Secondary and Tertiary Amines

With the discovery of mecamlamine, a non-quaternary ganglion-blocking agent was made available for the first time. This compound is a secondary amine, and the more recently introduced pempidine, which has many similarities, is a tertiary amine. Both mecamlamine and pempidine have the great advantage that they are fully and regularly absorbed when given by mouth and are therefore more convenient to use in clinical practice. Both drugs are largely excreted in the urine, and their rate of excretion is influenced by urinary pH, being greater in an acid and less in an alkaline urine. The chief disadvantage of mecamlamine is that it is very long-acting, so that the dose can only be built up gradually, and if untoward side-effects occur they tend to be prolonged as the drug is slowly excreted. Pempidine is excreted more rapidly, and this makes for easier control of dosage; correspondingly its shorter duration of action (5-6 hours after an oral dose) means that pempidine needs to be administered at more frequent intervals than mecamlamine.

Mecamlamine and pempidine are freely diffusible across cell membranes, and in fact are more concentrated inside the cell than outside the plasma or extracellular fluid. Their exact mode of action is likely to be different from that of the quaternary ganglion-blocking compounds, but their effect is similar, and symptoms from parasympathetic blockade are equally, if not more, frequent with these two drugs. In addition, mecamlamine may sometimes produce alarming symptoms of toxicity to the central nervous system—tremor, confusion, and delirium—though usually only when given in large doses and in the presence of some degree of renal failure.

Chlorothiazide

This drug, in addition to its diuretic action, has a powerful potentiating effect in the hypotensive action of various drugs, in particular the ganglion-blocking agents. In the case of the quaternary ganglion-blocking compounds (such as hexamethonium and pentolinium), this effect of chlorothiazide appears to be principally related to the reduction in volume of the plasma which accompanies the sodium depletion produced by the drug, since the increased sensitivity to the ganglion-blocking agents may be abolished by restoration of the lost plasma volume with sodium-free dextran. It is likely that this also applies to the potentiation by chlorothiazide of the secondary and tertiary amines mecamlamine and pempidine, though the different chemical behaviour of these latter compounds suggests the possibility that other additional factors may play a part.

Chlorothiazide has no direct hypotensive action *per se*, and intravenous administration of the drug is without effect on the blood-pressure. After repeated dosage, however, some hypertensive subjects may develop postural hypotension, and this is particularly noticeable in patients who have undergone sympathectomy. This effect also appears to result from the diminution in plasma volume brought about by chlorothiazide.

Conclusion

There is thus available a wide range of hypotensive agents, many of them active at different points in the

circle of reflexes which helps to maintain the established state of hypertension. With our present knowledge, the most satisfactory therapeutic effect in a particular case can be obtained by trial and error, using drugs from the several different groups, either singly or more often in combination.

SHOES FOR CHILDREN

A SURVEY OF RETAIL SHOE-SHOPS IN THE BOROUGH OF EALING

BY

CATHARINE HOLLMAN, M.B., D.Obst.R.C.O.G.

*Assistant Medical Officer, Middlesex County Council
Area No. 7*

Doctors and health workers can readily describe suitable designs of children's shoes which promote the growth of healthy feet, but are these shoes in fact to be obtained in the shops? Parents tell of the difficulty experienced in finding shoes of correct style and size, but how true is this? and to what extent can the blame be with the manufacturers for not making such shoes, or with the retailers for not stocking them? If the retailers have them, do they stock a sufficient range of sizes and fittings? How often do the retailers stock other girls' shoes of inferior design as, for example, the fashionable casual style? Again, if well-designed shoes are stocked in the shoe-shops, is it the fitting by the assistants that is at fault? Can it be that the poorly designed shoes are cheaper than the well-fitting ones?

To try to find the answer to some of these questions, an inquiry, by means of a questionnaire, was made in the Borough of Ealing during the period January-June, 1958. Ealing has long been concerned about the damage done to children's feet by ill-fitting shoes, and has produced much valuable and original research in the past 10 years. Surveys carried out by Dr. D. A. Craigmile in Ealing revealed the incidence and variety of foot defects in children, many of which are known to cause foot pain in adults. The Ealing Contributory Shoe Scheme clearly showed that many of these acquired foot defects can be cured or improved by well-fitting shoes alone. At the present time in this area a foot health nurse visits the schools, inspects the children's feet, and records her findings. Children with early foot defects and in need of advice are asked to attend the foot clinics at which the particular problem can be discussed with the parents. Ealing can thus be regarded as having a high standard of foot care.

In this inquiry the visits to the shoe-shops were carried out by the foot health nurse and myself only, in order to keep the personal error as small as possible. The questionnaire was completed in each case by one of us in the shop at the time of the interview with the manager, who was on the whole most interested and helpful. Occasionally the manager thought he should first seek permission to answer the questions from his employer, in which case the questionnaire was left with him for completion and was subsequently collected or returned by post.

A list of footwear retailers in the Ealing area was obtained from the Public Health Inspectors Department. Out of 49 shops selling shoes, 39 sold children's shoes. Of these 39 shops 3 were multiple stores—for example, Woolworths. Some of these 39 shops were branch shops

of one particular firm, but as their stocks of shoes were found to differ with the individual manager's choice, they were counted as separate shops in this survey.

In two shops the managers were unwilling to co-operate. In 15 shops the questionnaire had to be left with the manager concerned; of these, four were never recovered though a letter of reminder was sent, and in eight cases the questionnaire was incomplete or inaccurate. These were discarded and the final analysis was made with the results from 25 shops.

At the time of the questionnaire (mid-year, 1958) the population of Ealing was 183,000, and the number of children aged 1-15 years was estimated at 34,000.

Description of Questionnaire

The questionnaire was devised in the form of a series of questions, followed by the possible answers, of which the pertinent answer was ringed by the questioner in each case. For example: (1) Do you stock shoes with rounded toes and straight inner borders? . . . Yes./No. (2) Are all or some or none of your assistants trained to fit children's shoes?

The questionnaire was in seven main parts.

Part I.—This ascertained whether suitable children's shoes were stocked and, if so, whether they were in half-sizes and width-fittings. How many width-fittings? Were these shoes of a lace-up style or bar-instep style,* or both? Were they stocked for toddler aged 1-3 years, infant aged 3-7 years, junior aged 7-11 years, and senior aged 11-18 years? Were these shoes stocked in large sizes—that is, size 7, 8, 9, and 10 for boys and girls?

Part II.—Besides these well-shaped shoes, what other styles for girls were stocked in the shop? That is, did the shop stock (1) double ankle-bar, (2) high-cut casual, (3) low cut casual shoes?

Part III.—Did the shop recommend or sell only one make of shoe, or several?

Part IV.—Did the shop carry a stock of the good shoes with (a) half-sizes and (b) width fittings in all, or some, or none of the shoes? The manager was then asked to show a narrow-fitting shoe (10c child's shoe) and a large-size shoe (8 girl's shoe) as a check of the shop's stock at the time of the survey. Could the shop obtain shoes out of stock in one day, two or three days, one week, or several weeks? Did they try to do this?

Part V.—Four shoes were specified and the prices asked. For example, a request was, "Quote the price of size 5 toddler's shoe in brown leather and composition sole."

Part VI.—In this shop do all or some or none of the assistants fit children's shoes during busy periods? By whom are the assistants trained? Do they attend a refresher course of training once, or periodically, or never?

Part VII.—Did the shop employ an x-ray machine for fitting; if so, did they rely on it a great deal or a small amount when fitting children's shoes.

Results

Part I.—Table I shows the results of Part I of the questionnaire. All 25 shops stocked a well-shaped shoe—that is, with rounded toe and straight inner border. Of these, 17 shops had half-sizes in all these shoes and five had half-sizes in some of them. Fifteen shops stocked width-fittings in all these shoes; two stocked width-fittings in only some of these shoes. Yet of the 17 shops with these shoes in width-fittings, only four stocked four width-fittings, seven stocked three width-fittings, and six stocked two width-fittings. A lace-up

*Bar-instep style denotes a shoe with a strap across the instep.

TABLE I.—Details of Well-shaped Shoes in 25 Shops

	No. of Shops
Good shoe stocked	25
Half-sizes { All	17
Some	5
Width-fittings { All	15
Some	2
No. of width-fittings { 4	4
3	7
2	6
Lace-up style	25
Bar-instep style	19
Age { 1-3 years	15
3-7 "	21
7-11 "	23
11-18 "	14

Large Sizes		B	G
Boys	Girls		
7	7	14	11
8	8	8	7
9	9	5	0
10	10	2	0

style of shoe was common to all 25 shops, but 19 also stocked a bar-instep style. These well-shaped shoes were well stocked for infant age range (3-7 years) and junior age range (7-11 years), but less so for toddler age range (1-3 years), and only 14 shops had these shoes for age range 11-18 years. The range of large sizes in these shoes was very poor, particularly for girls.

Parts II and III.—Table II shows how many shops stocked other inferior designs of girls' shoes. All 25 stocked a high-cut casual style and 17 shops stocked the low-cut casual style. Eight shops stocked one make of shoe. Yet of these eight shops only four carried an adequate range of half-sizes and three width-fittings.

TABLE II.—Details of Badly Designed Girls' Shoes in 25 Shops

	No. of Shops
Double ankle-bar	7
High-cut casual	25
Low-cut casual	17
One make stocked	8

Part IV.—Table III shows the extent of the stock of well-made shoes in the 25 shops. Only six shops stocked half-sizes in all their well-shaped shoes, and 15 shops stocked half-sizes in some of these shoes. Five shops had three width-fittings or more in all their stock of well-shaped shoes. Twelve shops had width-fittings in

TABLE III.—Number of Shops Having a Comprehensive Stock of Half-sizes and Width Fittings, and Time Taken to Obtain Shoes Out of Stock

	No. of Shops
Half-sizes in { All	6
Some	15
None	4
Width-fittings in { All	5
Some	12
None	8
Able to show { 10c shoe	12
Girls 8	8
Time to obtain shoes { 2-3 days	3
1 week	19
2-3 weeks	2
No. which did this	22

some of the well-shaped shoes, but only five of these stocked three or more width-fittings. On asking to see two selected shoes as a check on the stock of the shop at the time of the visit, only 12 shops could show a narrow-fitting child's shoe, size 10c, and only eight could show a large-size girl's shoe, size 8. Nineteen shops took one week to obtain shoes out of stock; three shops took only two or three days. Twenty-two shops tried to obtain shoes out of stock for their customers.

Part V.—Four children's shoes were described to obtain the price. The results showed two basic price

ranges. The more expensive range was that in which the shoes had width-fittings. In the cheaper range the shoes had no width-fittings. These results are analysed in Table IV.

TABLE IV.—*Details of Price Range of Four Specified Shoes According to Whether Width-fittings were Stocked*

	Shops with Width-fittings	Shops with No Width-fittings
Size 5 toddlers	14s. 6d.–21s. 9d.	8s. 0d.–15s. 11d.
12½ brown leather, composition sole	24s. 11d.–37s. 6d.	21s. 9d.–26s. 9d.
12½ brown leather, leather sole	26s. 11d.–43s. 6d.	21s. 9d.–27s. 11d.
7 boys' brown leather, crepe rubber sole	31s. 11d.–55s. 0d.	26s. 9d.–39s. 6d.

Part VI.—Table V shows that out of the 25 shops, 14 allowed all their assistants to fit children's shoes; eight allowed only some of their assistants to do so, and one shop had one assistant only who did the fitting of children's shoes; 16 shops trained all their assistants to fit children's shoes, and six trained some of them. Eight shops allowed untrained assistants to fit children's shoes at busy periods. The training in 16 shops was

TABLE V.—*Details of the Fittings of Children's Shoes in 25 Shops*

		No. of Shops
Fitting by assistants	{ All	14
	{ Some	8
	{ None	1
Whether trained	{ All	16
	{ Some	6
Untrained assistants fitting in busy periods		8
Training by	{ Manager	16
	{ Firm	4
	{ Course	0
Refresher course	{ Periodically ..	11
	{ Once	1
	{ Never	9
X-ray machine used		8
Value of machine	{ Great	0
	{ Little	8

done by the manager and by a firm in four shops. None of the 25 shops sent their assistants to a shoe-fitting training course. Eleven shops gave their assistants refresher courses in shoe-fitting from time to time, but nine never did.

Part VII.—Eight shops used an x-ray machine for fitting, but they all agreed it was of little value.

Discussion

Though there are many criteria that can be used to define a well-designed shoe, only two were used in this survey. A suitable children's shoe was defined as having a rounded toe and a straight inner border. All the 25 shoe-shops stocked such a shoe.

Other surveys have shown that to fit a high proportion of children's feet there must be at least three width-fittings to every half-size (Craigmile, 1953). The Somerset survey, carried out with the co-operation of Clarks shoe firm, stated that with their multi-fitting range of shoes, 92% of girls and 87% of boys could be properly fitted in winter, and 98% of girls and 95% of boys with summer sandals (County Medical Officer, Somerset, 1953). The Satra House Research Report (RR98), "Dimensions of Children's Feet," showed that a range of five width-fittings would cover 95% of children's feet and three width-fittings 91% of children's feet. This Ealing survey shows how poor is the stock of width-fittings in the shoe-shops, for less than half of them stocked three or more width-fittings.

Though well-designed shoes were found to be adequately stocked for the age-group 3–11 years, fewer shops catered for the 11–18 age-group. This infers that men's and ladies' styled shoes are usually sold to this age-group.

A very poor stock of shoes of the larger sizes was found in the shops. This obviously adds a further difficulty to the parents of children with big feet, and, in the case of girls, encourages the purchase of a ladies' style shoe.

Inferior Styles of Girls' Shoes.—A girl's shoe is made to look "pretty" or "fashionable" by altering the basic details of a well-designed shoe in one of the following ways:

(a) The site of the strap in a bar-instep style is changed from the side of the shoe to the back, doubled, and fastened by a button across the front of the instep. The toe shape remains unchanged, but because of the inadequate grip of the double strap at the instep the shoe fits poorly. Luckily, this double-ankle-bar style is a dying fashion, but it can still be found in the toddler age-group. Seven shops stocked this style.

(b) The toe shoe is altered by curving the inner border of the shoe inwards to meet the outer border at a point of varying degree. The straight inner border and generous rounded toe shape are thus lost. The upper of the shoe is made to fit tightly across the metatarsal arch of the foot, and this, plus the "digital wedge" effect described by Haines and McDougall (1954), keeps the shoe applied to the foot. This design of shoe is much in favour with parents of older girls and with the shoe-fitters. Twenty-five shops stocked this style of shoe.

(c) It is surely true to say that the low-cut casual style of shoe has no residual good features of design at all. These shoes have pointed toes, low-cut sides, and low-cut fronts. They stay on the foot because they are "short-fitted" in length, narrow in width, and use the toes as a "digital wedge." Seventeen shops stocked such a shoe. The results of this survey show how often the shoe-shops cater for the fashion-conscious girl by stocking these casual shoes. These sell well, and can be shown to parents when the shop itself has not got the correct fitting in a well-shaped shoe, or when the parents want a more grown-up style, or when the girl is allowed to choose her own shoes.

Eight shops stocked and recommended one make of shoe. Yet of these only four had the adequate range of half-sizes and three width-fittings to cover accurate fitting of children's feet.

Size of Stock.—The results as expressed in Table III show how poor was the extent of the stock of well-shaped shoes. Only 12 shops could show a narrow-fitting child's shoe, and only eight could show a large size for girls. The present custom of selling children's and adult shoes together from any one shop limits the size of the stock. The retailers claim that in order to stock a comprehensive range of half-sizes and three width-fittings in children's shoes, their shops would have to be enormous. There is an obvious need for the establishment of shoe-shops in which only children's shoes will be sold and where a sufficient range of sizes and width-fittings can be stocked. However, even with the existing system of selling children's shoes, the size of the stock would be relatively unimportant if the time taken to obtain shoes not in stock was one or two days. This survey shows, however, that the usual time to obtain these shoes is one week, which is far too long an interval. Shoes out of stock could be obtained in 48 hours if the manufacturers were contacted immediately.

Price Range of Four Specified Shoes.—The prices quoted by the managers had, of course, a wide range, but on analysis were found to fall into two groups. The more expensive were those of shoes with width-fittings, but the two price-ranges show an overlap, clearly demonstrating that all shoes for children could be multi-fitting and yet reasonably priced.

Fitting of Children's Shoes.—The fitting of any shoe is a skill requiring training and experience, and particularly is this true with children's shoes. Many firms have their own foot-gauges, which are very useful, but in addition a trained assistant should be able to fit by hand.

Table V shows that the training of shop assistants is not nearly good enough. Much selling of children's shoes takes place unfortunately on a Saturday, when the shops are very busy; some shops employ young unskilled girls on that day as a source of extra help. In fact, eight managers admitted that they allow untrained assistants to fit children's shoes in busy periods.

The training of assistants was found to be usually done by the managers themselves. Only four shops used training by a shoe firm, and none of the 25 shops sent their assistants to a training course in shoe-fitting. Less than half the shops allowed their assistants to attend a refresher course.

Only a third of the shops used x-ray machines, and all agreed that these machines were of little use in the fitting of children's shoes.

Summary

A survey of 25 shops selling children's shoes is described. All the shops were found to stock well-designed shoes for children. Very few shops, however, stocked a comprehensive range of half-sizes and three width-fittings in these shoes, and such a range is essential to fit the majority of children's feet. Only half the shops kept these shoes for children of 11–18 years. Stocks of larger shoes, of size 7 and over, were also limited.

Yet all 25 shops stocked the inferior-styled girls' shoe known as the "casual."

There was an unnecessary time-lag in obtaining shoes out of stock. Adequate training of shop assistants in the art of fitting children's shoes was lacking. The few shops that employed an x-ray machine found it of little value in shoe-fitting.

It was shown that all well-designed children's shoes could be multi-fitting and yet be reasonably priced.

The need to establish shops which sell only children's shoes is discussed.

I am indebted to Mrs. B. Murton, S.R.N., foot health nurse, for her help with the survey, and to Dr. W. G. Booth, joint area medical officer, Middlesex County Council Area No. 7, Ealing, for his encouragement and advice.

While permission for publication has been given, Middlesex County Council take no responsibility for the opinions expressed therein.

REFERENCES

- County Medical Officer, Somerset (1953). Annual Report. Craigmile, D. A. (1953). *Brit. med. J.*, 2, 749.
Haines, R. W., and McDougall, A. (1954). *Lancet*, 2, 1308.
Satra House Research Report (RR.98).

INVESTIGATION OF VISUAL ACUITY OF DRIVERS

BY

D. J. K. WILKIE, M.R.C.S., D.O.M.S.
Sheffield

This investigation was carried out in routine ophthalmic practice. Out of a total number of 4,422 patients, 1,011 were holders of current driving licences.

Ministry of Transport and Civil Aviation Regulations Governing Eyesight of Motor Drivers

The diseases and physical disabilities which are a bar to the granting of a driving licence are prescribed in the Motor Vehicles (Driving Licences) Regulations, 1950 (S.I. 1950. No. 333), and include: "Inability to read at a distance of 25 yards in good daylight (with the aid of glasses if worn) a series of six letters and figures in white on a black ground of the same size and arrangement as those prescribed for the identification mark of a motor-car."

The analysis of the visual acuity of these 1,011 patients is:

- 460 (45.5%) able to read a number-plate at 25 yards without the aid of glasses.
- 476 (47.1%) in possession of distance glasses and, with their aid, able to read a number-plate at 25 yards.
- 75 (7.5%) not in possession of distance glasses, not able to read a number plate at 25 yards.

The analysis of the age groups of the 75 patients with vision below the required standard is: 16–20, 4%; 21–30, 8%; 31–40, 8%; 41–50, 36%; 51–60, 22%; 61–70, 12%; over 70, 10%.

Fifty-two (69.3%) of these patients were unaware, or professed to be unaware, of the fact that their distance vision was defective. It will be noted that inadequate distance vision is the greatest in age-groups 41–60 (58%). This can be accounted for by the fact that most of them have only moderate errors of refraction for which previously, when they were younger, they had been able to compensate, and deterioration of vision was so gradual as to be unnoticeable.

There were four in those aged 61 to over 70, whose vision could not be improved with glasses. This was due to senile macular degeneration in two cases and two had immature cataracts. There was also one person aged 52, with congenital nystagmus, whose vision had obviously never been up to the required standard, and one aged 39 with optic atrophy. All these patients were advised to cease driving at once. Four agreed and two flatly refused.

Five of the cases seen had failed their driving test owing to alleged defective vision. Two of these were found to have normal vision; the other three required glasses. From this it is apparent that sometimes the examination of vision carried out on the occasion of a driving test is inadequate. Standard conditions are presumably, at these times, not available—for example, the number plate used may be dirty, the distance may not be correct, and the lighting conditions may be poor.

Ability to Read a Number Plate at 25 Yards.—It is suggested that the onus of proof in this matter should no longer rest with the applicant, but with the licensing authority. The reasons for this are: (1) the severe and