SYMPOSIUM
ON ENDODONTICS
YEAR 2000

HELD ON 7TH DECEMBER 2000, PALACIO MONTE MIRAMAR, MALAGA

(Resumé of the papers and talks)

Director: *Prof. Dr. Chaparro Heredia*
Head Professor of Dental Pathology & Therapeutics
University of Seville

Collaborators: *Prof. Dr. Benz, Prof. Dr. Haffner and Prof Dr. Hickel*
(Research Group on the use of high frequency current in Endodontics, Univ. Ludwig Maximillian, Munich, Germany)
Dr. Juan Oliveres Folguera
(Endodontist, Clinica Stoma, Barcelona)
Dr. Eng. Vittorio Sacchi
(Inventor of Endox Endodontic System)
Dentists Users of Endox Endodontic System,
providing their experiences, clinical techniques, results and suggestions.

Written communications submitted by Dentists using Endox:
Dr. Regino Arenas dalla Vecchia (Villena, Alicante)
Dr. Antonio Llorente Illera (Segovia)
Dr. Ulf Thams Lorey (Madrid)

Oral communications by Dentists using Endox:
Prof. Dr. Concepción Murillo (University of Seville)
Prof. Dr. Aníbal González (University of Seville)
Dr. Azagra'Peres (Marbella)
Dr. Andre Ballard (Algeciras)
Dr. Vicente Colomer Fariñas (Algeciras)
Dr. Francisco Javier Denche Molina (Madrid)
Dra. Silvia Herrero (Madrid)
Dr. Carlos Llorente del Campo (Madrid)
Dr. Rafael Roman Jara
Dr. Juan de Vicente Catalá (Valencia)

PREMISE

The method used by Endox Endodontic System, high frequency in the radicular canal, produces the elimination of the pulp as well as the sterilisation of the radicular system in a simple, rapid and painless manner with greater safety.

In Palacio Monte Miramar, in Malaga, on the 7'", of December 2000, a meeting was held with university professors, endodontists and 75 dentists from Germany, Italy, Portugal, Greece and Spain to analyse the experience matured with the use of a new method Endodontics, Endox - Directed by Professor Dr. Chaparro, Head Professor of Dental Pathology & Therapeutics at the University of Seville.

FIRST PAPER, DESCRIPTION OF THE SYSTEM: MR. SACCHI.

The inventor of the system, Mr. Sacchi, explained how, dne to his own impediment which prevented him of maintaining his mouth open for more than a few minutes gave him the input to conceiving a method which, in a quick and efficient manner, could resolve one of the most common problems encountered nowadays in everyday endodontics. The long sessions necessary to eliminate the last residue within the radicular canal and, in most cases, its complex combination of tubules, canal accessories and other irregularities are practically inaccessible to traditional methods. That is, it is imperitive before using gutta-percha for the obturation as a blocking is imperative, otherwise the proliferation of bacteria will, sooner o later, simply undo even the very best of the most skilled professional, it is from this that the high percentage of
re-endodoncies and post-operative problems are present for everybody,

The Endox method, internationally patented, consists of some dosifiers, perfectly adequate for various types of teeth, and which allow the application, via the introduction into the root to be treated, of a very subtle and extremely flexible metal probe through which a very short electronic fulguration of very high intensity and high frequency, 600 MHz, for a time of less than one-tenth of a second, is carried out, this fulguration instantly vaporises the pulp that surrounds the probe and with moving the probe around the adjacent canals, a perfect disinfection is achieved; which now makes the tooth ready for obturation with gutta-percha. If the canal is too narrow to be thus blocked, then traditional instruments will have to be used in order to obtain the minimum diameter to complete the filling.

SECOND PAPER. INVESTIGATION "IN-VITRO" AND "IN-VIVO" PROFESSORS HAFFNER, BENZ & HICKLE (UNIV. OF MUNICH)

Professor Haffner took over to explain the investigations that were carried out by the team under Professor Hickel in the Faculty of Odontology of the University of Munich to confirm the effects of the Endox Method and its possible influence on the tooth and the bone and ligament support.

The first preoccupation was to determine that the rise in temperature produced in the interior of

the canal by the Endox fulgurations did not trespass the said tooth in a harmful measure. To that end, ultra-high-speed infrared video camera was installed which permitted the visualisation in function of a scale of the gradient elevation through colours.
In photo 1 the temperature of the tooth, through the laboratory set-up, is shown before the fulguration; precisely the apex, marked with an "X", shows a temperature of 19.5"C.
In photo 2, we see at the very instant of the triggering and how the temperature has risen only at the apex. Actually, the dental cement acts as insulation, up to 29.5"C. This rise of temperature is unable to affect the tissues encasing he root; besides, the short duration, +/- 6 see., serves to assert the innocuosness of the method, in this sense.

Photo 1 Termography, 19.5 °C

Photo 2 Triggering, 29,5 °C

PULPAL ELIMINATION. In the same University of Munich, as well, Professors Benz & Haffner, under the direction of the Head of Department, Professor Hickel, (who to this meeting sent a letter of full support to his collaborators) had carried out, before presenting this method at the disposition of the odontological community of the world, tests that proved the elimination of all the biological material present in the dental root: nerves, blood supply system and bacteria. In photo 3, an open conduct is shown after the fulguration with the total elimination of blood vessel/nerve packet; photo 3A shows a 4000x pulp before the application of the Endox electromagnetic fulguration; photo 4, an electronic microscope take of the drained zone, but not vaporised, where the fulguration has not reached directly. In photo 5, it can be appreciated how in the superior part there has been a total elimination and in inferior part, indicated by the arrows, where the fulgurating probe has not reached, one sees the remnants of pulpal tissue. This gives us an idea of the controllability of the method, as long as one knows exactly where the tip of the probe is found (to this end, Endox has provisioned an electronic conductometer , apex finder, of high sensibility).

Photo 3A-Open channel before fulguration

In photo 6, a take greater than l000x we can see how the internal surface of the fulgurated root

Photo 3-Total removal of Image vessel-nerve packet

has resulted: Dental tubuli open, absolute absence of the smear layer of biological material and the rest of ashes of the material fulgurated.
In photo 7, a 4,800 amplification, it can seen that the mouths of the dental tubuli open arc perfectly clean showing, in its interior, freedom of residues. On the surface we verified that the ash material appraised in photo 6 is biologically inert, which means that it is not necessary, from the bacterial point of view, to clean it out prior to the obturation.

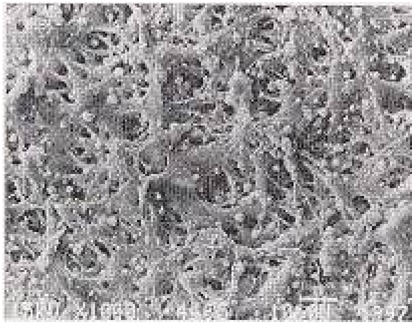

Photo 4 Non vaporised dentin

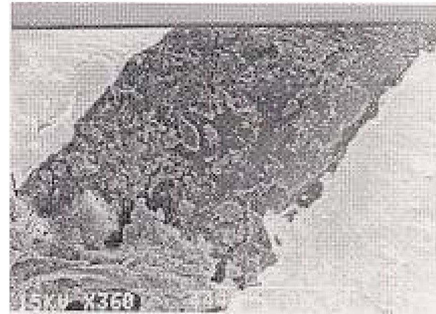

Photo 5 On top, clean surface of channel. Down the area not reached by probe

BACTERIAL ELIMINATION. Professor Benz
referred to the research as a conclusive proof of the hypotheses, in other parts evident,of this elimination of microorganisms in the interior of the dental roots after electronic fulguration.
In the study, cultures of E. Coli and S. Aureus were installed into the canal to be treated with concentrations of 3,6x10" per ml. After the application of fulguration, corresponding to the characteristics of the canal treated, a procedure to open the tooth (teeth) longitudinally along the root (roots) «photo 8» making evident the disappearance of pulpal tissue, both, to the naked eye ad the microscope.
Effecting a count of the surviving microorganisms it was found that there was a relation of 230 (+/- 180) bacterias/ml., which means, a reduction of the order of 99.98%.

Photo 6 Clean dentin w/o smear layer.

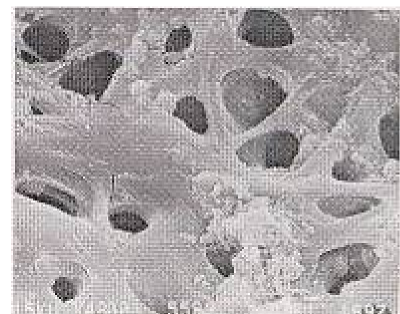

Photo 7 Clean tubuli.

FIRST CLINICAL RESULTS

In the application of electronic fulguration carried out after determining the procedures to be effected in the university clinic of the Faculty of Odonthology of Munich, the use of the Endox system was not considered uncomfortable by the patients; both, during the taking of endometric measurements as well as the application of fulguration. A patient, without local anaesthetic, described the first fulguration as stabbing. Thus local anaesthetic is recommended.

None of the patients, in the course of two years, present signs, subjective or clinical, of an insufficient endodontic therapy. Some of the patients described a sensation of heat during the following three hours without any of the cases treated having noted any post-operative incidents, contrary to the habitual.

THIRD PAPER: CLINICAL RESEARCH
PROFESSORS MURILLO & CHAPARRO
(UNIVERSITY OF SEVILLA)

Professor Chaparro Heredia began by thanking his collegues of the University of Munich for the research "in vitro" and "in vivo" carried out over the four years which it would not have been possible to effect the first clinical tests at the Univesity of Sevilla, since the fact of producing an electromagnetic fulguration within the interior of a dental root of a patient because the first thing it produces is anxiety, both, in the patient as well as the clinician.

"The certainty of not causing harm", said Prof. Chaparro, "is what had induced them to verify the results accrued in Munich in a sufficiently ample clinical report .More than 300 cases.
"We have used the Endox system in 320 endodontic treatments of patients and processes of an ample variety, the majority being with irreversible pulpitis. Of them
10 % presented evident inflammatory signs (abscesses).

Photo 8 Fenix abcess

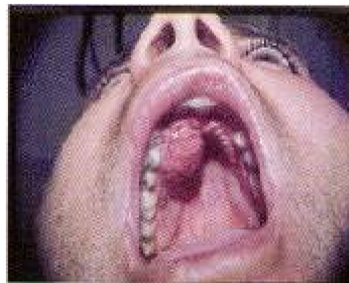

Photo 9
Previous Xray

Photo 10
Two months later.

Besides these cases, we have performed, and we remark it for its spectacularity, a retreatment of a first upper molar that presented a vestibular fistula because of an endodoncy badly carried out, with an evolution of two years.

"Radiologically, half the cases presented slight widening of the periodontal space, some 15% presented a radiolucent periapical image very evident (chronic apical periodontitis) and the rest of the radiology was normal.

"All patients received anaesthesia and the work area was isolated by a rubber dam. The Endox system was used according to the instructions. The exactness of the endometric measures with Endox, verified radiologically, were comparable with other endometric studies, having, sometimes, to resort to the special measuring probe (not that of fulguration) that accompanies the apparatus. Some 96,3% accuracy was obtained. In any case, we think it convenient to radiologically prove the length of the work, above all, in cases of necrotic pulpitis.

"In the phase of the application of high frequency current, some 65% noted a slight sensation of stabbing or prickling in spite of the anaesthesia, which did not bother the patient.
"With a conventional file we tested for the existence of pulpal residues and widened to the size of ISO 30 in order to continue to do the obturation.
"In the case of re-treatment, on not being able to eliminate the gutta-percha from the apical third by conventional means, we proceeded to introduce the tip of the Endox as far as we could, applying, where and when convenient, fulgurations; on extracting the tip we saw that the gutta-percha adhered to this tip due to the heat. Although one only case be not sufficient, it seems that the action of Endox is quite promising in re-treatments. The vestibular fistula disappeared once, in the same session, new endodoncy was carried out. "Practically none of the patients had any trouble or post-operatory symptoms in the days following the treatment, coinciding with other studies. It is also important to point out to a significant reduction of work-time, for which the patients arc grateful and benefits to us.
"We think that the Endox system, used in a rational manner, offers very interesting advantages in endodontic treatment, since a treatment of a sequential type and knowing that all the steps are important, the cleaning and disinfection of radicular canals is of virtual importance in order to ensure a long-term success. This point had been sufficiently demonstrated since Endox, thanks to the high frequency, eliminates the pulpal tissues, the germs of the adjacent canal system, without any risk whatsoever to the periapical tissues, in spite of the application of fulguration several times, a fact that allows us to obtain better results. The elimination of the "smear layer" and the zones of the radicular conduct which have been converted into a smooth surface after the treatment, permit a compact obturation, premise to the success of the treatment, besides simplifying the instrumentation of the canals, since it is not necessary to widen them too much, as seen from the results."

Photo 11-Periapical Reabsorption

Photo 12-2 months from treatment

In coordination with the exposition of his work, the University of Sevilla team showed several film-slides, of which we have chosen some of the radiographic evolution of the cases, especially in the re-absorbtion of the granulomas, some of which are spectacular with regard to dimension and profundity of the image of the radiolucent periapical image, at the time exceptionally short in its healing (two months), and very especially, the complete lack of

destruction of the dentinal wall which can be obtained through this method, which will rebound in greater solidity of the prosthesis. Also, the image of the fenix abscess with the remission of pain, almost instantaneously, deserves to be highlighted (photos: 8,9,10,11 & 12).

FOURTH PAPER; ENDOX IN THE DAILY PRACTICE OF THE SPECIALIST IN ENDODONCY WHAT THIS CONTRIBUTES AS A COMPLEMENT TO THE CLASSICAL TECHNIQUES.
DR. J. OLIVERES (CLINICA STOMA. BARCELONA).

Dr. Oliveres manifested as a preamble that his practice for more than thirty as a specialist in endodoncy involved, in a very special manner, the traditional techniques and that this familiarity , together with a team of highly experiences assistants, gives him functionality, rapidity in execution and a percentage of success in this type of treatment, logically of greater average, than generally accepted.

To Dr. Oliveres, the contribution of Endox is not significant in the process of the pulpal elimination as described in the instructions, since the conventional methods give him sufficient satisfaction and guarantee. Nor does he find the endometric system useful, as it has been endowed, in his opinion too sensitive, so he continues to employ the apex electronic locators already in existence in his clinic.

However, he qualifies as exceptional the service it offers as a sterilizer of the canal system and the spectacular reduction of post-operatory problems had since he has used Endox.
A highlight is the elimination of inflammatory processes, urgent calls from patients recently operated. It has practically done away with such as swelling and the gamut of post-operative pains that frequent when using other methods.

With the object of giving his practice greater expedition, Dr. Oliveres, who during the year 2000 states having treated more than 1,500 teeth with Endox, says that he "tricks" the security system which the equipment is endowed with: as Endox is, at the same time, a localizer of the apex and a fulgilrator of high energy frequency, a specific relay impedes the effectuation of fiilguration over the radicular apex, which guarantees the operator that there will be no provocation of effects in the periapical zone. To fulgurate, once we have localized the root where we wish to do it, pressing a pedal it passes from the "endometry mode" to the "fulguration mode", then the same pedal is pressed again and fiilguration is effectuated. As Dr. Oliveres docs not use the conductometer of the Endox, he may fulgurate at will at any point along the canal and thus proceed repeatedly, above all in the apical third.

"One needn't worry", he says, "because it doesn't affect the bone tissue if it is triggered outside the apex, I have it proved. If the earth wire of the socket where we have the Endox equipment be correct, the patient will hardly notice the instantaneous stabbing sensation, which disappears immediately. And after the first fulguration, if we decide to produce several more along the same canal, which is normal, nothing at all will be noticed".
The brilliant exposition of Dr. Oliveres which, possibly due to this wide experience with Endox and the marked meaning of daily practice was followed with enormous interest by the numerous audience, laid special emphasis on contraindications, pain in the clinic and the electrical sensation, beside his particular mode of usage.

CONTRAINDICATIONS: Patients with pace-marker and/or contact lenses, which must be removed before "sitting in the chair" with the object of avoiding "electrical alarm" which some suffer when they are warned that the Endox is going to be applied, although in the end nothing! The fact of removing the contact lenses is due to some of them containing carbon and could produce adherences, without great consequence.

Mr. Sacchi, the manufacturing designer, was presented with doubts with regard to: Those operated for cataract with internal lenses.- Should be avoided.

Internal esthetic wiring.- It poses no problem as long as the Endox electrode does not come in direct contact with them.

Pregnancy.- The applications of some fulgurations should not constitute any risk to the foetus. The fact of applying galvanic currents, or other, constitutes as an alternative to pharmaceutics during gestation. In any case, it should not be more than a subjective prevention.

Metal heart valves.- Contraindicated.
Open apexes.- One has to distinguish if it deals with a tooth in formation or not. In this case, research into it has yet to be pronounced.

Children-up to what age.- To what has been said earlier and in consideration of the possible damage to the cartilage of a growing tooth, apparatus of Hertwig, one should avoid applications on growing teeth. As there is no sufficient backing by research one should maintain the precaution.
Detachment of the retina.- There are no contraindications.

Deaf-aids.- Mr. Sacchi, the first patient with whom Endox was experimented, extracted at this moment his own hearing-aid. " The patient should turn it off, because there could be interference of the fulguration in the electrical transmission of sound, just as in cellular telephones, although in my case it wasn't so".

Pain.- Under this heading Dr. Oliveres presented a summary of the different clinical situations. "Under any circumstances anaesthesia has to be administered, with the exception of reendodoncy, which is compensated by the fact that in some very acute pulpal inflammations it can pain, including with patients under anaesthesia, but one has to have in mind the instantaneousness of the deed and which, generally, once the first fulguration has been effected, the rest of them are hardly noticed. The anesthetic to be used, from the strict point of view of pain, would be with adrenaline, but from a personal point of view I employ it without adrenaline, since it gives less rise of anxiety or tachycardias".
Also, during his wide experience on more than 1,500 teeth treated with Endox, he has appreciated that teeth with several roots, some are more sensitive than others. For example: With the lowers, the mesio-vestibular roots, while with the uppers, they seem to be the palatal ones.

Electricity: "Given that Endox is an electrical system, one has to take especial care, as with all the equipment in the clinic, but eve more so, that the earth connections are correct, because the static charge on some patients can be very high. I refer to persons who, with the mere act of inserting a key into a keyhole, can discharge an electrical spark, and even a mother who is breast-feeding her child could not do so without suffering a sensation of this kind. One must insist the installing firm of Endox verify the earth take of the clinic and check their correct functioning. (A legal obligation in the whole medical ambit). If there is no earth connection the patient will feel the discharge along his whole
body.
"Even so, patients with high sweating and anxiety, feel some discomfort, as with those that have the apexes very open and very big maxillary hollows. I would emphasise that the sensation is limited to one-tenth or a second and that, after effecting the first fulguration, the following ones are hardly perceived".

To resume, he referred to Endox as an equipment which serves to collaborate with classical techniques of endodoncy offering absolute sterilization of the root canal system entirety, guaranteeing the access to the hidden adjacent spaces, which for this only, is a justification for its use, and since using it the post-operative

problems have disappeared; and that practically none of the 1,500 cases treated have called to complain about pain or inflammations, and, to date, no news of not one of the endodoncy carried out with Endox has had to be re-treated.

FIFTH PART: COMMUNICATIONS FROM THE USERS OF ENDOX.

Named are the users present at the symposium:

Prof. Dr. Concepcion Murillo (Sevilla)
Dr. Azagra Percz (Marbella)
Dr. Vicente Colomer Farifias (Algeciras)
Dra. Silvia Herrero (Madrid)
Dr. Rafael Roman Jara (Sevilla)
Prof. Dr. Anibal Gonzalez (Sevilla)
Dr. Andre Ballard (Algeciras)
Dr. Francisco Javier Denche Molina (Madrid)
Dr. Carlos Llorente del Campo (Madrid)
Dr. Juan de Vicente Catala (Valencia)

All of them participated actively in the debate over how to extract maximum benefit from the Endox equipment and on the round table over which the different possibilities were being defined with the use of Endox and at the same time outlining new protocols of use, always refereed by those of greater experience.

Prof. Murillo made it patent that there was a drastic reduction in the time of the operations when Endox was utilized. On the one hand, she said, the safety and rapidity in the ridding of the pulpal remains in the apical third, the finishing with laborious process of disinfection with chlorine, and, above all, the carrying out of the obturation in one single session, this latter aspect elicited the agreement of all those present, permits the reduction of time, which was a made patent in the research studies carried out together with Prof. Chaparro; almost a 40% average on time-saving in cases treated by Endox than by conventional techniques.

Dr. Azagra manifested that in his case it was hard to adapt himself to the use of Endox, because the application of the high frequency on a dental root produced in him, at first, a feeling of rejection, but once he got into the habit and the high trustworthiness reported, he has got to use it with greater frequency. He showed two radiographic prints in which, within a three-month difference from the re-treatment with Endox one could appreciate a great reparation of the periodontal support of a molar very badly affected by conventional endodoncy not well accepted (Photo 13 & 14)

Photo 13 Previous RX

Photo 14 End of treatment (3 months)

Dr. Roman Jara explained that from the very first he had been integrating the Endox system into his clinics (he has two), and the satisfaction obtained by the reduction of time, in spite of the fact that his technique, a with Dr. Oliveres, continues to be the conventional, but supported by several

Endox fnigurations per canal, just before the obturation, because he considers that if he used instruments "a posteriori" Endox, he would have to use the latter again, to not re-introduce bacteria into the canal through the instrumentation. He has also appreciated, as with the all users present, a decline to almost zero, since using Endox, of post-operative problems. More than 300 endodoncies have been carried
out with Endox.

Besides the users cited above, summaries written by each, of their experiences with Endox, were:
Dr. Antonio Llorente Illera (Segovia)
Dr. Regino Arenas dalla Vecchia (Villena, Alicante)
Dr. Ulf Thanis Lorey (Madrid)
The first named, apart from showing his great estimation for the Endox system (terminated his work assuring that, "not one professional worth his salt will want to work without the help of this technology", expounds his personal theory that as long as one respects the apical biological closing up, the patient will feel no pain, so it is convenient to fulgurate from 1 to 2 mm., from the apex (which can be judged easily with the digital conductometer which the system is endowed with). Likewise he expounds in his writings that it is not convenient to leave all the work of pulpal extirpation to just Endox, limiting only to apical third with which, "we facilitate that all the potential of Endox is integrally applied to vaporize the content of the secondary canals on which the specifications of Endox are based.

"This is impossible through other methods, but it does not save the bungling quack".
He finished highlighting that, "with traditional endodoncy we subject the immunity system to a continuous overcharge due to the residua] toxicity and allergens of the mummified content of the secondary canals. That can be a time-bomb. With Endox, on cleaning also this secondary network, we take care of the patient's immunity system and now not depend on its well functioning for clinical success. From now on we will be able to talk about biological endodontics or clean endodoncies."

Dr. Arenas relates in his writings about his experience in 236 endodoncies with Endox;
102 of vital pulp and 134 of necrotic pulp, explaining in detail his technique of application which obviate several protocol steps of the manufacturer, which is left to conventional techniques, coming to the following conclusions:
"If the patient be well anaesthetized, he will hardly notice the discharges"
"Since I have been using Endox post-operatory incidents (pain, inflammations, etc.) have diminished, not to say disappeared, I have only had three cases of bother which was limited to pain 5-7 days after the endodoncy, which has already disappeared; I have no had any case of radicular fracture, bacause I use very few instruments on the canal".
"I do the endodoncies at one sitting (be they live pulp or necrotic)".
"In only three cases over these 7 months I have not been able to use the Endox (due to the patients wearing lenses) being a simple chance that one of these patients presented problems after endodoncy".

"I have carried out four re-treatments of earlier endodoncies and, at the moment, all goes well".
"I have had a case or two of the breaking of a rotary instrument which I have had to leave inside. After giving them three discharges with Endox, for the moment they have not given me any problems".

DR. THAMS communicates the following:

"... in my clinic more than a hundred endodoncies have been carried out with the Endox method, with favourable post-operatory results for the patient - lass pain, swellings and bothersome, in general, when compared with traditional methods"

SUMMARY

One can deduce two schools or systems of working with ENDOX clearly differentiated:

A) Those that follow the application according to their description and according to the university method (we define them thus to coincide with the researchers of the University of Munich as well as those of Seville) that apply diverse fulgurations in order to destroy through vaporization of the pulpar tissue in mid and the apical thirds of the root, eliminating manual instrumentation in them or limiting it to the eventual widening of the canal with the aim to allow the gutta-percha for blocking up.

B) Those that eliminate manually all the pulp, limiting the use of Endox to the additional disinfection of the canal as an annex or greater guarantee for the absolute sterilization of the same.

The organizers have received numerous congratulations for the quality of the works presented, the personalities that attended, both, as speakers and as users, the liberty of expression of their divergent concepts and the having favoured the interchange of information, which, without a doubt, will lead one to a more practical use of Endox, which comes out of this symposium with the total backing, from the point of view of the members of the universities as well as the endodoncy specialist, and, naturally, of the daily practice at the clinic, as long as the pertinent set up is observed.

Malaga, 7'" December 2000.

For Further information or to have a demonstration, please call:

Dental Practice Systems on: 01438 820 550
Fax: 01438 821425
Email: dps@btinternet.com

6 Ayot House
Ayot St Lawrence
Welwyn
Herts
AL6 9BP