Papers and Originals

Changing Pattern of Disease and Disability in Schoolchildren in England and Wales*

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Gavin Milroy (1805-86), whose memory we honour this afternoon, was born in the year that Nelson died. It was a hazardous time in this country's history: three weeks after Trafalgar, Pitt, in memorable language, said,¹ "England has saved herself by her exertions and will, I trust, save Europe by her example." Three months later he was dead, his last words¹ being: "My country! How I leave my country." Yet within 10 years Waterloo was fought and won, and the Industrial Revolution was firmly established and well on its way.

Social Conditions in the Nineteenth Century

What was the condition of the people of these islands, and particularly of the children, at that time? "At no period," wrote Trevelyan,² "had the upper class been wealthier, or happier, or more engrossed in the life of its pleasant country houses." But another and much larger section of British society had a very different life; one that led Lord Byron to say³ in his maiden speech in the House of Lords in 1812: "I have been in some of the most oppressed provinces of Turkey, but never under the most despotic of infidel governments did I behold such squalid wretchedness as I have seen since my return in the very heart of a Christian country."

Evil though these conditions were they were an improvement on those that existed in the eighteenth century: "notwithstanding the vice, the misery, and the disease which still abounds in London, its general prevalence has been greatly diminished" was the opinion⁴ of that robust reformer Francis Place. The big reduction in the death rate of children under 5 years of age from 74% in 1730 to 31% in 1830⁵ was strong support of Place's opinion. Even so, many children were still treated barbarously. Often they were convicted by the courts for relatively trivial offences and cruelly dealt with: two boys, aged 10 and 12 years, were sentenced at Manchester Quarter Sessions, in 1813, to transportation for seven years for stealing linen from a warehouse.⁶ The Royal Commission on Mines reported in 1842 that some children under the age of 5 years worked alone underground in the darkness of the coal pits for 14 hours a day.

Housing conditions were slow to improve. In his second annual report⁷ on the City of London, for the year 1850, John Simon wrote: "Instances are innumerable in which a single room is occupied by a whole family . . . ; where birth and death go on side by side; where the mother in travail, or the child with small pox, or the corpse waiting interment, has no separation from the rest."

By the middle of the nineteenth century determined efforts were being made to remedy some of the grosser social evils,

particularly the insanitary and overcrowded dwellings of the poor, and impure water supplies.

Early Educational Developments

When Gavin Milroy was still a young boy Robert Owen opened the first infant school in these islands, for the children of the cotton workers of New Lanark. Educational provision was sparse and slow to develop. By 1870 only about half the children were at school and most of them were indifferently taught. The public schools were in disfavour: "... life was very rough, their discipline harsh and their morality lax."⁸ There was open rebellion at Harrow and Winchester in 1818 and at Eton in 1832.⁹ It was not until 1880, six years before Gavin Milroy's death, that primary school attendance became compulsory, and not until 1891 that it was made free. Two years later, in 1893, the first Act in this country for the education of handicapped children went on the Statute Book; it dealt with the education of blind and deaf children; in 1899 a second Act was made that was concerned with the education of mentally and physically handicapped and epileptic children. Before the State entered the field of special education, just as had happened in the field of general education, schools for some handicapped boys and girls had been set up by voluntary organizations. The first special school in England was established in 1791, in Liverpool, for blind children. The school Health Service was established on a national basis in 1908.

The slow development of educational facilities for all children, and the equally slow introduction of sanitary reforms often against apathy or outright opposition, together with advances in medical care, gradually increased the health and life-span of children. The rate of progress quickened after 1900, and particularly in the past 30 to 40 years.

Control of Some Common Infectious Diseases

The infant mortality rate fell from 153 in 1841-1900 to 19 in 1966. A hundred years ago the death rate of children aged 5-9 years was 23 times greater than today, and those aged 10-14 years 16 times greater. During the period 1861-70, of every million children under 15 years of age almost 6,000 died annually from scarlet fever, diphtheria, whooping-cough, and measles; in 1965 only 11 died.

Scarlet Fever

The disease is still prevalent: in 1965 there were 25,464 notifications among children under 15 years of age, 17,634 being of those aged 5-14 years: there were no deaths. The steep fall in the death rate, per million under 15 years of age, from an annual average of 2,617 in the period 1861-70 to 73

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in 1921–30 is one of the mysteries of epidemiology; neither immunization nor vaccination was employed against it and sulphonamides were not introduced until 1932.

Diphtheria

Before immunization was generally introduced diphtheria was widespread and caused many deaths; as recently as 1938 about 65,000 persons contracted the disease and almost 3,000 died, 2,744 being children. In 1965 there were only 23 notifications among children and no deaths. These figures speak for themselves and are an unchallengeable case for immunization.

It is worth recalling that, following Klebs's discovery of the diphtheria bacillus in 1883, bacteriological investigations in New York City showed¹⁰ that from a quarter to a third of the cases then clinically diagnosed as diphtheria were "not the true disease." The introduction of antitoxin by von Behring in 1890 undoubtedly saved many lives in the years before immunization was generally adopted. Though Ramon, in 1923, found that diphtheria toxin could be modified by formaldehyde without interfering with its antigenic action, immunization against diphtheria was undertaken extensively only during the second world war and in the years immediately following, and with spectacular results.

Whooping-cough

Immunization against whooping-cough has been widely used only within the past 20 years. Though the annual notifications among children under 15 years of age have fluctuated (they fell from 155,130 in 1950 to 12,624 in 1965) about a third were of children aged 5–14 years. During the same period the number of deaths fell from 393 to 21, all in children under 5 years of age.

Whatever the cause of the fluctuation in notifications, whether due to the emergence of a new subtype of *Bordetella pertussis* or to natural epidemic fluctuations, what is not in doubt is that vaccination has substantially reduced the hazard of whooping-cough and provides a powerful case for a high vaccination rate among children, especially since the vaccines now in use contain the new subtype of *B. pertussis*.

Measles

Measles has maintained its rhythm of high and relatively low prevalence in alternate years, but even in years of low prevalence it attacks from 100,000 to 300,000 children; in years of high prevalence as many as three-quarters of a million children may be affected. Children under 10 years, particularly those under 5 years of age, are the chief victims. In 1965 half a million children contracted the disease, of whom 77 under and 26 over 5 years of age died. Measles not only kills but still gives rise to pneumonia, otitis media, encephalitis, and other serious complications. This toll of disability should, however, be substantially reduced when measles vaccination becomes general.

Poliomyelitis

Poliomyelitis was made notifiable in 1911, but small outbreaks had been reported earlier. Both incidence and fatality rates fluctuated; the largest outbreak was in 1947, when there were 2,700 notifications and 168 deaths among children aged 5–14 years. In 1957 inactivated poliomyelitis (Salk-type) vaccine was offered to all children, and in 1962 the Sabin live oral vaccine was made available. As a result of widespread and intensive vaccination there were only 11 notifications and no deaths among children aged 5–14 years in 1965.

Poliomyelitis used to be one of the chief causes of crippling in schoolchildren; in 1964 about 600 boys and girls were in

the special schools for the physically handicapped on account of the disease. If vaccination is steadily maintained poliomyelitis should become as rare as tuberculosis of bones and joints.

Tuberculosis

Tuberculosis was for long a scourge of children, in both its respiratory and its non-respiratory form. Though the tubercle bacillus was found by Koch in 1882, and x rays were discovered by Roentgen in 1895, for many years afterwards respiratory tuberculosis continued, often not to be diagnosed until it was well advanced; in consequence, it was widespread in the community. The disease has not yet been overcome, but it is no longer the menace it once was. In 1907 over 3,000 children aged 5–14 years died from its various forms; five died in 1965 (two respiratory and three non-respiratory); 60 years ago three times as many schoolchildren died from it as now contract it (in 1965 there were 764 notifications of respiratory and 171 of other forms of the disease).

Improved nutrition, higher living standards, better and less-overcrowded houses, and improved medical care, including earlier diagnosis and thorough follow-up of contacts, all contributed to the reduction in incidence and mortality, especially of the respiratory type of the disease, before chemotherapy was introduced in 1947.

Mass miniature radiography has been used extensively in diagnosis since 1943. In 1953 B.C.G. vaccination was offered to all children aged 13 years and over, and in 1961 to those aged 10 years and upwards. This type of vaccination was first employed by Calmette in France in 1921, but its efficacy was long contested, and, indeed, the controversy has not been finally stilled.

In the years before the second world war bovine tuberculosis was widespread; 84% of primary abdominal tuberculosis and 50% of tuberculous cervical adenitis were reported¹¹ to be due to bovine type disease; up to 40% of cows were said¹² to be infected. The Attested Herd Scheme and heat treatment of milk became generally adopted only after the second world war. The pasteurization of milk, long advocated by the Public Health Service, was stubbornly resisted by farmers and others, and Parliament was slow to make regulations for ensuring a safe milk supply. These two measures have almost eliminated tuberculosis of bones and joints: of the 400,000 children aged 5–14 years who were discharged from hospitals in 1963 only 211 had been admitted with this form of the disease.¹³

The history of these six infectious diseases in the past 100 years vividly depicts the changing pattern of disease and disability in children and reflects the medical and social advances that have been made.

The same story can be told about acute rheumatism and rheumatic heart disease.

Acute Rheumatism and Heart Disease

Rheumatic Fever and Rheumatic Heart Disease.—Rheumatic fever and chorea killed 388 children aged 5–14 years in 1938 but only 5 in 1965; chronic rheumatic and other forms of heart disease, excluding congenital heart defects, killed 526 in 1938 and 26 in 1965. In the 12 areas in England and Wales where juvenile rheumatism is notifiable, notifications are about a tenth of those in 1948; even so, it still attacks a fair number of children; of the 400,000 boys and girls discharged from hospitals in 1963 about 1,560 had been admitted with rheumatic fever or chorea and 85 with chronic rheumatic heart disease. The relatively small number of children who develop chronic rheumatic heart disease nowadays is indeed remarkable. Improved nutrition, better social and economic conditions, and chemotherapy have all contributed to its decline.

Congenital Heart Disease.—Unlike rheumatic heart disease congenital heart disease appears to be as prevalent as it was a generation ago; advances in surgical, medical, and nursing skills now enable some children to attend ordinary schools who once would have been admitted to special schools. Schoolchildren with congenital heart defects now far outnumber those with rheumatic heart disease; in 1964 there were 532 in the special schools for the physically handicapped but only 76 with rheumatic heart disease. Between 1938 and 1965 deaths of children under 5 years of age from congenital heart defects fell from 470 to 400 per million; for children aged 5–14 years the numbers were 12 per million in 1938 and 23 in 1965. Congenital heart disease continues to be one of the chief destroyers of child life and one of the few remaining major causes of physical disability in childhood.

Changes in Mortality from Some Other Diseases

The saving in child life since Gavin Milroy's time has been immense: if the death rates of 100 years ago among children under 15 years of age from all the infectious diseases and acute rheumatism prevailed today over 70,000 would die annually whereas the actual number is about 400. This sweeping reduction in mortality captures the imagination, but the less dramatic reduction in mortality from some other diseases is also noteworthy. A few examples among children aged 5–14 years will show the trend.

Between 1938 and 1965 deaths from pneumonia fell from 634 to 133, appendicitis from 370 to 31, diseases of the ear and mastoid process from 230 to 4, nephritis from 180 to 47, osteomyelitis from 150 to 0, epilepsy from 129 to 48, diabetes from 69 to 16, and violence, including accidents, from 1,230 to 914 (654 boys and 260 girls). These reductions in mortality are all the more remarkable when it is remembered that in the same period the child population concerned increased by over three-quarters of a million.

This saving of child life has undoubtedly been due largely to greatly improved medical care and treatment in the past 30 years, and particularly to chemotherapy. Whatever the weaknesses of the National Health Service—and given the will they can be overcome—it has certainly improved considerably the hospital and specialist services for children.

The fewer deaths from accidents may at first sight appear surprising. They are still scandalously high, but the fact that they are less than formerly, even though both the population at risk and the number of vehicles on the roads have increased substantially, is strong encouragement to those who persevere, often against apathy and indifference, with accident-prevention measures, and not least to those teachers and others who include home and road safety in school health education programmes.

Though the overall saving of child life between 1938 and 1965 has been considerable there was, unfortunately, an increase in schoolchild deaths from several causes; the number of those aged 5–14 years who died from asthma rose from 24 to 84 (the increase beginning about 1960–1), from congenital malformations, including heart defects, from 108 to 247, and from cancer, including leukaemia, from 253 to 516.

The recent increased death rate from asthma in adults as well as children was unexpected but is being investigated. It has been estimated that there may be about 100,000 asthmatic schoolchildren; though most appear to "grow out" of the condition it is a serious disability for many and one that may retard their educational progress and that often persists into adult life. Asthmatics form the largest group in the special schools for delicate children, and local education authorities now provide about 50 asthma clinics.

Accidents and all forms of violence are far the largest cause of death of children aged 5–14 years. Of the 2,556 deaths in 1965, accidents accounted for 36%, cancer (including leukaemia) for 20%, congenital malformations for 10%, respiratory disease

for 8%, and infectious and parasitic diseases for only 3%. Among children under 5 years of age the chief causes of death in 1965 were congenital malformations and respiratory disease (mainly pneumonia), each group claiming 19% of the total of 19,060 deaths; accidents and all forms of violence came next with 7%, and were followed by infectious and parasitic diseases, enteritis, and cancer, each accounting for about 2% of the total.

Congenital Malformations

These mortality statistics show more clearly than words the changing pattern of disease and disability in children. Congenital defects and the cancers present tough problems. The brilliant, imaginative surgical study and treatment of spina bifida cystica in the past 20 years has saved the lives of many children who formerly would have died in infancy. Though the child population under 5 years of age increased by almost 50% between 1938 and 1965 the number who died from spina bifida fell from 1,143 to 639; of those aged 5–14 years 2 died in 1938 and 17 in 1965.

For long it was thought that congenital deformities of the limbs were an "Act of God." If the thalidomide tragedy did nothing else it showed with harsh abruptness that this drug if taken by a woman in the early weeks of pregnancy may produce gross defects in the developing foetus. And if one drug can do this why not others? We simply do not know. It was not until 1941 that it was found that a baby whose mother had rubella in the early weeks of pregnancy might be born blind or partially sighted, deaf or partially hearing, mentally retarded or with a heart defect. If a mild infection such as rubella can do this why not other infections? Again we do not know. More accurate diagnostic techniques may yet incriminate other drugs and other infections.

Advances in Genetics

Yet another door to research was opened as recently as 1959 when for the first time a satisfactory technique was introduced for the examination of human chromosomes; since then discovery has followed discovery with almost breathtaking speed. It may be that some of the hopes they now raise may be shattered by further investigations, but there can be no doubt of the value of this new knowledge, not least for genetic counselling. What, for instance, is the significance of the extra chromosome in mongols, particularly since only a minority of their parents appear to have an abnormal chromosome pattern? What, too, is the significance of the various chromosomal abnormalities now being reported in some criminals? The answers to these and other related questions may in time reduce the toll of hereditary and congenital defects.

Improved Health and Nutrition

Not only has there been a big saving in child life but boys and girls have become healthier and the expectation of life at birth is 30 years longer than it was a century ago. In 1915 13% of schoolchildren were undernourished, 4% had rickets, and 14% had verminous heads, whereas in 1966 only about 0.4% were of unsatisfactory physical condition, rickets was virtually non-existent, and fewer than 3% were verminous. Between 1946 and 1966 the proportion of children having school meals rose from 42 to 65% and of those taking school milk from 71 to 81%. The presumptive evidence is strong that school meals and milk have been important factors in safeguarding the nutrition of many of the children in large families and in homes with a low net family income. In 1966 over 300,000 schoolchildren—4% of the total school population—were having free school dinners; the percentage varied in different parts of the country and many children entitled to

free meals did not take them. Children from large families are particularly vulnerable; in the first quarter of 1967, for example, a British household with three or more children spent 11s. 10d. a week per head less on food than a family with one child.¹⁴

In July 1967 the Ministry of Social Security published a report on "Circumstances of Families" that expressed particular concern about 160,000 families, with half a million children, whose fathers were not paid enough to cover essential needs.

Uncleanliness

A substantial number of children are still brought up in poor economic circumstances and, too often, in dismal, outworn houses. It is deplorable that there are still almost three-quarters of a million unfit houses in England and Wales¹⁵: there is little wonder that some of the children who live in them are verminous. Even so, the number of children found verminous at school fell from 850,000 in 1926 to 190,000 in 1966. This is essentially a family problem, and it took long years of persistent health education by school nurses and teachers, and much home visiting by the nurses, to effect this improvement, but much still remains to be done.

Treatment in Hospitals

Another indication of the changing pattern of disease and defect in schoolchildren is provided by hospital inpatient records. It was estimated¹⁶ that there were just over 400,000 discharges of children aged 5–14 years from hospitals in 1963, including those discharged more than once during the year. Only 3% had been admitted on account of infectious and parasitic diseases (11,488), including tuberculosis (1,711), and about 5% (20,727) with respiratory diseases; almost a third (128,000) had undergone tonsillectomy and about 8% appendectomy, and over 13% (54,188) were treated for injuries, burns, or poisoning. In fact, more schoolchildren were treated for accidents than for all the infectious and respiratory diseases together. No fewer than 21,329 had head injuries, almost equalling the combined total of those with diseases of the ear and mastoid process (11,594), asthma (3,210), diabetes mellitus (1,806), epilepsy (2,048), mental illness (1,658), and malignant neoplasm (1,700). More were treated for burns (2,376), and about as many for poisoning (1,457) as for rheumatic fever and chorea (1,563). Congenital malformations (12,386) accounted for 3% of the total. Strabismus (12,649) accounted for another 3%, and just over 1% (5,322) had been circumcised (there were about three times as many circumcisions (14,962) among boys under 5 years of age). About 2% (7,402) had diseases of the skin or cellular tissues, 3% (13,061) of the bones and organs of movement, and practically the same number (13,104) had the ill-defined condition of abdominal pain.

The very large number of tonsillectomies is one of the most arresting features of this list. It really is remarkable that so many children, year in year out, are subjected to this tonsillar holocaust. In addition to the 128,000 children aged 5–14 years, 28,773 under 5 years of age also had the operation. The time is long overdue for a critical assessment of the indications for this operation and of its long-term effects.

Skin Diseases

Still another indicator of the changing pattern of disease in schoolchildren is to be found in the records of the minor ailments treatment clinics provided by local education authorities. Not so long ago impetigo, ringworm, and scabies were rampant among schoolchildren, but the painstaking persistent work of school nurses with the families of the affected children—often a thankless task—and thorough medical treatment substantially reduced the number of boys and girls with these infections.

The continued subjection of these social pests depends on unremitting vigilance by the school health, general-practitioner, and hospital services. Unfortunately, there is clear evidence that *Sarcoptes scabiei* is again on the loose in some areas, and unless it is soon controlled it will become a widespread nuisance.

Annual statistics showing the prevalence of these three skin diseases among schoolchildren were not collected nationally until 1947.

Impetigo.—Apart from a sharp temporary increase in 1954 the number of children treated for impetigo at school clinics fell from 64,129 in 1947 to 6,306 in 1966.

Ringworm.—In 1947 5,454 boys and girls were treated for ringworm of the scalp but only 196 in 1966; the numbers with body ringworm fell from 6,654 to 636. *Microsporum audouinii* and *M. canis*, that used to be responsible for over 70% of the cases, accounted for only 5 to 6% in 1962–5. In the same period the proportion of infections due to *Trichophyton rubrum* increased from about 4 to almost 50%; *T. rubrum* may have been brought into this country "in quantity"¹⁷ during the second world war with subsequent wide spread.

Scabies.—The number of schoolchildren treated for scabies fell from 38,577 in 1947 to 2,650 in 1957, rose to 3,419 in 1958, and then fluctuated between 3,000 and 3,500 for the next five years, when it started rising again until by 1966 it had reached 7,186. It has been suggested¹⁸ that scabies may give rise to hypersensitivity; that the disease wanes when a sufficiently high percentage of the population is affected and waxes again with an increase in the number of persons who have not been infested. Another suggestion¹⁹ was that "herd hypersensitivity" explained the "gap of about 15 years between the end of one and the start of the next epidemic." Whether this is true or not a vital factor in the spread of the disease is failure to diagnose it early, with the result that often it involves more than one member of a family and spreads out in widening circles in the community.

Though these three skin diseases do not rank in severity or gravity with the other diseases and defects we have been considering, none the less their control shows clearly the interplay of curative and preventive medicine and the social factors that are so often involved in illness and disability. Their nuisance value is high and they once caused much loss of school time.

Present Pattern of Diseases and Disability

Over the years many major and minor diseases and disabilities of schoolchildren have been substantially reduced, some almost to vanishing-point, and so have thrown into increased prominence those that remain. Those most frequently causing admission to hospitals have already been mentioned, so will not be considered further.

A twelve months' study²⁰ of 106 general practices in 1955–6 showed that 74% of children under 15 years of age on the lists of the practitioners taking part in the study consulted their doctors at least once. Respiratory diseases formed by far the largest group of conditions that caused the children to consult their general practitioners; next in order of frequency were infectious diseases, skin diseases, accidents, diseases of the digestive system including enteritis, otitis media, and allergic and metabolic diseases including asthma.

Many schoolchildren, however, have other disabilities and diseases that adversely affect not only their health but also their education and development. Chief among these are congenital and hereditary defects, mental retardation, speech and language disorders, and emotional and behaviour difficulties. In 1966 over 100,000 handicapped children received special education or were waiting admission to special schools; 65,000 were treated for defective speech; 57,000 attended child guidance clinics; from 10 to 15% of those in ordinary schools were in need of remedial teaching; about 30,000 were considered to be unsuitable for education at school on account of severe

subnormality and were at local health authority training centres, in subnormality hospitals, or at home. And, for good measure, it must be mentioned that in 1965 1,172 girls under the age of 16 years had an illegitimate baby; 190 boys and girls under the age of 16 years were treated at venereal diseases clinics, but very few of them were known to be at school; about 63,000 of those under 17 years of age were found guilty of indictable offences (mainly larceny and breaking and entering); and almost 70,000 of those under the age of 18 years were in the care of local authorities on 31 March 1967.

They add up to a formidable total, and present educational, medical, and social problems of greater or less degree; their management depends on a close working partnership between education, medicine, and the other social services. They are the very stuff of present-day paediatrics and will be the subject of my second lecture. But we must keep all this in perspective and remember that although many schoolboys and schoolgirls have defects and disabilities that retard their development and education, and some are permanently incapacitated, the big majority are healthy, without handicap of any kind, and are well-behaved; and this I emphasize. There always have been those who have criticized the younger generation, and so it is today; but I am not of their company. In my opinion the present generation of children and young people compare favourably with their predecessors and I believe that our society will be safe in their hands.

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[The second lecture will appear in next week's issue.]

Antifertility Effect of Continuous Low-dosage Oral Progestogen Therapy

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Inhibition of fertility with progesterone and 19-norsteroids was first reported by Pincus *et al.* (1958); it was evident that progestogens in adequate dosage inhibited ovulation. The use of injectable long-acting progestogens without oestrogens for fertility control was reported by us in 1965. It was shown that medroxyprogesterone acetate 250 to 500 mg. intramuscularly induced ovulation inhibition for a period of at least six months (Zañartu and Navarro, 1965; Zañartu *et al.*, 1965). However, it was soon observed that in subjects receiving one single injection fertility was still inhibited for two or more months even after ovulation was re-established, as shown by the existence of corpus luteum under macroscopic and microscopical examination of the ovaries (Zañartu *et al.*, 1965). It was felt that the effect of injected progestogens induced the inhibition of fertility during this period by modifying other factors more sensitive to lower doses (endometrium, cervical glands, etc.).

The observations reported by Martinez-Manautou *et al.* (1965, 1966, 1967a) and by Rudel *et al.* (1965) of inducing contraception with daily microdoses of progestogen have opened a new approach to fertility control without interfering with the hypothalamic-pituitary-ovarian axis, at least in respect of ovulation. From a historical viewpoint it is interesting to note the gradual reduction in the steroid dosage required to obtain fertility inhibition in women. The initial pioneering clinical work from Pincus *et al.* (1958) used 10 mg. of norethynodrel with 150 µg. of ethinyloestradiol 3-methyl ether, compared with the progestogen microdosage (0.5 mg. of

chlormadinone acetate) now being reported as successful in inhibiting fertility.

The continuous "non-stop" form of administration may be particularly acceptable and be easier to follow in subjects from low socio-economic and educational levels. The low cost and easy handling of the treatment is also attractive for family planning purposes in this population. The present report therefore attempts to explore the acceptability and clinical effectiveness of the therapy in fertile healthy young women from low socio-economic and educational levels as compared with a group of well-to-do educated subjects.

Material and Methods

From 1965 to March 1967 390 fertile healthy young women from two different socio-economic and educational groups were studied. Forty-five were educated and came from families with an above-average income. The remaining 345 were from low-income groups. Chlormadinone acetate 0.5-mg. tablets were given daily without interruption. The therapy was offered to women when conventional combined or sequential

TABLE I.—Age and Fertility Before Treatment

Age	Group A	Group B	Fertility (No. of Pregnancies)	Group A	Group B
16 to 20 years	26	—	1 to 4 ..	146	23
21 " 30 "	199	23	5 " 8 ..	124	20
31 " 40 "	117	21	9 " 12 ..	58	2
41 or more "	3	1	13 or more ..	17	—

Group A = 345 clinical patients. Group B = 45 private patients.

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