THE HISTORY OF CHILDREN'S AND INVALIDS' CARRIAGES

Author(s): Samuel J. Sewell

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PROCEEDINGS OF THE SOCIETY.

TWENTY-FIRST ORDINARY MEETING.

WEDNESDAY, 30TH MAY, 1923.

MR. L. BERESFORD SEYLER, in the Chair.

The paper read was:

THE HISTORY OF CHILDREN'S AND INVALIDS' CARRIAGES.

By SAMUEL J. SEWELL.

The physicians of all countries agree that a woman is not fitted by nature to carry a babe in her arms, on her back, nor on her head or shoulders—these are injurious to both. Hence the need of a miniature carriage.

Such vehicles are generally called perambulators or bassinettes.

That nomenclature is, I must admit, unsatisfactory, since the first name comes from *per* and *ambulare*, meaning to walk through or over, and thus it is the person who wheels the vehicle who is the perambulator according to our best dictionaries, and not the carriage itself. And as to "bassinette," that is French for a cradle made of wicker, and wood is the material mostly used for the bodies.

I shall, then, use the term "pram" for the vehicle.

It is passing strange that, although 3,000,000 are in use in this country, and they have been an inestimable boon to both mother and child, no one has hitherto attempted to give the history of prams. In stepping, not rushing, in, then, where others fear to tread, and in spite of enormous correspondence and investigation, and having for thirty-eight years edited a journal for the trade, I shall welcome the fullest criticism.

As regards origin, British manufacturers, knowing that for over a century this country has led the world in the construction of miniature carriages, are prone to think that we were the pioneers. That is not true, although one cannot say when the first pram was made, and by whom. Proof of this is found in several books, notably in that on toys by Mrs. F. Neville Jackson, published by "Country Life" in 1908, and now, alas, out of print. That gifted writer tells us that "glancing at the toy world of the past is like looking at history through a diminishing glass; we can see things exactly reproduced in miniature," and she advances the proposition that the "basis of the toy is mimicry." If we accept this, as I do, and owing to the discovery in Athens of baked clay toys fitted with wheels, we are entitled to assume that a primitive form of child's carriage was in use several centuries before the Christian era. But history appears to be silent as to what happened in development until the fourteenth century, when a Chinese child's chair on four wheels, drawn by rope, was painted by a Japanese artist. And there exists a drawing showing a wooden frame on wheels, for teaching a child to walk, which was made in the fifteenth century, and Lancret painted a similar device as used in France in the eighteenth century, but with the child actually being wheeled.

As to Egypt, I learn from Professor E. Newberry and Professor Elliot Smith, both great authorities, that there is no evidence of the early use in that country of carriages for children. But both in India and Ceylon toy miniature carts have been known for centuries.

Next, as to Britain, we appear to have utterly ignored the existence in other countries of prams for transport or play, and the precursor of our pram would seem to have been the humble "hop wagon" used in Kent for centuries by hop and fruit pickers for the carrying of cooking utensils and food to their place of labour. It is known that mothers used to place their children in this wagon, which, at first, was little else than a rough box fastened to axles of wood which engaged with four wheels of similar material. In the early part of last century several of the makers in London made improvements from time to time, but these wagons were never upholstered or fitted with springs, and they were then called "stick wagons." But townspeople rarely bought them, and, as they were drawn by a handle, the child might easily fall out unnoticed. Before the 'fifties the trade in these wagons all but ceased in favour of another style of pram.

In the meantime, in 1780, there were built for Lady Georgina Dorothy Cavendish, the eldest daughter of the fifth Duke of Devonshire, two carriages by a coachbuilder whose name is no longer remembered, and they were certainly remarkable. These are still to be seen at Chatsworth in a perfect state of preservation, and are, I believe,

The first pram known. Model of clay. Discovered in Athens. Supposed to be 3,000 years old.

Tilting by boys in the fourteenth century.

Chinese chair on wheels, of the fourteenth century. From a painting.

Carriage made for Lady Georgina Dorothy Cavendish in 1780. (*Copyright of the Duke of Devonshire.*)

Domestic scene in 1493.

not only the oldest prams in existence but also the finest ever made.

The most interesting is the one constructed to imitate a C-spring and perch coach, except as regards the body, which approximates to that used later for the three-wheel pram. It has four wheels, 18in. and 12in., of wood, ironshod, wooden axles, a canopy of leather, luxurious upholstery in which fine printed linen is used, and a handle for drawing the carriage.

The second pram was drawn by a small animal, the collar for which still exists, and the body, similar in shape to the other vehicle, has four similar wheels, 21in. and 18in., and a three-quarter lock. The body suggests a scalloped shell of bronze, and there is a detachable apron of like material and fashioning. The under-carriage is most fantastic, depicting the Cavendish snakes, which form part of the Devonshire family crest, and they are linked up with the springs in a curious manner.

These carriages, built in 1780, were, probably, never used outside Chatsworth, or their maker would have built up a big trade as the first manufacturer of a pram which was safe, comfortable and artistic.

Their one defect, however, was that they had to be drawn—their builder could not get away from the idea of horse-traction—and it was not until sixty years later that a pram was fitted with a handle at back, instead of a pole in front, and could then be pushed and the occupant kept under observation.

In 1840 several men took up the manufacture on a small scale of a three-wheel vehicle, which they called a child's carriage, notably John Allen, of Hackney Road, E., and A. Babin, of New Street, E.C., and they found that the London people were now open to buy prams. Success caused others to enter the trade, particularly Charles Burton, who in 1853 took out the first patent for prams in this or any other country. There never has been a "master patent," the nearest approach to such being the suspension of the body by T. Simpson in 1887 from two handles, and the outside spring chassis of Charles Thompson in the same year.

In 1843, Babin and Ripkey and John Allen were the only makers of "child's carriages."

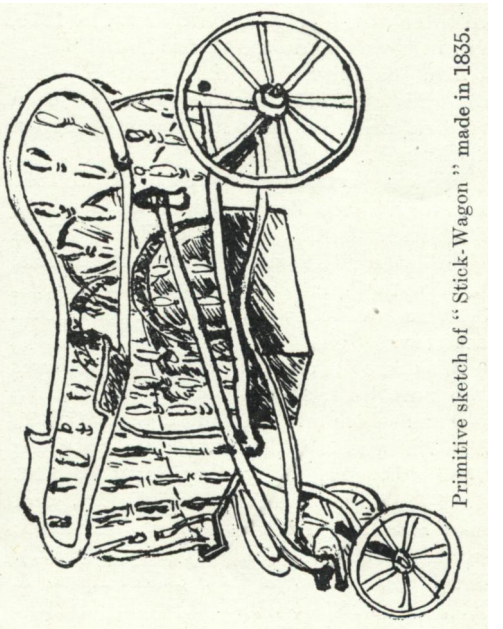
By 1850, the makers numbered four, owing to William Parker, founder of Parker Bros., of Curtain Road, E.C., joining the ranks, and he is one of the several who lay claim to having first used the word "perambulator."

In 1852 Charles Burton started a small factory in Hampstead, and here constructed a pram according to his, the very first, patent, dated 1853, and opened a showroom in Oxford Street, London, and in a district which within three years became the centre of the trade. In 1856, there were four shops devoted to what were now called "perambulators," and all within a few hundred yards of Burton's showroom, and no fewer than 20 makers in all London.

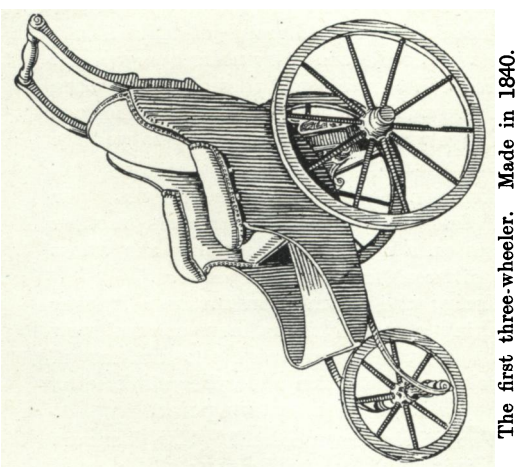
Burton appears to have considered his folding device the most important feature in his patent, and the other makers left this alone but copied some of his ideas or improved on them, particularly J. R. Frampton, who, in addition to chairs, made in Trinity Street, S.E., "stick wagons." On seeing the Burton patent pram in 1853, he decided to improve the three-wheeler, and constructed his wheels with metal for the hubs and spokes and gave them half-round iron tyres and iron handles. His son, Louis Frampton, still alive, remembers the first of these prams, in which he was placed for a trial trip in South London. A big crowd surrounded the pram, and orders for it at once flowed in, mostly from the working classes, who hitherto had not been purchasers of real prams. It might also be stated that at Frampton's factory, in 1862, was made by the workers as a gift to their employer's daughter, the first toy pram—the first and only one made there since Mr. Frampton thought that no trade was to be done in such "nonsense," as he called it. That estimate was appallingly wrong, since the production of toy prams was soon started by others and the output became, and still is, enormous. However, Frampton was one of the most successful of the pram manufacturers of all times, he retiring before the 'eighties to live in Belgium, in which country he is said to have been shot during the late war. His pram factory in the Borough was sold by auction in 1880, but his descendants still deal in pram fittings in Ipswich.

Returning to the year 1855, James Monk, who had acted as foreman at Burton's factory, started making prams in Winsley Street, W., later removing to Oxford Street. Since 1881, as W. Monk & Co., this business has been carried on at Bath, first by the son of the founder, who still lives, and it

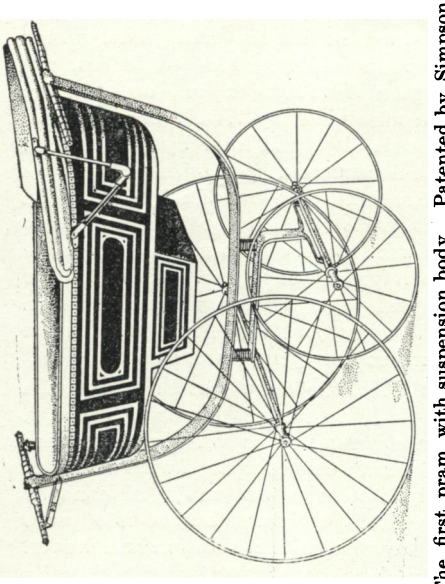
Play of the eighteenth century. From a print of Chodowiecki.



Primitive sketch of "Stick-Wagon" made in 1835.



The first three-wheeler. Made in 1840.



The first pram with suspension body. Patented by Simpson, Fawcett & Co., in 1887.

is now conducted by W. H. Monk, the grandson. This firm own the Bath Chair Factory started by James Heath, the inventor of the original bath chair, in 1829, and in it was made the "Prize Bath Chair," which, exhibited in the great London Exhibition of 1851, was bought by Queen Victoria and presented to the Empress of the French.

The only concerns which existed in 1856 and survive are Parker Bros., of London; W. Monk & Co., now of Bath; Leon L'Hollier, now known as Thomas McKenzie, of Birmingham; John Dove, of Glasgow; Trotman, of Holloway, having closed down last year.

But there are several pram manufacturers who date back some 40 or more years as follows:—London: Presland & Sons (1858), W. J. Harris & Co., Ltd. (1880), Simmons (1883), Dalston Baby Carriage Co., Ltd. (1883), Lines of Tottenham (1869), and Star Manufacturing Co. (1886). Bristol: Smith (1850), and Twiggs (1877). Birmingham: Harris (1870), Jas. Lloyd & Co., Ltd. (1874), W. H. Dunkley (1882). Leeds: Myers (1876) and Wilson (1877). Nottingham: Hardstaff (1858), J. Green & Co., Ltd. (1874). Oldham: Bradbury & Co., Ltd. (1885). Several manufacturers go back nearly 30 years, such as Rothschild & Baker, of Birmingham, but of the total existing makers, 50 per cent. started within the past 25 years.

One word as to the mail cart, which originated in Leeds in 1886 at the factory of Simpson, Fawcett & Co., and shortly after was also made by Wm. Wilson & Sons, of the same city, and later by other firms. It was introduced as a plaything for boys and girls, but since mothers persisted in using it as a vehicle for infants, many patents were taken out to make it available as both a pram and a car. The sales for some fifteen years were enormous, and then dropped to so small a figure that most pram makers now ignore mail carts.

As to U.S., the duty has been so much against us as to restrict imports, although the American pram is an inartistic, uncomfortable vehicle compared with our own. Formerly, its body was made of cane or other vegetable product, but of late years of wire, covered with a solution and woven by a machine constructed under Lloyd's patent. That class of pram, however, scarcely suits British tastes, yet it is made here at Lusty's factory in Bromley-by-Bow.

But it is only fair to say that to America is due the invention, in 1904, of an ingenious metal folding car, of which, before the war, many thousands came to this country. It was found, however, that these could be produced more cheaply in this country, and then firms opened factories in Birmingham and Leeds. Further, they made substantial improvements, notably Messrs. Headley, Baker & Giles, and we now not only supply ourselves but also export such metal folders.

But our export trade was killed by the war, so steps are now being taken to regain it. Yet the heavy cost of transport, rail or shipping, are tremendous obstacles to its expansion. Could transport be reduced 50 per cent., which is not unreasonable, then an export trade of a million prams a year should be quite possible. Cheaper transport rates are being agitated for by the Pram Manufacturers' Association, a thoroughly representative body, whose main efforts are devoted to cheapening the cost to the buyer.

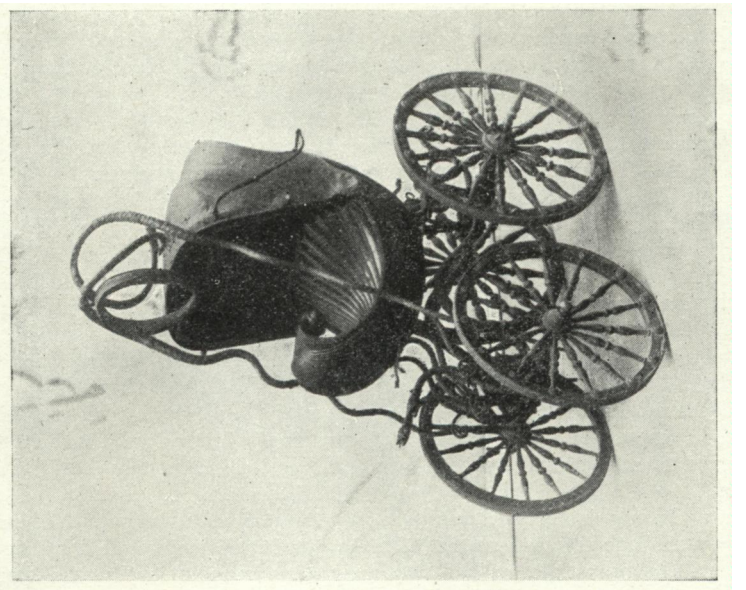
Of the 200 big and little pram manufacturers, one-sixth have factories equipped with the latest and best machinery, also up-to-date office arrangements, and they need not fear comparison with any other industry. In a word, our pram manufacturers are efficient, enterprising, industrious, charge only a reasonable rate of profit and fully deserve that their art, employing many thousands of hands, shall continue to prosper.

What becomes of old prams, of which 50,000 at least, are discarded by users every year? As regards 50 per cent., these are renovated and live again, and as to the remainder ask the boys with sufficient ingenuity to wed the wheels to soap boxes.

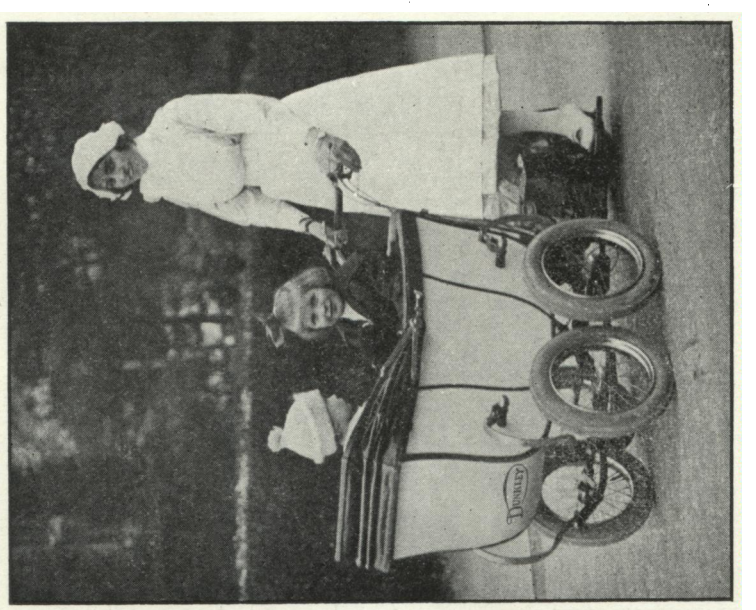
Experience shows, however, that for the first-born even the poorest mother insists on a new pram, and that she wants one different from her neighbours.

Hence, the pram manufacturer is ever thinking of new designs, new colours, new kinds of upholstery, and the makers of wheels, springs, fittings, leather cloth, etc., are ever kept at inventive point.

Who starts the fashion? The honours are divided. The public say: "I should buy that were so-and-so altered." "Then," says the dealer, "it shall be done," and an order goes to the factory, and not to lose trade, the maker has to change his designs, already, perhaps, numbering 100, and the



Animal-drawn Carriage made for Lady Georgina Dorothy Cavendish in 1780.
(*Copyright of the Duke of Devonshire*).



The first petrol-motor pram for both nurse and children. Patented by W. H. Dunkley, in 1921.

pram so produced catches on and other dealers want it. But thousands of pounds have been lost to the makers through catering to a passing whim and then building up a stock which becomes unsaleable.

Yet, with all their troubles, and they are not few or light, pram makers are long-lived, as, too, are their workpeople. There still lives, and over ninety, Mr. S. T. Fawcett, of Simpson & Fawcett—the grand old man of the trade ; and Mr. Simmons is now over seventy, not to mention a half-dozen other manufacturers who have passed the sixty mark. And in the factories it is common to find hands who have worked for their firm over forty years, yet still take a delight in their tasks.

But I cannot recall more than a half-dozen of the 250 firms who have made prams who acquired even small fortunes, and dealers who sell even twenty prams a week are few in number.

Since prams are largely sold through catalogues, thirty years ago it used to be said that those who sent out the best illustrated lists made the worst prams. But none can say this to-day.

Not only for prams, but also for their wheels, fittings, tyres and canopies is Britain famed, and our export of these parts, great before the war, is now on the increase—there is nothing made abroad which will compare with them.

As regards Scotland, prams were first made in Stirling in 1856, in a factory now closed, and the oldest Scottish maker is now John Dove, who started in 1850.

Ireland has never done much in pram making, but has a small factory in Londonderry.

Wales produces but few prams, and these at Cardiff.

The Ideal Pram.

Now as to how a pram should be constructed, and I will here quote the opinion of Dr. Eric C. Pritchard, a Harley Street physician who has for years specialised in children's welfare. He says that until seven or eight months' old a child should be allowed to lie down in its pram, and after that should be induced to sit. Hence the necessity of a well. The body of the pram should be upholstered to provide comfort, and the material used should be of such a nature that it can be easily cleansed. As to the springs, these should be so elastic that no shocks or jars are conveyed to either infant or mother, and the body should be so attached to the chassis that the pram cannot be overturned by the child. Lastly, the pram should be easy for the mother to propel, and it is eminently desirable that a brake be provided and that this be automatic.

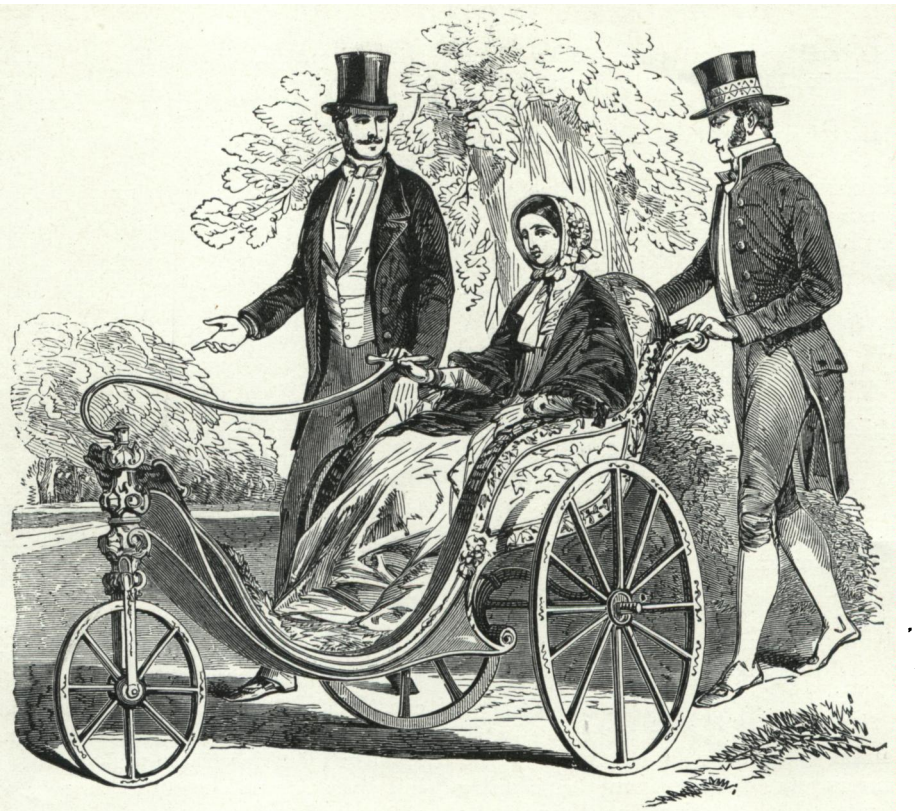
If we take this expert's specification as correct, and then study how far our pram manufacturers have worked to it, we must agree they have done much, and that the ideal pram no longer exists in theory but in actual practice. Indeed, I know of no device in the world which, starting so humbly, has been developed to a higher standard of perfection. For proof, go to any pram dealer who is properly stocked—and there are 5,000 of them—and examine his carriages, and note the prices, which are amazingly low when the cost of production, of which nearly half is in raw material, is considered. Really, this country has every reason to be proud of its pram industry, which is unequalled by any other country, and outside our Empire there are a dozen countries in which prams are made. Germany, before the war, tried to sell to Britain, but both her designs and her prices were too unsatisfactory. France has for many years been an importer of British prams, although she started making herself a small, slender chair with wheels in the 'fifties, and has since copied English designs.

Development.

With the able assistance of my sub-editor, Mr. J. R. Francis, nearly 2,000 patents have been examined with the view to, may I say, tracing the oak from the acorn. The specifications comprised over 8,000 pages and 5,000 drawings and, although we have compressed the result into the smallest possible compass, it would take three hours to read what we have compiled. I, therefore, propose to merely give you a short survey, but shall be pleased to supply a copy of our full report if desired.

The need for compression is obvious when it is further stated that down to April 30th, 1,198 pram patents had been taken out by almost as many persons, and that the patentees had placed them in 25 sections.

But I feel that I must mention the names of a few of those who have contributed to the art of miniature carriage building. First, as to those who have passed away—Charles Burton (the first patentee), T.



A Royal Invalid Carriage. Exhibited at the Great Exhibition, 1851. Bought by Queen Victoria and Presented to Empress of the French. Made by Jas. Heath (W. Monk & Co.), Bath.

Grant, John Harrop, James Lloyd, Leon L'Hollier, W. Hatchman and George H. C. Hughes—the last mentioned much cheapened and improved the pram wheel and founded the largest pram wheel business in the world. Then G. Lines, W. J. and E. G. Parker, G. R. Price, H. E. Reinhold, J. Stone, James Smith, W. J. Harris, J. Starley and W. Wilson.

Next as to those who survive, and I might first mention those who have more than a dozen patents to their credit, these being: S. T. Fawcett and his co-adjudicators, the Messrs. Simpson & Dow (40), W. H. Dunkley (31), H. V. Baker (20), and F. Headley (14). The others are: Thomas F. Simmons, E. Atkins, A. R. H. Baveystock, T. H. Cole, W. H. Ball, W. H. Brassington, W. and W. E. Ashton, C. E. Cowtan, A. Craven, W. J. Harris & Co., H. I. & E. J. Humphry, H. S. Jarvis, T. H. Brooke-Hitching, F. O. Harland, W. J. Fieldhouse, S. & F. Hodgetts, F. N. Giles, H. B. Murdoch, W. Lines, J. Lines, H. Hodges, F. C. Mathieson, Nelville Smith, A. E. Robotham, E. O. Robathan, L. B. & L. G. Seyler, J. W. & A. Wilson, H. Sillers, H. W. Twiggs, E. Taylor, O. O. Richards, S. Rones, C. T. Clover, W. T. Gower, C. S. Farris, G. F. Hubner, H. E. Salmon, Bradbury & Co., W. Saward, John Hampson, F. A. Cartwright, H. L. Gledhill, W. S. Dove and E. T. Morriss. Should I have missed anyone who deserves mention, it is by oversight and absolutely unintentional.

I shall now attempt to give in a few words the trend of invention.

Head Rests.—The first patent was taken out by Saunders in 1884, he being one of four patentees who aimed at comfort and adjustability.

Sanitary Devices.—The public have always considered these as unnecessary, but the first patent was in 1883, by E. Sandow, who proposed to use a "medicated medium" and a ventilating fan driven by clockwork. Some proposed detachable upholstery.

Mudgards and Umbrella Holders.—As to the first, there have been six patents, starting in 1884, although mudguards were in use 70 years ago. Umbrella holders have mostly consisted of hooks, sockets, rings or

baskets, and were first patented by Bond & Sadler in 1885, they attaching a hook and an eyelet to the side of the carriage. The latest form is of leather, and is retailed at 2s. 6d.

SECURITY DEVICES.—At one time there were numerous accidents through children either falling out of, or overturning, their prams, and sometimes with fatal results. But our manufacturers have now made the pram so safe that, according to official returns, no fatal accident has taken place for several years. In the days of the three-wheeler, a thoughtful mother simply tied her child to its pram, but in 1884 Koopmann provided an adjustable belt, and since then there have been many inventions in that class, notably by E. O Robathan, J. P. Neville and C. Newman. In 1895, Paulsen and Moller patented the fitting of revolving balls at the top of the pram, so that when the child tried to rise, the balls would revolve as soon as it touched them, which prevented it rising. As showing the attention given to security devices, there have been 28 patents by 27 persons.

WHEELS.—Since wheeled vehicles for passengers were not made in this country until after 1555, it is certain that no baby carriages, and, therefore, no pram wheels, were produced here until long after that date. The first patent for wheels for prams was taken out in 1855 by Wren, it being for securing the fore and hind wheels of a three-wheeler in such a way that they could be readily detached and the carriage folded. Since then patents for pram wheels and axles have been taken out to the number of 124 and by 97 persons, from which it is clear that only a few can be referred to. To start with, the first pram wheels were made entirely of wood, as, too, were the axles. Gradually iron axles and hubs were adopted, and hoop-iron encircled wooden felloes. In the early 'fifties J. R. Frampton used half-round iron for the tyres, and by the early 'seventies there were several firms making all-metal wheels, rubber tyred, for the trade. J. Starley, in 1874, patented a new method of mounting pram wheels on their axles, and George H. C. Hughes introduced an oil box, a protection for the spokes, and serrated tyres to prevent creeping. J. Fry introduced a method of casting hubs. In 1887 George H. C. Hughes conceived the idea of building satisfactory pram wheels at a much lower cost, and opened a factory in Birmingham, which still exists, and is the largest of its kind in the world, producing 125,000 wheels weekly ; there are now three other factories of smaller capacity making for the trade. After this date there were many patents for tightening the spokes, for improved lubrication, better methods of adjusting the axles, and several for disc wheels, not to mention others for ball bearings. As regards ball bearings, recent tests show that their advantage in the saving of labour in pushing a pram is considerable.

Then as to tyres, there have been many inventions, mostly for methods of securing, first, flat, and afterwards round, tyres to the rim. And pneumatics have been used, but it has been found that the public will not take the trouble to keep them inflated. The latest idea is to use spongy rubber known as the " Sorbo."

SPRINGS.—There have been no fewer than 130 patents taken out by 94 persons in connexion with this department in pram construction. It should be understood that the two prams of the Duke of Devonshire, made in 1780, were fitted with metal springs, but there are no records that springs were again applied to prams until 50 years after. The first patent for a pram spring was that of W. C. Fuller, who, in 1855, used india-rubber, and in the following year Johnson coiled a flat strip of steel into a circle, using two such springs so that one was elongated whilst the other was contracted. Then came along a number of patents, Simpson & Fawcett, in 1887, suspending the body from two handles, and calling it a hammock carriage. In the same year there was patented by C. Thompson C springs which were fixed to the sides instead of the ends of the body, but that inventor met with small success as regards sales. Then we had several other ideas in pram springs, which also failed to attract, except such as were of the U-shaped suspension type. And we now arrive at 1916, when W. H. Dunkley took out his patent for side C springs from which the body was so supported that it could be brought nearer the ground than formerly. Had the late C. Thompson only thought of lower suspension and provided for it, his patent would have been the most important in the history of pram manufacture.

Since 1916 there have been other patents for outside C springs too numerous to detail. But another idea has recently

taken root, which is to use coil springs to support the body, the latest of which is to make such springs of conical shape in order to allow of elasticity in every direction.

BRAKES.—There have been cases where prams have run away and the occupant been killed, but according to official returns these do not number one a year for the whole country. No statistics are compiled unless there is a fatal accident Beyond question, a brake which acts automatically is a great safeguard, but the experience of the pram trade is that the public do not want automatic brakes because they involve the holding off of the brake, when the carriage is wheeled, by a cord or lever, and although there have been 94 patents, by 90 inventors, most of the devices being practical and inexpensive, the only type which the public will buy, as a rule, is a clip for the wheel, which, of course, is not automatic.

HANDLES AND SHAFTS.—In mail cart days folding shafts were almost a necessity, and J. M. Wilson's patent of 1894 sold in thousands. As to carriages, H. Lloyd was the first, in 1865, to hinge the handle, but this is no longer done. There have been many inventions for reversible handles, for example that of W. H. Dunkley in 1894, and the methods of fixing the handles have been legion, such as within the levers, extending beyond them, and the making of the handles telescopic. And as regards material, they were first of wood, then of metal, porcelain, cork, vulcanite, and, to-day, celluloid is in great use. But the tendency is to fit the handle levers to the chassis and not to the body, and to use U-shaped suspension frames. There have been 86 patents taken out in this section by 80 inventors.

HOODS, CANOPIES, APRONS, ETC.—Although both of the Duke of Devonshire's baby carriages were fitted with excellent hoods, it does not appear that these were applied to other makes until the 'thirties, and the first patent, dated 1858, is by Thornber, and it had a semi-circular body into which retired a covered semi-circular frame when not required. In the 'sixties the hood, much like it is to-day, made its appearance and, ten years later, improvements were introduced in the holders for canopies. Perhaps one of the most interesting of recent inventions in this line was that of Muckett, in 1908, for a combination hood and canopy, the former of waterproof material fitting over holland, with simple means for separating them, and it is curious to note that during the war a second patent for a rigid hood to retire within the body was effected.

POWER PROPULSION.—No fewer than 16 patents have been taken out for devices for rendering it unnecessary to push or pull a pram or invalid carriage. The first was in 1769, by Francis Moore, who, without giving any details, proposed to "use fire, water or air." In 1869, Chambers used cranks on the front wheel of a three-wheeler, and in 1888, Plant and Brown fitted to prams and invalid carriages a spring motor, Garvey in the next year using a hand lever in combination with a crank. S. Johnson, in 1892, applied tricycle mechanism to a bath chair, and Schreiger produced a pram which was propelled by the child alternately sitting and standing. The most useful of self-propelled carriages now existing, however, would seem to be the one using an electric motor made by Carters, and that driven by a petrol motor made by Dunkley. The latter is constructed to accommodate the nurse as well as the occupant of the carriage, but since the price of these motor carriages is £100 or so, the market for them is very limited, and they are not allowed to travel on the pathway, and require a licence. In 1916, G. C. Kennedy patented a canoe-shaped carriage for children and invalids who propelled themselves by rocking the seat.

VARIABLE BODIES.—By this I mean inventions for folding, converting, adjusting and reversing. No fewer than 367 patents have been taken out in these classes, and by 279 persons. Most of them had reference to the mail-cart, which started in popularity in 1886, but went out of favour 15 years ago, and since the sales to-day are very few, I need only remark that the patentees aimed mainly at making the cart convertible so that it could be used for one child to lie down and the other to sit, or for them to face or back each other. Of course, many patents were taken out for the wooden folder, which is still sold in large quantities, the idea being to make riding easier and to permit of, what it only was at the start, a folding chair on wheels blossoming into a substitute for a carriage. Yet I must assert that this object has not been satisfactorily attained. In 1904 there was taken out a patent by an American for a steel folder, the wheels of which contracted under the body. That was called the "Allwin," and a few months

later another American brought out different mechanism, his car being called the "Sturgis." Both of these cars were imported in large numbers, and then three Englishmen, F. H. Headley, H. V. Baker and F. N. Giles, introduced improvements, and the import has ceased for many years. Indeed, of the million of these cars now in use in this country, fully 95 per cent. were made here.

Passing now to carriages, as distinct from cars or carts which could be folded without anything being detached, the first patent was taken out in 1855, by H. Nunn, that applying to a three-wheeler, and there were numerous other inventions in connexion with that pram for doubling its capacity or allowing a child to either recline or sit, but these need not be detailed since the three-wheeler became all but obsolete before the 'eighties, the four-wheeler taking its place. The inventions as regards variation since then it is unnecessary to mention in this short summary.

It might be said, however, that there have been several patents for converting a carriage into a push-car and for using the body as a bath, cradle, trolley and swing boat, and as recently as 1921 there was a patent for converting a garden roller into a child's carriage ; further, one inventor, in 1886, by working a screw, was able to alter the body lengthwise, and in 1914 Smallwood applied two wheels to a wicker chair in such a manner that these could be housed under its seat, and in 1920 the idea of converting a bedstead into a bath-chair was patented. About the same time there was introduced a car which would so fold that it could be placed in a golf bag, and there is about to be put on the market a folding car which weighs only 16lb.

Invalid Carriages.—The first invalid carriage was patented by Sir John Christopher Van Berg in 1636, and his specification deals with dozens of other articles, none of which are described. Next we come to that of Burton, in 1853, and it was for a three-wheeler with a long handle for obtaining better leverage when raising or turning the front. Metcalfe, in 1854, made a chair for invalids with wheels affixed, which could be folded. In 1895 G. G. Rawl made a carriage which could be used in the house as a carrying chair, and two years later R. Gibbs applied a handle and gearing for propulsion purposes. In 1899 Roberts and Smith produced a carriage, with two wheels, which could be wheeled up or downstairs as well as on the level. N. A. Sawyer, in 1900, patented a carriage propelled by two handles with a chain drive, and Schmidt in 1903 applied an electric motor. Leg rests were patented by Foot in 1904, and in 1907 Maudsley gave us a bath-chair which could be shut up to form a box. In 1912 L. M. Murdoch made an up and down stairs carriage. The war is answerable for many inventions in this line, but mostly for use in the field. One of these, by Foot, in 1915, is for propulsion by the patient rising and sitting, and there have been several inventions of nets to keep out insects, for the comfort of invalids. There have been 167 patents taken out for invalid vehicles by 156 inventors.

Steering.—There have been 34 patents by 31 persons since Schmoock took out the first in 1854. But the public attach no importance to steering devices, so we need not here discuss them.

Bodies.—Did time permit, it would be interesting to describe the various alterations which have been made from time to time in the design of bodies, and in the material used for their production. As to the latter, there were used solid hard wood, soft wood veneered, stamped sheet metal, papier-maché, wicker, cane, reed, wire gauze filled with a composition, etc., and then plywood, in 1909, and since then celluloid has been used for the panels. The latest idea is to make both pram bodies and hoods of a rubber composition, which could be moulded to any shape, and then vulcanised, yet would be pliable in use. We have had as many as 56 patents taken out, and by 49 persons.

Lights.—"Dora" is answerable for an Order that red and white lights must be affixed to prams, but this is never obeyed. The fines which might have been inflicted to date, should the police have cared to act, would, I estimate, pay off our national debt.

Miscellaneous.—Among the novelties patented was a net which could be instantly fixed over the sides of the carriage and thus form a cradle for a second child—this was the only patent in connexion with prams taken out by a woman. G. H. Needham, in 1883, made a folding cot, with wheels, which would pack into a box, in 1884 Oppenheim constructed a portmanteau with openings at the bottom

for two wheels, and with a handle, which could also be used as a go-cart, and in 1891 Outram introduced a mail cart with removable seats, so that it could be used as a parcel carrier. Schaefer patented, in 1903, a baby carriage with a folding seat for the nurse, and in the same year Feld applied to a carriage a feeding bottle receptacle. Kriz, in 1903, folded his pram so that it could be carried in a carpet bag. In 1908, Fleischmann introduced a carriage with a single wheel, the child reclining in a hammock. Several inventors have constructed prams which could readily be converted into sledges, and in 1912 Gordon-Glassford constructed one which folded up inside a travelling trunk.

But my long list of pram patents only partially covers the range of invention, since many designs were merely registered, and for proof, let me say that H. V. Baker, although taking out only 20 patents, registered upwards of 50 designs. Further, scores of new practical ideas were never protected at all by their inventors.

Yet I have said enough to prove that "mewling and puking in the nurse's arms," neither good for the infant nor its nurse, is now unnecessary. Secondly, that the pram has had seven stages, as follows :—

At first a mere board on two wheels, to push or pull ;

Then a simple lattice of wood on four wheels, which could be drawn ;

And then a mere box drawn on four wheels ;

Then a thing of beauty on four wheels, with springs, which, too, was drawn.

And then of wicker body, springless, with handle still in front ;

The sixth stage, a thing on three wheels, pushed from the back.

Last stage of all that ends this eventful history :

A pram on four wheels, to push, artistic, buoyant, inexpensive,

Sans shocks, sans danger, sans everything undesired,

A feast to the eye, a pleasure to child and nurse.

DISCUSSION.

THE CHAIRMAN was sure the meeting had been greatly interested in the paper. As far as he was concerned, and he thought it would be the same with most other people, he had been too busy in connection with present manufacture to have been able to devote very much thought to the past. The general aim of most makers in the trade to-day was to produce a highly artistic and useful carriage, and he would have liked to hear a little more from the author in regard to the great attention that was given to artistic features in the carriages of the present day, because he took it that the main object was to obtain the approval of the Society in classing the industry amongst the artistic trades. Most of what the author had said appeared to be a history of the business in the past, when there were a good many quite useless inventions which had never been adopted. However, they were all full of interest in the history of prams. He hoped the author, before the paper was published, would see his way to put in some brief description of the high-class artistic article makers were so much interested in to-day.

MR. W. LINES wished to correct a little inaccuracy in the paper by saying that the firm of G. and J. Lines, Limited, were the successors to Mr. John Allen of Hackney Road, E., they having bought the business in the year 1888 and carried it on for a considerable time, afterwards transferring the premises to the Caledonian Road, Islington.

THE AUTHOR said he was delighted to have this explanation. He had written many letters to firms, but he had not been able to compel the firms to answer them. His correspondence had run into hundreds of letters. The father of Mr. Lines had received a letter from him asking about the origin of his business, but no reply was obtained, and, therefore, he was scarcely to be blamed for the omission.

MR. G. K. MENZIES said he hoped the meeting would not resent a layman venturing to say a word or two on the matter. Like everyone else in the room he had been much impressed with the great care the author had taken to get up the history of the past ; he had been at immense trouble in that matter for several months. The paper would go out to the world in the Society's *Journal* and he should like very much if Mr. Sewell would add something at the end on the lines the Chairman had suggested, giving some idea of the present state and size of the industry in this country. He himself should like to know something about the number of firms who were manufacturing and the value of their output and so on. He did not know whether that could be done, but it would add very much to the value of the paper. Another point in the paper that interested him particularly was the question of export trade. The author had stated that before the war there was an export trade in perambulators, but that that had been killed by the heavy cost of transport. There were a number of people in the room who could speak with authority on that subject, and it would be very interesting if they could say whether that really was the sole cause of

the decline of the export trade, and, secondly, whether they had any idea of how that trouble could be overcome.

MR. S. DUNKLEY said it was only that day that he had realised the questions he had been asked in a letter from Mr. Sewell, and, therefore, he had to apologise for not having answered them. He knew Mr. Sewell well and he had read his journal every month for the 30 years that he had been in London. The first memory he had of the baby carriage was something made by a village blacksmith. It was like two steel fire-guards put together with a well very much like that of to-day. That was made in Warwickshire, a few miles from Stratford-on-Avon, and he remembered that when his mother had been gleaning and he was being brought home in the baby carriage from the harvest field the corn that had been gleaned was sticking into his face as he sat in the pram. One or two firms had been mentioned, and he himself recollected 40 years ago Lloyds of Liverpool and Morris of Freeman Street, Birmingham. Someone had asked a question about the origin of the name "bassinette." At one time he could remember his firm buying English wicker cradles which were fixed on an undercarriage, but afterwards they bought the French bassinette, because it was closer woven and very much nicer. He wondered whether that was where the name of "bassinette" came from; it was a name used in the workshops, He had remembrance of many firms mentioned in the paper and the reading of them brought back very sentimental memories of the past. Thirty-five years ago he had had the pleasure of working in a factory (Thos. Simmons & Co., London) where a man named Charles Burton was employed, and he should like to know whether that was the man mentioned by the author.

The paper was a very useful one to the trade, and he thanked the reader.

MR. D. STONE also expressed his appreciation of the paper. No doubt many could call to mind the great impetus given to the trade about 1882 when the bassinette was first introduced. In the early days perambulators were considered to be for children of about 2 or 3 years of age, the idea of carrying them being quite out of the question. He could recollect the appearance of the first bassinette; it was really the French bassinette put on to four wheels. The bottom was quite level, the idea of the well not coming along until a year later. There was no doubt that the bassinette, being adapted for carrying young children, gave a tremendous impetus to the trade. He could just call to mind sitting in the old three-wheel perambulator, with three wooden wheels and no hood. That was the earliest type of carriage he could remember in the year 1872-1873. The trade at that time was very small in comparison with what it was now.

THE CHAIRMAN said that everyone recognised the great work the author had done. It was from a thoroughly disinterested motive that he went to work to put the trade on a higher status amongst the artistic trades. He proposed a very hearty vote of thanks to him for what he had done.

THE AUTHOR said very little criticism had been expressed; certainly not to the extent that he wished, as he was very fond of criticism. He did not put the paper forward as any perfect production. The Society did not exist for the purpose of advertising firms' modern productions, but concerned itself with development, and, therefore, he felt himself restricted, and had concerned himself with trying to show the development from the acorn to the oak. There were 200 firms making perambulators and it would have been difficult to have included 200 names in the paper.

MR. G. K. MENZIES said he only wanted general statistics.

THE AUTHOR said that out of the 200 manufacturers, only about 60 were in any large way of business, and of those about 35 firms would make something like 25 to 75 different designs, and it would take three volumes to deal with those. He had been most careful to avoid referring to the particular make of goods of firms. He was greatly indebted to the Chairman for presiding over the meeting. Mr. Seyler was the proprietor of an active and prosperous concern dating back further than any other pram concern in this country. He thanked the Meeting for the kind way in which the address had been received. With regard to more recent matters, he thought he might be doing a service to the trade if he amplified the details. Very likely he should bring out the history of the pram at an early date, and in that would embody what the secretary had suggested.

GENERAL NOTE.

INTERNATIONAL CONGRESS ON ARCHITECTURAL EDUCATION.—The Board of Architectural Education of the Royal Institute of British Architects, announce that the International Congress on Architectural Education will be held in London from Monday, July 28th, to Friday, 1st August, 1924.

ERRATUM.—The name of the successor of Sir George Beilby, LL.D., F.R.S., as Director of Fuel Research was, by a typographical error, incorrectly given in the *Journal* of 3rd August (p. 658); it should have been Mr. C. H. Lander, D.Sc., M.I.Mech.E., A.M.Inst.C.E.