THREE YEARS ago a questionnaire was sent out to members of the American Association of Orthodontists, with the request that they answer a series of questions concerning the status of orthodontics in 1969. The whole field of orthodontics was covered in the questionnaire, with questions ranging from the needs and training of orthodontists for the present and future to vacations and optimum retirement age. The results of this questionnaire were reported in an article entitled "Orthodontics in 1969." Of the 2,300 questionnaires sent out, 1,325 were returned (Fig. 1). There are many interesting and fascinating observations and projections to be made from the compilation of the results. The most intriguing of these concern problems of office location, type of building, the use of auxiliary personnel, and the personal responsibilities of the orthodontist. The changing emphasis is on mechanotherapy, more widespread use of removable appliances, and more efficient use of ancillary aid. More than three years have elapsed since the questionnaires were returned and analyzed. This is a sufficient period of time to permit a study of what has actually happened and a comparison of the fait accompli with our considered opinions of things to come as registered on the questionnaire. Despite the fact that 175 to 200 orthodontists are being trained each year, we have not been able to keep up with the mushrooming demand for orthodontic services. University facilities at present are heavily taxed and could not expand significantly without materially reducing the caliber of graduate training. Obtaining even an adequate orthodontic faculty to satisfy present graduate-training demands has not been possible, and the number of qualified full-time orthodontic teachers in the United States can be counted on the fingers of one hand. How are we to meet

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Presented before the Northeastern Society of Orthodontists, New York City, March 6, 1961, and the University of Tennessee Orthodontic Alumni meeting, Nov. 17, 1961.
this challenge? At least part of the answer lies in a reappraisal of our basic philosophy of treatment, in a more efficient physical setup, and in the more effective use of auxiliary help. These problems will be discussed in the present article. Wherever possible, I will give answers based on personal experience.

Fig. 1. Geographic distribution of results of "Orthodontics in 1969" questionnaire. 1, Northeast. 2, Midwest. 3, South. 4, Plains States. 5, Southwest. 6, West (and Hawaii). (Drawings for this article were prepared by Dr. Tsuneo Aoba.)

LOCATION OF OFFICE

With the great increase in demand for orthodontic services, with the decentralization of our population, and with the appearance of giant suburban shopping centers, freeways, toll roads, etc., it is obvious that the traditional downtown location of the orthodontist's office is inadequate to handle the situation with the greatest efficiency.

The questionnaire reflected a strong feeling that the trend for orthodontists was toward the suburbs (Fig. 2), and this has certainly been the case. As one of the many orthodontists who saw the "handwriting on the wall," I closed my centrally located office to spend all my time in the residential area. Working with children, as we do, we belong as close to the schools as possible.

SCHOOLTIME APPOINTMENTS. There is a constant battle between the schools and the orthodontists and the less time spent away from school, the better for all concerned. If possible, the office location should be such that the majority of the children need be away from school for a total elapsed time of no more than one hour for routine adjustments and longer only for appliance fabrication and changes. If such is the case, the patient will no longer need to take off

*The American Dental Association approved Resolution 2 at its annual meeting in Philadelphia in 1961. This means that preceptorship training will no longer be accepted after 1965, and to qualify as a specialist a man must have taken university training in a course approved by the Council on Education of the American Dental Association.
a half-day or a whole day for his adjustments, incurring the wrath of teachers and principals with each visit unless he comes after school. It is just not possible to render proper service to the community and to the individual patients if adjustments are limited to after-school hours and Saturdays. Most children of orthodontic age are able to keep their appointments without being

Fig. 2. Trend of office location as projected for the ten-year period of 1959 to 1969. Figures are based on 2,300 questionnaires sent to members of the American Association of Orthodontists. Black column signifies total return from entire country. Numbered columns correspond to geographic areas delineated in Fig. 1. 1, Northeastern section; 2, Middle West; 3, Southeastern section; 4, Plains States; 5, Southwestern section; 6, Far West and Hawaii. Far West and Southwest show greatest trend toward suburbs; Northeast shows the least trend in this direction.
brought by their parents; this is particularly true if the office is in the immediate vicinity of the school or home. Certainly, no parent wants his child out alone after dark and this would be necessary if adjustments could not be made routinely during the day. An additional factor is that the child is a much better patient in the morning, or even during the early afternoon before he has been tired by the day’s activities. On the basis of a very successful personal experience, I strongly recommend that patients be accepted for orthodontic treatment only on the provision that all appointments be kept during school hours once every three or four weeks if the child is in grammar school and every six to eight weeks, or every other appointment time, if the patient is in high school. Regular school excusal forms have been developed by the Chicago Dental Society and have been approved by the Board of Education (Fig. 3). These are used routinely for schooltime appointments. If such excusal forms have not

**APPLICATION FOR EXCUSAL FROM SCHOOL**

**FOR DENTAL APPOINTMENT**

(Name of Pupil) has an appointment for necessary dental service on ________, 19___ at ______ p.m. to approximately ______ p.m. This service cannot be rendered satisfactorily outside of school hours. It will be appreciated, therefore, if this pupil is excused from school to keep the appointment indicated above.

The parent assumes full responsibility for the child’s safe conduct during the time absent from school.

(Signature of Parent)  (Signature of Dentist)

EXCUSAL APPROVED BY

(Signature of School Official)

__________________________ was in my office from ______ p.m. to ______ p.m. on

__________________________, 19___ for necessary professional services.

(Signature of Dentist)

(This permit must be returned to teacher or principal after appointment.)

Fig. 3. Official Chicago area school excusal form. It was developed through the combined efforts of the Chicago Board of Education and the Chicago Dental Society and is used for all school excusals.

been developed in your community, all dentists who work primarily with children should take it upon themselves to meet with school officials and develop a suitable form. Adjustment appointments must run right through the day if the orthodontist is to make proper use of his time and render the best possible service to the community.

Since the end of World War II, as we know, shopping centers literally dot the suburban landscape. Professional concentrations have allied themselves to these centers in some areas. This trend was predicted on the questionnaire, and the experience of the majority of men who have chosen this office location seems to be most gratifying (Fig. 4). The disadvantage is that the child usually has
Fig. 4. Orthodontic practice located in conjunction with multiple-unit shopping centers. The trend is predicted for all areas of the country. The West Coast predicts the greatest trend, while the Northeastern states consider this least desirable.

to take public transportation or be driven to the shopping center. Since visits are usually at three- to four-week intervals, this is not too serious, as the mother often combines the visit to the orthodontist with necessary shopping (Figs. 5 and 6).

**TYPE OF BUILDING**

Members of the American Association of Orthodontists predicted in 1969 that there would be a strong trend toward so-called "bungalow" offices (Fig. 7). Such has been the case. There are, of course, variations in the bungalow type of office. It may be a home-and-office combination; it may be a small building
used exclusively by the orthodontist; or it may be a somewhat larger building that accommodates a number of men from associated dental and medical fields.

The bungalow office-and-home combination has been most successful in the Eastern section of the country, and questionnaire results show that the greatest number of such combinations have been established there. Part of the reason is the high value of land, a higher level of taxes, and a more complete building up within the community limits (Fig. 8). Home-and-office combinations are springing up all over the country, however, and the majority of men who have gone into this type of arrangement are satisfied. Possible disadvantages are the tendency to work later, since home is but a step away, and the occasional call of
a parent whose child has a loose band or broken arch wire. Appreciable income tax savings are possible with such an arrangement.

Even more popular than the bungalow office-and-home combination is the small professional building that has been erected exclusively for dental or medical practice (Figs. 9 to 12). Construction costs and land values mitigate against the building of offices for one man only, so that most of the new professional buildings are occupied by group practices or by men in associated
fields of medicine and dentistry. Despite the great popularity and advantages of the group-practice concept, the single-unit type of structure should not be completely ignored (Figs. 13 and 14). Practice management consultants recommend the establishment of a revocable trust, with the orthodontist the beneficiary of this trust after a ten- to fifteen-year period. During the time that the trust controls the building, the orthodontist pays rent to the trust and is also allowed to deduct the maintenance and decoration expenses incurred during the time of occupancy. These legitimate deductions reduce the

net taxable income at the point that is most desirable—the upper end. The trust also pays an income tax on the monies received, but in a much lower bracket. Such a trust arrangement can also be drawn up with a group-practice type of building. Each man pays rent to the trust and pays current expenses associated with maintenance of practice, and all the men involved are the legitimate beneficiaries at the time of termination of the trust agreement. An alternate trend that is beneficial from a tax standpoint is to incorporate a building that is owned by a medical or dental group. Both the trust and corporate setups have inherent tax advantages, not only for current income but also

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Fig. 7. Will there be an increase in bungalow offices by 1969? An overwhelming number of A.A.O. members think so. The greatest affirmative opinion is seen in the Southeastern and Southwestern states and in the Far West. Higher property values, taxes, and reduced availability of land probably account for the lower percentage predicted in the Northeastern and Middle Western states.
Fig. 8. Prediction concerning home and office increase by 1969 and an opinion on desirability of this arrangement. The greatest increase is predicted in the Northeastern section, in contrast to a negative opinion against such an increase in the Far West. (Hollow bars represent “no” answers; solid bars represent “yes” answers.) Only the Northeastern part of the country considers such an arrangement desirable.

estate-wise. Legal experiences with trusts and corporations vary in different sections of the country, and it is essential that such arrangements be culminated under the guidance of an expert tax counselor.

Regardless of the type of office—whether it is in a regular professional building, a home-and-office combination, or a bungalow type of setup—it is strongly recommended that for maximum efficiency each man have at least two operating chairs available at all times. There may be separate rooms, with the lab directly behind (Fig. 9), or two or three chairs in a larger room, separated by a semidivider, planter, etc. My arrangement of three chairs in the same
Fig. 9. Floor plan of an efficient bungalow office arrangement, which is versatile and adaptable to use by a dental group practice or by an orthodontic "team" only. Technician's lab, lounge, storage, and utilities are downstairs.

room with no separation at all between them has been most satisfactory. The freedom of movement for patients, parents, operator, and ancillary help recommends this arrangement. Children do not mind if others are seated in the same room, and the psychological advantage of social pressure at times actually improves the patient's cooperation and eases management during impression-taking or band-fitting procedures (Fig. 15).

GROUP PRACTICES AND PARTNERSHIPS

An efficient and attractive physical plant is only part of the picture. As the "team" concept has developed in the handling of congenital defects, such as cleft palate, it has become apparent that a better service can be rendered the patient with more effective use of professional personnel. The same "team approach" has much to offer in providing more and better orthodontic service to
Fig. 10. East and north frontal elevations of floor plan shown in Fig. 9. Note use of skylights for operating rooms. Building is constructed to allow for addition of more operating rooms, etc., if desired, for future expansion.

the public. The profession recognizes the need for training more orthodontists, judging from the questionnaire (Fig. 16), and all sections of the country look favorably toward establishing orthodontic internships (Fig. 17). The university training facilities are limited, however, and the faculty shortage is critical. Orthodontic internships exist now in only a few scattered hospitals, and the mutual benefits of such arrangements have not been extended to private practice as yet. Properly conceived group practices and partnerships foster the team philosophy, making more efficient use of facilities and reducing the strain, tension, and possible future cardiac involvement engendered by heavy orthodontic practices. More frequent vacations, free of the gnawing fear of what may be happening to the practice, cannot help but improve the orthodontist's perspective. If one man gets sick, routine service for the patients continues, just
as it does when he is on vacation. In the questionnaire replies, group practices were strongly endorsed as desirable, as serving the public better, and as likely to increase in popularity (Fig. 18).
There is less sanction for the pooled income—split fee group practice than for the group practices in which each man has independent financial dealings with his own patients, but the pooled income setups are increasing also and are working out very well in many instances. Regardless of the type of group practice, it is recommended that a competent practice management counselor draw up a formal agreement which protects each member, the practice, and the families in case of death, disability, or emergency.

One form of group practice is the partnership. Members of the A.A.O. were asked on the questionnaire if they considered partnerships desirable and if we should have more such arrangements in the next ten years. As Fig. 19 shows, both of these questions were answered overwhelmingly in the affirmative.
Fig. 13. Attractive bungalow type of office that makes good use of available space. Children's play section (lower left) and adult waiting room are both part of large reception area.

Fig. 14. Floor plan of office shown in Fig. 13. (Courtesy Dr. Robert N. Tanis.)
Fig. 15. Ten by fifteen foot two-chair orthodontic operatory, with welding and soldering island that serves as a case for the mobile operating cabinets which roll out for use and back out of the way when not in use. Vertical dowels with ivy planter serve to make an attractive divider. Back wall of operatory provides adequate model and appliance storage and a versatile “working island” for the assistant.

Fig. 16. Should more orthodontists per capita be trained in the next ten years? The “yes” answer is almost unanimous for all sections of the country.
There has been a rapid increase in such “team” arrangements. In most instances, there are a senior and a junior partner. Established orthodontists take on associates. Usually there is a one-year “trial period” for the office marriage. The income is set up on a graduated scale, with the junior partner’s portion increasing as the length of the associateship increases. The advantages of partnerships are obvious (Table I). Disadvantages are less apparent, but they can be fatal if not considered in advance before a formal agreement is consummated (Table II). The majority of men feel that the advantages strongly outweigh the disadvantages. It cannot be emphasized too strongly, however, that

Table I. Partnership advantages

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<th>Claim</th>
<th>Very valid</th>
<th>Valid</th>
<th>Less valid</th>
</tr>
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<tbody>
<tr>
<td>1. Better service for patients</td>
<td>508</td>
<td>487</td>
<td>250</td>
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<tr>
<td>2. Less strain for each partner</td>
<td>706</td>
<td>430</td>
<td>102</td>
</tr>
<tr>
<td>3. More efficient operating setup</td>
<td>615</td>
<td>446</td>
<td>161</td>
</tr>
<tr>
<td>4. Less net expense per man</td>
<td>680</td>
<td>466</td>
<td>82</td>
</tr>
<tr>
<td>5. More time for vacations</td>
<td>787</td>
<td>379</td>
<td>66</td>
</tr>
</tbody>
</table>

Table II. Partnership disadvantages

<table>
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<th>Valid</th>
<th>Less valid</th>
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<tr>
<td>1. Possible friction</td>
<td>539</td>
<td>573</td>
<td>195</td>
</tr>
<tr>
<td>2. One man taking advantage of other</td>
<td>337</td>
<td>576</td>
<td>298</td>
</tr>
<tr>
<td>3. Divided responsibility for therapy</td>
<td>285</td>
<td>497</td>
<td>412</td>
</tr>
<tr>
<td>4. Poorer service to patients</td>
<td>111</td>
<td>211</td>
<td>848</td>
</tr>
<tr>
<td>5. Death benefit difficulties</td>
<td>194</td>
<td>355</td>
<td>582</td>
</tr>
</tbody>
</table>
Fig. 18. Very little geographic difference is seen in opinion on group practice. The greatest negative opinion, percentagewise, appears to come from the Plains States.
the problem must be studied carefully, personalities must be analyzed, arrangements must be made for a trial period, and a formal legal document must be drawn up to cover all contingencies, protecting both the partners and their families. Experienced practice management and legal counsel is essential and available.

Fig. 19. Desirability and likelihood of more partnership arrangements.

ANCILLARY AID

It is in the area of ancillary aid that we must concentrate if we are really to make the most of our services and obtain optimum efficiency. Orthodontists all over the country strongly endorse an increase in ancillary aid (Fig. 20) as
desirable. They recognize the need for more professional and nonprofessional personnel (Fig. 21). This means that if we are to render a better service, more junior associates, more hygienists, more chairside assistants, and more technicians must be employed. This applies regardless of whether group practice or partnership arrangements have been established.

Fig. 20. Should orthodontist have more ancillary help? An overwhelming majority of A.A.O. members think that he should.

One source of help would be a program similar to the New Zealand Dental Nurse program. While we were opposed to this on the questionnaire, there is an increasing amount of sentiment in favor of such ancillary aid under strict orthodontic control. Such a change would require a great deal of study, and legal changes would be required in the majority of states; thus, such assistance would be unavailable for a quite considerable time.

The most logical place to turn for immediate aid is to the hygienist. In most states, dental practice acts are quite strict, implicitly forbidding anyone but a licensed dentist or hygienist to work directly in the mouth. To sample the professional sentiment on just what a hygienist should or should not do, nine questions were asked on the questionnaire. These ranged from the cleaning of teeth, which we all agree is within the province of the hygienist, to the placing of arch wires, where there is universal opposition. Significantly, the great majority of the profession feels that the hygienist may clean cement off the bands after cementation (Fig. 22). How many of us avail ourselves of assistance in this time-consuming procedure? The same reasoning applies to the removal of broken arch wires and loose bands, cleaning them, and preparing them for re cementation by the orthodontist. We sanction this as a group, but few orthodontists have turned in this direction. In two other areas—the taking of impressions and the removing of appliances—almost half the A.A.O. members in 1959 considered this a legitimate endeavor for the hygienist. It is safe
Fig. 21. Should there be more professional degree (associates and hygienists) and nonprofessional personnel (assistants, technicians, etc.) in the next ten years? Affirmative opinion is relatively uniform on nonprofessional personnel, but Southeastern, Southwestern, and Far Western states are distinctly more favorably inclined toward professional degree personnel than Northeastern, Middle Western, and Plains States.

to predict that the percentage would be higher if the questionnaire were sent out in 1962 (Figs. 23 and 24). It should not be very difficult to train a hygienist to trace and take cephalometric headplates, to give muscle exercises, to weld brackets, to repair retainers, etc.

In addition to the hygienist, the orthodontist should make effective use of dental assistants and technicians (Figs. 25 and 26). Some balance must be maintained, of course, and this is dependent on the practice load and the availability of suitable personnel. *The crux of the problem is to delegate all possible*
Fig. 22. Activities of the hygienist. There is almost unanimous approval of the hygienist cleaning cement off orthodontic bands.

Fig. 23. Should hygienists take impressions? Total opinion is negative, although it is evenly divided in the Plains States and almost so in the Southwest. Greatest opposition comes from the Northeast and Far West.

Fig. 24. Should hygienists remove appliances? No section of the country shows an affirmative majority, but only in the Middle West and Far West is the negative majority significant.
TECHNICIANS FOR INDIRECT APPLIANCE

Fig. 25. Should there be more technicians for indirect appliance construction? Opinion is affirmative except for the Plains States. The greatest "yes" vote comes from the Northeast.

duties to others who can legally and from the standpoint of ability perform these tasks as well as the orthodontist, thus freeing him for the things that he can do best in the office. The following division of duties has proved to be efficient:

Senior associate
1. Make all routine adjustments every three or four weeks.
2. Place all original 0.010 and 0.018 inch arch wires.
3. Cement isolated bands that do not require extensive repairs.
4. See all new patients, observation patients, serial-extraction patients, and pretreatment, retention, and postretention patients.

Associate
1. Fabricate and place all bands.
2. Place all original 0.014 inch arch wires.
3. Make all original rectangular arches.
5. Do any extensive repair work.
6. Remove all appliances.
7. Take impressions and fit retainers.

Hygienist
1. Take initial impressions.
2. Take headplates and dental radiographs.
3. Clean the teeth periodically.
4. Clean cement off all bands.
5. Remove loose appliances and clean and ready them for recementation.
6. Weld brackets and eyelets to strips.
7. Repair retainers.
8. On emergency basis, tuck in ligatures that are irritating the mucosa.

Assistant
1. Take headplates.
2. Clean and ready loose bands for recementation.
Fig. 26. A well-equipped laboratory and a technician are valuable assets in a bungalow type of office arrangement. (See Figs. 9 to 12.) Less expensive lower-level space may be used for this purpose and still be efficient and attractive.

3. Mix cement.
4. Weld brackets, eyelets, etc.
5. Repair retainers.
7. Sterilize instruments.
8. Take dictation on each record.
10. Make appointments.
11. Answer telephone.
12. Take care of mail.
13. Pour up, trim, and finish down plaster models.
14. Develop x-rays.
15. Take care of finances, write receipts, etc.

Technician
1. Make all fixed and removable appliances.
2. Make all retainers.
3. Fabricate elastoplastic appliances.
4. Make all habit appliances.
5. Make all holding arches.
6. Make all bite plates and splints.
7. Make all cast overlays.
8. Study casts when not doing one of the aforementioned tasks.

Secretary
1. Type all reports, letters to parents, patients records, etc.
2. Type up all dictation on current correspondence.
3. Handle finances, day sheets, monthly reports, statements, checkbook reconciliation.
4. Answer telephone.
5. Help make appointments when not busy.

Such an arrangement of duties is purely arbitrary and can be varied as the operator desires. There is some overlapping of duties, but this is beneficial. When one of the “team” is sick or on vacation, someone else has been trained to step in and assume at least part of the duties. This arrangement, or a similar one delegating suitable tasks to others, permits the senior associate to see a much larger number of patients each day. Since all grammar school children have their adjustment appointments during school hours and all patients of
high school age are required to have every other appointment during school hours, the appointment schedule for the senior associate should run right through the day, with a constant high level of activity. Patients may be scheduled at the rate of two every fifteen minutes when the orthodontist uses a multibanded technique employing a combination of differential light forces and edgewise philosophy. The interval between appointments is three or four weeks, depending on the adjustment to be made. It is wise to set aside one Saturday morning a month to serve as a “recall morning.” During this time, serial-extraction, pretreatment, and posttreatment cases may be seen at the rate of three every fifteen minutes. Since last-minute cancellations or “no-shows” are more likely on a recall schedule, several extra appointments may be worked in to take up the slack.

If the office is properly laid out, and if ancillary aid is working at proper efficiency, an orthodontist and one associate should be able to carry an active, appliance-wearing practice of 350 patients with a four-day work week for both the junior and the senior associate. An additional 350 initial-examination, pretreatment, retention, and postretention patients make up the balance of the practice. Naturally, there are many variables which would alter practice size, length of time of appointments, and length of treatment time. With a larger practice, there is a higher level of pressure on each member of the team during the time when the senior associate is making the adjustments. The junior associate should have hour-long appointments for “setups” and fifteen-minute appointments for placing retainers. Appliance modification and repair requires fifteen- to thirty-minute appointments in most instances.

Not only is the patient better served with an efficient arrangement such as the one outlined here, but the senior associate is free from onerous, time-consuming tasks that others can learn to do equally well. With a relatively high gross income, the orthodontist can afford to pay well for ancillary aid, and this expense is deductible at a favorable rate from the top-income dollars. Before we open the floodgates to increase the number of men practicing orthodontics or encourage general dentists and pedodontists to handle orthodontic problems beyond the scope of their knowledge and training, each orthodontist should analyze his own practice with an eye toward increasing his efficiency. He should list all the duties around the office and then see which ones he must do to render proper professional services; which ones an associate may handle, which ones the hygienist can do, which ones the assistants can and should do, and which ones the technician may perform. He should avail himself of the services of a good practice management firm and get some sound advice on the economic aspects of practice. Too many orthodontists are running big businesses, from the standpoint of gross income, but under the pressure of heavy practices they are paying the penalty in tension, possible future cardiac problems, ulcers, time away from their families, and lack of vacations.

As the office becomes more efficient, however, it should not be any harder to maintain a pleasant environment. Soft hi-fi music of a light classical variety provides a tension-reducing background. Color arrangements that are bright and decorations that are eye-catching for child patients serve as a conversation
piece. Magazines should be varied and current. The presence of fresh flowers always adds a homey touch. The consultation office should be as comfortable and attractive as possible for both the orthodontist and the parents of patients. A coffeepot, if it is properly handled, need not make the office smell like a restaurant. Morning and afternoon “breaks” are important but should not exceed five or ten minutes. Most personnel would prefer to leave the office earlier in the afternoon instead of taking a longer break or lunch period.

CONCLUSION

In our striving for efficiency, important as this may be if we are to render the best possible service to the most patients, it is well to heed the admonition of Joseph Conrad:

Efficiency of a practically flawless kind may be reached naturally in the struggle for bread. But there is something beyond—a higher point, a subtle and unmistakable touch of love and pride beyond mere skill; almost an inspiration which gives to all work that finish which is almost art—which is art.

This is the art and science and challenge that is orthodontics today.

REFERENCES


450 Green Bay Rd.