Chapter IV

The changing Profile of a bicycle
Introduction

In the study of the impact of a bicycle it is necessary to study the correlation between changes in the model of a bicycle and the convenience offered to a cyclist. This is quite logical because the more the convenience offered to a cyclist by a bicycle in cycling, the more would be the tendency on the part of people to prefer bicycle to any other vehicle. Therefore this chapter is devoted to the study of the evolution of different models of a bicycle right from the time of invention of a bicycle to the modern age.

The brief history of the evolution of different models of a bicycle that follows points out that different models of a bicycle were invented according to the changing needs of a cyclist. E.g., a bicycle was required for performing postal, messenger service, it was also required for the purpose of exercise and sport. The most important need which was satisfied by a bicycle was the need to cover short distances for shopping, pleasure-ride, school going etc. Accordingly a bicycle has come to be used in modern times by school-going children, women, milkmen, small hawkers, (vegetable sellers) government servants, workers,
Considering the different purposes of cycling to cover short and long distances, cycle manufacturing companies have been introducing several structural and technical changes, as well as changes in accessories and other parts of a bicycle like seat, gear system, handle, frame, wheels, or lamps. As a result of these changes, the modern bicycle model offers conveniences for a cyclist to make cycling a useful and pleasant activity.

1. Modern 'Road Star' model is sturdy.
2. Though it is sturdy, it is light-weight. Its weight is kept low so that even children, women, and normal persons can lift the cycle very easily.
3. The gear-system increases the speed of the bicycle. This reduces waste of physical energy in frequent pedalling. (In India, however, a highly sophisticated system of gear is not in vogue.)
4. Height of a bicycle can be conveniently increased or reduced in order to suit the height of any cycle rider.
5. For women - the middle bar has been eliminated.
6. Cushioning of the seat saves a cycle rider from the possible jirks on a rough road.
7. In modern models, folding arrangements are also made so that a cycle can be easily folded and lifted to any height. This would solve the problem of parking when parking place is not available.
The life of a bicycle has been increased because of electroplating and use of high quality raw material. This advantage is more important for agriculturists and workers who want to use a bicycle for a long time and who cover a long mileage.

4.1 THE CHANGING PROFILE OF A BICYCLE AND A BICYCLIST.

HISTORICAL CHANGES IN THE MODEL

Bicycles completed 100 years of their life span right from the time when the penny farthing appeared in 1871. It was a curious machine with its front wheel four and five feet tall. The main factor retarding development in bicycle design was the roughness of the roads.
The penny-farthing model of the bicycle attracted the people because it was a Spectacular tall bicycle which coped with rough or waterlogged surfaces and held the cycle rider well above the mud.

The coaching and animal driven (or bullock cart) days were already over when the railway age came. In the railway age the main roads were empty of through traffic and other minor roads and lanes received less and less attention. Yet the cycle riders paid no rates and consequently used the roads on sufferance. Cyclists were regarded in early days as figures of fun. Nobody believed in early nineties that in few years there would be at least one bicycle in everyone of their houses, that men would ride to work on them and the younger women, when their house work was done, would lightly mount the old bike and pedal away to the market town to see the shops.

People in early twentieth century were willing to walk six or seven miles for shopping & except for the carrier's cart or the tongas there was no other way of travelling. The only obstacle in the way of cycle riders, before the
bicycle became universal was bad conditions of roads.

The status of a bicyclist began to improve when it was conceded by governments in the various countries that the bicycle was a carriage and was therefore entitled to a place on roads. As a result the bicyclist came to be charged with a tax. The only condition which was put for bicycle riding was that a bell was fitted, a lamp was fitted and the bell was rung continuously so long as the machine was in motion. In the end the bicycle came to be seen as the most powerful factor in reawakening the idea that roads were a national rather than just a local concern. Taxation returns of local government show how bicycles rose in the social scale and the expenditure on road maintenance also increased.

When the municipal authorities did not care for maintenance of roads, bicyclists needed resolution and physical strength to get their machines across the stones &
potholes. Consequently the old models were made of strong metal, with a total weight of about 17 cwt. In the case of a sociable tricle, Punch made the most of accidents in 1886.

and it was not till after about 1910, when the cars were appearing, that the great sealing operation with tar at last began. With the tarring of roads, which began very late (after 1940s) in India, the roads
became a pleasure to bicycle along.

The earliest bicycles had no pedals or steering mechanism. They were simply beams on wheels one behind the other, propelled by striking out with the feet as through skatug. They could be made to deviate from a fixed direction only by lifting or dragging the front to one side. There was no need to acquire balance pushing oneself along and it became a pastime for dashing young men. In 1817 locomotion in two wheels at last rose above a purely playful level.
The German Baron von Drais de Sauerbrun succeeded in making a velocifere with a steerable front wheel. He provided himself with a cushioned saddle, and a resort for the arms and chest to facilitate the work of thrusting at the ground with the feet. It is reported that when he first rode his invention in Karlsruhe, where he lived, the people fled in alarm and houres plunged about uncontrollably.

Von Drais was employed as a superintendent of forests and found the machine of use to him on journeys along forest paths. He once rode from Karlsruhe to Schewetzingen in an hour, along a route-mostly downhill which on foot took over three hours.

In 1818 he brought the machine to Paris and called it the Draisienne. As a result of his performance in the Luxembourg Gardens, a new craze began. A draisienne rider covered the thirty seven kilometres between Beaune and Dijoi at an average speed of fifteen kilometres an hours.

France's amusing new sport was copied in England the same year (1818). Some draisienes were advertised as swiftwalkers, though they were
generally known as hobby or dandy-horses. Denis Johnson, a London coachmaker who made various improvements, tried unsuccessfully to introduce the term pedestrian curricle. The novelty of the hobby horse appealed to the Regency beaux, and hundreds were made and sold. Johnson turned out models for ladies with an ingenious dropped frame to allow room for their dresses.

Hobby horses:
About the hobby horses, their possibilities for the messengers was being spoken. Their other possibilities such as take exercise in parks, or have an opportunity of travelling on level roads, were also spoken of and the machines were said
to be beneficial.

One claim about the hobby-horse was -

-A person who has made himself tolerably well acquainted with one could without difficulty, urge himself forward at the rate of eight, nine or even ten miles an hour.... And as schools were about to be opened to instruct young students it was brought into extensive use.

However the new sport irritated the general public. By the end of 1820 only a small body of enthusiasts continued to ride though rarely in public places. Such was the popular prejudice against the hobby-horse that for the next forty-five years little attention was paid to any invention which involved travel on two wheels.

THE VELOCOPEDE

Hobby-horses 13
The two wheeled velocipede was the first true bicycle that could be ridden with the feet entirely off the ground and it appeared in 1839. It was a significant advance on the hobby horse; the frame was a curved wooden backbone, forked to accommodate the rear-driving wheel and to carry the axle bearing near its end. Macmillan velocipede was the first rear driven bicycle in 1839.

In 1865, the velocipede got itself on the map in England and in 1869 velocipede mania developed in U.S.A.
However, it was realised that even a normally athletic person learning to ride a bicycle for the first time would find it hard and exasperating to learn to ride one of the heavy, clumsy, front wheel, driven velocipedes of 1869. This was a skill unthought of by users of 20th century bicycles which involved continuous adjustment of hold on the handle bar against the tendency of each thrust on the pedals to change the direction of the front wheel.
At about 1868 there appeared a British machine that was hinged down the middle. (as indicated in Phantom, 1868 and the other picture above)
The velocipedes models found answer to the various hazards met with in steering. This was a half way stage in the development of the bicycle. Then came the Penny Farthings.

**THE PENNY FARTHINGS**

The shape of the high or penny farthing was extraordinary and they looked dangerous. In the experiments and improvements attempted, later the front wheel steadily grew in diameter and the back one shrank.
In 1881 the Smith Machine Company of New Jersey produced an allegedly safer version of the high bicycle called the star. It had the large wheel behind and the small one in front—in a manner of speaking, anyway—and was said to make falling
forwards impossible since the rider's weight was above the back wheel. Although nervous people were afraid of falling over backwards, the Star sold well for several years. It was propelled by levers with a strap and pawl and offered the peculiarity that each treadle worked independently; indeed, for a sudden spurt, both feet could be pressed down together.

Surprisingly, it was found that the Star travelled quite well over rough ground. An English visitor from Swansea—Stanley Heard—tried it out on a railway track and reported that he rode several miles over the sleepers.

But the Star was a heavy machine and to steer it properly a skill could only be acquired with much practice.)
The American Star was not seriously taken up in England. But even while the high-wheeler was at the height of its popularity (when scarcely any other sort of bicycle was seen on the roads), great efforts were being made behind the scenes to invent something safer and not less fast; apart from falls, it was by no means simple to stop as quickly as events often demanded in heavy traffic.

The early attempts were all based on the high-wheeler. The saddles was moved further back. But it was found that this made pedalling harder, and that vibrations from the small back wheel became uncomfortably noticeable. Once it was taking a greater proportion of the rider's weight. The back wheel was enlarged: this made the bicycle heavier. Pedalling by indirect means seemed the only way to seat the rider lower down and further back. As the front wheel remained the driver, some curious-looking machines resulted.
The most celebrated of the bicycles then known as safety ordinaries were the extraordinary of 1878.

The Kangaroo, as shown in the above picture, patented by E.C.F. Otto, and J. Walls, was even more of a departure in that its front wheel was only thirty-six inches in diameter. But an arrangement of short chains
sprockets with a step up ratio compensated for the decrease in diameter; in fact the wheel was so geared that it could cover for each revolution of the pedals the same distance as a fifty-four inch wheel. On 27 September 1884 G. Smith covered a hundred miles on a Kangaroo in seven hours seven minutes then the fastest time on record for any cycle.
4.2 THE SAFETY BICYCLES:

The safety bicycle, the familiar low machine with a chain-driven to the back wheel began to make tentative showing on the roads in 1884. The high wheeler was holding its own in 1890. But, the solid tyred safeties vibrated more and pedalling so near the ground allowed mud to splash over the feet and the chain driven wasted power.

But the introduction of airfilled tires was beginning to tip the scales in favour of the machine. The first man to fit a bicycle with air tyres was John Boyd Dunlop.

Safety bicycle fitted with the even and improved pneumatic tyres brought about a remarkable change in every day life. By the middle of the 1890, it was obvious that a cycling boon was in process. People of every social class wanted a bicycle and existing factories found themselves unable to keep up with the demand. The bicycle became an accepted conveyance for getting to social and business engagements. Meanwhile the
high bicycle no longer seemed in the list 'Ordinary' and acquired the good name of penny farthing. One of the last high bicycles to be turned out was the Rudge Ordinary of 1892 with a pneumatic tyre on its 56" wheel.

B.S.A. Safety, constructed largely with tricycle parts was introduced in 1884.
J.K. Stanley's first Rober Safety was introduced in 1884.
As the above photograph indicates, the Rover had almost a modern air because the difference the diameters of the wheels was reduced. (other front wheel 32" and the back wheel 30" indiameter) The main advantage desired by the Rorer Safety was that for the same expenditure of muscular energy a person riding this type of bicycle could cover about five times the distance that could normally be covered on foot. Nevertheless following other designs were made up before the diamond frame arrangement became standard.
The year 1890 saw the production of a diamond framed Humber bicycle barely distinguishable from bicycles running today.

*Safety bicycles* 99
The fact that bicycling was being taken up by the rich gave manufacturers a chance to experiment with very expensive bicycles. The Durley Penderson model was comfortable as well as light and went on being made till 1944.

The first practical bicycle appeared in 1886. It reached a satisfactory form in 1897 with the introduction of a sturdy model by Raleigh.
THE ROADSTAR MODEL
4.3 Usefulness of different models:

ROADSTER Model No 1

This is the most popular model used by Indians. The price of this model is moderate for a middle class consumer. There is no difficulty regarding availability of spare parts as they are manufactured by the Indian companies. The duration of Life of this cycle is 10 years. Thus the cost of Rupees 650/- invested in the vehicle is distributed over 10 years. This is the most sturdily multipurpose model which is used by newsboys, milkmen, college students. The cost of maintenance and repairs does not go beyond Rs 10/- per month. The parking of vehicle is also convenient because of the light weight it can be lifted and put into homes at the second or third floor.

FEATURES OF ROADSTER

FRAME: 55/60 cms. (22/24 x 28 x 1.1/2 wheel. Built of best quality steel tubes, brazed up lugs, seatstays, front Fork with tubular crown and plated thimbles Blacks of Green enameled.

HANDLEBAR: Raised pattern with double levers and grips.

RIMS: 28 x 1.1/2 Westwood Pattern 32/40 holes, BCP finish.

TYRES: 28 x 1.1/2 Slick.
SPOKES: 14 G High Tensile Steel Wire bright galvanised.

HUBS: Front & Rear thin barrel with 5/16 and 3/8 spindles.

FREEWHEEL: 1/2 x 1/8 x 18 Teeth.

BRAKES: Front & Rear Rim brakes.

MUDGUARDS: Deep dome shaped with white tail and reflector.

CHAINWHEEL AND CRANK: 1/2 x 1/8 x 44 Teeth with square cranks CP.

CHAIN: 1/2 x 1/8 best roller chain.

PEDALS: 4" with pyramid cut black rubber colour.

SADDLE: 90/3 CP with leather top.

ACCESSORIES: Quarter Chain cover.

EXTRA ACCESSORIES: Full oilbat gearcase, bell, carrier, pump with pump clips, single side stand a tool bag with tools and dynamo lighting set.

PACKING: 10 CKD Bicycles in a strong wooden case.
SLR Model No. 2

This is described as sport Light Roadstar Model. As the name suggests it is a light vehicle used by school and college students. The model is light and cannot be used for transporting heavy articles. The handlebar and brake arrangement are such that it can be driven fast. The height of the model is lower than the Roadstar model No. 1 and this facilitates the getting on and getting down activities in rush hours on heavy traffic roads. A variance in this model is very convenient for the Lady cyclist to go to offices and shops and colleges.
FRAME: Gent's 21" or 23" x 26 x 1 3/8" built of best quality steel tube. Brazed up lugs, straight tapered seat and chain stays entirely brazed. Front fork with tubular crown and plated thimbles. Flamboyant finish with Red, Blue, Green Lemon and Rich Burgandy, with attractive Decorals on bottom and seat tube.

HANDLE BAR: Sports Handle Bar bent with extension stem and PVC Grips. RIMS: 26" x 1 3/8" Endrick C.P.

TYRES: 25" x 1 3/8" Black or with white side wall.

SPOKES: 14 G High Tensile Steel Wire

HUSS: Thin barrel, front with 5/16" and rear with 3/8" spindles.

FREEWHEELS: 1/2" x 1/8" x 18 Teeth with full row of steel balls.

BRAKES: Caliper Brake C.P.

MUDGUARDS: Centre Ribbed Section with attractive C.P. Mascot and half round stays.

CHAINWHEEL & CRANK: 46 T x 6 1/2" Crank C.P.

CHAINS: 1/2" x 1/8" Best Roller Chain.

PEDALS: 3 1/2" with curved rubber.

SADDLE: Spring Seat with two tone rexine cover.

ACCESSORIES: Quarter Chaincover, Single Side Stand and Carrier.

EXTRA ACCESSORIES: Tool Bag with tools, Pump, Bell, Full Oil Bath Gear Case, Dynamo lighting set.

PACKING: 3 to or 6 Bicycles in case.
This model was introduced specifically for the people residing in the flat system and housing colonies the wheels of the bicycle one smaller than the wheels of the regular bicycle. The model is light and can be shifted to any floor, by using the lift system. The frame and the handle arrangements are such that, the height can be reduced or lowered depending upon the age and height of the person using it. This is a fancy model used by rich people their children and the aged people. It is a status symbol or Luxary item for the rich families. The maintenance cost is less relatively but the spare parts are not easily available, because of its odd size.

HANDLE BAR : High Riser with plastic grips.

RIMS : 20" x 1.75" Endrick, C.P.

TYRES : Front 20" x 1.75" and Rear 20" x 2.125" Black or with

HUBS : Thin barrel-front with 5/16" White side wall and Rear with 3/8" spindles.

SPOKES : 14 G High Tensile Steel with full row of steel balls.

BRAKES : Caliper Brake - C.P.

MUDGUARDS : High Riser profile white painted.

CHAINWHEEL AND CRANK : 46 T. 5 1/2" Crank C.P.

CHAIN : 1/2" x 1/8" x 92 Links

PEDALS : 3.1/2" with reflector.

SADDLE : Banana Seat with single steel base, 3% reflector and 'SISSY' bar.

ACCESSORIES : Rear safety reflectors, Chaincover, Kickstan Bell and Pump.
This model possesses all the salient features of the regular roadstar model. Moreover the additional facilities which are available in this model are specially made for persons like workers and milkmen who carry heavy loads on the wheel. Therefore this is popular heavy vehicle among the workers and milkmen. This model can be used with maximum convenience on rough roads in villages.

FRAME: 55/60 cms. (22/24) x 28 x 1.1/2 wheel, Built of best quality steel tubes, brazed up lugs, seat stays Front Fork with box crown and CP cover Black or Green enameled.
HANDLEBAR : Raised pattern with double levers and grips.

RIMS : 28 x 1.1/2 Westwood Pattern 32/40 holes, BCP finish.

TYRES : 28 x 1.1/2 Black.

SPOKES : 14 G High Tensile Steel Wire bright galvanised.

HUBS : Front & Rear thick barrel with 5/16 and 3/8 spindles.

FREEWHEEL : 1/2 x 1/8 x 18 Teeth.

BREAKES : Front and Rear Rim brakes, sidepull type.

MUDGUARDS : Deep dome shaped with white tail.

CHAINWHEEL AND CRANK : 1/2 x 1/8 x 44 Teeth with square cranks CP.

CHAIN : 1/2 x 1/8 best roller chain.

PEDALS : 4" with Pyramid cut black rubber.

SADDLE : 90/3 CP with leather top.

ACCESSORIES : Quarter Chain Cover and reflector.

EXTRA ACCESSORIES : Full oilbath gearcase, bell carrier, bell pump with pump clips, single side stand, tool bag with tools and dynamo lighting set.

PACKING : 10 C.K. D. Bicycles in strong wooden case.
MINI HI RISER MODEL No. 5

This is a model specially manufactured for children who want to learn cycling because there are supporting wheels which facilitate balancing in early period. This reduces accident frequency and injury to the cycle riders. The supporting wheels can be later on taken away. Because of the small size of wheels this model cannot be used for long run journeys. As production of this Mini Hi Riser Model No. 5,
is on relatively small scale, the cost of vehicle is relatively high. It is popular among the rich families. It is used for small pleasure trips and not for long journeys.

FRAME 12" x 16" x 1.75" Cantilever type built of high resisting cold drawn precision steel tubes. Telescopic front fork with spring. Flamboyant finish with Red, Blue, Green, Lemon and Rich Burgundy.

HANDLEBAR : High Riser adjustable plastic grips.

RIMS : 16" x 1.75" Endrick, CP.

TYRES : 16" x 1.75" front and rear

SPOKES: 14 G High Tensile Steel Wire, UCP.

HUBES: Thin barrel front with 5/16" and rear with 3/8" spindles.

FREEWHEEL : 1/2" x 1/8" x 16T.

BREAKS: Caliper Brake CP

MUDGUARDS: Deep Dome Shape with Sheet metal stays.

CHAINWHEEL & CRANKS: 34T x 5" Cranks CP.

CHAINS : 1/2" x 1/8" x 74 links.

PEDALS : 3" Black

SADDLE : Banana Seats with reflector and 'Sissy' Bar.

ACCESSORIES : Quarter Chaincover and training wheel.

EXTRA ACCESSORIES : Bell and Pump

PACKING : One Semi assembled bicycle in a carton.
ALL ROUNDER MODEL No. 6

This is the all rounder-multi purpose multi generation model. The peculiarities of this all rounder model are - the adjustable handal and the bend. The adjustment in the handal and seat arrangement can be made according to the age, height and temperament of the person. This model can be used in one family from one generation to another. It can be used by all children of different ages in the family so that the cost is divided among many persons. The wheels of the bicycle and its height are small and it can be used for covering small distances and for pleasure trips.
FRAME: 14" x 20" x 1.75". Built of best quality steel tubes. Brazed up lugs, cranked seat and bolted-up, chain stays. Front fork with Balloon type fork lugs and Crown Cover-Flamboyant finish Red Blue, Green, Lemon and Rich Burgandy.

HANDLE BAR: Hi-Riser Model with adjustable stems and PVC grips.

RIMS: 20" x 1.75" Endrick C.P.

TYRES: 20" x 1.75" front and rear

SPOKES: 14 G High Tensile Steel Wire UCP

HUBS: Thin Barrel front with 5/16" and Rear with 3/8" spindles.

FREEWHEELS: 1/2" x 1/8" x 18 Teeth with full row of steel balls.

BRAKES: Caliper Brake C.P.

MUDGUARDS: Deep Dome Shape with half round stays.

CHAINWHEEL & CRANK: 40T x 5 1/2 Crank C.P.

CHAIN: 1/2" x 1/8" x 92 links.

PEDALS: 3 1/2" with white or black rubber.

SADDLE: Two tone Sports Model.

ACCESSORIES: Centre side Stand Quarter Chaincover and Reflector

EXTRA ACCESSORIES: Tool Bag with tools; Pump, Bell and lock.

PACKING: 3 Bicycles in a case.
This is a typical model introduced not for the purpose of cycle riding exactly. It is a chaired cycle machine used as health or exercise apparatus having medicinal qualities. As has been said earlier cycling is a good exercise for keeping good health. It is advantageous to patients suffering from old age, excess weight, rheumatism and heart disease, because it has medicinal properties, hence it is used in hospitals, adult homes and gymnasiums.
BICYCLE ON THE MARCH

NEW DESIGN BICYCLE

The compulsion to save energy and interest in keeping fit have led to a renaissance for the bicycle. Although improvements have been made over the years, the bicycle has remained basically unchanged since its introduction some 100 years ago.

A completely new design is now coming on to the market. Developed and produced in Sweden, the new bicycle is almost completely constructed of glass fibre reinforced plastic. This material has high strength and is lighter than steel. It is corrosion resistant as well. The complete frame, fork spoked wheels, mudgards, handlebars, crankcase and carrier are all produced by injection moulding techniques. The damping properties of the plastic make the bicycle easy to ride, little effort is required and progress is smooth.
4.4 CHANGE IN THE MODELS OF THE CYCLE AND THEIR IMPLICATIONS FOR A CYCLE RIDER.

We have studied the changes in the models of a bicycle with a view to relating these changes to mobility of a cyclist. It is not a study for its own sake. The changes in the models of bicycle have the following important implications from the point of view of a cycle rider:

(1) Change in the height of a bicycle has increased cyclist's convenience in terms of balance. The loss of strength in getting up and down the cycle is saved. This would increase mileage covered with a little energy spent.

(2) The weight of the cycle is reduced and people of different ages and sex (children, women workers, sportsmen) can now drive the cycle, with much ease and loss of energy. Under the new multi-storeyed flat system a housing this has a typical advantage in respect of parking. The security of a bicycle has increased as the new model can even be folded and carried over any distance and lifted to any height.
The changes in the models have increased the sturdiness and life of the cycle without increasing the cost of maintenance and repairs. It can be put to many uses — people can ride it to work, children to the schools, women can pedal it away to the market. Thus modern cycle has got recognition as "carriage" from governments, which entitles it a place on roads and even without a tax. Sturdiness of a bicycle is important in our country taking into consideration the bad condition of roads.

Cycle can be driven with a minimum condition of 'bell' and a 'lamp'. Accident frequency can be reduced where this minimum condition is fulfilled.

With the tarring of roads pleasure in cycling has increased and fatigue reduced. On a bicycle a cyclist can carry a load up to 20 Kilos and can comfortably cover a distance of 25 to 50 kilometers. This is an advantage typical to workers, agriculturists, milkmen, hawkers, among whom 'Cycle' is the most popular and cheapest means of transporting goods.
With the introduction of gearing mechanism in future, steering process will be simplified. There is a special advantage when one is cycling in a hilly area where the roads are topsy turvy.

The handles of cycle deviate easily from a fixed position. This facilitates swift movement in crowded areas. Machines of a bicycle can be propelled at 20 to 30 miles an hour. Thus coverage of distance and average speed (8 to 9 miles an hour) increases and cushioning of the seat does not add to physical harassment over a long distance. Journeys along the forest paths are also possible. This is a special advantage to messenger postmen.

With balancing power used by hands and legs, response to lateral pressures is quick. This is an important sport aspect of the vehicle.

A bicycle requires energy 1/5th of the energy required for a machine-driven vehicle. On a bicycle one can ride at the rate of 15 to 20 kilometers an hour. Cycling renders physical exercise which is equivalent of exercise in wrestling for 10 minutes, table tennis for 50 minutes and 4 kilometers of fast walking. This is the peculiar health advantage.
(10) A plastic model of a cycle has a much lesser weight than that of the common model. A plastic elastic coating inside the wheel reduces the frequency of punctures by 75%.

(11) Improvements in the cycle model are going to reduce health hazards and accident hazards. During 1981 a total of 2731 traffic accidents were recorded involving 163 deaths in Pune. The high frequency of accidents is the result of an increase in the number of vehicles. In 1961 these were 22,252 registered vehicles (all types). In 1982 there are more than 1,70,600 registered vehicles. Today, population of Poona is 17 lakhs. This is expected to be doubled by 2005 and the traffic is expected to be threefold of the present traffic volume. As a result we need a bicycle which reduces accident hazards.

There has been preponderance of cycle traffic and the main reason behind it is the inadequacy and high cost of public passenger transport system. (P.M.T. Buses). The Pune people have a historical frame of mind to exert themselves over long distances. People want bus stops at their doors. To cover short distances they make use of bicycles. If the people take to walking to cover
distances requiring 10 to 15 minutes, a lot of bicycle traffic could get reduced; so will be the pressure on public transport. However facilities like mini buses of 25 passengers are not introduced so far and people depend either on bicycles or on scooter rickshaws which carry two or three passengers. Taking into consideration the rising costs of machine driven vehicles one can say that dependence on bicycles is going to increase and the more the improvements in a cycle model the more would be dependence of cycle in future.

All these peculiarities of the modern cycle model have gone a long way in creating a "Cycle age" and "the cycle boom" in both the developed and underdeveloped countries.
4.5 Conclusions:

The improvements in the model of a bicycle render cycling an easy and useful activity. This activity is bound to increase mobility of common people who cannot afford to purchase a costly power-driven vehicle. From the point of view of society also it has the following specific advantages:

1. It reduces health-hazards and accident hazard resulting from pollution and traffic congestion respectively created by other vehicles.

2. It can be used on rough roads, hilly areas and forest areas. This is important in view of the fact that still 70% of our population lives in villages - areas of rough roads and hills.

3. Cycle can be used irrespective of age, sex and other physical characteristics of a cycle riders. All types of convenient and sturdy models are available to the rich and the poor, to men and women, to old persons and children. Thus influence of a bicycle on the mobility of population in all pervasive both in cities and villages. This is a development which is not only
peculiar to developing countries like India but also to other advanced nations like Germany, U.S.A. and U.K. where several hazards and problems of the city life are solved by a cycle.

The world has taken to cycling for various reasons. We have indeed come a long way from the earliest crude machines to the most sophisticated speedy machines of today. There is, doubtless a bicycle boom all over the world. Mr. Jawaharlal Nehru, on knowing that the number of cycles in the country was greater than that of the other vehicles said "India had entered the Bicycle Age". One can but be proud of this development. But there is no time for complacency. Our efforts should be to make and put out the BEST BICYCLES in terms of quality and in terms of better value for customer's money. This need is an everlasting one and the cycle industry has to dedicate itself to the cause of cycling.

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