bleeding should be noted, since a restosteitis can also develop from a "dry" alveolus. The "granuloma," the chronic periapical osteitis, should also be removed with a suitable instrument since extraction by itself does not always guarantee complete healing of the chronic inflammation, especially when processes of larger dimensions are involved. The primary opening up, as demanded by ALTMANN (1965), yields the only overview as to whether radical removal of diseased bone is needed. If a deeply fractured root requires opening up, we must make certain that no bone splinters **remain** in the alveolus. Also, the reamer or drill must not be used in a manner to allow heat necrosis

I could not find an
English term for
"interkalaer."

of the bone. Both can lead to a restosteitis. In addition, SIEGMUND (1929) **sees** another possible cause in the unthinking application of arsenic.

The common pathogenetic principle of the alterations mentioned under points d), e) and f) (**see** also Table 1, Fig. 3) consists essentially in the missing ability to break down the materials involved. After ten to fifteen days a microcellular infiltrate starts to form around the healed-in foreign material, which will not be affected by subsequent events of the healing of a wound (KELLNER, 1969). This lymphocytic-plasmacellular infiltrate is seen as a chronic inflammation, but in addition it is also an indicator of a local hypoxia of the tissue, establishing a cause for a latter destruction of connective tissue. In addition, material which could not be broken down will **lead** to a parapraxis in reactions of the basic tissue (PISCHINGER, 1953). The reason for this faulty regulation is found in a permanent vegetative-neural irritation on the part of the disturbed spot or surroundings. The effectiveness of focal effects rests on such formations. In this connection, the following should perhaps be mentioned: If, as shown by KELLNER and KERESZTESI (1964) in the tests of root filling materials, the harmful effect on a cell of a not soluble **material depends** on the amount of added substance, then the surface of the substance is solely responsible but not the amount. Each material which cannot be broken down by the body, has this surface, including protein, resulting in a disturbing effect. An object of study for the disturbing effect which originates from a skin surface are, for

instance, the talcum crystals that can be traceable in scar tissue, constituting a disturbing event and development of a focus. The disturbance does not result primarily from the focus, but rather from the boundary level of the material which could not be broken **down**, the crystals or the root filling materials (cement, gutta-percha, etc .) as they relate to tissue (KELLNER, 1969).

re 4 Regarding the status of Gingivitis, Parodontitis, Parodontosis, Dentitio difficilis, Gingival pockets of the gums, Osteitis, etc. , in the frame of a dentogenous focus event requires the following comments:

The effectiveness of a focus in diseases rests mainly on the chronic inflammatory events on which it is based and, second, on the vegetative reactivity of the gingiva itself. The latter fact was not known until now and could only recently be established by means of histological, electron microscopical and histochemical inquiries by PLENK Jr. and RAAB (1969, 1970) on the nerves of the human gingiva. This provided, for the first time, verification of also adrenergic, autonomous vegetative nerves in human gingiva, helping us to deduce functional connections involving the whole organisms, which could formerly not be verified on a morphological basis. The clinical importance of these findings was documented in a study of mine (**RAAB**, 1970). It is my view that being able to show the existence of vegetative nerves in the gingiva is new clarification of previously uncertain pathophysiology of gingival-caused distant effects on the whole organism as well as the sometimes

observable also diseased gingiva in cases of varied common insults of a physical and psychical nature (RAAB, and others) presents a new and more illuminating viewpoint. There are many clinical examples:

The German internist W.H. VEIL (1939) described how an existing parodontosis will usually **also** affect the tonsils or vice **versa**, that a **severe** foetid parodontosis could only be healed after undertaking of a double-sided tonsillectomy. In addition it is known that an existing acute or chronic gingivitis respectively parodontopathy will at the same **time** cause rheumatic thrusts to various joints or other circumscribed organ-related distant effects. This will be the case with the affected **areas** especially when we are dealing with an abnormal hereditary disposition in the sense of a constitutionally inferior system or previous disease areas causing a heightened local burdening of the connective **tissues**, **as** such may occur in altered skeletal statics. These factors create **areas** in the body of lessened resistance ("loci **minoris** resistentiae") or so-called "puncta majoris reactionis," with the disturbances manifesting themselves foremost and strongest here. Until now the diseased gingiva itself was not **seen** as the primary focus-causing event for these types of accompanying and resulting conditions but rather as an attending existing gingivitis, and concurrent adhesive gingival pockets with their osteitic alterations were believed responsible. It is also known that a lengthy hormonal stress situation such as puberty, pregnancy, menopause, as well as psychic shocks as, for instance, conflict situations in

family and work can open the door to a gingivitis in situations where local trigger factors could not be blamed. It was almost impossible to find a causative interpretation however, current scientific knowledge enables us to offer the following explanation:

The existence of adrenergic, autonomous vegetative nerve fibers in the human gingiva, a fact which was not known previously, proves without a doubt that the supporting tooth structure, **aside** from its "taut" connective tissue guaranteeing organ-caused support function via the interspersed loose cell-rich "soft" connective tissue (PISCHINGER, 1955, 1959, and others) in combination with autonomous vegetative nerve fibers underlies the vegetative regulation of the whole organism and is thereby able to react and regulate, even alone and independently on a vegetative **basis**. In this finding lies the clinical significance of our histological investigative results . This situation is undoubtedly most suitable to awaken an understanding for the pathophysiology and pathogenesis of parodontal-gingival caused distant effects as well as an inclusion of the morbid gingiva in all possible influences within and without. The above mentioned clinical observations received their confirmation for the first time through additional morphological acknowledgements .

re 5) Corrosions of Tooth Metals

We understand under corrosion the disintegration found in dental crowns and bridges permitted by non-precious inferior metal alloys or various neighboring metals that may occur especially in

soldering areas and which can be identified by either the naked eye or probe touch, showing a porosity of the pertinent metal surface. It is known that corroding tooth metals can cause disturbances in the body, resembling focal effects. These disturbances are effected by existing corrosions permitting metal ions to escape in solution, whereupon the surrounding gum tissue area is sensitized by the formation of protein-metal complexes, thereby also creating allergy factors in the organism.

re 6) Bi-Metals

Under this term we understand various metals existing in the mouth such as gold and amalgam or white metal units such as steel, etc. These mouth metals can generate electric current in the sense of potential differences which in their totality can function as a field of disturbance. According to B. THIELEMANN it is not even necessary to have a combination of metals; a potential effect can also occur if one alloy is heterogeneous, such as amalgam, or when inexpert workmanship of gold alloys and stainless steel permit these metals to become heterogeneous.

An impressive example of a metal-caused distant effect has been related by F. SINGER (Meran): A 62-year-old patient suffering **f rom** stenocardia after myocardia infarct received 12 mg gold dissolved in oil with ultrasound for testing on degreased uninjured skin; **severe** stenocardic attacks occurred within 5 hours during bed rest: after removal of existing dental crowns (consisting of an inferior gold-silver alloy), the patient remained symptom-free for

now three years.

re 7) Living, but Diseased Teeth

Occasionally the living tooth will achieve the status of a focal event. Since this fact is not well known, it is described in more detail here. The efficacy of such teeth **is impaired** when influences of, for example, mechanic-traumatic, thermic-physical, electrical, bacterial-infectious, toxic, chemical-pharmaceutical kinds or strong abrasion, **deep** reaching caries--as often seen in multiple sclerosis--respectively under metal, plastic materials and silicate cement fillings have resulted in chronic inflamed or degenerated changes of the tooth marrow, causing in turn, reduction of protein and formation of antigens (HILLER, DITTMAR, and others). This can be seen especially well in vital crowned teeth, namely clasp denture teeth. Even the initial grinding to prepare the tooth for crowning will result in a "wound" (REBEL), which can cause **damage** to the tooth pulp. Should the pertinent tooth be well ground--as seen from a strictly dental perspective--there exists a greater probability of a perhaps irreversible irritation of its pulp: if the tooth is badly ground its **seat** of the crown will be inadequate, meaning that due to overreaching crown edges the gums will remain in a state of chronic inflammation and thereby develop into a field of disturbance with distant effects. To return to our main topic, it must be stressed that not the caries but the morbid change of the pulp in above mentioned cases causes the fields of disturbance. In these processes, clinically never especially

obvious, the fundamental pathologic-anatomic substrate consists in a series of morbid changes which are primarily marked by a disappearance of high-grade pulp tissue that is only incompletely replaced by connective tissue. This condition was named and described in a different connection by HAEUPL, RAAB, and others as a "phlegmasia" of the tooth pulp. We emphasized at this time that this process did not constitute a disease "sui generis," because **from** a developmental perspective, the pulp would be the only possible morphologic form of expression and this would be the answer to a series of various irritations. The morbid occurrences are always introduced by local circulatory disturbances. It is possible in such cases that the pertinent change in the pulp can cause a focal effect by itself. These are the reasons when and why living teeth can also achieve the character of a focus. The common pathogenetic principle of the devitalized and the sometimes still alive but morbid tooth consists in the sensitization and allergization of the body by means of albumen reduction, respectively decay products. To this, just one example:

Pischinger received at one time the pulp of a tooth with documented although reduced vitality for a histological examination, a pulp whose removal resulted in the healing of a trigeminal neuralgia; in the section there was a completely sterile but somewhat sapless tissue with ample amyloid clods, a sign that the metabolism was already badly disturbed. The cause remained unknown. Degenerative changes, however, were sufficient to cause "scattering effects," even without the influence of bacteria (PISCHINGER,

personal note, 1961).

When above findings are taken into consideration we would be well advised during the dentogenous search for foci, apart from looking for other dentogenous focus possibilities, not to limit our search to a quest for devitalized or live teeth, but to extend the investigation as to whether there are healthy or diseased teeth in the mouth.

History

Relative to the historical changes of viewpoints on the subject of focus events, it must be remembered that common belief originally included only the "focal infection" (PAESSLER, 1909), which limited itself to a bacterial hematogenous scattering as the foremost of all genetic explanations. Recognizing that toxins of bacterial and abacterial origins could also play a role, SLAOCK enlarged the field with the term "focal toxicosis." After it became more widely known that these toxic effects in the majority caused a sensitization and allergization in the whole organism, the term "focal allergy" was coined (ROSENOW, BOTTYAN, and others). Basically we must add the remark that all three terms are causally defined by a partial event; where the words "infection" and "toxicosis" represented, for instance an influence upon the body, "allergy," however, was already termed a type of reaction, i.e. a reply of the body. The so-called "focus infection" is also only a special occurrence in a focal event in which irritants play a role,

that is why above term is only justified for this particular case. The old term "oral sepsis" (HUNTER, 1911) is not in common use anymore und would be only appropriate, if at all, in cases of genuine **sepsis** in the mouth area; with other words, when noxae via the digestive passage arrive in the body. Today we speak in general of a "focus event" (see also B. LAUTENBACH, 1962).

Today's View of Pocal Bvents

The findings of SPESKY, supported by the discoveries by F. HUNEKE and his "lightning reaction," since then have helped to mold our view of the focal event into the shape of a neural pathological problem which, it is clear today, occurs in the vegetativum (PISOHNGER, 1961). It is in this **sense** of a common definition of terms that SCHEIDT and SIEGMUND speak of the focus as a "vegetative field of disturbance." Detailed clinical and laboratory investigations conducted by F. PERGER revealed that the principal role in the occurrence of a focal event are regulatory disturbances; **i.e.** a faulty performance of the vegetativum. This has furnished proof that the focus event rests in the functions of the vegetativum.

Above basic perception and the fact that, as already emphasized in the introduction, each focus as well as each dentogenous focus, seen histologically, lies in soft connective tissue wherever it may be found anatomically (PISCHINGER, 1963). Therefore, the effect of a focus or field of disturbance will involve first and primarily the interstitial connective tissue: a con-

clusion which leads us to the proper consideration that we can understand the focus event only by studying the conduct of nonspecific defense reactions, respectively the basic living functions which of course originate in this connective tissue: we cannot understand the subject by solely studying organ disturbances and specific antigen-antibody reactions, because with **these we** can perceive only a portion of the whole. Using this view **makes is** immaterial whether the focal effect is caused by bacterial or abacterial noxae, or through dehydration of sensitivity-causing substances or allergens: what is important is that the focal event as such transforms in each case the basic situation of the whole organism. The mechanism of action will still be discussed in **more** detail. Using the viewpoint of such an all-encompassing consideration of the body also allows us attain a truly uniform standpoint permitting a look at the natural sciences in the spirit of Schopenhauer who said that "the guide of causality shows all possible material conditions upon one another, they lead together and then apart and lastly come from one" (SCHOPENHAUER: "Die Welt als Wille und Vorstellung," page **64**).

The "Vegetativum"

The focal event occurs in the so-called vegetativum, as agreed by all authors. With this we arrive at the basic question: What is meant under "vegetative"? A dissertation about the vegetativum must first of all define this expression. There exist two versions

in the available literature:

One version tells us that this word is based on the Latin "vegere," meaning "lively, animated;" and "vegetare" meaning "enliven, set into motion. "According to this etymology we can consider as "vegetative" everything which keeps the involuntary functions of life in motion; with other words, the entire regulations and defense mechanisms . This exists not only in animals and plants, but especially in the embryo before nerves and vessels are fully formed. This exemplifies that our view must differentiate between the vegetative nervous system und a vegetative total system (**PISCHINGER**, 1969).

The second version assumes that the name comes from the Latin word "vegetus," i.e. "plant," or "belonging to a plant" (L.R. MUELLER, HOEBER, 1920). Using this definition we understand under "vegetative" all such basic functions which are also inherent in the plant; this reaches down to even the bacterium, although not to the virus because viruses are situated between living and non-living substances and occur outside the organism.

The regulation of the so-called basic living functions is the central definition, the common factor seen in both versions. It would be wrong .in this connection, however, to speak only of regulations. Before there can be regulations, there must be first output which has to be regulated. The basic living functions belong foremost to this output (A. BETHE, 1952), that is:

1. The oxygen physiology (= oxygen as vehicle for electrons = "electron swing") ,

2. The acid-base equilibrium,
3. The mineral physiology (Ca, Mg, Ka, Na, etc.),
4. The water physiology (= there is no life without water),
5. A certain temperature (= also poikilotherms).

To this will have to be added nutritive materials such as albumen, fats, and carbohydrates which are necessary to maintain primitive life. All these tightly connected factors determine the bioelectrical potential of cell and tissue, which can actually be measured on a physical level; they constitute the kernel of the vegetative output. Their undisturbed common functioning results in the defense mechanisms against noxae, for instance cellular and fermentive processes. On these basic events, the life functions without which an intact life would not be possible, rest upon all other effects as well as the immune-biological proceedings; including the specific effects of the organ cells (H. EPPINGER, 1949). In addition, it is important to know that these basic functions of life play **a decisive** role in all physical and psychic processes. It is therefore possible to ascertain the reactive situation in the vegetativum, the so-called vegetative basic situation (see above) , by determining the changes in the physiology of calcium, magnesium, sodium and potassium in the blood, respectively serum (blood criteria determination after F. PERGER, 1963). This is of practical importance because especially during a focal event the vegetative basic situation will visibly change due to the focus-caused burdening of the organism.

These basic life functions must, of course, be tuned to each

other or somehow regulated to achieve an optimal adjustment of the cell to its individual environment. To do this, a coordinated system is required for many-celled systems. This system was until now called a "vegetative system." It directs the totality of the non-conscious life processes. Now what belongs to the "vegetative system"? Here we must include the comment that not only is the so-called autonomic nervous system included (LANGLEY, 1922}, but also the vagus, sympathicus, hypothalamus, diencephalon, etc., or the endocrinium with the hormones as until now commonly assumed, because this regulatory ability is inherent in each cell. Evidence for this is furnished by tissue culture, respectively tissue cultivation outside the body, without vagus and sympathicus.

In the year 1907 HARRISON observed the growth of nerve fibers in explantat of embryonal frog tissue kept in frog lymph. This was the begin of tissue cultivation (BARGMANN, 1964}.

Proof that the autonomic nervous system cannot be the principal regulating mechanism is seen in the fact that despite major efforts so far it has not been possible to furnish histological evidence of a vagus or sympathicus fiber (which in the end cannot be differentiated morphologically}, reaching directly onto an organ cell as, for instance, onto a liver or muscle cell; namely they end before. The organ cells are grasped or surrounded by soft interstitial connective tissue, the mesenchyme, with the extracellular liquor. It must also be considered that there are also organizations that, although showing perfect regulation, are free of nerves (PISCHINGER, 1969). This has been widely known in the

matter of tumors, the placenta, and the earliest stage of animal embryos, apart from the lowest and plant organisms. They will, for instance, not directly innervate the parenchym cells of the liver. In hundreds of sections involving dozens of liver biopies, L. STOCKINGER could just once find a small nerve which, moreover, did not have a connection to the liver cells. The adrenal cortex is not much different. Even if examined by electron microscopy, the walls of the lung alveolus, the alveolar septum, do not show any nerves. In addition, it is a mistake to assume that the capillary vegetativum may be directly innervated. Viewed by electron microscopy, there does not appear to be a clue for this belief.

Another argument which runs counter to the current view about the importance of the vegetative nervous system lies in the experiences involving organ transplants. In this, the vessel connections are restored but the nerves remain severed for the time being. According to a personal communication from NAVRATIL (Vienna) to PISCHINGER, an autotransplanted heart in a dog will first react after weeks to vagus stimulation. This is how long the organ works without central-nervous steering. As a property of the organ cells, it is also known in physic-and pharmacology (R. HESS, 1948) that there exists a partial autonomy in the the vegetative periphery as shown, for example, in the rhythmic contractions of isolated muscle fibers in tissue cultures. On the other hand, there are peripheral, mainly subepicardial nerve cells whose fibers participate in the formation of the nervous primary plexus in the myo- and endocardium, so that the implantate does not appear to be without all

nerve function. Nevertheless it has been proved through the findings involving organ transplants that there can be organ function without the vegetative-nervous, i.e. diencephalic centers. *The primary vegetative steering must therefore be found in the periphery.* This cannot be otherwise, as seen in experiences of the lower animal world and embryo (PISCHINGER, 1969).

If I emphasized a little while ago that the organ cells intimately and exclusively in soft interstitial connective tissue in union with the extracellular liquid are held or enveloped but not directly by the vegetative nerve fibers, then it is obvious to speculate about which actual body system might regulate the basic functions of life. We think of the mesenchymal connective tissue which is spread about everywhere in the body, encompassing every cell, when replying to the basic question. It is in this direction that must we look for the development and completion of a new medical theory of medicine. So long as we do not have one, *we will not be able to understand the theory of focal events.* However, I hold the **view** that we already have such an all-encompassing and scientifically documented theory of modern medicine and that is the theory of the "vegetative basic system," as worked out by A. PISCHINGER and revealed in 1969, who began with his definition of "soft" connective tissues and their relationship to the vegetative-nervous periphery (1955, 1959). Based upon the newest findings of such a comprehensive way of looking at things, in this dissertation I will attempt to bring forth a closer understanding of the vegetative basic foundation of dentogenous focus diseases.

There was no lack of older efforts to work out a comprehensive biological basis for a theory of medicine, but these directions could not be proven to the very last consequences because the new teachings, despite their very real basis, supported only partial areas of the organism and did not reach down to the very foundation of life processes, such as: Bioelectrical Potential and Breathing (**see A. BETHE**). In this connection I recall the "Teachings of the Macrophages" by METSCHNIKOFF-BOGUMOLETZ, as well as the "**Krasenlehre**" by ROKITANSKY; developed during the previous century it was ultimately pushed aside by VIRCHOV's cellular pathology. The "Relations Pathology" by RICKERS attempted to prove how each cell is subject to a dependence relation on the total organism and that these relations occur in sequence: nerve--terminal blood circulation--tissue. RICKER talked about the "primate" of the capillaries. But the capillaries are the road of transportation and fulfill their role only as an expedient. SPERANSKY's "neural pathology" stressed the dominant role of the nervous system where all events derive predominantly from the hypothalamus. But what regulates the basic functions of living beings which do not have a hypothalamus or where the hypothalamus is destroyed and which are nevertheless alive? Above explanation is also incomplete. Other conceptions in an effort to establish a common and valid base in medicine that would permit dealing with problems from all directions were moreover the "adaptions theory" of SELYE (see above) as well as the "humoral theory" by EPPINGER. The latter refers to the oldest theory in medicine, namely the teachings of "humores" by HIP-

POCRATES. Based upon this hum.oral theory is then today's almost forgotten EPPINGER's thesis of "permeability pathology," a teaching of the origin of disease which probably has the most value of above views. In particular, the serous inflammation theory deserves closer attention because EPPINGER was able to document in "hum.ores" substances with regulatory abilities that were not proteins. They had self-fluorescence, were easily diffusible, largely heat resistant but enzyme sensitive, they existed in all body fluids (blood, saliva), but they did not, however, receive closer definition by EPPINGER. This concludes our review of history.

More recently, pertinent observations about the regulatory abilities of a self-contained system came mainly from F. HUNEKE, 1940 (= lightning reaction phenomenon) as well as from F. LUTZ and A. PISCHINGER (1949) through the discovery of the "redox system," respectively the "oxydo-reductive system." An explanation for these will follow. Other favorable reactions of the body are seen in diet and fasting cures, massage cures as well as especially the **KHBIPP** cold water cures **where** a therapeutic effect such, as for instance, a normalization in the blood sedimentation rate was seen within one hour; also not forgetting modern acupuncture with its needle prick reaction. To prevent misunderstandings it must be stated that these lastly mentioned reactions do not give us information about the nature of a self-contained system, but they prove nevertheless that there must exist a regulatory "entity." Erroneous, however, is the "fresh cell therapy" by NIEHANS since their theoretical presuppositions are incorrect.

NIEHANS claimed to be able to heal disease, especially degenerative diseases, through injections of "living" embryonal cells, respectively being able to exert a positive influence upon ailments. He reasoned that delivery of fresh cells into the aged or diseased body would help to kill the diseased cells whereupon young, healthy cells would take their place. PISCHINGER was able to show by means of animal experiments that live cells did not play a role here, only cell detritus. Such injections even caused bland abscesses in brain and necroses and not infrequently led to a lethal end. This is why the Chamber of German Physicians issued an official alert regarding this therapy (PISCHINGER, personal communication).

Now I come to the definition and explanation of the "lightning reaction" as discovered by HUNEKE (= also called "sekunden" or seconds phenomenon) and subsequently to a discussion of the "oxydo-reductive system" by LUTZ and PISCHINGER. First Huneke's lightning reaction phenomenon:

Under this we understand the phenomenon that with an impletol injection into an "active" focus, or better expressed, into a field of disturbance such as, for instance, to the root apex of a suspected tooth, its proceeding distant effect (i.e. joint pains) will cause a reaction within seconds. The freedom from pain must last at least eight hours in teeth foci and must be reproducible (HUNEKE). Although these facts are beyond dispute today, it took quite some time to arrive at an explanation; at first they appear almost beyond understanding. Seen from a comprehensive viewpoint

of the vegetativum we can better perceive its nature. If we consider that the carrier of primary basic life functions is an undivided syncytial cell system with which a capillary and a neural end-net as well as the nonspecific regulation centers of the body together with the specific organ cells maintain closest correlation, then we must definitely expect that due to a momentary switch-off or changeover of general reflecting fields of disturbance, as for instance, with novocaine (which is well known to act as an anti-inflammatory agent according to FLECKENSTEIN), the vegetativum will be relieved in its entirety and its functions revert to a normal reacting position. This effectively causes complaints, which **may be** situated far away from the field of disturbance, to disappear on a temporary basis, in as far this is anatomically still possible. The speed by which relief occurs can be seen as a parallel to sudden fits of unconsciousness in insults of physical and psychic types, provided these are sufficiently powerful to encompass the non-specific in its entirety. A lighting reaction can of course only then be triggered, according to HUNEKE himself, when we are dealing with neural distant steering effects via the vegetativum caused by a field of disturbance; never when there exists a bacteria-caused strewing of a hematogenous or lymphogenous type, which of course cannot be forestalled by an injection of impletol.

As to the dental application of the impletol test it must be **mentioned** that it is necessary to inject each suspicious tooth buccally and lingually in its local root apex area. The break in

conduction at the foramen mandibulare resp. foramen mentale in the lower jaw or at the tuber maxillae in the canalis infraorbitalis in the upper jaw is not suited for testing focus-suspicious teeth lying in this nerve-supplied area since the individual field of disturbance, from which the organ-bound distant complaints originate, must be reached locally by the impletol which, however, is not possible with a trunk anesthetic placed far away. If, as is claimed by some authors, a lightning reaction occurs--triggered by the jaw area--during the carrying out of a trunk anesthesia, in my view this can only be explained that in such cases the field of disturbance responsible for the distant effects still remained in the diffusion area of the injected anestheticum. It is a fact that this diffusion area is usually greater than commonly assumed the effectiveness of my modified method of intra-oral conduction at the tuber maxillaris is based on it (**RAAB**, 1959). We know that all devitalized and diseased teeth and their attachment apparatus in their totality can function as a common field of disturbance, and this is why all suspected teeth, including possible scars, must be injected in *ONE* session.

The lightning reaction phenomenon is a classical example and principal clinical argument for the existence of a comprehensive regulating system. It is a reality and does not depend on suggestion, possessing cellular and humeral support which has been scientifically documented. How deep reaching the total vegetativum, up to the cellular and humoral regulations area, is affected by a field of disturbance is shown by the fact that already a few

minutes after begin of a positive lightning reaction, a characteristic change is demonstrable in the differential hemogram: What happens is that the large lymphocytes will disappear, forms of irritability occur according to KLIMA. and stress-lymphocytes according to FRANK and DAUGHTEDY as well as the normalization of, for instance, a too high iodine consumption value in albumen-free blood serum extract (PISOHINGER, 1965).

The discovery of the lightning reaction was made thanks to a fortuitous coincidence in what turned to be a true highlight in medicine: While working in his practice in Duesseldorf (Germany) in 1940, the general practitioner Ferdinand HUNEKE injected impletol into an old operation scar on the right tibia to help a chronic relapsing inflammation. This female patient suffered, in addition, from a most painful and altogether therapy-resistant capsule arthritis in the left shoulder joint. As soon as the patient arose after receiving the impletol injection on the right tibia, she experienced a sudden disappearance of all pain in the left shoulder joint; the shoulder was completely mobile again and remained so in the future. It turned out that the operation scar on the right tibia was responsible and constituted a field of disturbance for the disease of the right shoulder joint. This was the first consciously registered occurrence of the lightning reaction phenomenon in the history of medicine and is probably the **most** significant observation in the modern art of healing within the previous fifty years; it may be compared with the needle reaction which was built into a comprehensive system in the four

thousand year old practice of acupuncture which, of course, was not aware of the lightning reaction phenomenon. It shows the genius of HUNEKE that he did not ignore his observation (as did so many of his contemporary medical colleagues) but rather investigated the puzzle although he did not have an explanation for it at the time. He emphasized: "...I am a doctor who heals, let the theorists try to find an answer... but the one who heals is always correct."

The second pioneering observation--but pointing toward a different direction--was made by LUTZ and PISCHINGER (1949) and concerned an important regulating mechanisms of a comprehensive system, resulting in the discovery of the so-called "oxydo-reductive system."

With this I come to an explanation of the not neural but humeral possibilities for a communication between the interstitial, mesenchymal connective tissue, the "basic tissue" (BUTTERSACK) and the whole organism. Blood and lymph will usually be considered first. But we must not overlook the large quantity of fluid which fills the extracellular space. Derived from investigations conducted by EPPINGER and his group we know that in this space there is room in an adult for a total quantity of 15 to 18 liters of fluid (MOLENAR and ROLLER, 1939). This quantity of fluid is in constant movement, according to EPPINGER and derives largely from the arterial thigh of the capillaries and is again taken up by the venous thigh of the capillaries. For the other part this fluid will reunite with the blood via the lymph passages and mainly through

the principal lymphatic ducts. In the entire lymphatic tissue and the spleen--both consisting of connective tissues rich in cells--there is direct communication (hemolytic-lymphatic flood-gates) between blood and the intracellular fluid (PISCHINGER, 1963, KELLNER, 1963). EPPINGER talks about the "inner circulation." Various efforts were made towards a closer identification of an actual humoral working principle. Several definitions were postulated: however, there was no resounding success. As already mentioned, it was EPPINGER who ultimately became aware that it was not protein fractions which were involved. A remarkable observation by F. LUTZ suddenly helped to better clarify this question:

During 1946 LUTZ was a general practitioner in Baden, near Vienna, when he attempted to treat a patient who was originally referred to him with the diagnosis of "lung tuberculosis," with protein-containing serum injections. There was no success this time, although the **very** same injections always produced positive and fast reactions in other TB cases. In this particular patient after a series there were always totally different, out of place reactions. This circumstance caused LUTZ to doubt whether he was really dealing with TB here. Another examination by the lung expert and X-ray specialist reaffirmed the diagnosis of "tuberculosis pulmonarum." After repeated injections of the same type the patient died. The autopsy revealed a "carcinoma of the lung," but no trace of tuberculosis. LUTZ arrived now at an intuitive conclusion: The serum injections did not work because no infectious disease did exist which could have been fought with the serum-protein bound

carriers of the immune reactions, instead there was a cancer. However, since reactions occurred, although completely different and odd, there must exist in the blood serum not only substances which are but proteins, i. e. to which as commonly believed the so-called immune reactions are bound, but there must be others, protein-free "humeral regulating substances," which are able to devisively influence the vegative basic situation of the whole organism. Working together with PISCHINGER, after suitable preparation of the host animals, a protein-less extract of horse blood-serum (remaining serum) could be more closely analyzed. A diagnostic and therapeutic evaluation based on above consideration resulted in the preparation of a product called "Elpimed" (GEBRO}. Subsequent investigations by PISCHINGER showed that these complexes possess an effect which is primarily not organotropic. These extend directly to undifferentiated functions of the organism in the sense of an "activation." The complexes in question contain mainly conjugated-unsaturated high-molecular fatty acids and possess pronounced physical and physico-chemical markers such as self-fluorescence and ultraviolet absorption, especially in a wavelength of 2650 Angstrom. They are able to deposit oxygen, hydrogen and elementary iodine, they can also be oxydated and reduced (= redox substances). Accordingly, they have a definite potential which can be measured with a platinum electrode; they are surface active and easily diffusible, like the substances observed by EPPINGER. They increase in a Warburg apparatus (investigated by E. KAISER) the endogenous breathing of cells considerably (40 to

45%). They do not exist merely in horse blood but are found as analog complexes in all systems, in lower animals as well as humans. They can be isolated from all body fluids (lymphs, liquor, ascites, etc.) and also from leukocytes and from soft connective tissue, the fibroblasts, since they demonstrably originate from the cell. They are found foremost in the intracellular fluid of the basic systems. We are dealing therefore with universally found, non-protein **systems** which, due to their pronounced oxydo-reductive characters can influence the cell-breathing, respectively oxygen utilization. These substances which appear to be working complexes of life, received the name "oxydo-reductive system" by PISCHINGER. In addition, the active principles react to all possible influences such as electro-shock, X-rays, blood-letting, even needling of the skin, in a quick and impressive manner and change, for instance, after a successful defocization. By means of iodometry these complexes can be fairly easily in single form as also quantitatively recorded (PISCHINGER, 1961, 1966).

What has been said so far already encompasses two regulation areas of the vegetativum, namely the nerval (the vegetative autonomic nervous system) and secondly the humeral. The humoral is therefore in its nature the effective area of substance complexes which, among others, contain highly unsaturated fatty acids, are easily diffusible, highly surface active and possess oxydo-reductive properties. The question will arise where and how these humeral substance complexes change on a regulatory basis. According to PISCHINGER there are three possibilities: first is the lymphatic

connective tissue (PISCHINGER, 1963) and secondly the spleen (KELLNER, 1963). These are organs which almost exclusively consist of soft, cell-rich connective tissue. Both have provisions which allow a flooding of blood **plasma** through the reticular cell tissue: in the lymphatic tissue the post-capillary veins (PISCHINGER), in the spleen the periarterial shield apparatus (KELLNER) and thirdly, in the process of leukolysis. The latter factor brings us now to the cellular regulation.

The vegetativum has available as total regulation system a third sphere, namely over the cellular. To this belongs the reticulo-histiocytare **system** (in his time ASCHOFF called it the "reticulo-endothelial **system**") with the lymphatic tissue and the spleen. From there the white blood cells, via the blood and lymph **passages**, arrive peripherally toward the interstitial basic tissue to fulfill their task, mainly in the sense of leukolysis. According to the investigations conducted by ASCHOFF and KIYOH (1913), and PISCHINGER (1957), among others, the white blood cells dissolve after a stay of, for instance, the lymphocytes in blood of only four hours, principally in blood of the capillary areas. Even normally there are in flowing blood at any **time** billions of leukocytes of all kinds in dissolution. Although the intermediary products of this leukolysis are known, they are not properly identified, as already outlined by PISCHINGER: We are concerned here with the core shadows of GUMPRECHT and the ferrata forms which, due to their pathological forms, are considered artifacts without contemplating that 1) these forms are also found in normal

healthy blood and, 2) **sometimes** even an artifact will tell us something. Frequently **we are** able to **see a** core shadow lying immediately next to an intact cell. Both were subject to the same preparation stress. How if one cell is destroyed this means that it existed in a state of reduced resistance. This uneven resistance of leukocytes was already known to SCHROEDER (1957). The purpose of leukolysis appears to lie in the fact that non-degenerated cells release biologically important substances such as protein, lipoids, carbohydrates and especially enzymes of all types. With this, however, all effective cell substances of the body proper escape into the blood and tissue and are able to regulate the basic functions of life. PISCBINGER found in all previous tests involving extracts of leukocytes not inconsiderable amounts of substances with **similar** UV-absorption and with a iodine binding ability, similar to the previously mentioned humoral substance complexes from blood and tissues. We can infer **from** this that because of leukolysis, substances with regulatory abilities are released which can also be measured with iodometry. This can be proved on a practical level by the fact that after interventions in peripheral connective tissue, the blood will react quickly with a significant change in its composition of leukocytes (LICKINIT, **PAPE**).

In addition, it is important to realize that the principal **mass** of RHS and lymphatic tissue is situated in the abdomen, in the portal vein and the splanchnic area, mainly in the intestinal mucosa. This is the reason why the intestinal milieu complies with the regulatory sphere of the non-specificum, a circumstance which

is usually not taken into consideration when the vegetativum is discussed.

The endocriniwa with its hormones is always mentioned as a additional component when the vegetativum is alluded to in the literature. But it must be said that the organ-specific endocrinium engages in the vegetative basic functions only in a secondary capacity, with one exception, this being the adrenal gland (SBLYE). The effects of the cortex hormone extend to primarily the functions of the connective tissues: the blood, the lymphatic tissue, the inflammatory functions of the connective tissues, as well as the **aineral** and water economy, among others. In stress tests the graphs of iodine conswaption values or leukocyte numbers, also the mineral economy (PERGBR), showed movements which commenced during normal reactions with an alarm response, consisting of a shock and anti-shock phase. Without doubt, this is a reminder of adaption reactions and so constitutes evidence for a participation of the cortex hormone. The effects of the adrenal cortex must therefore be taken into consideration in our views about the connective tissue functions (PISCHINGBR, 1965).

The vegetative TOTAL system features thus--as shown in this thesis--a definable morphological foundation, based on the individual regulatory areas. Summarized, this includes:

1. The entire Mesenchyme (EPPINGER), i.e. the soft, slack interstitial connective tissue totality which occurs in the body and is able to penetrate the most minute spaces between the organ cells due to its ultrafine fibers and capillaries and nerves. This

connective tissue totality is simply the "basic tissue of the organism," as denoted by BUTTBRSACK at that time.

2. The autonomic vegetative Nervous system. Based on our newest findings, the vegetative nervous system receives an evaluation differing from current prevailing views. It has, of course, its regulatory significance, but not as dominant and direct as heretofore assumed, functioning rather only as part of the total vegetative regulating system in which a principle is never active by itself, such as only nerves or only humors or only cells. The entire system reacts always to regulations and guarantees the totality in the organism of organ functions as the basis (PISCHINGER, 1969).

3. The Humeral System with its previously described regulatory **effective** substance complexes.

4. The Reticulo-histiocytic System (RHS) with the lymphatic tissue and the spleen as mediator of cellular regulations.

5. The endocrinium as Hormonal **System**, under which the endocrinal gland must be emphasized.

If we were to conduct a rating of the regulating areas of the vegetativum, then the mesenchymal basic system and the humeral system would receive primary positions due to their totality in the organism. A body builds onto- and phylogenetically from its original cell up to the higher differentiated organs. In the fields of zoology and embryology we know of organizations possessing perfect functions which, however, consist only of cells and their milieu; likewise there exist in mammals nerveless organs with important

tasks such as, for instance, the placenta (see above). On the other hand, we do not know of an organism consisting only of nerves and betweenbrain. Life begins with the simple undifferentiated cell, and this is the Mesenchyme, or with a word, the connective tissue cell (PISCHINGER, 1965).

We may conclude from above that the connective tissue cell, thus the fibroblast, stands in the forefront of all life functions and secondly, that each focus and each field of disturbance with its action will first and immediately affect this interstitial connective tissue totality because each focus and each field of disturbances lies, **seen** from a histologic viewpoint, in connective tissue regardless wherever it may be found anatomically, and is identified by alterations there.

And now a few remarks concerning the relations of the vegetativum to the body universally: The vegetativum maintains with two facilities closest anatomic connections to the unrestricted organism: first through the vegetative-nervous terminal network for the nerval **side** and secondly through the capillary terminal network for the humoral **side**. Both of course lie in the interstitial connective tissue or, according to an older expression, in the so-called "**primary** apparatus." In addition, the correlations of the vegetativum to the higher regulating centers (a better term would be help-poles) of the body in many-celled organisms are maintained by three **systems**, namely first through the nervous regulations pole, represented by the nervous terminal network with the hypothalamus and the overlying strata to the cerebral cortex:

secondly through the hormonal regulations pole, represented by the capillary terminal network with the hypophysis and the adrenal gland, over which the remaining endocrinium is built upon to the sexual organs, and thirdly through the cellular regulations pole, represented by the RBS with the lymphatic tissue and the spleen.

To conclude above survey of the vegetativum we may reiterate the following:

The total "carrier" is the available interstitial soft mesenchymal connective tissue totality, the "steering" of this totality is conducted by the humeral and cellular regulations in **team** work with the hormonal influences and the autonomic vegetative nervous system.

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Now our aim is to more closely identify the essential mechanism of action in all focal effects. I emphasized repeatedly that each focus and each field of disturbance lies in the soft interstitial connective tissue and causes alterations there. This decisive fact must become the starting point for all discussions about the focal problem because it is in this tissue that there are found all immediate disturbances caused by a focus or a field of disturbance. All theoretical discussions regarding the focal effects must therefore begin with the build-up and the functions and connections of this tissue as they affect the rest of the body. Let us therefore have a closer look at this connective tissue.

We are dealing in the case of so-called "soft" connective tissue with connective tissue in which not the fiber, but the cell function is in the foreground. To this belong the embryonal mesenchyme, the lymph tissue, the reticulo-histiocytic system (RHS) and the slack interstitial tissue. It can be found everywhere in the body: the largest masses are found in the skin, in the intestinal mucosa, in the lymph organs and in the spleen as well as in the lungs. In addition, it is also found in the tooth pulp, in the gingiva, in bones (including the parodontal bones), in the serous **membranes**, and even in the tendons. Finally, it pushes into the most minute fissures of the organs.

The dominant position of the soft connective tissue is already obvious if we look at the stages of its development: When during the differentiation of the germinate the close reciprocal contacts of the epithelial germ layers ectoderm and entoderm are lost, formation of the first connective tissue, the mesenchyme, will occur through the center germ layer, the mesoderm. This mesenchyme consists of only a reticular fibroblast bandage with the intracellular substance, respectively extracellular fluid, which is a product of the fibroblasts and their life milieu. In this stage the regulating events occur only on a cellular and humoral level. It is only later that the capillaries form together with the ingrowth of nerves. Only then will the mesenchyme become the carrier of nerves and vessels which constitute secondary formations. This theory of evolution gives us also clarity about the basic relations between the connective tissue and the specific organ tissue. The

organ cells grow from their epithelial mother tissue, the germ layer, into the mesenchymal basic tissue and appear only through this via the circulation and the nerves. The same basic morphological circumstances can be found in the adult organism. The importance of the soft connective tissue has been known for some time and is emphasized in the works by BUTTERSACK (**see** above), von MOELLER, H. PFEIFFER, STANDENATH, HUECK and H. SIEGMUND. These authors called this tissue typically "basic tissue," respectively "active connective tissue." PISCHINGER named it the "interstitial basic **system**." This concurs with the **term** of "histion" by LETTERER. Its importance for the clinic and practical **medicine** has been described in detail by EPPINGER. With this, the recognition that all foci and fields of disturbance are found in soft connective tissue, received added significance (PISCHINGER, 1965).

Before I turn to the relationship between this basic system and the body, I would like to look at the relationship of the connective tissue cell to its immediate surrounding, the extracellular fluid: It is known that the formation of free cells such as histiocytes, granulocytes, and plasma cells, occurs through differentiation from fixed reticular stem cells. These free cells **remain** through phagocytosis, pinocytosis, degranulation or enzyme delivery in reciprocal action. It was not known until now that the reticular **stem** cell itself, the fibroblast, already has the ability to influence the extracellular **milieu**. **This** fact was taught to us by the cell culture in glass as model experiment. One author, G. KELLNER (1963) was able to show that human fibroblasts have a high

regulating ability: In order to live and grow, cells need a suitable milieu, in our case a culture medium. The physico-chemical factors of oxydoreduction and ion potential are most important here. Coarse deviations in the culture medium will cause the cells to die; mild deviations will stop their growth, causing growth to **reappear** after a while. Namely, at this time masses of cells will disintegrate and enrich the culture milieu with their own cell-detritus so that new cell growth can occur. This means therefore that the cells which are sensitive to physio-chemical milieu changes (the extracellular fluid) react and the fibroblasts are capable by themselves to regenerate their milieu and regulate it. Based on these findings we come to the conclusion that the connective tissue cells cannot be seen by themselves, as was usually the case so far, but must be viewed together with the extracellular fluid since the primary life regulations occur between the cell and this milieu. This acknowledged functional unity was named "cell milieu system" by PISCBINGER 1965). It is found everywhere in the body and represents the environment for the specific organ cells and organ functions; it is also the carrier of the blood and lymph vessels and the nerves which, however, as already mentioned, are secondary formations.

In this tissue lie the so-called foci and fields of disturbance. And with this I come to the cardinal question of my subject:

Which paths and reactions lead now from this tissue to the actual focus effects? To be able to answer our question as to the effective mechanism, we must search for the connections between the

disturbed field and the remaining organism.

Due to anatomic-histologic realities only two possibilities **exist** , namely the **nervous** and the humoral. To this must be added the following:

So far, in order to explain such a focus reaction on the entire organism, the vegetative nervous system always received priority. However, with this explanation alone we cannot clarify the focus situation because: If documented foci effect are close to soft connective tissue and *only vegetative nerves* relay the reflexive action, *then the soft connective tissue should have closer morphologic relations to these nerves*, which it does not **have**. Neither physiology nor pharmacology know of an answer to this question. All researchers are of the opinion that in the vegetative sphere no classic synapses between nerve and success cell, be it organ or connective-tissue cell, can be found. This circumstance causes problems for a pure morphological explanation of the irritation transmission. We must therefore see whether the morphology of the vegetative-nerve¹⁸ periphery allows us **some** pointers. PISCHINGBR (1965) had the following opinion:

We agree today that sympathicus and parasympathicus end into a peripheral roomy network of unmedullated nerve drawings, especially well marked as perivasal nerve plexus. Opinions differ, however, if the question is posed how the impulse reaches the success cells. Older papers dealing with light optics believed to be able to demonstrate direct contacts. Against this spoke findings in electron microscopy which showed that no such contacts existed,

at least not such as we know them from innervations of skeletal muscles or in synapses of nerve cells. ZABONERO assumes that from the nervous end formative mediative substances reach their surroundings which over the intermediary, i.e. the intracellular substance of the connective tissue (the extracellular fluid) are able to influence the success cells. Consequently, ZABONERO speaks of a "synapsis per distance." On the other hand, FEYRTER believes that the impulses are transmitted on a plasmatic basis through so-called "interkalaer" cells. This view cannot be documented by electron optics. However, ZABONERO's view is affirmed more and more (**see** also BRETTSCHEIDER, NEMETSCHKEK, GANSLER, H. RUSKA). Namely, electron microscopy results showed firstly only approaches of tiny vegetative nerve fibers toward muscle and glandular elements but never genuine synapses, and secondly in the course of the nerves --regardless of their neighborhood to organ cells--dense or empty small bubbles. It could be documented that they contain the mediative substances resp. transmitting substances (catecholamine, acetylcholine). These are the nerval chemical active substances contained by the autonomous vegetative nerves in their axons, where the catecholamine (adrenaline, noradrenaline, serotonin) function as active substance of the sympathicus and acetylcholine functions as active substance of the parasympathicus (see literature, KOLB, 1967). These nerval active substances represent the basis of the stimulation transmission between nerve and a non-nervous success cell. Therefore, they do not function on a direct basis but only via an intermediate stretch, that is, as dispensed by the nerves

into the extracellular fluid of the soft connective tissue. From there they reach to and into the organ cells and do their work. It is said that the areas of the essential irritation transmission are supposedly those · axon segments which are not covered by the SCHWANH's cell and which were identified as "neuro-effective area" (RUSKA and RUSKA, 1961; VAN DEN ZYPEN, 1967).

Based on these findings we must ask then how the actual affinity relates between the soft connective tissue itself and the vegetative nerves. Although I stressed a while ago that the closer morphological relations cannot be documented, further detailed inquiries have nevertheless affirmed that there exist intimate relations between vegetative nerves and connective tissue, that is, in the sense of *physiological relations*. This can be studied most advantageously on organs which possess nerves but do not contain muscle fibers nor glands, respectively epithelial cells, such as: tooth pulp (PISCHINGER and STOCKINGER, 1965, 1968), gingiva (PLENK 3r., and RAAB, 1969, 1970, RAAB, 1970, PLENK 3r., 1971), peritoneum (KELLNER, referenced by PISCHINGER, 1966) and which also do not have capillaries as, for instance, the pulmonary valve {LIPP, 1951, LIPP and RODIN, 1968, KOLB, PISCHINGER and STOCKINGER, 1967} or the endocardium. The tooth pulp was found to be an especially suitable object for study and was investigated by PISCHINGER and STOCKINGER (1968) by electron optical methods. There were no organ cells. The somewhat thicker, unmyelinated nerves consist of a sheath plasmodium into which were sunk the axial cylinders by so-called mesaxones. The thinner the nerves, the more axones push toward the surface and

gain with their free levels direct contact with the surrounding extracellular fluid. The last branchings, sometimes with only single axons and without the SCHWANN's sheath plasmodium, lie free in the extracellular fluid. As stressed by both authors, there remains no other interpretation than to believe that the extracellular fluid is provided or controlled by naked, extremely fine nerve fibers. Neither could a truly synaptic innervation of connective tissue cells be documented here. Nevertheless, we have to think of effector action, because we can also see nerves with the previously mentioned mediate-substance bubbles. Variations in the intercellular milieu lead again to nerve irritations and to the release of reflexes. This reinforces our understanding about the existence of, in any case, physiological relations between connective tissue and vegetative nerves, because the success cell in the tooth pulp, as is the same in the gingiva (PLENI{ Jr. and RAAB) lacking the existence of special organ cells, can only be the connective tissue cell.

In conclusion, we are therefore able to emphasize the following: The basis of the irritation transmission is undoubtedly the cell-rich soft connective tissue, consisting essentially of cells and their life milieu, the extracellular fluid. This is why we speak of a cell-milieu-system. Above has also been verified by the so-called "needle reaction" of PISCBINGER, 1965). Namely, we can observe that the puncture of a needle into the skin in, as for instance the taking of 3-5 ml blood from the vena cubitalis, already causes a general and nonspecific reaction in the body,

expressed significantly in the oxydoreductive complexes and in the Bb02 content of venous blood. This effect is probably caused by the micro-wound of the needle affecting the connective tissue of the **skin** and **vessel** adventitia, but not by the small amount of blood lost. Further proof for the dominant role of the soft connective tissue as stimulation carrier is the fact that this basic tissue is also nervally "provided by." To this have to be added the capillaries, as a rule, with the theory thereby gaining increased biological significance. The milieu of the cell is influenced from the outside as well as humoral--from the capillaries--as also nerval--from the nervous end formation.

PISCINGBR (1969) was the first to recognize the connections between connective tissue cells, capillaries and nerve in common with the field of influence of the extracellular fluid: he defined the "vegetative basic system" on an experimental as well as on a practical level. With this, PISCINGBR **was able** to work out and develop *a new and comprehensive theory of medicine*; this system provides the missing link between organ cell and humeral and nervous influences on the one hand, and influences from the outside on the other. The nerval pathways and humeral passages with the "inner circulation" (EPPINGER, 1949) including the lymphatic system and blood form the **means** of communication with the entire organism.

Via these paths, that is, over the reactions of the "vegetative basic system" develop therefore the consequences of focal events. I began with the fact that each focus and each field of disturbance **lies** in soft connective tissue and causes morbid

changes there. Disease causing retroactive actions of such milieu changes on the organism are therefore not difficult to understand if we consider the thesis of the vegetative basic system. They have to be sufficiently strong to break through local barriers. This explains the difference between "active" and "silent" foci. In addition, it can be documented that each, including local focus-caused disease is accompanied by general changes of the vegetative basic situation (see above) in the organism or is preceded by such. Foci require a protopathic condition, constituting the basis for the occurrence of local symptoms under the influence of secondary noxae. It will also be understandable that the healing power of the body can be hampered and retarded by the existence of foci (**PISCHINGER, 1965**).

Pathophysiology of the Dentogenous

Focus Effect

Lastly we come to the representation of the pathophysiology of the dentogenous focus effect and with that, to a concrete answer to the question in what manner foci in the teeth can cause organ-related distant effects in the rest of the body. As a good example for this I choose the devitalized (or diseased) tooth, since this, **as is** well known through experience, constitutes the most common and most important source of foci:

The tooth is over the tooth compartment organically connected with the bone. It has also neighboring attachments to the connec-

tive tissues of the gingiva. If the medullary space of a devitalized (or **diseased**) tooth constitutes the seat of pathological occurrences, along the pathway of cross connections there will be influences encompassing the pulp--dentine--cementum--periodontium and over the foramina apicalia first of all the connective tissue of the surrounding area, and later the bone. We must also consider that in the HAVERS' s microchannels of the periodontal bone all elements of the vegetative basic system, i.e. the soft interstitial connective tissue with vessels, capillaries, lymph vessels and vegetative nerves as well as all cellous components are to be found. These compounds respond to every noxa, of whatever different nature--as will all other connective tissue--with inflammation and defense, during which process **some** bony substance will usually be lost. If the defense forces of the body are sufficient, a demarcation line will form, leading in turn to development of a granuloma or, if the defense is too weak for an encapsulation, to formation of a more or less diffuse periapical osteitis. In these events, as already previously mentioned, it **does** not matter whether the influencing noxae are of a bacterial or abacterial nature.

Nbat will happen next?

a) An elemental comment must be added. Of course, not every irritated connective tissue in the area of a dental focus will represent a radiating field of disturbance--also erroneously called a "strewing focus;" the body's local defense may be sufficient to contain the disturbance on a local level.

b) Should the defense be insufficient, larger reaction areas may become involved via the nervous and capillary end network of the vegetative basic system, if not the entire organism. When the totality of this interstitial system (as previously discussed) is borne in mind, this appears entirely plausible. Regarding the observed pathologic-anatomical tissue changes, W. BLOMENCROH (1951) reported:

The pathologic-anatomical substratum underlying the distant effects in experimentally-caused dental root foci encircling the entire organism on a tissular level, was investigated by BLUMENCROH by means of animal experimentation. Histologically, there was seen in parenchymatous organs (heart, liver, kidney) a conspicuous and regular disturbance of the vessel permeability--in all instances with the fluorescence microscope documentable--resulting in a distinct deposition of protein-containing masses in the vessel wall, in the perivascular space, and here and there also manifesting itself in an albumen imbibition. Another, especially conspicuous finding consisted in an enormous bloating of the vessel wall and the perivascular connective tissue. Summarizing these histological investigations, BLUMENCROH came to the conclusion that the consequences of disturbed vessel permeability, which were identified **as serous** inflammation or albuminuria into tissue by EPPINGER, constituted a common dominant marker.

c) In this case too the organism is still able to compensate for focal impairment caused by a field of disturbance, sometimes up to a certain degree with assistance of the superimposed

regulation centers ("assisting pole"). At this point, no visible threatening deviations are **seen** in the vegetative basic situation, such as in the blood (leukocytes, mineral household). However, the vegetativum of such a person is already prestressed; in other words, dystonic or dyscratic. By a stress probe such as, for instance, after incorporating a dosis of Elpimed, an already existing alteration will become visible in the sense of a change in the reaction situation. This can be determined in the laboratory with a blood criteria evaluation test (PERGER) or by iodometry (PISCHINGER). Such a condition can be termed "premorbid" (RICKER) or "protopathic" (SIEGMUND). Evidence of this situation is provided by the patient's recurring virus infections or a hormonal lasting stress such as puberty, climacterium, or gravidism. A clinical correspondence of this stage is given by susceptibility to so-called "podromal complaints" (FUDALLA), such as weariness, disinclination for work, disturbed sleep, "under the weather," etc.

d) If the organism is unable to compensate for the **stress** emitted by the field of disturbance as, for instance, by the addition of another stress of a common occurrence such as a cold, infection, or insult of a psychic nature (situations of conflict at work or in the family), or of a local nature: Should the local **damage** be sufficiently powerful to affect the vegetativum, *then the so rar more or less latent JnsurrJcJency wJll maJnfest Jtself in the area or the non-speciric.*

e) What can happen here-- and now we reach the main point of the dentogenous focal event--is that the dental focus or respec-

tively the field of disturbance will bring about circumscribed organ or system-controlled remote complaints of, for instance, arthritides or neuritides. This phenomenon caused the most difficulty in earlier interpretations. However, according to the current stand of scientific knowledge, we know today that each dental focus and each dentogenous field of disturbance lies in the totality of an existing vegetative basic system which is distributed everywhere in the body, including the areas of the joints, and that the manifestations of each dentogenous focus or field of disturbance will affect first and most directly this totality **system**, causing therefore a propagation of these effects to whatever **area** of the body. Inversely, such distant disturbances can be nullified by the temporary switching-off of a neural field of disturbance from the totality by a targeted injection of impletol according to HUNEKE; although immediate, the effect is usually temporary (the so-called lightning reaction). As an impressive **example** of the totality reaction of the vegetative basic system is to be mentioned that, **aside** from the never consciously **registered** fact that during existence of a powerful pulpitis, for instance, the *whole* person feels ill. During the duration or **even** after removal of an irradiating dentogenous field of disturbance there can **sometimes** occur a sudden jaundice (PISCHINGER) which is due to the functional change of the von KUPFFER's star-shaped cells representing the vegetative regulating apparatus of the liver; it is *here* and *there* where we find the **same** connected vegetative basic system, closely associated with each other. This way of looking at

things helps us to understand such a process, even if we are currently still unable to define such a reflex completely. Predisposed for distant reactions are also (as mentioned before) areas of abnormal hereditary disposition in the sense of a constitutional inferior system or previous morbid areas, respectively areas of an increased stress on local tissue. as can be possible in a changed statics of the skeleton. Such areas in the organism will form zones of reduced resistances (loci minoris resistiae) or puncta majoris reactionis (SIEGMUND) , so that disturbances in the non-specificum there will occur first and particularly intense.

Such a pre-stress condition in the non-specificum is contrary to the view that a healing of such previously existing local complaints is an impediment. This is why exogenous-caused non-focus related diseases which resist therapy such as arthroses of traumatic genesis, and yes, even specific pulmonary ailments (see also RAAB, 1961, 1963, 1964) can often only be controlled when the simultaneously existing dentogenous potential foci and fields of disturbance are removed.

By means of these statements I believe to have shown that even the dental focus theory as a part of the total focus theory has its basis in the vegetativum anchored in a tissular foundation: it is not built on hypothetical knowledge. Beyond it, this dissertation **aims** to contribute to the knowledge that a scientific discussion about foci and their consequences must only be based on a functionally oriented tissue theory.

Summary

1. This dissertation has as its goal to define the **existing** connections between tooth and jaw foci and their resulting distant effects on the entire organism, based on which framework the vegetative basic functions of life can be explained.

2. After an introductory definition of the essential terms used in the theory of focal events, the importance of the so-called "vegetative quotient" for the evaluation of the pertinent reactive situation of the body is emphasized and commented upon.

3. Following this, the numerous dentogenous focus possibilities are extensively discussed, with special emphasis on the dominant role played by devitalized teeth in the field of dentogenous focal events.

4. After a brief retrospective view on the historical changes of viewpoints in the area of focus events our current perspective is communicated, culminating in the recognition that focus events **play** their role in the vegetativum and that each focus and each field of disturbance **lies** in the totality of available soft connective tissue. This totality-view serves as starting point for the subject, without which the focus theory cannot be understood.

5. A detailed discussion of the "vegetativum" as seen from the viewpoint of today's knowledge is the bridge toward the cardinal question of how the vegetative mechanism of action of dentogenous foci relates to the remaining body. The answer to this question can be found in the guiding theory of the "vegetative basic system"

of PISCHINGER, with which all reflexes can be explained. This theory is interpreted by the author to **mean** a *new totality theory of modern medicine*, constituting a novum and hithertofore not available.

6. Above findings are taken as a basis for the discussion of the pathophysiology of dentogenous foci.

7. In conclusion it is emphasized that the dental focus theory, **as a** division of the total focus theory, has its foundation based on the vegetativum's tissular substratum and does not rely on hypotheses, and that a scientific discussion on foci and focus **events** can only be founded on a functionally oriented tissue theory.

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