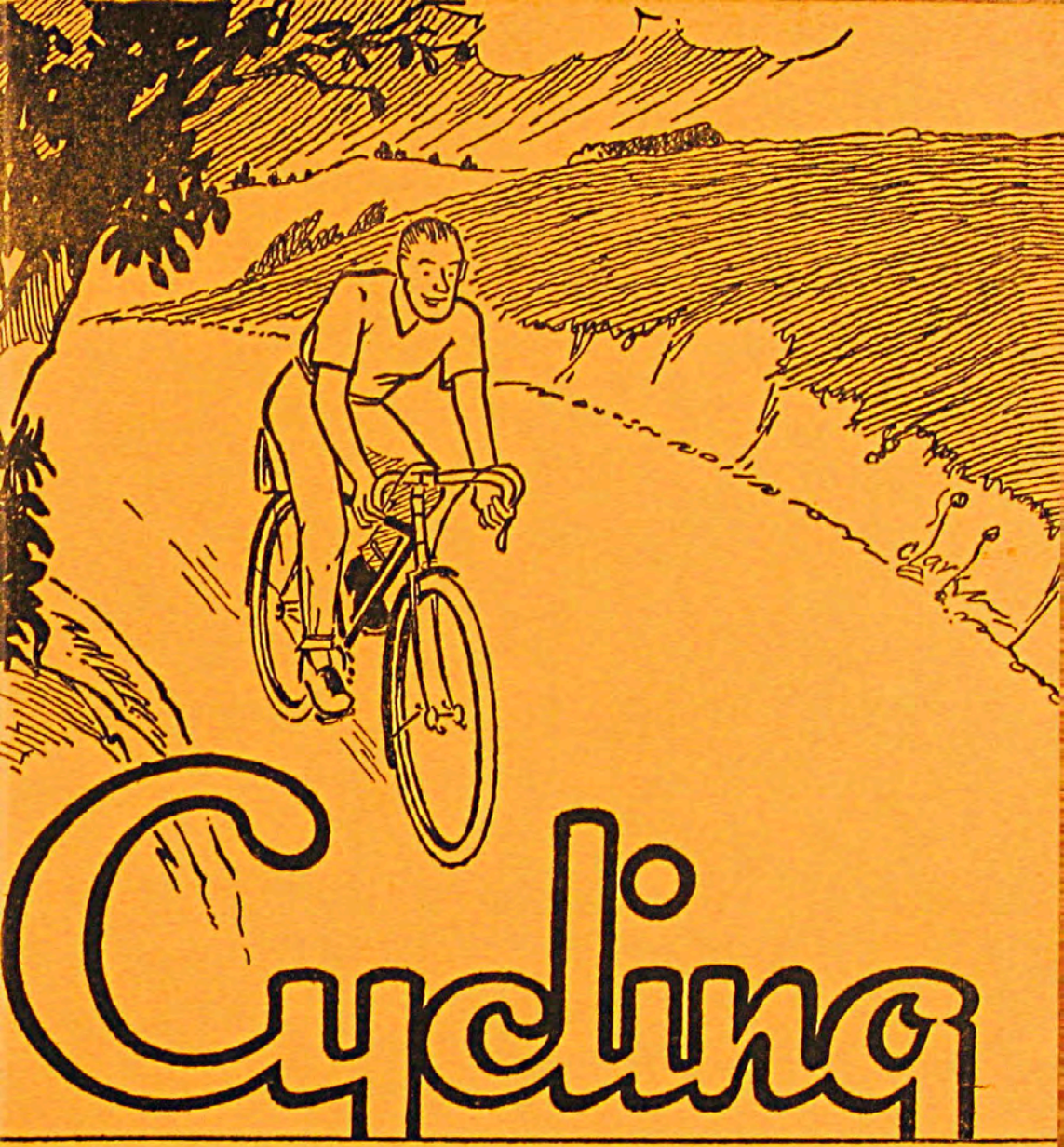


Cycling HANDBOOK

PUBLISHED BY
LEAGUE of AMERICAN WHEELMEN, INC.
CHICAGO, ILL. U.S.A.

CYCLING HANDBOOK

Published by

LEAGUE OF AMERICAN WHEELMEN INCORPORATED
224 NORTH DESPLAINES STREET
CHICAGO 6, ILLINOIS

PRICE $1.00

PRESS OF
THE JUDSON COMPANY
CLEVELAND, OHIO

CONTENTS

FOREWORD

It is high time we had an anthology of the cycle touring sport in the United States, and here it is. We felt that there was a place for it, not only because of its literary merit but principally because cycling and cycle touring provide such excellent benefits in health, recreation, companionship, and good fellowship. To this end we solicited ardent cyclists, amateur and professional, all experts in their fields, for the preparation of chapters. This book is the result.

Grateful acknowledgment is due the following contributors of written material in *Cycling Handbook:*

John P. Bayler
Frank T. Christian
Paul O. Dedmon
Miriam Dickerson
W. T. Farwell*
Will Hahn
Fred F. Harris
A. Vern Heim
Norman Hill
Bob Jacoby
John Kruger
Alfred Letourneur
Watson Nordquist
Walter Norris
Hans Ohrt
Hamilton Osgood
Charles G. Peker
George E. Russell
Bill Shepherd
Jack W. Stauffacher
Oscar Wastyn
Sidney B. Zwick

To Warden Clark for the cover illustration and other drawings, and for invaluable advice and assistance on layout.

To the manufacturers and individuals who contributed cuts and photographs to illustrate the text.

To the faithful and forward-looking persons who had confidence in us and who contributed to the L.A.W. Publicity Foundation.

To Miriam Dickerson, L.A.W. Publications Chairman, for her many months of work in gathering and editing material for the book.

To the advertisers whose splendid support made possible its production.

* * * * * * *

The opinions expressed in the following chapters are those of the individual authors and do not necessarily reflect the official opinion of the League of American Wheelmen, Inc.

*Deceased February 23, 1946.

We are confident you will find this volume full of interest and helpful to you in experiencing keener enjoyment of cycling. Its abundance of information makes it a truly worthwhile and valuable book, fulfilling a long-felt need. We hope you will like it.

George R. Schweitzer
President, 1945-1946

League of American Wheelmen, Inc.

Chapter I

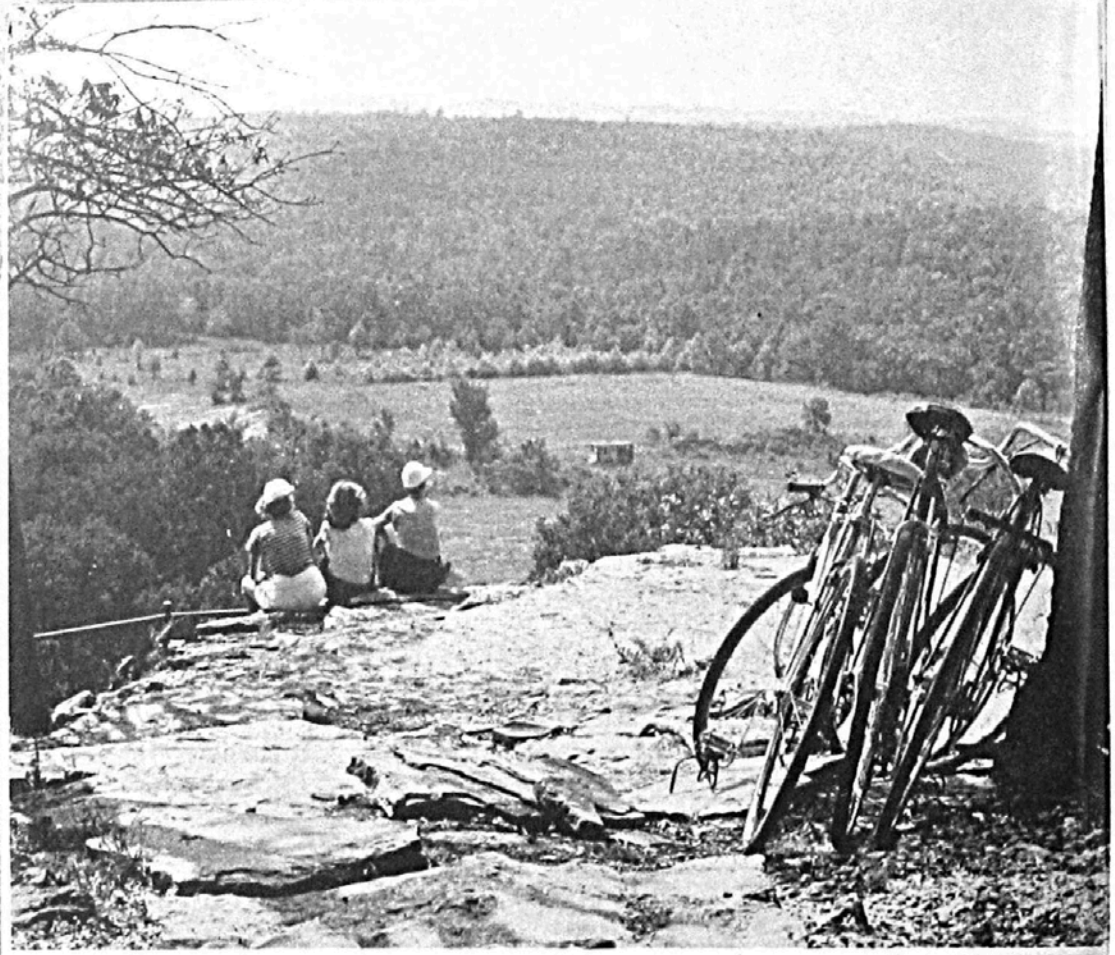
Popularity and Benefits of Cycling

Advantages of Organization of the Sport

BETWEEN the years when the bicycle swiftly lost favor to the automobile and the years immediately preceding World War II, the bicycle in the United States was used primarily by children, first as a toy and later as a means of transportation to work or play. Usually boys stopped riding bikes when they became more interested in driving an automobile, and girls stopped riding whenever they began to feel that bicycles were childish. Here and there an adult would continue using his bicycle for transportation to work, but he was likely to be regarded as a bit eccentric. These riders, together with the racing fraternity, who cultivated the sport for a different reason and required specialized equipment, composed the "cycling body" of the American public.

Because of the absence, between World Wars I and II, of an enlightened stratum of adults who liked to cycle for pleasure and health and would demand appropriate equipment for their sport, the design of the bicycle as purchased by or for American chil-

Miller W. Robb



Bob Jacoby

dren became more and more exaggerated. The classic simple lines perfected in the heyday of the "wheel" became distorted, sometimes almost beyond recognition, as American manufacturers vied with one another to produce machines which would please American youth by their resemblance to motorcycles and which could be mass-produced cheaply.

The introduction by progressive manufacturers, a few years before we entered World War II, of lightweight touring bicycles in both inexpensive and expensive models brought about a revolution in the sport. Cycle touring clubs composed of adults and late teen-agers rapidly developed in well-populated centers, and information about the new type of bicycle was spread throughout the country by dealers interested in promoting cycling as adult recreation.

The new cycle clubs, some railroad companies, and a few newspapers developed publicity for the sport by sponsoring "cycle trains" which would bring together large numbers of urban cyclists for a day of sociability, making it possible for them to travel together by special train to some point distant from the city before beginning their

special bike ride for the day—all carefully planned in advance.

Today cycling owes its popularity to the same characteristics that made it zoom into favor in the late part of the last century. It is a "ready" sport. One need not search around for a certain number of other "players" before being able to enjoy it. Assuming his wheel is in usable condition, the cyclist is always ready to go. The health and recreational benefits of the sport are ever at hand, at the rider's beck and call.

In this democratic country of ours, cycling is one of the most democratic of all sports. It is a great leveler. Everyone who rides a bike is on the same terms with the sport as every other rider; he must use *leg* power to get where he wants to go. Differences in wealth, social position, and education are of no significance in the enjoyment of this sport, except as they make possible differences in the quality of the rider's machine.

Many medical authorities of the past and present could be quoted on the salutary effects of cycling on individual health. It is especially beneficial for those who are too mature to take part in competitive sports, and for those whose sedentary occupations have made strenuous exercise inadvisable. They can readily and safely obtain the desired amounts of fresh air, sunshine, and exercise by cycling out either alone or in a group. The pedal action exercises practically all muscles of the body, strengthens the legs, induces good breathing, stimulates the circulation, and improves digestion.

Cycling is relaxing to the mind and nerves. The temporary freedom from the "daily grind" and the delightful sensation of moving forward on a road without appreciable effort (which is true if one's bicycle is of the proper size and in good running order, and if his position on it is correct) provide a release for the spirit that is difficult to understand until it has been experienced.

As mentioned before, cycling is a sport which can be as readily enjoyed alone as in a group, but it is an extremely sociable pastime. A cyclist meeting or passing another cyclist on the road feels for him a sense of comradeship. The sport lends itself naturally to group participation, and most novices will soon discover that it is even more enjoyable in the company of others. Cycling clubs, the natural result of this comradely attitude, are discussed elsewhere in this book.

Cyclists becoming sincerely interested in their sport will look about them to learn what other sportsmen are doing in the same field. Those who are chiefly interested in bicycle racing will become acquainted with the Amateur Bicycle League of America, which is the official governing body of organized bicycle racing in this country. The League of American Wheelmen is devoted to the welfare and progress of touring cyclists, who of course are more numerous than the racing specialists. The lodging facilities for tourists offered through membership in the American Youth Hostels are available to all cyclists, as to all other sportsmen who "travel under their own steam."

The reborn League of American Wheelmen, discussed in Chapter II, is

Miller W. Robb

devoting its attention to reestablishing for modern cycle tourists the same sort of benefits offered by the League to the cyclists of the '90's. Many working together can achieve more than the same individuals working separately or without a goal. Membership in the League offers to cyclists information on advancement of the sport and the opportunity to learn what other cyclists and cycle clubs are doing in their own localities. It also provides information about large social gatherings of cyclists (often termed "round-ups") through which one's friendships may be increased and his experience enriched in both pleasure and new knowledge about the sport.

CHAPTER II*

The League of American Wheelmen

Its History and Accomplishments

THE League of American Wheelmen is a venerable and honorable institution which played a vitally important part in fostering and promoting the cycling movement in America. When cycling was a very young thing it needed care, encouragement, and protection. The League supplied that need. From the date of its founding, in 1880, the L. A. W. walked hand in hand with all cycling development during the first two decades of its active life. Starting with fewer than two hundred members, it rapidly gained in growth and power until it topped one hundred thousand at the height of the bicycle boom in the late '90's.

In the early days the L.A.W. fought the good fight for the right of wheelmen to use the public streets and highways. It started the good roads movement. It opened the parks and drives to wheelmen. It promoted touring and published road books. It governed amateur racing for twenty years. Nothing was too great, nothing too small for this organization to take under its wing.

Before we go into the history of the L.A.W., let us dig up the old velocipede or "Boneshaker" of 1868-69. Crude and impractical as it was, it nevertheless created a worldwide furor, and nowhere did it rage more violently than in this country. Carriage makers had all they could do to supply the

"Free-wheeling" in Boneshaker days.

demand, and riding rinks were established all over the country. P. T. Barnum, of circus fame, opened one in Jersey City. When tried out on the road, however, the machine proved impractical—a "boneshaker," but definitely—and after one short year the velocipede boom blew up with a loud

*Ed.: Most of the following chapter was written by William T. Farwell of Chicago, and was completed less than two weeks before he passed away suddenly on February 23, 1946. We are deeply indebted to him for setting down for us this excellent historical record which he knew so well.

The "Facile" bicycle—1878.

bang. We in America dropped it like a hot cake. The boom lasted long enough, however, to arouse considerable prejudice, and the ordinances of nearly every city in the East contained restrictions against the use of the velocipede. These old laws, in many instances, were dusted off and put into effect when the first real bicycles were imported into this country.

While the Boneshaker was quickly forgotten over here, English and French makers continued its development and finally evolved the well-remembered all-metal, rubber-tired high bike, or "Ordinary," as it was later called. A half dozen or so of these English bicycles were exhibited at the Philadelphia Exposition in 1876, and most of them were later sold to Boston riders.

These Boston men were the real cycling pioneers. A. D. Chandler, a Boston attorney, imported a Singer bicycle direct from England in the spring of 1877 and became the first to ride regularly. Others soon followed. Frank W. Weston, prominent architect, was the greatest enthusiast of them all. He founded the first cycle importing firm in 1877. He published the first cycling paper, *American Bicycling Journal,* December 22, 1877, when there was but a handful of bicycle riders. He organized the first bicycle club, the Boston Bicycle Club, February 11, 1878, and he was the first to suggest a national organization such as the L.A.W. Weston was known for many years as "the father of American cycling." It was also a Boston man, Colonel Albert A. Pope, who established the first American bicycle manufacturing concern in 1878. Thus Boston was the cradle of cycling America.

After the first club was established, more began to spring up all over the country, from Maine to California and from Canada to the Mexican border. Wherever five or six wheelmen could be rounded up, they formed a club for companionship and protection. The lone rider was frequently the object of unwanted attention—overripe tomatoes and such—from corner loafers. Then there was the animosity of the horse and buggy drivers to combat. They claimed that the bicycle had no right on the highway because it made their horses shy. The clubs and the L.A.W. fought and won many cases in which drivers had crowded wheelmen off the road or had deliberately run them down.

The clubs were a most important factor in promoting the growth of cycling. By 1880 there were some forty clubs in existence. They led to

the founding of the League, and that institution saw its palmiest days when its cornerstones were clubs. When the novice became the proud possessor of a new wheel he immediately joined a club, and the club—with very few exceptions—joined the L.A.W.

The foregoing discussion touches upon the high spots in cycling history which prepared the ground for the founding of the League.

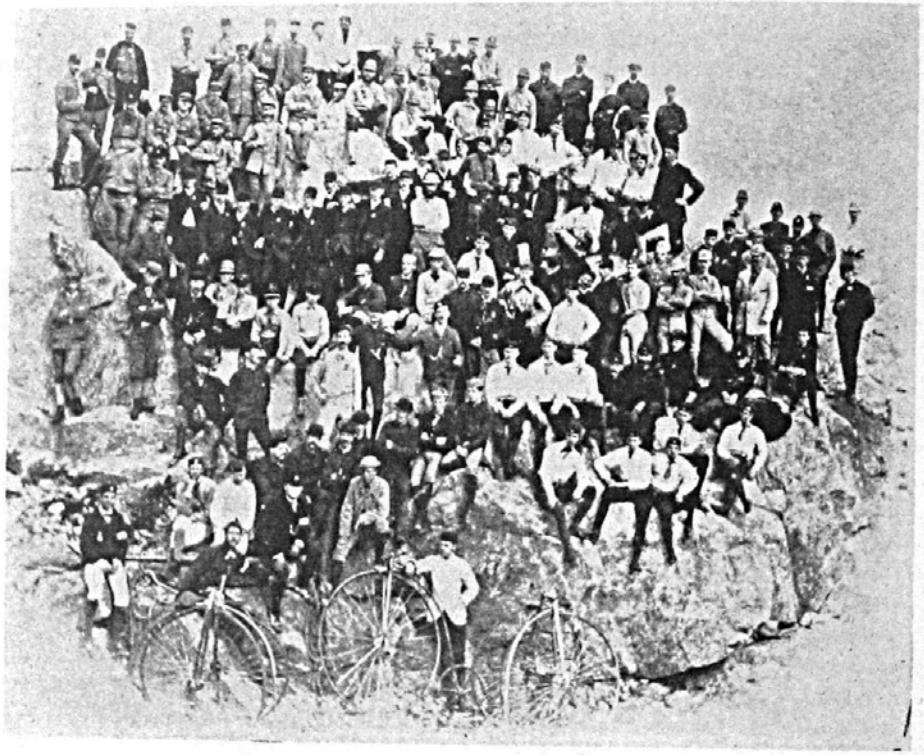
Three prominent cycling pioneers were the prime movers in the organization of the L. A. W.: Frank W. Weston, Charles E. Pratt, president of the Boston Bicycle Club and editor of *Bicycling World* (founded in 1879), and C. Kirk Monroe, editor of *Harper's Young People* and president of the New York Bicycle Club. In *Bicycling World* of March 20, 1880, Pratt developed the Weston idea, and announced that considerable correspondence had passed between Boston and New York parties pertaining to the holding of a grand meet at Newport, Rhode Island, on Decoration Day. On April 17, in *Bicycling World,* Monroe issued a call to all bicycle riders, cordially inviting them to participate in the meet. Mr. Pratt carried the suggestion still further in the same magazine of May 1, when, in a statement to all club secretaries, he suggested that the forthcoming meet would prove a most suitable opportunity for the formation of a bicycle league. On May 15 the advance program of the meet was published, together with a strong Pratt editorial urging all wheelmen to attend.

The Newport convention was a great success. It was a three-day affair. On the 29th and 30th of May, representatives of New York, Boston, Philadelphia, Washington, Chicago, Cleveland, and many other points gathered in this famous town. By Monday, May 31, when the convention met, there were 150 wheelmen in the city, representing 32 clubs, and including a number of unattached riders. The convention was called to order in a skating rink by Mr. Monroe, who briefly stated the objects of the meeting. The usual committees were appointed, a constitution was adopted, and officers were elected for the year 1880-81.

As stated in the second clause of the constitution, the objects of the League were "to promote the general interests of bicycling, to ascertain, defend and protect the rights of wheelmen, and to encourage and facilitate touring."

The first officers of the League are worthy of mention here: president, Charles E. Pratt; vice president, T. K. Longstreth of Philadelphia; commander, C. K. Monroe of New York; corresponding secretary, A. S. Parsons of Cambridge; recording secretary, J. F. Burrill of New York; treasurer, H. L. Willoughby of Saratoga. State Directors—afterwards called Consuls—were appointed, and the organization got off to a good start. The machinery was similar to that of the English Cyclists' Touring Club, which was founded in 1878.

The meet wound up with a bicycle parade in the afternoon and a banquet in the evening. The parade, with 151 riders in club formations—each club in uniform, created quite a sensation, as well as much favorable publicity for cycling. The press was well represented, and the newspapers of New



Courtesy A. E. Schaaf

Organization Meet of the League of American Wheelmen, taken on the rocks at Newport, Rhode Island, May 30, 1880.

York, Boston, and other cities carried reports of the meet. *Harper's Weekly* published a full-page drawing of the parade. So favorably did the wheelmen and the parade impress the Newport authorities that the Mayor rescinded a restrictive ordinance. Only a year before the meet, he had issued strict orders to exclude bicycles from the streets, and a special permit had to be obtained before the meet could be held.

On September 18, 1880, a meeting of the Board of Officers was held in New York, when a set of by-laws, together with rules and regulations for the control of amateur racing, was adopted. By this time the membership had grown to 527.

The first case affecting the rights of wheelmen with which the L.A.W. dealt was the Haddenfield (New Jersey) Turnpike case. The Pike company refused to allow bicycles on the Pike. The League proposed making a test case and supported the Philadelphia club in starting suit. Then the company backed down and revoked its anti-cycling policy. All expenses—$50—were paid by the League.

By the date of the second annual meet, which was held in Boston May 30, 1881, the League membership had mounted to 1,654, an increase of 1,503 in the first year of its life. About 750 riders took part in the big parade, in which 61 clubs were represented, and there were 137 unattached wheelmen.

As the majority of the members lived in the eastern States, it was decided to spread the gospel of cycling farther afield by holding the third annual meet in Chicago, May 30, 1882. Although the attendance was not up to that of the eastern meets, this Chicago meeting proved to be a wise move. The parade, with 294 wheelmen in line, created quite a sensation. The bicycle was still a novelty in the Middle West, and the public had never seen such a large gathering of riders.

Mayor Carter Harrison was the guest of honor at the banquet, which was held at the old Grand Pacific Hotel. In his very complimentary address he praised the work of the League and promised to do all he could to abolish the restrictive bicycle ordinances then in force. As a result all parks and drives, formerly closed to wheelmen, were soon opened to them. A new code of by-laws was adopted at this meet which provided for the election of Chief Consuls in each State, and Representatives based upon membership. William H. Miller of Columbus, Ohio, was elected president, and the membership was reported to be 2,500.

New York was the scene of the fourth annual meet, May 28, 1883. The parade had 723 wheelmen in line. The orderly riding of the wheelmen through Central Park—by special permission—gave the Park Board an excuse to relax its long-standing prohibitory policy to a limited extent, and permit bicycles on certain drives at certain times.

In 1879 the Park Board of Commissioners had excluded bicycles from Central Park, and despite petitions and all influences that could be brought to bear, the Commissioners remained obdurate. Finally it was decided to make a test case and bring the matter into court. Colonel A. A. Pope backed the League undertaking, agreeing to pay all legal expenses. On July 2, 1881, three members of the New York Bicycle Club rode into the Park and were promptly arrested. The case was fought from court to court for several years, but the wheelmen were defeated at every turn.

This famous Central Park case did not end here, however. The League drafted a law which the courts would have to recognize and called it the "Liberty Bill." George R. Bidwell, Chief Consul, and I. B. Potter, attorney for the New York Bicycle Club, were largely responsible for framing this bill and putting it through the New York State Legislature. The bill was signed by Governor Hill in 1887. It revoked all laws discriminating against bicycles and tricycles, and established the rights of wheelmen to ride on any parkways, streets, or highways in the State of New York. Many other States soon followed with the passing of similar bills.

The L.A.W. was now expanding rapidly in membership as well as political power. At the end of its fifth year, 1885, there were 5,176 on the rolls. Even more rapid was the

Courtesy A. E. Schaaf

The men who took part in the "Wheel about the Hub," 1879.

increase during the next five years, as evidenced by the reported membership of 12,703 as of April 30, 1890.

As the League expanded it was necessary to change its structure from time to time. A new constitution was adopted at the Baltimore meet in 1888, which provided for a National Assembly composed of Chief Consuls, Vice Consuls, and Delegates from each State Division to hold an annual business meeting during the winter for election of officers, etc. The big summer meets were to be largely given over to the L.A.W. Championship races, parades, and social affairs.

The new constitution also provided for a Standing Committee on the Improvement of Highways. During the early '80's much progress had been made by the League in spreading the "Gospel of Good Roads." Next to the establishment of the rights of wheelmen to use the public highways, the League considered it most important to work for the improvement of highways. Thousands of pamphlets advocating the movement were printed and distributed—at League expense—to Governors, State Representatives, road commissioners, and other officials throughout the country.

In 1891 the magazine *Good Roads* was founded, financed, and published by the L.A.W. It was of regular magazine size, containing 150 pages or more in each monthly issue, and was entirely devoted to articles on the building of good roads and the need for them. This publication was continued for more than ten years and was undoubtedly an important factor in furthering the good roads movement.

The following is an interesting excerpt from an address by *Good Roads*

Editor Sterling Elliott at the Carriage Makers convention in 1894: "I want to tell you that it was the wheelmen who started the good roads movement, for the reason that the carriage makers didn't know about it. The horse knew about it, but couldn't talk. As soon as man began to be his own horse, he realized the power it took and made a fuss about it, and other wheelmen agreed with him. They commenced to organize, and we are now doing more for good roads than anybody else is or has been doing. We have spent $40,000 and have the only magazine devoted to that subject, and it is published at a loss simply because we have extended it so far and fast that it can't pay. We don't want it to pay, but are doing it in the interest of good roads. We are going to keep up the work, and we hope you will look upon the wheelmen as kindly as you can."

In the early '80's a cycle touring wave hit the United States. Wheelmen began to venture on long tours into strange parts of the country. The League established a touring bureau to furnish information as to routes, maps, etc. Members were asked to send in detailed information regarding their tours. Each State Division gathered information relating to its own roads, and many of the Divisions published road books. Hotels which granted reduced rates to League members were listed, together with railroads which carried bicycles as baggage. It was the League, by the way, that finally forced the railroads to make this concession, through the efforts of L. A. W. Tourmaster Burley Ayres, who was also Chairman of the Transportation Committee.

Group touring actually began in 1879, when the famous "Wheel about the Hub" took place. This two-day tour, promoted by Charles E. Pratt, took in nearby towns encircling Boston, and some forty wheelmen participated in the affair. Pratt wrote an entertaining story of the tour which was published, with many illustrations, in *Scribner's Magazine* and reprinted in *The Wheelman*. This article did much to publicize the bicycle, about which the public knew little at that time.

To Karl Kron (whose real name was Lyman H. Bagg) belongs the honor of initiating a decided advance both in number and length of tours. His book, *Ten Thousand Miles on a Bicycle,* indicates the distance covered in his solitary peregrinations. His longest continuous ride took place in 1883. Starting from Detroit he wheeled to Staunton, Virginia, a distance of 1,422 miles, then the longest on record.

The famous "Big Four" tours date from 1883, the first of which was carried out by a group of Chicago Bicycle Club men under the management of Burley Ayres. From Detroit to Buffalo, over Canadian roads, the tourists, 47 strong, rode the 300 miles in ten days. The group comprised riders from Boston, New York, Buffalo, and Chicago; hence the "Big Four." These organized tours continued each year through the '80's.

Thomas Stevens, the first man to ride around the world on a bicycle, was the first transcontinental tourist. Starting from San Francisco April 22, 1884, he rode and trundled his 50-inch Columbia high-wheel across the country to Boston in 101 days. Taking ship to England, Stevens crossed

How the ladies cycled in the "Elegant Eighties."

Europe and Asia to Japan, and returned by steamer to San Francisco.

You will note that the fair sex has thus far had no mention in connection with the L.A.W.——for the good reason that the old high bike was not suitable for women. However, a few rode ladies' tricycles and joined the League. When the "Safety" or modern type of bicycle and the pneumatic tire were introduced, about 1890, the picture quickly changed. Here was a bike everyone could ride. At first it was considered a bit daring for women to bestride the two-wheeler, but such inhibitions were quickly forgotten, and soon came the emancipation of women from the overstuffed skirts and stays of the "Elegant Eighties" to the freedom of shorter skirts and bloomers of the "Gay Nineties."

Starting its second decade with a membership of over 18,000, the League enjoyed a truly remarkable growth. In 1893 there were close to 40,000 members. Then the well-remembered bicycle boom started. Fashion set its stamp of approval on cycling, and everybody wanted a bicycle. The cycle industry expanded tremendously. In 1895-96 there were about 300 bicycle factories. Production reached a top of nearly 2,000,000 bicycles in 1897. League expansion kept pace with the cycle trade until the membership reached the all-time high of 102,636 in 1898.

Then the bubble burst! The public —excepting the real cycling enthusiasts —turned from bikes to the new "horseless carriage," and bicycle production dwindled along with the cycle industry. In 1900 League membership dropped to 76,944; then it took a nosedive to 8,629 in 1902. Each year more members deserted the sinking ship. However, the League did not cease entirely to function. It was carried on solely through the efforts of Secretary Abbott Bassett, who was one of the most prominent workers for forty years. He became Chairman of the Racing Board in 1883, was elected Secretary in 1887, and held office from that time until his passing in 1924; and that was the end of the old L.A.W.

Abbott Bassett

There is not space in this story to take up racing, which the League controlled and built up to a headline national sport in the '90's. That is a story in itself. Then there were the various cycle journals which acted as mouthpiece for the League: *Bicycling World, The Wheel,* then its own *L.A.W. Bulletin,* which was too costly, then back to *Bicycling World.* During the last fifteen years of his life Abbott Bassett published a little monthly called *Official Bulletin and Scrap Book of the League of American Wheelmen.*

* * * * * * * *

The first move toward the modern revival of the League occurred in August 1933 at Chicago, Illinois. At a convention of Cycle Trades of America held there, Alvin J. Musselman, coaster brake inventor and manufacturer, suggested that action be started toward reestablishing the L.A.W. At a C.T.A. meeting held in New York the following year, Mr. Musselman again introduced the subject. As a result, he and two others, Charles A. Persons, saddle manufacturer, and Walter Bardgett of *American Bicyclist,* were delegated to make an effort to revive the L.A.W. in 1934.

Publicity for the revival was furnished through the columns of *American Bicyclist,* and especially through the staging of a double transcontinental relay race in conjunction with the World's Fair which was taking place that year in Chicago. The race occurred in August 1934. The riders did the 3,039 miles from Los Angeles to New York in 6 days, 22 hours, 51 minutes, and the 3,155 miles from New York to San Francisco in slightly over 7 days. A change of riders was made in front of the Travel and Transport Building at the Chicago Fair.

Also in August 1934 another C.T.A. meeting was held in Chicago, and one of the days on the program—August 21—was designated as "Bicycle Day" at the Fair. Arrangements were made that anyone coming to the Fair that day on a bicycle would be admitted free of charge. It was estimated that over 25,000 entered the Fair grounds on bicycles on that occasion. It was perhaps the largest demonstration of bicycle riders ever gathered together at one time, and needless to say, it received publicity in practically all papers in the United States. The L.A.W. revival was prominently featured in connection with Bicycle Day, and thus received a great boost.

Cycle Trades of America soon established an office for the L.A.W. in New York. Actually, during this period of the late 1930's and the early 1940's, the L.A.W. was used by the C.T.A. as a means of creating for the bicycle publicity which Cycle Trades could not seek in its own name. Bicycle days were staged throughout the country, and the L.A.W. office enjoyed considerable success in popularizing bicycles through connections with various civic organizations, fashion shows, etc.

Courtesy *American Bicyclist*

The 1942 Convention of the League of American Wheelmen.

It was through these efforts that Atlantic City was persuaded to open its famed boardwalk to bicycle riding.

No great effort was made to establish individual clubs. However, spurred by the return of lightweight bicycles to the market, clubs formed rapidly in some cities. H. P. ("Jack") Hansen, a Chicago jobber, became interested in club cycling, and the organization of so many clubs in the Chicago area was due principally to his interest and support. When the financial assistance of the C.T.A. was withdrawn, following our entrance into the war and the curtailment of bicycle manufacture, it was in Chicago that the desire of the cyclists to control and operate the League for their own interests took concrete form. On April 18 and 19, 1942, a group of 375 cyclists met there to reorganize and make a fresh start. Since that occasion, an annual convention has been held at various points in the Middle West, and the League is once more, as it was in "the good old days," run by and for the cyclists who are its members.

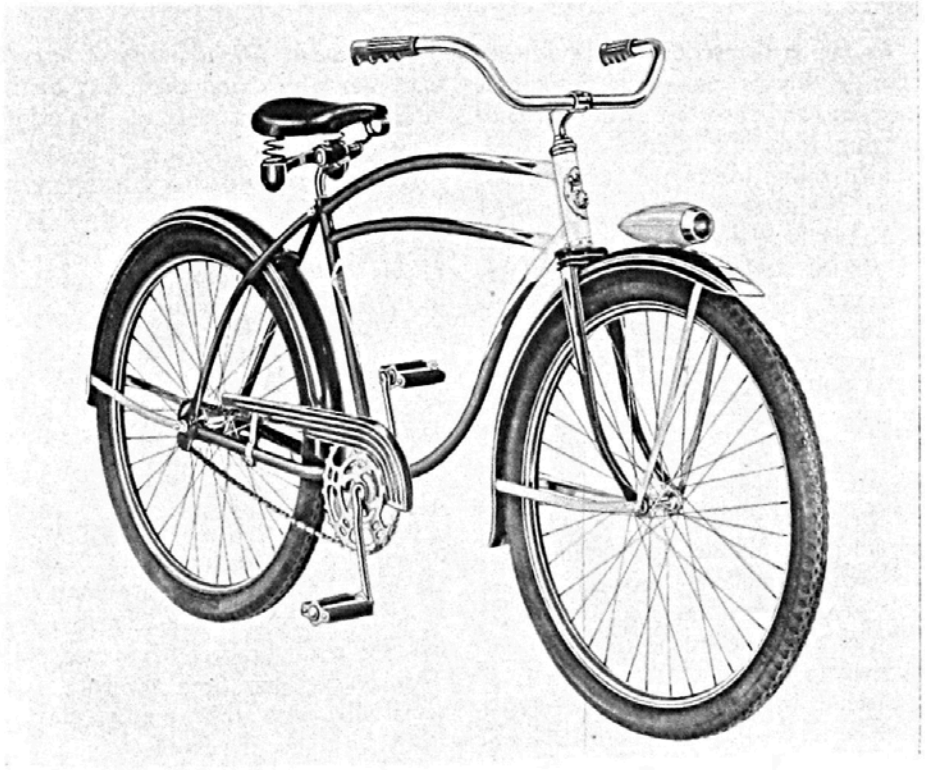
CHAPTER III

Types of Bicycles

The Heavyweight Bicycle

THE heavyweight, or balloon tire, bicycle was developed especially for children and young teen agers. It is made heavy, with strong frames and forks, well adapted to the abuse given it by children in riding up and down curbs and across ditches, perhaps carrying one or two small friends, etc. Most of these bicycles are built for the low-priced trade.

Heavyweights are generally equipped with coaster brakes, "tanks," double-bar frames, kickstands, and other accoutrements dear to the hearts of juvenile Americans, which make them heavier and clumsier than the cycles of any other nation. The cranks are of the one-piece type, with a simple fool-proof bearing arrangement. The bearings are contained in races and



Heavyweight bicycle

run in pressed steel cups which are held in the main bracket by friction. This arrangement, while cheap and easily replaceable, is by no means easy-running, nor is it mud and water-proof. The bearings in the head are also contained in races, and run in friction-held cups.

The general outlines of the heavy-weight frame are familiar to everyone. It is generally made of heavy steel seamed tubing, welded up. Occasionally the tubing is of a good grade, but usually it is best described as "gas pipe." One American manufacturer, before World War II, made an aluminum bicycle which was supposed to be light, but weighed just as much as the ordinary bicycles.

The handlebars are of the "Boy Scout" or motorbike type—wide, and with long types of spring arrangements. Because of the width of the saddle and the length of the handlebars, the juvenile American adjusts his cycle in such a manner that a comfortable and correct riding position is impossible. This is one of the reasons why he seldom comes to regard his bike as a serious machine and is inclined to discard it in favor of a cheap "jalopy" as soon as possible.

The Lightweight Touring Cycle

As far as the serious cyclist is concerned, this is our most important machine, and there are many varieties ranging from the simple, low-priced, welded frame job to the custom-made super lightweight. The low-priced machines have diamond-shaped frames of welded steel tubing, in some cases "seamless." The cranks, bearings, brakes, etc., are similar to those on the heavyweight models. The handlebars and saddles are of the "touring" type, and allow a better riding position than on the balloon tire bikes. Mudguards are lighter and thinner than on the heavy models. These machines are adequate for the intermittent rider, and with a moderate amount of care will give years of satisfactory service.

Next we come to the middle grade of touring machine. The frame is of the same diamond shape; however, it may be of chrome molybdenum seamless tubing, welded up, or a special bicycle tubing of brazed-construction seamless steel. The majority of foreign machines which find their way to the American market are of brazed-up construction.

An important difference becomes apparent in this grade of lightweight. All foreign cycles have what are known as three-piece cranks; that is, the crank arms may be disassembled from the crank spindle, which was turned on a lathe during its manufacture and thus is inherently much more true than the one-piece forging of the balloon tire and cheaper lightweight models.

Another important difference is the manner in which the crank bearings are used. The bearings are contained in turned hardened cups which screw into the main bracket from each side. This bracket has been threaded concentrically with the spindle; thus a fine adjustment is possible.

The rear hub on this grade of lightweight seldom has a coaster brake.

Lightweight bicycle (wartime grade)

Usually it has a free-wheel unit with rim brakes or a hand-operated, built-in expander brake.

Many of the foreign cycles, and some American ones, are equipped with variable gear hubs, which are of two general types. One is the internal geared type, such as the British Sturmey-Archer. This is supplied in a variety of models, from two to four speeds, and from racing style with fixed gear to tandem touring styles with a built-in expander brake. There are one or two other makes which are similar to the Sturmey-Archer, but they have never been widely used in the United States and are therefore not being discussed here.

Several years ago an American company brought out a variable speed coaster brake hub, which, while a laudable attempt, did not attain the running qualities of the foreign hubs.

Another type of variable gear which is gaining in popularity is the "derailleur." This consists of a free-wheel gear containing from two to four cogs with varying numbers of teeth. An idler running on a spring arm is provided to take up the slack and maintain the proper chain tautness. Also a method of moving the chain from one cog to another is provided, the most popular being a Bowden Wire Control to move the idler from left to right, carrying the chain with it and thus changing gear ratios.

The disadvantage of the internal geared type is that one must stop pedaling to shift gears, which usually occurs on a hill. However, it is clean, smooth-running, and long-lived. The derailleur may be shifted while pedaling, but it requires frequent attention and, like any exposed sprocket, is a dirt collector. Both types of variable

gears have advantages and disadvantages, and a rider should match his needs against their various features in making a choice. For a fast machine, the derailleur will be found most satisfactory, whereas for day-in, day-out touring, the internal geared hub will probably give better service. In moderately rolling or flat country a variable gear hub is extra weight and offers little advantage. In mountainous country a derailleur and internal geared hub have been combined to make extreme gear reductions possible.

The pedals on this grade of touring machines are sometimes of the racing type, complete with toe clips. These give the cyclist an advantage in keeping his feet in proper position on the pedals, allowing full use of the ankles and correct pedaling technique.

The super lightweight is the aristocrat of cycles. Usually no cost has been spared to build into it the utmost in speed, beauty, lightness, and durability. To begin with, by the time a cyclist arrives at the state where he can appreciate a machine of this quality, he has definite ideas about frame size, dimensions, angles, lugwork, finish, and so on; hence the frame is usually built to order, incorporating his pet ideas. It is made of Reynolds 531 steel tubing or chrome molybdenum tubing. Occasionally other types of tubing or even aluminum alloys are used. However, a lightweight alloy steel tubing is generally considered to be the best for the purpose.

The cranks are often of the three-pin type, designed for lightness and strength. Alloy, or racing type, pedals are used. When mudguards are included, they may be made of dural or celluloid. The saddle usually is a racing type or a light tourist. Hand brakes have dural levers and fittings. Wheels and tires are generally of the Dunlop "Sports" type, or the Dunlop 26- or 27-inch Road Racing High-Pressure, which latter are the fastest wheel and tire combinations next to a strictly racing outfit.

The hubs are of the highest quality, usually of foreign manufacture. However, the Schwinn Paramount hubs are equal to the finest imported hubs. While a flanged or Continental type hub is not absolutely necessary, it does give added class and makes a stronger wheel. Another advantage of the flanged hub is that a broken spoke may be easily replaced. The rear hub, if it is not of the variable gear type, is usually of the double-sided variety, having a fixed gear on one side and a free-wheel on the other. The hub nuts may be of the wing variety, which enables one to dismount the wheel without a wrench in case of tire or mechanical trouble.

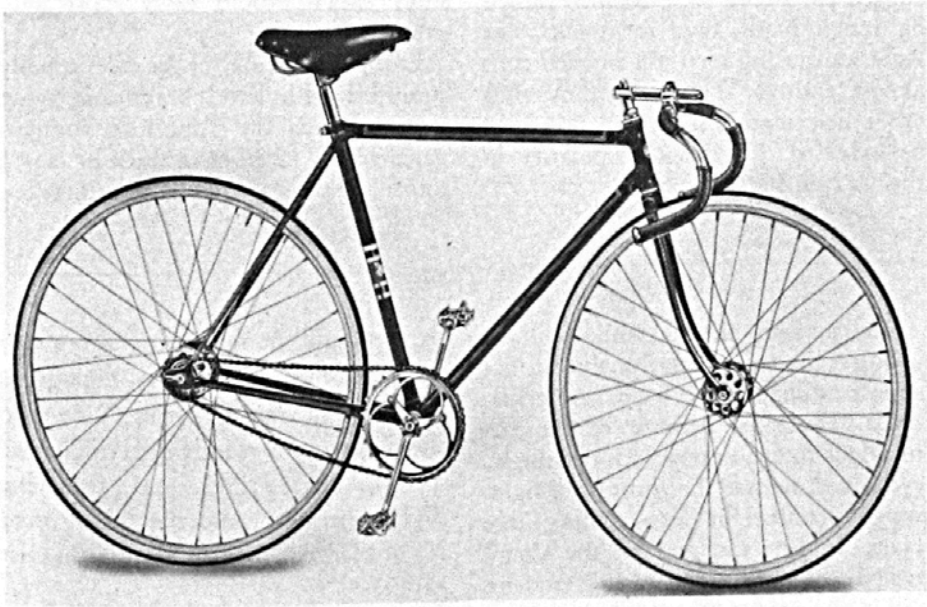
The handlebars are generally of modified racing type and may be of light tubing or an aluminum alloy. The stem is specially chosen for lightness and strength and can be made to any desired length and drop; or it may be a sliding extension of the Major Taylor type which can be adjusted for different riding conditions.

The finish of the super lightweight is in keeping with the high quality of workmanship of the whole machine, and ranges from a complete chrome-plated finish to combinations of chrome and enamel, according to the taste of the individual. The finished machine is usually a thing of beauty, and repays the labor and expense which go into it by pride of possession and many years of faithful, trouble-free, superlative service.

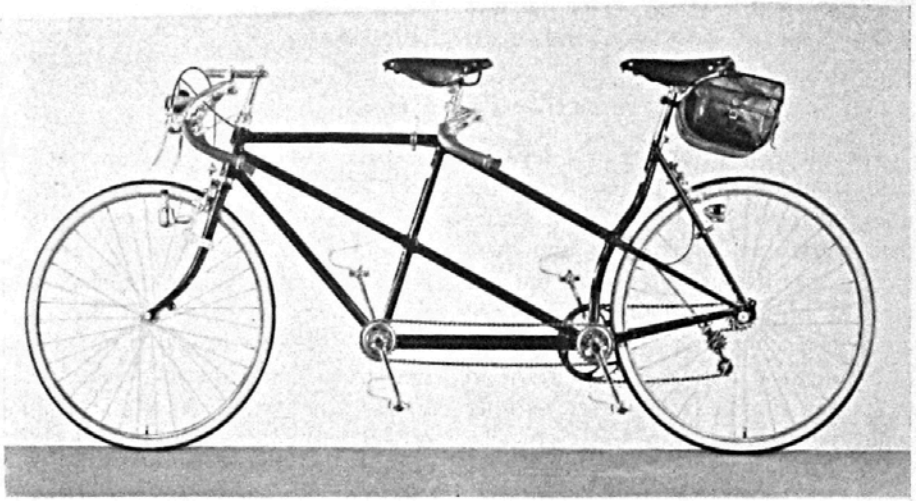
The Racing Bicycle

The racing machine is in a separate class from all other cycles. Even the uninitiated are aware at first glance that everything which goes into these bicycles has been evolved with but one idea in mind—speed. To the casual observer, each racing mount may seem to be identical with every other one in its spartan simplicity; however, nothing could be farther from the facts. To begin with, every experienced racing rider has his own ideas as to what his machine shall be to take greatest advantage of his height and weight, the length of his legs and his arms, and so on; what gear ratio he will use; what type and size of saddle; width and drop of bars and extension; crank length, etc. He may be a six-day rider requiring an extremely upright machine with a short wheel-base, or he may want the slightly longer sprint machine with plenty of drop in the main bracket. He may want a road machine of similar dimensions to the super lightweight. Or, last of all, a machine incorporating several of the features of these three types may be just what the racing rider wants.

After the frame is laid out and all dimensions decided upon, the racer chooses his hubs, wheels, tires, cranks, and other fittings, each item combining the greatest strength with the least



Racing bicycle



Touring tandem

weight for the job it must do. It is obvious that a machine for a smooth board track need not have the heavy rugged parts used on a machine ridden on rough roads, over car tracks, etc. American racing men use wooden rims almost entirely. However, alloy rims are widely used abroad, and they may be expected to gain in popularity in the United States.

Tires used are of the glued-on type, which have the tubes sewed in and are able to stand up under air pressures which would blow most auto tires to shreds.

European racing cycles are usually equipped with hand brake and wing nuts, whereas the American counterpart, usually raced on a track or closed course, dispenses with these fittings.

The Tandem

The tandem bicycle, while still enjoying a limited popularity abroad, has almost disappeared from American roads. However, because of the tremendous return to popularity of the bicycle in America, the short-base, lightweight tandem is also coming into favor. In England and on the Continent both touring and racing tandems are seen, and the same general remarks apply to them as to the high-grade touring and racing cycles. However, one difference is readily discernible: the spokes, hubs, rims, and tires are slightly heavier. Also the tubing used is of larger diameter and heavier gauge.

How To Determine Correct Frame Size In Selecting Any Type Of Bicycle

By "frame size" is meant the distance from the top of the seat lug (where the saddle-pin enters) to a point equivalent to the center of the crank axle. Therefore it is the measurement in which the rider's leg reach is concerned. In selecting a frame it is of the utmost importance not to buy one that is too large, for this will result in discomfort, inefficiency, and perhaps even injury to the rider. If a frame is too small, adjustment can be made by raising the saddle, up to the limit of stability and safety.

To determine the approximate size of frame that will be best, take the inside leg measurement and subtract eleven inches from it. The result is the *maximum* height of frame which should be used.

From the foregoing it will be evident that it is unwise for parents to purchase overlarge bicycles for their children with the idea that they can "grow up" to them. By constantly straining for the pedals, children can do themselves harm.

Another standard of frame measurement used by many dealers is to have the prospective rider stand while straddling the crossbar. If his feet are flat on the floor, the frame height is a safe one.

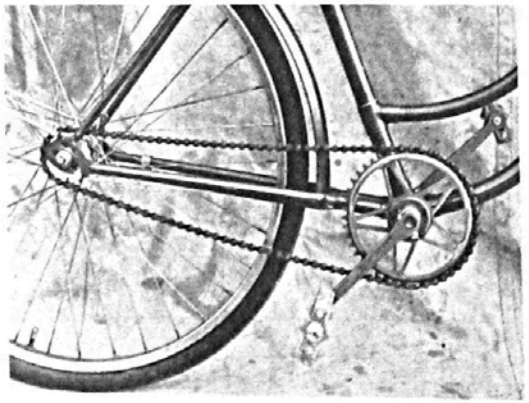
CHAPTER IV

How a Bicycle Works

Care of Your Bicycle
Variable Gears

A MODERN bicycle is simply a frame for supporting a rider between two wheels of equal size to attain the mechanical advantages of a rolling ball. The result is, for the rider, greatly increased efficiency and reduction in energy required, as compared with any other form of locomotion dependent on physical energy.

The rider applies power, or energy, via pedals, cranks, a chain, and two sprockets to the drive wheel. The



Walter Norris
Bottom bracket assembly.

energy applied, less that lost in overcoming inertia and the friction of air, moving parts, road surfaces, etc., is returned in the form of locomotion. As the rider's energy is used to overcome various forms of friction, it is plain to see that weight, lubrication, and adjustment, as well as the quality of materials and workmanship, are of the greatest importance. However, strength, safety, and durability should not be sacrificed for lightness.

For practical purposes bicycles are given a "gear ratio," which means they are equipped with a front sprocket larger than the rear so that the drive wheel will revolve oftener than the pedals. From this it is obvious that as a bicycle is geared up it will travel farther with each revolution of the pedals; or, conversely, fewer pedal revolutions are required to travel a given distance. However, as speed and power cannot be increased at the same time, the cost of this greater distance is that greater strength is required of the rider. The cost of the power gained from low gears is the very rapid pedal and leg action required when any considerable speed is attempted.

Within certain limits low gears are best for heavy equipment, hill climbing, head winds, and other adverse conditions, higher gears, of course, being indicated for opposite conditions. Therefore, it follows that the correct gear to ride is largely determined by the physical characteristics of the rider, the terrain and distance to be traveled, and the type of equipment used. A good rule to follow is to ride the low-

est gear that will allow the average speed desired without excessive or uncomfortable pedal action, which in general will be between 64 and 72 for men and 56 to 68 for women.

One of several formulas for determining the gear of a bicycle is to divide the number of teeth on the front sprocket by the number of teeth on the rear sprocket, and then to multiply the diameter of the rear wheel by the result.

Example: $\frac{26 \text{ T.F.S.}}{10 \text{ T.R.S.}} = 2.6$ ratio x 26″ wheel = 67.6″ gear.

The resulting gear means the bicycle will travel with each revolution of a pedal the same distance a wheel of that diameter would travel with one revolution; or, gear x 22/7 = distance traveled with each revolution of a pedal.

Example: 67.6 gear x 22/7 = 212.45″

Bicycles are manufactured in three basic types, namely, touring, racing, and heavyweight, each embodying materials, engineering, fabrication, and workmanship resulting from years of experience. Each will give the greatest satisfaction when used as intended. In

GEAR TABLE FOR 26, 27, AND 28-INCH WHEELS
(½-inch pitch sprockets)

No. of Teeth Front Sprocket	Wheel Size	No. of Teeth Rear Sprocket 12	13	14	15	16	17	18	19	20	22
40	26″	86.6	80.0	74.2	69.3	65.0	61.1	57.8	54.7	52.0	47.2
	27″	90.0	83.1	77.1	72.0	67.5	63.5	60.0	56.7	54.0	49.0
	28″	93.3	86.1	80.0	74.6	70.0	65.8	62.2	58.9	56.0	50.9
42	26″	91.0	84.0	78.0	72.8	68.2	64.3	60.6	57.5	54.6	49.6
	27″	94.1	87.4	81.0	75.7	70.8	66.7	63.0	59.6	56.7	51.5
	28″	98.0	90.5	84.0	78.4	73.5	69.2	65.3	61.9	58.8	53.4
44	26″	95.3	88.0	81.7	76.2	71.5	67.2	63.5	60.2	57.2	52.0
	27″	99.0	91.3	84.8	79.2	74.2	69.8	66.0	62.5	59.4	54.0
	28″	102.2	94.8	88.0	82.1	77.0	72.4	68.4	64.8	61.6	56.0
46	26″	99.6	92.0	85.4	79.7	74.7	70.3	66.4	63.0	59.8	54.3
	27″	103.5	95.5	88.7	82.1	77.6	73.0	69.0	65.4	62.0	56.4
	28″	107.3	99.0	92.0	85.8	80.5	75.7	71.5	67.8	64.4	58.5
48	26″	104.0	96.0	89.1	83.2	78.0	73.4	69.3	65.7	62.4	56.7
	27″	108.0	99.7	92.5	86.4	81.0	76.2	72.0	68.2	64.8	59.1
	28″	112.0	103.4	96.0	89.6	84.0	79.0	74.6	70.7	67.2	61.0
52	26″	112.6	104.0	96.5	90.1	84.5	78.5	75.1	71.2	67.6	61.4
	27″	117.0	108.0	100.2	93.6	87.7	82.3	78.0	74.0	70.2	63.8
	28″	121.2	112.3	104.0	97.0	91.0	85.6	80.8	76.6	72.8	66.1
56	26″	121.2	112.0	104.0	97.0	91.0	85.6	81.0	76.6	72.8	66.1
	27″	126.0	116.3	108.0	100.8	94.0	89.0	84.0	79.6	75.6	68.7
	28″	130.6	120.6	112.0	104.5	98.0	92.2	87.2	82.5	78.4	71.2
60	26″	130.0	120.0	111.3	104.0	97.5	91.7	86.7	82.0	78.0	70.8
	27″	135.0	124.6	115.7	108.0	101.2	95.2	90.0	85.1	81.0	73.5
	28″	140.0	129.2	120.0	112.0	105.0	98.7	93.3	88.3	84.0	75.3

addition, there is a wide variety of accessories and equipment such as variable gears, extra light or heavy tires and rims, various styles of handlebars, saddles, luggage carriers, lights, warning signals, etc. Hence the most exacting rider can obtain any desired equipment. When in doubt as to the type of bicycle or equipment best suited to your needs, consult with an experienced rider or qualified dealer before purchasing.

Once a bicycle has been selected according to intended use and personal preferences, it is a machine that will, if properly operated and cared for, reward the owner with years of the most healthful exercise and economical transportation known.

Care of Your Bicycle

One of the most important things about bicycling is the care of your bicycle. Keep it in condition to enjoy it more thoroughly. A few salient points on the subject are as follows:

1. For major repairs go to your dealer.

2. Keep your bicycle clean and properly oiled.

3. Bearings may be cleaned by loosening the cones, injecting plenty of kerosene or gasoline, and keeping the part slowly moving, so that every part of the bearing is flooded. Continue to run the fluid in and out until it runs clear; then refill with light oil.

4. The coaster brake is an ingenious device which you should not attempt to clean or adjust. Take it to your dealer.

5. The cleaning and adjusting of the crank hanger bearings deserve special mention, for these are the most important bearings in the entire machine. In taking down the hanger, study its construction, using, if necessary, the description of the hanger which will undoubtedly be found in the catalogue of the manufacturer of your bicycle. One-piece hangers can easily be removed by unscrewing the lock nut and then the cone on the left-hand side of the hanger. The cone and the balls on the retainer are slipped over the left crank, and the whole unit—cranks, axle, and sprocket—can be slipped out of the axle shell. Notice particularly the way the ball retainers face the cups and the arrangement of cones, washers, and nuts.

It is a good idea to lay these parts down in a row in the order they occupy in the machine, thus avoiding any confusion in reassembling them later. Soak each part in kerosene and remove the caked-up grease, much of which gathers in the ball retainers. The balls themselves, however, need not be taken out of the cages. Each piece should be wiped dry. Then when the hanger is reassembled, the bearings should be well oiled and adjusted with sufficient play to allow the cranks to revolve freely and without a suspicion of binding.

6. In removing the rear wheel, look out for the arrangement of the chain adjusters, and in the case of a coaster hub there will be a brake arm to detach. Clean the wheel bearings in the same way as those of the crank hanger, and observe the same care in reassembling. Don't forget that the adjusting cones should always be on the left side of both wheels.

7. In most cases it will not be necessary to take down the head bearings. Simply loosen the cones and flush out the bearings with kerosene; then oil and readjust them properly, and they will go a long time without further attention.

8. One of the most important parts of the bicycle, and one which is most frequently neglected, is the chain. That the chain is vital to the easy running of the machine can readily be appreciated when we consider that it is depended upon to deliver the rider's driving power to the rear wheel.

To clean a chain thoroughly, soak it in kerosene for half a day or more. Take a shallow pan and on the bottom lay a couple of blocks of wood. The chain, coiled up, is laid on these. Then the kerosene is poured in, completely covering the chain, and the pan rocked for a while, so that the grit is washed out and settles at the bottom. When removed from this bath, the chain should be wiped dry and then given a similar bath in a good lubricating oil (SAE No. 10 is recommended) and each joint worked until it moves freely. Wipe the chain dry and replace it on the machine, carefully adjusting the rear wheel so that the chain is neither too tight nor too loose.

The cardinal principle of chain lubrication is to keep the insides of the links clean and moist, and the outsides clean and dry.

When a chain has been thoroughly treated in this way once, the process need not be resorted to again for some time. For ordinary purposes, it is sufficient to brush the chain off frequently and to place occasionally a drop of oil near each end of all the pins, where it will work in. Stick graphite is used by some cyclists, but is not recommended by chain manufacturers.

9. The pedal bearings should by no means be forgotten, as they come in for much hard usage and will soon clog up and run stiffly if neglected. They should frequently be taken apart and cleaned, oiled, and readjusted. This can be done by unscrewing the dust cap on the outside end of the pedal. Then the lock nut and bearing cone can be taken off, and the pedal, together with the ball retainer, will slide off the pedal pin.

10. Cleaning the frame and nickel or chromium work on the bicycle is a comparatively simple operation. Caked mud can be removed with a damp cloth, care being taken not to scratch the enamel. Give all bright parts a frequent "once over" with an oiled woolen rag. This will prevent rust from forming.

11. The final adjustment of the bearings and parts, after everything is cleaned up, is a matter of considerable importance and should not be slighted. Bearings and chain should never be adjusted too tightly, as not only will the machine run extremely hard, but the cones and cups will be unevenly worn or cracked and the balls are likely to break. To be on the safe side, there should be a barely perceptible play in all bearings after everything is tightened, and the wheels, cranks, and pedals should balance back and forth for some time before coming to a full

stop. The chain should be slack, but not too slack, to give the best results. If it is tight it will bind and make the machine run very hard. If there is noticeable back lash every time your feet come around to the up-and-down position of the cranks, it is a sure sign that you are not pedaling properly.

12. Bicycle tires are an important factor in the operation of your bicycle, and therefore the utmost care should be taken in their maintenance to insure the maximum of service and wear.

a. Always keep your tires inflated to the air pressure indicated on the sidewalls. In the event no air pressure is indicated, ask your dealer. Always use a gauge to check the inflation, and remember that too much pressure is just as bad as too little.

b. Check the air in the tires at least once a week to be sure to maintain the proper pressure.

c. When you have occasion to remount wire bead tires, pull the valve through the hole in the rim and run down the hex nut. Then examine the tire all around at both beads to make sure the tube is not caught between the bead of the tire and the rim. Inflate to ten pounds and examine the tire all around both beads to make sure the tire is properly seated on the rim. When the tire is properly seated, a small bead on the sidewall of the tire is visible all the way around just above the edge of the rim. Now inflate to full pressure.

d. When you have occasion to remount single tube tires, cement the tire firmly to the rim by applying a good rim cement to both the rim and the tire, allowing ten minutes' drying time after application of the cement. Single tube tires that are not properly cemented on will slip, causing damage to the valve.

e. Keep your wheel true and properly lined up between the forks so that the sidewalls of the tire do not rub.

f. Never jump curbs with your bicycle, for you are likely to rupture the fabric in the tires.

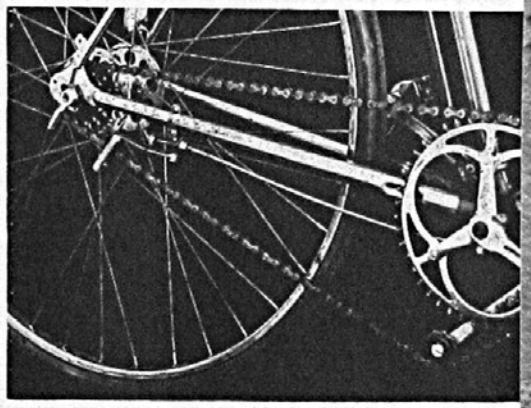
g. Remember that tires are not subject to adjustment if rendered unserviceable because of punctures, accident, abuse, or neglect.

Variable Gears

Derailleur Maintenance

The free wheel and the idler wheel bearings should have a few drops of light oil occasionally. A drop or two of oil on all working joints in the shifter mechanism will keep things working smoothly.

About once a year the idler wheel bearings as well as the free wheel should be disassembled and the parts thoroughly cleaned and reassembled. When reassembling, adjust the bearings so that the wheels roll freely with minimum side play. Adjustment is usually accomplished by removing the shims between the bearing cones.



Bicycle with derailleur.

Note idler wheel.

Walter Norris

The Operation and Care of Sturmey-Archer 3-Speed Gears and Brakes (Models AW and AB)

I *Operation*

Sturmey-Archer hubs embody the simplest form of gear variation—the planetary type. The pinions are always in mesh, and the middle gear is the direct drive. "High" is obtained by the sliding clutch falling back onto the gear ring, the drive being off the right end of the hub. In "low" the sliding clutch travels to the right end of the hub, preventing the "pawls" from engaging, and thus permitting the drive to occur through the pinions and on to the left end of the hub.

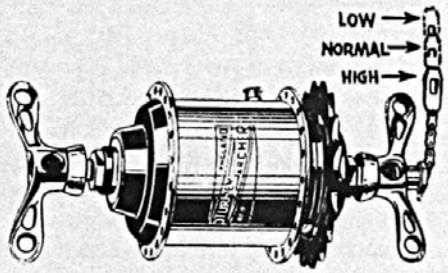
In operation the one thing to bear in mind is that the rear hub must not be driven while changing gears. Rotation of pedals must be stopped or at least must only be following the rear wheel.

II *Scope*

The Sturmey-Archer wide ratio hub gives a large number of possible gear ratio combinations. With the "normal" ratio in direct drive, the high is 33 1/3 per cent above and the "low" 25 per cent below normal respectively. Possible gear ratios are given in the table on page 34.

The AW may be fitted to any cycle equipped with independent hand brakes.

The AB provides the same ratios as the AW, but also incorporates the internal expanding, hand-operated hub brake lined with friction linings. The AB hub is adaptable to any cycle.



Sturmey-Archer hub.

GEAR RATIO TABLE. AW PATTERN HUB

The following table shows the ratio obtainable with 26 and 28 in. wheels, and 16 to 20 tooth hub sprockets.

No. of teeth on Bracket Chain Wheel	Hub Sprocket	26 inch Wheel Low	26 inch Wheel Nor.	26 inch Wheel High	28 inch Wheel Low	28 inch Wheel Nor.	28 inch Wheel High
	16	48.8	65	86.7	52.5	70	93.3
	17	45.9	61.2	81.6	49.4	65.9	87.9
40	18	43.4	57.8	77.1	46.6	62.2	82.9
	19	41	54.7	72.9	44.2	58.9	78.5
	20	39	52	69.3	42	56	74.7
	16	51.2	68.2	90.9	55.1	73.5	98
	17	48.2	64.2	85.6	51.9	69.2	92.3
42	18	45.5	60.7	80.9	49	65.3	87.1
	19	43.1	57.5	76.7	46.4	61.9	82.5
	20	41	54.6	72.8	44.1	58.8	78.4
	16	53.6	71.5	95.3	57.8	77	102.7
	17	50.5	67.3	89.8	54.4	72.5	96.7
44	18	47.7	63.6	84.8	51.3	68.4	91.2
	19	45.2	60.2	80.3	48.6	64.8	86.4
	20	42.9	57.2	76.3	46.2	61.6	82.1
	16	56	74.7	99.6	60.4	80.5	107.3
	17	52.7	70.3	93.7	56.9	75.8	101.1
46	18	49.8	66.4	88.5	53.6	71.5	95.3
	19	47.2	62.9	83.9	50.9	67.8	90.4
	20	44.9	59.8	79.7	48.3	64.4	85.9
	16	58.5	78	104	63	84	112
	17	55.1	73.5	98	59.3	79.1	105.5
48	18	52	69.3	92.4	56	74.7	99.6
	19	49.3	65.7	87.6	53	70.7	94.3
	20	46.8	62.4	83.2	50.4	67.2	89.6
	16	61	81.3	108.4	65.6	87.5	116.7
	17	57.4	76.5	102	61.8	82.4	109.9
50	18	54.2	72.2	96.3	58.4	77.8	103.7
	19	51.3	68.4	91.2	55.3	73.7	98.3
	20	48.8	65	86.7	52.5	70	93.3

The normal gear is according to the number of teeth on the front chain wheel, as in a single-speed machine.

III *Care*

Riders must be cautioned against using certain widely sold proprietary lubricants which tend to gum the pawls and even rust the internals. Greases likewise must be avoided. If the pawls are not always perfectly free, the hub cannot operate satisfactorily and serious damage is inevitable. Use only a good grade of fairly light mineral oil (the lubricant prepared especially for the purpose is ideal), adding a few drops about every 200 miles and injecting this only through the lubricator in the hub shell. Do not overoil, for if you do the oil will tend to run down the spokes and rot the rubber tubes.

IV *Adjustments*

About 90 per cent of Sturmey-Archer hubs received for service are in need of attention merely on account of the hub's having been ridden with the cable out of adjustment. A new cable will usually stretch initially and should be checked after being put into commission, and occasionally thereafter.

A. Gear Adjustment

After fitting the wheel to the cycle, screw the indicator into the axle key up to its stop. This can be checked by noting that the second rivet will then be level with the end of the axle. The indicator may then require unscrewing a trifle to line the chain up with the control wire. It is NEVER necessary to unscrew more than one half-turn for this purpose, as the chain can be turned over on itself to point either up or down. FURTHER UNSCREWING WILL MAKE IT IMPOSSIBLE TO ADJUST THE GEARS.

Next screw the knurled connection fitted to the wire onto the chain connection. Place the gear lever in NORMAL gear position and adjust the knurled connection until the first indicator shoulder is level with the end of the axle. This can be seen through the slots in the right hand nut. Now lock the knurled connection in place by means of the small locknut on the chain connection.

On moving the gear lever to the LOW gear position, one will find the second shoulder or base of cone level with the end of the axle. This is used to check the original adjustment.

In HIGH gear the indicator is within the axle and cannot be seen.

If insufficient adjustment is obtained by means of the chain connection, the quadrant (or wire stop in the case of a handlebar control) can be moved along the top tube in the required direction, and the final adjustment made on the chain connection.

If at any time the wheel should be removed, or the control wire disconnected, it is important to check that the indicator is screwed fully home, before attempting to readjust the gear control as instructed previously.

B. Bearing Adjustment

All bearings are adjusted simultaneously by turning the left-hand cone after slacking off the cone locknut, locking this again after adjustment. The right-hand cone is set at the factory, is locked with a special washer, and should not be disturbed. If the right-hand cone should be moved, correct adjustment is as follows: screw up finger-tight as far as it will go, slack back half a turn, and lock with special washer and locknut.

In the case of hubs fitted with in-

ternal expanding brakes, the left-hand cone projects through the brake plate and has flats which engage with a large slotted washer. Bearing adjustment in this case is done by rotating the slotted washer after slacking off the axle nut and locknut. After adjusting the bearings, tighten up the locknut before securing the axle nut.

C. Cable Brake Adjustment

Types of Sturmey-Archer Hub Brakes

ABC 3-Speed, Solo
BFC Front, Solo
BRC Single Speed Rear, Solo
ATC 3-Speed, Tandem
BFT Front, Tandem
BRTC Single Speed Rear, Tandem

During the first few miles of running, the brake shoes will bed down in the brake drum, and the brake cable will then require adjusting to take up all unnecessary movement of the handlebar lever, still keeping the wheel perfectly free. To do this, slack off the small hexagon nut, S.93, on the adjusting screw, K.119, and screw the adjuster the required amount in a counterclockwise direction. Tighten up the locknut, S.93, after completing the adjustment.

CHAPTER V

Brakes

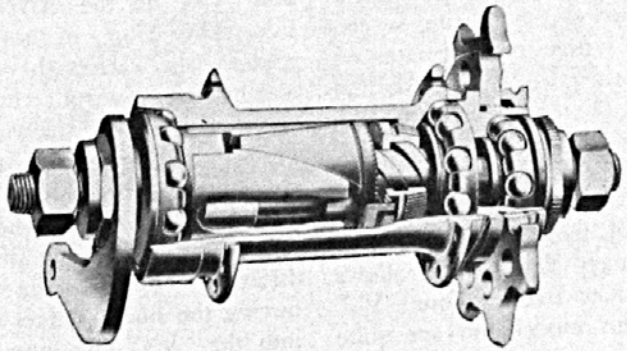
EVERY vehicle must have some means of slowing or stopping the wheels from rotating. Our first bicycle, the "Ordinary" or "high-wheeler," depended on spoon-shaped pieces of metal or rollers pressing on the solid rubber tires, to slow the vehicle (which was most of the time) or stop it (occasionally). This method was unsatisfactory, and in time, with the advent of the modern or "Safety" bicycle, other and better means of braking were invented. We will concern ourselves with three types, the internal coaster brake, the rim brake, and the internal expanding hub brake.

Coaster Brakes

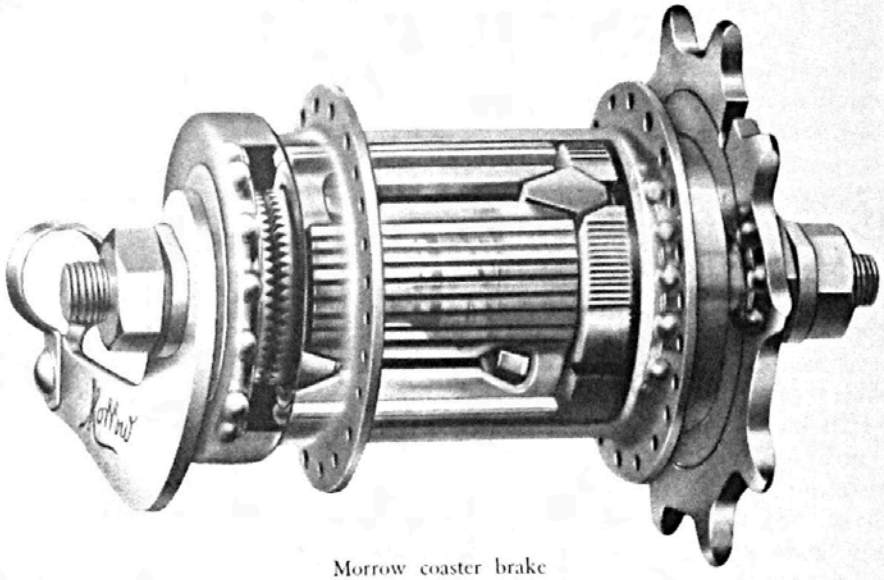
The modern coaster brake in all outward appearances is the same. The body of the brake or "shell" forms the hub of the wheel and is an integral part of the wheel. On the right side is the driving sprocket, and on the left side is an arm that is fastened to the chain stay with a metal strap. This arm prevents the entire assembly from rotating with the wheel when the bicycle is back-pedaled. Back-pedaling is the method by which the brake is put into operation.

It is the "innards" that differ, and although difficult to explain by the written word, they are simple in operation. The three most popular types now in general use are the small wedge expanding barrel (Musselman), the large wedge expanding barrel (Morrow), and the disc type (New Departure).

In the small wedge type of brake, the barrel fits over the axle. The arm side (left) has a slot which engages a key on the axle; thus the barrel does not rotate with the hub. Now the driver (sprocket) side has a large "V" cut in it. A wedge fits in this "V" and is held in place with a combined clutch and spring. When the driver is turned



Musselman coaster brake



Morrow coaster brake

ahead, the clutch is engaged and presses against the end of the hub shell, which is slightly tapered. This imparts the forward motion to the wheel. When the sprocket is reversed (back-pedaled), the clutch is driven back in the opposite direction (toward the arm or left side). This forces the wedge into the "V" in the barrel, expanding it and pressing it against the inner surface of the hub shell, and the resulting friction stops the wheel. This type of brake is quite free-running and stops the wheel without being severe.

The large wedge type operates on the same principle, i.e., expanding barrel against the inner side of the hub shell. This is accomplished in the following manner. The barrel has four wide shoes with slots between each two shoes. This tends to make the barrel comparatively flexible and allows lubricant to flow freely. Four "V's" are cut in this model and are quite small, being about $\frac{3}{16}$ of an inch across. On the arm side the lower part of the cone is serrated. Against this edge is a ring of metal, also serrated. These edges are kept apart by a stiff coil spring. Also a part of this ring of metal are two small wedges which fit in the two "V's" on the arm side of the barrel.

Now on the sprocket side is another ring of metal with a thread inside, into which the driver is threaded. This ring also has two wedges that fit into the two "V's" on the driver or sprocket side. This ring, in addition to the wedges, also carries the clutch, which in this case is a split ring. When the sprocket is turned forward, it brings the clutch ring into contact with the end of the hub shell, which in turn imparts motion to the wheel. Reversing throws the clutch ring in the opposite direction (toward the arm side), forcing the small wedges on both ends into the "V's" engaging the serrated edges of the arm side ring and cone,

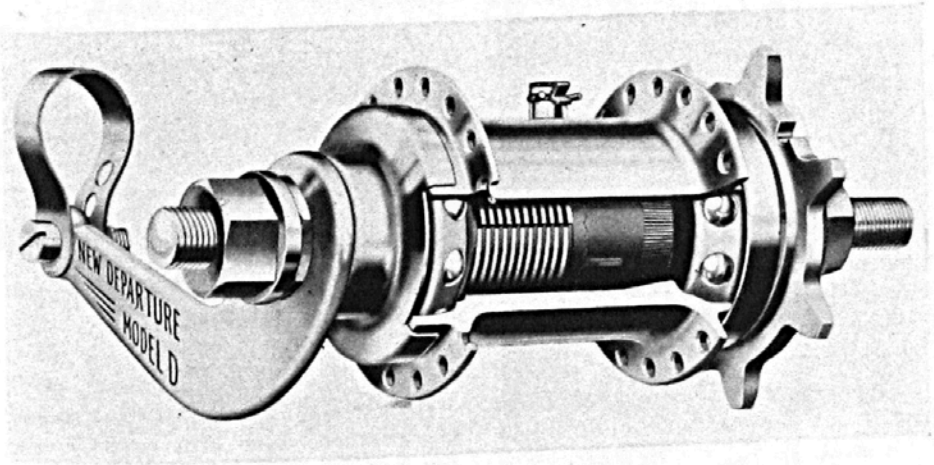
compressing the spring, and expanding the shoes against the inner side of the hub shell, thus stopping the rotating of the wheel. This brake rolls with little or no friction and is quite powerful, although greater pressure is needed to operate it.

The disc type of brake operates on an entirely different principle, although parts are similar to the two brakes described above. On the arm side of this brake, the cone is elongated into a semi-oval piece of metal that is threaded halfway down on the axle. Over this piece of metal or disc holder are strung several discs about an inch in diameter. Part of these discs revolve freely around the disc holder; the rest fit snugly over the holder and do not rotate.

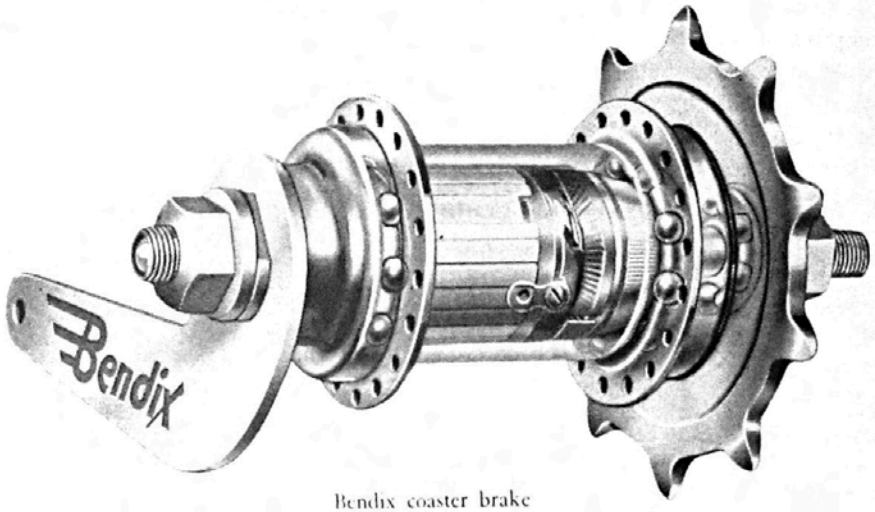
The freely revolving discs have three nibs situated equidistant on their perimeters. The hub shell has three slots cut entirely across from arm side to driver or sprocket side. The driver side is tapered at the end. The nibs of the freely rotating discs fit into the three grooves.

The clutch and transfer spring fit over the disc holder on the driver side. The transfer spring keeps the clutch from slipping out of the serrated edges on the transfer spring holder and the under side of the clutch. The clutch is threaded inside as the other two brakes are, and the driver fits inside, also. When the driver is turned ahead, the clutch is forced against the tapered end of the hub shell, imparting the forward motion to the wheel. Reversing, the clutch is turned back against the discs. The freely rotating discs are forced against the stationary discs, thus creating the friction that stops the wheel from rotating. This brake is not as free-rolling as the other two, but is more positive and operates with less pressure.

In recent months a new coaster brake has appeared on the market—the Bendix. It operates basically in the same manner as most other coaster brakes. Forward drive and braking are ac-



New Departure coaster brake



Bendix coaster brake

complished by moving the control nut in one direction or the other along the triple-threaded shaft to which the sprocket is assembled. Rotation of the sprocket causes movement of the control nut.

Forward drive of the bicycle occurs when the conical knurled surface of the control nut is moved into contact with the tapered surface within the brake hub. Coasting occurs when the control nut assumes a neutral position between the driving and braking positions. This action permits free coasting with a minimum of drag.

To apply the brake, the rider moves the pedals in a backward direction so that the control nut moves toward the brake shoe. The dentils on the face of the control nut engage those on the face of the brake shoe expander. There are two expanders with conical surfaces, which operate on the ends of the brake shoes and cause them to be forced out into contact with the hub. The inside diameter of the hub serves as a brake drum.

The braking load is transmitted from the brass brake shoes to the keys against which they bear. The keys transmit the load to the anchor cone, which carries the brake arm on its outer end. The load is then transmitted from the end of the brake arm to the frame of the bicycle by means of the arm clip.

In order to maintain longitudinal movement of the control nut and limit its rotarial movement, a spring steel retarder is anchored to one of the brake shoe expanders. The flexible fingers of the retarder bear on the smooth outside diameter of the control nut.

The braking surfaces of the brake shoes are grooved so that grease will be wiped from the inside of the hub when braking takes place.

Rim Brakes

Rim brakes all use the same method of operation. Two arms straddle the tire and on the end of each arm is fixed a holder into which a block of

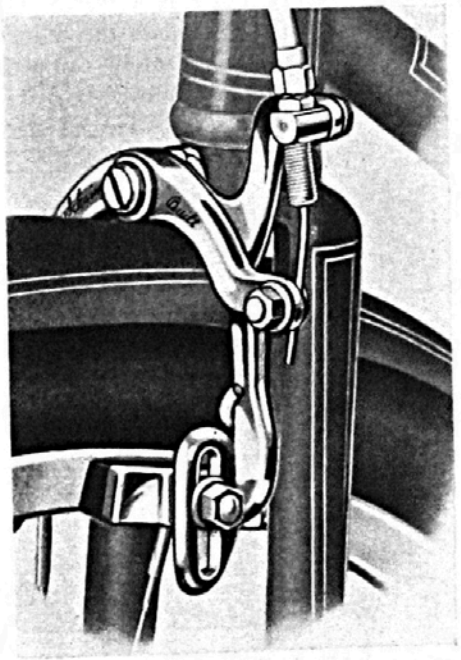
especially compounded rubber is slid. These blocks of rubber, or shoes, are pressed against the rim, and the resulting friction stops the forward motion of the bicycle.

The manner in which the arms of the brake move toward the rim is accomplished by means of rods or cables, one end attached to the brake and the other to a movable handle which is fastened to the handlebars. The arms of the brake are made to return to their original position by means of a small coil spring or a single turn long arm spring.

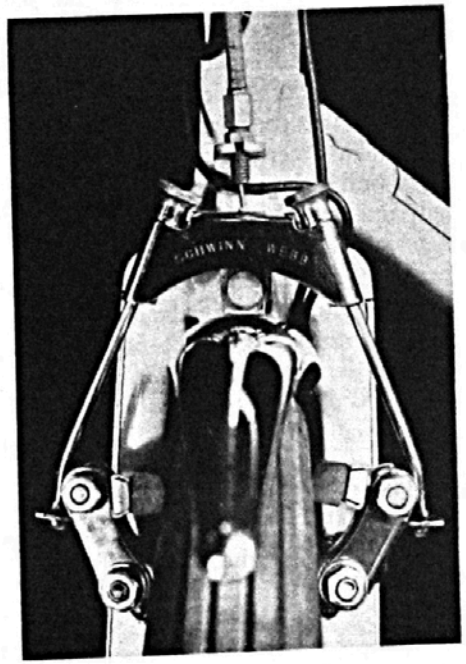
Cables are by far the most popular means of controlling caliper or rim brakes here in America. Cables consist of small steel "threads" twisted together, inside a flexible steel tube formed by a closely wound spiral of highly tempered wire, the cable being practically inextensible and the tube practically incompressible.

Although the tube and cable may be led around corners and bent at angles, the frictional resistance increases with each bend in the tube; in other words, the fewer the bends and curves, the more easily the cable moves.

There are two types of caliper brakes, the center pull and the side pull. Some cyclists swear by one kind and swear at the other, but both types are acceptable. The side pull caliper brake is held away from the rims by the single turn long arm spring mentioned above. It is the weakening of this spring that causes the brake arm to rub the rim on one side or the other. The remedy for this is a new spring, although an emergency repair may be



Caliper brakes, side pull



Caliper brakes, center pull

effected by removing the spring and pulling the weak side back into position.

Adjusting the distance of the shoes from the rim is done by taking up or letting out the cable. This is accomplished by either a locknut, through which the cable is threaded, or a combination locknut and tubular threaded bolt.

Center pull brakes are actuated by compound leverage, and the shoes are kept away from the rims by a small coil spring at the top of the brake. The adjustment is the locknut and threaded tube described above.

In addition to the methods set forth here, it is also possible to adjust the shoes by moving them on the arms, since most caliper brakes are set up that way, although a few makes allow only an up-and-down motion to adjust to the curvature of the rims.

Rod-operated brakes are adjusted by lengthening or shortening the rods. Most of the rod brakes can be used only with a certain type of rim, since these brakes brake on the inside of the rim and not the outside edge, although a few makes do work the latter way.

Many riders consider the "cantilever" brake to be the best rim brake available today. It is one of the most popular brakes used in Great Britain and is said to be twice as effective as any other type of brake. The cantilever is unlike any other brake on the market. The brake members are clamped around the forks and seat stays by shields which carry the cable stops and adjusters. Each side is independently adjustable to the rim with micrometer precision, and the absence of any bridge work entails a considerable saving in weight. The cantilever is a brake that can be relied on at all times; there is always braking power in reserve.

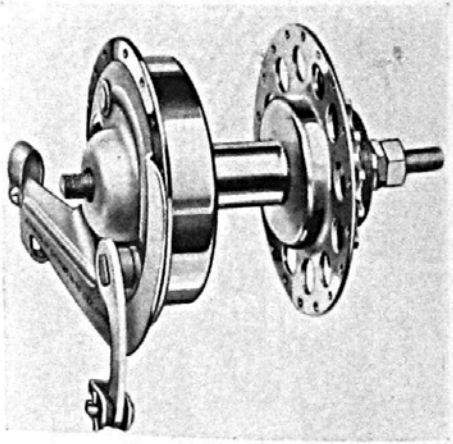
It must be remembered that all rim brakes must work on dry rims, and under no circumstances should oil be allowed on either rims or brake shoes. If the wheel is removed for any reason and the brake blocks squeal and squeak after the wheel is replaced, don't be alarmed. If the shoes are not rubbing the tire, the noise will vanish when the shoes wear to their new position.

It is a very good habit to wipe both rims with a dry clean cloth after each day's trip.

Internal Expanding Hub Brake

We now come to the internal expanding drum or hub brake, the most powerful bicycle brake now used. This brake is much heavier than the caliper brake, but the added safety compensates for the extra weight.

The hub brake is an integral part of the hub, and the wheel is built up from it. It is about 4½ inches in diameter and 1½ inches wide. It is fully enclosed, which tends to keep the internal parts clean and dry.

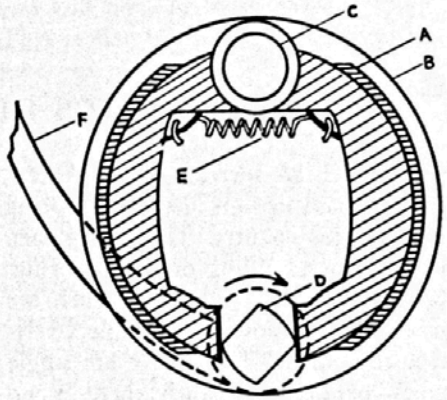


Large flange expander brake hub with built-in freewheel unit

The two brake shoes (A) which are inside the shell (B) and immediately beneath are hinged together with an anchor pin (C) at the upper end. The other ends of the shoes are separated by a rounded rectangular piece of metal (D) fixed to an arm (F), which in turn has the cable attached. When the cable is pulled, the arm (F) is raised, turning the piece of metal (D), which in turn forces the shoes (A) against the inside of the shell (B) or drum. The tremendous leverage exerted by this system is the same as that on automobiles, which explains why it is the most powerful bicycle brake now made.

The drum brake needs very little attention except for shortening the cable as it stretches.

It is said that hydraulically-operated drum brakes are used in the Canal Zone, but none have appeared in the United States as yet.



Warden Clark

Cross-section of expander brake hub

The only lubrication for cable brakes is a small amount of grease or vaseline applied to the cable where it leaves the metal tube housing. This helps avoid frayed cables. A drop of oil should be applied to the central pivot on the side pull brakes, and on the center pull where the arms are fastened together.

Chapter VI

Tires and Tubes

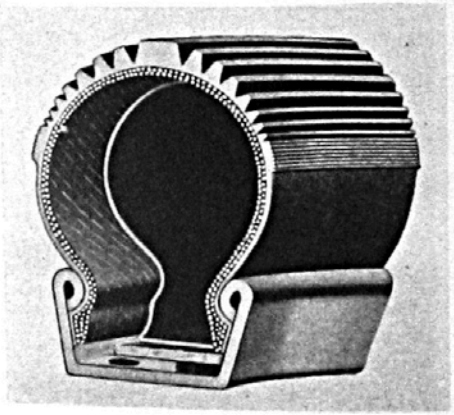
THERE are several types of American and foreign bicycle tires being used in this country. The racing men may be found riding on French, English, or American tubulars, which are probably the most comfortable lively-type tires made. Then there are single tubes, or tires in which there is no inner tube, and the drop center tire, which is most commonly used and is similar to an automobile tire. The American bicycles come equipped with any of these kinds of tires.

The drop center tire is about the easiest tire to repair. Its dimensions are usually 26 x 1-⅜ or 26 x 1-¼ inches, and it is the most common touring tire. The most difficult part of repairing it is the removal of the tire from the rim. A good pair of tire irons, however, will help. These can be made easily from strap iron or flat pieces of metal bent slightly about ¾ of an inch at each end and rounded for about the same distance. These can be as short as six inches, or longer for added leverage.

It is necessary to pry off the casing of the drop center tire by inserting a tire iron under the edge of the casing and bearing down until the casing edge is over the rim. Hold this first iron, and with another move down about three or four inches and pry another section over the rim. This should be enough so that the first iron can be removed and inserted a few more inches along the rim. This should loosen up the casing enough so that it can be pried over the rim at three-inch intervals until the whole casing is loose and outside the rim.

The inner tube should then be removed, valve first, and pulled outside the casing. This should be done with care, especially if the tube is old or sticks to the inside of the casing. It is necessary to use care around the valve and to pull the casing away so that the valve can be shoved through the rim.

Before the tire is removed from the rim, it should be inflated, if possible, in order to find the place where it leaks. The casing can then be marked with tape or pencil and the leak located on the tube. Nail and pin leaks are sometimes hard to find, and high pressure leaks can be found only by inflating the tire to full pressure and immersing it in water. Most service stations are equipped for this, but



Cross-section of lightweight touring tire, mounted on rim

if you are in the country, a puddle, lake, or stream will do as well.

If the leak is of the usual sort, it can be located in the tube by pumping in a few pounds of air, or by immersing the tube in water. If you have soapy water, the leak will blow a bubble.

When the leak is found, it is simple to roughen the surface around it and select a patch. Spread the surface around the leak with rubber cement (enough to cover the space which will be occupied by the patch) and pull off the protective covering from the patch. Let the rubber cement dry a few seconds before applying the patch. After this is done, the casing should be examined for dirt, stones, and a cut where the puncture occurred. This hole should be patched with a tape or even a boot if it is large. A tire patch helps, or a piece of canvas will do temporarily.

To remount the tire, fit one side of the casing over the rim and put the valve through the rim. It will be necessary to pull the casing away from the valve hole in order to get the valve through the hole and adjust the hex nut. Then spread the deflated tube around the inside of the casing and push it well inside the rim. The other edge of the casing should be pushed equally with firmness around the rim on the inside, as far as you can with your hands.

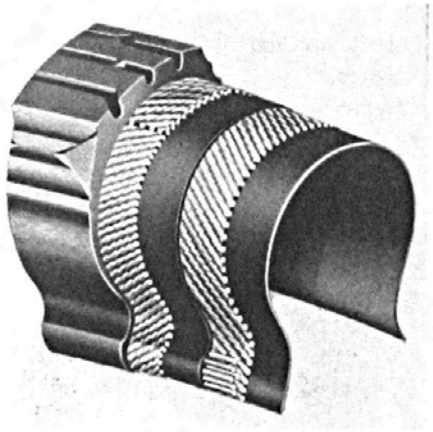
Some tires, like the English Dunlops, can be mounted entirely by hand. It is usually necessary, however, to use tire irons to get the last few inches of the casing over the rim. But you must be very careful not to pinch the tube in the process as it may puncture and you will have to begin all over again. This is not too difficult an operation, however.

If you carry your own pump, it will not be necessary to look for a gas station, and the ordinary tire repair kit is a "must" for continued maintenance of a bicycle. Any kit that is older than four months should be thrown away, especially if it has been damaged by extreme heat. A new kit should be purchased for each long trip taken.

The new hosteler or L.A.W. enthusiast usually has new tires, and thus experiences only an occasional puncture. The more experienced cyclist, however, usually has older tires and more practice in keeping them running. The best tires sometimes have flats while others run for thousands of miles and several years without any trouble.

The new cyclist may have purchased a second-hand mount with not-so-good tires or with synthetic inner tubes, which are difficult to patch. For the latter, more than one coat of cement should be applied on the roughened surface around the leak. Better yet, secure some special cement for synthetic inner tubes. If sufficient care is taken in applying the patch it will hold quite well.

When a tire has blown out, you may often want or are compelled to use it still longer (and indeed it may last quite a while longer). To make this possible, take a piece of canvas, a regular boot, or even a regular tire patch. Adhesive tape is sometimes useful as a temporary patch, or a piece of canvas cemented on the inside of the casing. An ordinary tire patch will also reinforce the weak spot.



Section of lightweight tire, showing construction

The patch or boot should be large enough to cover all of the weakened spot or any part of the tire that was exposed to wet or dirt so that the threads have become loosened or soiled. This area should be reinforced on the inside for a clean job. The boot can be cemented to the casing or sewed to it if the casing is thin enough to allow the use of a needle.

To repair a pulled-out valve, first remove the supports of fabric and rubber from the old valve hole and then patch it. Move to a clean spot on the tube and make a neat insertion for a new location for the valve. Support the valve with a rubber patch or special fabric piece found in some repair kits, and turn the nut down tight on the valve stem.

When removing an old inner tube from its casing, particularly in a tubular tire, the cyclist sometimes pulls it in two. Other times, when there are several patches in the same place, it is necessary to pull them all off and make a clean patch of the whole section; and in doing so, the tube may inadvertently be pulled apart. To repair such a tube, make two clean edges of the break. Use a small piece of wood the size of the inflated tire and insert it in one end of the open tube. Pull the other end of the tube over it and cement the two ends together. To remove the wood (which is inside the tube after sealing of the break), move it along to a place in the tube unencumbered with patches. Make a small opening, remove the wood, and patch the hole as usual.

Another type of tire is the single tube, 28-inch high pressure type. These tires can be repaired successfully only if the leak is small. A large cut or a pulled valve in this kind of tire is almost impossible to repair without using professional methods and equipment. These single tubes are serviceable but must be kept well inflated and be carefully mounted and cemented on the rims. They are not as lively as other types of tires, although racing men talk of Palmer tires made ten and fifteen years ago which were flexible enough to be folded and packed in a saddle bag as a spare, like tubular tires.

It is interesting to note that in most cases these tires can be repaired without removing them from the rims. To repair such a tire, it is necessary to have a single tube tire kit, which consists of patches, rubber bands, cement, and a gadget to stretch the bands and place them in a hole or cut. It is known as a rubber band shooter. Holes as large as one-fourth inch in diameter can be filled with these rubber bands, stuffed tightly, and soaked in cement. They are then vulcanized by igniting with a match.

The bands are first stretchd on the frame and pushed into the hole. Then the gadget is pulled out, leaving the bands loose, but tight in the hole as the frame releases them. After igniting with a match, the cement-soaked ends of the bands are allowed to burn down level to the tire before the flame is extinguished. The bands are thus fused with the tire.

The types of racing tires which are in most common use in this country are the Wolber 26 x 1-⅜, the Pye tire made in America, the Dunlop tubular made in England, and the Pirelli of Italy.

These tires vary in weight from the six- or seven-ounce tires used in six-day bicycle races, which are inflated to 150 pounds and range from ¾ to one inch in diameter (x 27 inches), to the 23-ounce Hutchensons, 27 x 1½ inches, for heavy touring. These latter are inflated to about 75 pounds.

The tubular tire is sewed up on the inside. That is, the casing is sewed up to make a completely sealed tube, and the inner tube is held inside. This tire is completely round, even oval, in shape, and is the fastest and liveliest tire made. Its construction is such that it fits a rim that has merely a groove in the center, and it is held there with rim cement or rim tape, as is the single tube tire.

This tire can easily be mounted or dismounted. However, the stitching must be cut open for an inch or two for patching purposes. After the leak is located, the casing is cut open. You must be careful, however, to cut nothing but the stitching. The inner tube is then pulled out part way and patched. Push the inner tube back into the casing when it has been patched, and the casing is ready to be sewed up again. Use the old thread holes if possible.

Tubular tire for racing bicycle

When sewing, be careful to keep the needle away from the inner tube. Use a fairly heavy thread, a fishing line, or waxed thread, and pull the sewing as tight as possible, as the line will tend to stretch.

There is another type of tire, the English Constrictor. It is a beaded tire of tubular variety and is mounted on a racing-type rim.

The most common tire is the American or English drop center touring tire. These are fairly easy to repair, reasonably light, serviceable, and fit most bikes of the lightweight type.

Chapter VII

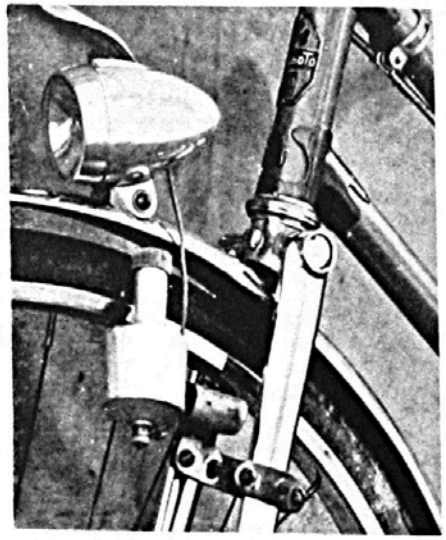
Lights

FOR the average cycle tourist, the generator set is better than any other type of light. The initial expense is high but maintenance amounts to almost nothing for several years. The principal advantages are:

1. More light. The twelve-volt generator, used extensively, furnishes more light than six batteries. The six-volt generator, also in wide use, provides ample power at all speeds for a bright head and tail light.

2. Consolidated power. Both head and tail light are operated from a single unit.

3. Dependability. The light is constant. There are no batteries to dim or burn out. This is especially important on long night rides or trips, as it is not only annoying, but can be dangerous, to have the light fail at an inopportune time.



Walter Norris

Generator set, showing friction wheel and headlight

In the purchase of this equipment, experienced riders have found Swiss, German, and English generator sets to be the most satisfactory in performance, workmanship, and appearance.

Correct alignment of the generator is essential to the quiet ease of operation. The friction wheel should be at right angles to the tire, in line with the hub, and the point of contact should be just below the tread line. Reasonable care should be given to seeing that the bulb is screwed up tightly, that the glass does not rattle, that the ground points contact properly, and that the wires are located so that they won't bind, because a short circuit is likely to result if the insulation is scuffed off.

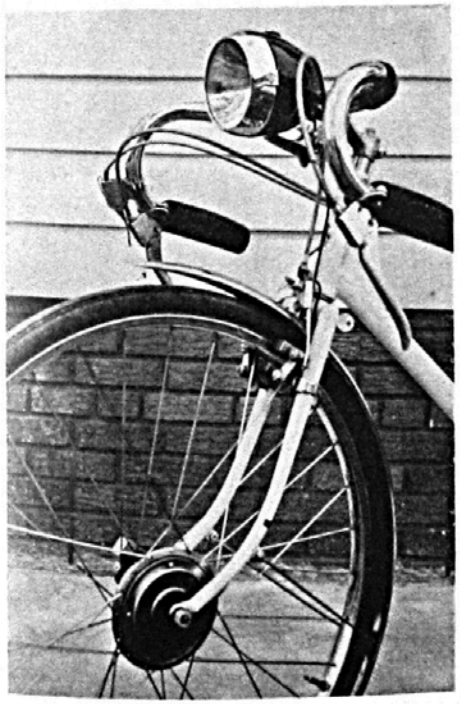
Some riders in very hilly country may object to this type of generator as it does cause a slight drag at low speeds. For them, either the Dynohub or the battery type light might prove more satisfactory.

The Dynohub, which is comparatively new to American cyclists, looks somewhat like a hub brake. It is built into the front wheel at the hub and revolves at normal speed with very little noise and on the ordinary bearings of the wheel. Furthermore, the built-in position of this generator

renders it immune to damage by rain, snow, dirt, or accidental knocks. It is claimed that with the Dynohub lighting system, whether in or out of operation, there is no frictional resistance.

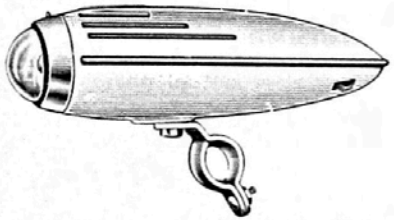
For those who ride racing cycles, and others who do not wish to add permanent accessories and fixtures to their bicycles, the battery-operated lamp is preferred. Among the more satisfactory types of head lights to be used with the batteries are:

1. Those designed especially for bicycles and built to withstand shock and vibration. They are readily mounted to the bicycles in a few seconds. To facilitate the mounting and removal, wing nuts should be substituted for the standard nuts furnished with these lights.



Warden Clark

Dynohub installation



Typical inexpensive bicycle headlight

2. Those fastened on a band to be worn on the forehead, which have the following advantages:

a. They are not fastened, even temporarily, to the bicycles.

b. The beam of light is always in the direction in which you are looking.

c. The batteries are in a case either clipped to the belt or carried in the pocket.

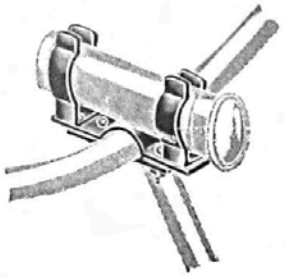
3. Ordinary flashlights with attachments for securing them to the bicycles. These are inexpensive and can be used for other purposes.

In purchasing this equipment look for rattle-proof headlights. Remember that although the first cost of battery-type equipment is low, you may require quite a few batteries in a season if much night cycling is done.

The importance of a tail light should not be overlooked, for it is definitely a protection to the cyclist. Many States require it.

A single-cell tail light can be riveted or taped to a strap to be worn on the left ankle. This readily catches the eye of the motorist.

Red reflectors should be used on the rear of bicycles in addition to electric lights. On racing cycles where there



Flashlight mounted in handlebar bracket

are no fenders on which to attach the reflectors, cat's eyes reflectors fastened to the pedals have been proved very satisfactory, as the circular motion of the steel pedals with these reflectors inserted is eye-catching.

It is a good idea to have a white patch equivalent to twelve square inches painted on the rear fender. This is required in other countries where bicycles are used extensively. The color "white" is not meant to include polished aluminum or chromium plating, for lighting engineers have found that they tend to absorb rather than reflect light.

For additional protection, wear white or light-colored shirts or jackets for night riding.

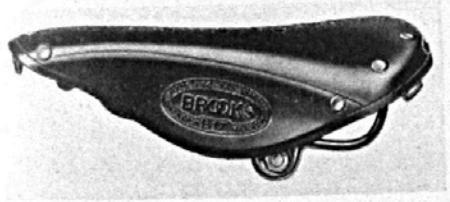
Adjust your speed according to the distance you can see ahead. Be particularly careful when turning. Remember that not only is your width of vision restricted, but your bicycle may be almost invisible to traffic on either side.

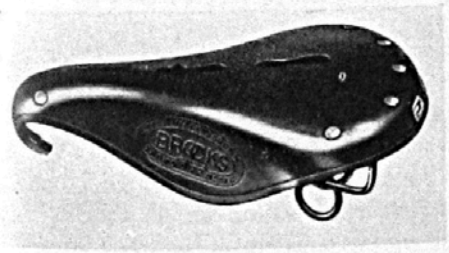
CHAPTER VIII

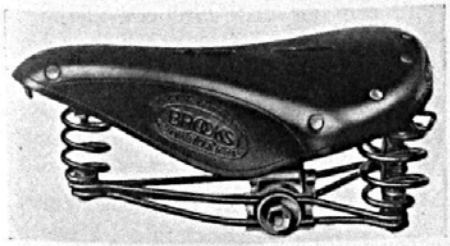
Other Accessories

Saddles

AFTER he acquires the legs for extended bicycle trips, the first thing of which the novice rider becomes acutely aware is the saddle. The lack of a proper saddle can detract completely from the pleasures of a cycling trip. Proper saddle selection is subject to some variables, namely, size and weight of rider, and type and degree of riding. The illustrations show a few types of saddles. There are two general classifications: coil spring and loop spring types. To generalize individually on the foregoing classifications: the coil spring type offers an easy spring ride; however, much of the power thrust of the legs is lost because of the "give" in the saddle, and also the body must be raised higher when shifting position for hill climbing or fast riding. The loop spring type of saddle suspension provides adequate support with no "give" during the leg thrust, and with ability to shift position on the saddle with the minimum of effort.

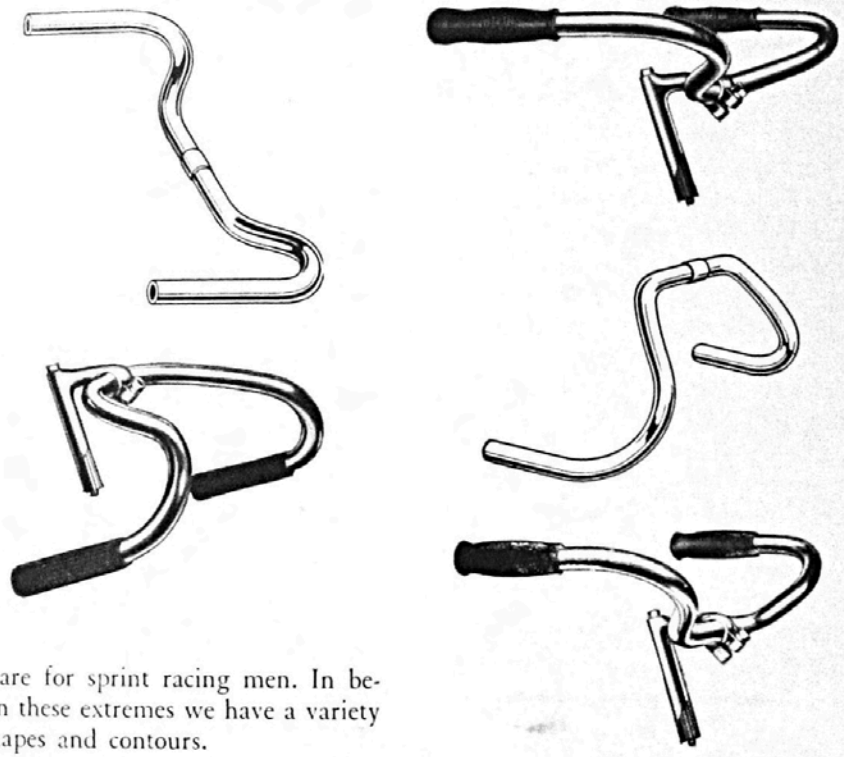






Types of saddle covers vary widely, from the padded mattress type to the slick, hard, high-grade leather category. The padded type of saddle cover usually is found on the coil spring saddle. Although soft and yielding, it tends to cramp and pull buttock and thigh muscles during prolonged riding. The straight leather variety of cover is hard but will tend to shape to the pelvic bones after some riding. This is called "breaking in" of the saddle. Once broken in, the saddle is comfortable, allows easy weight shift during riding, and will not pull or pinch muscles.

Saddle shapes vary extensively from extremely wide to extremely narrow; from short saddles for women to long ones for men. Wide saddles are generally associated with coil springs and mattress type covers. Very narrow sad-



dles are for sprint racing men. In between these extremes we have a variety of shapes and contours.

To sum up the question of saddles: the uninitiated would do well to consider the type of riding intended, and his weight and size. For long distances the loop type of saddle with leather cover is recommended, the width to vary according to the individual. Generally large persons can use less saddle width. For the intermittent rider (shopping, park riding, etc.), a modified coil spring saddle (i.e., with leather cover) is recommended.

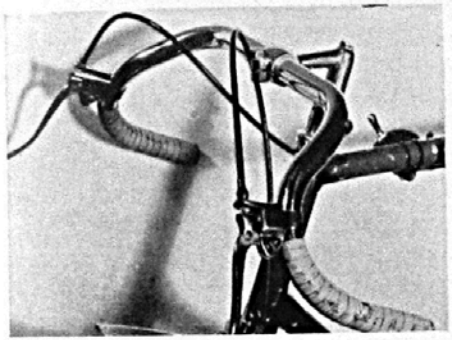
Handlebars

In dealing with handlebars on the bicycle we again touch on a subject of direct interest to the novice. Present bicycle handlebar patterns are somewhat of an enigma if we stop to realize that after all it is only necessary to supply two bars directly up from the fork, in a straight line, with which to handle the bike. Illustrations show a small sampling of the variety of shapes available in bars.

By far the most popular bar among club riders and advanced tourists is the conventional drop bar. The "drop" or the distance of the "hooks" from the top of the bar can vary considerably. Very little drop with a straight top bar is recommended for the novice tourist. The lower section of the bar is for riding into the wind and mounting hills, and certainly will be found useful from the first tour where head winds are encountered, on through a lifetime

of riding. The top of the bar is considered a rest position.

For casual in-town riding, a flat bar is recommended, or the Lauter Wasser style, which has about 1 to 1½ inch drop. In no case are the extreme upturned or "steer horn" types of bars



Bob Jacoby

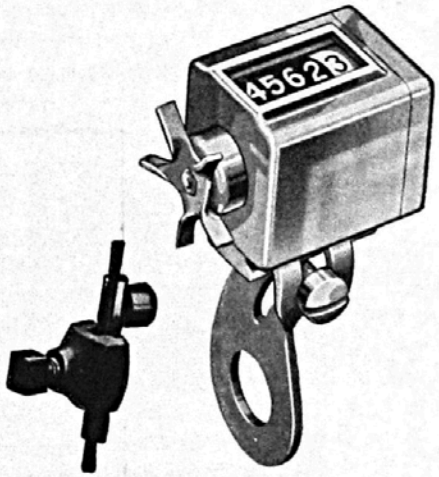
Bars with straight top tube, comfortable for touring

recommended, because use of a bar of this type results in maximum weight centering on the saddle and pedals, instead of the correct three-point balance among saddle, pedals, and handlebars. It is well to select the shape of bar that will give two or more positions for the hands, for during long periods of riding the change in position will prove very restful. Handlebar grips are optional. However, the thick sponge rubber type is not recommended, for it proves hot, uncomfortable, and unsafe during extended riding periods. Many riders use tape as a very satisfactory handlebar covering.

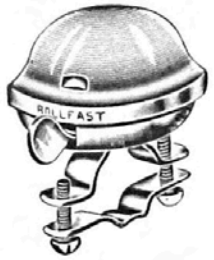
Mudguards

One of those "take it or leave it" items for your bicycle, mudguards can prove very welcome at certain times. Whether you equip your bike with them depends principally upon the climate where you will ride and the type of riding you will do. It is best for all novice riders to purchase bikes with fenders or the proper facilities for handling them, i.e., wheel clearance and stay lugs. The modern bike builder (club model lightweight) generally so equips a bike with mudguards as to make it possible to mount or demount them quickly.

Guards are manufactured of four materials: steel, aluminum, celluloid, and dural. Of the four, steel is the least satisfactory, being heavy and likely to fracture from its weight and vibration. Aluminum is light but easily bent, which makes it rather difficult to hold stays in place because they deform so easily. Celluloid is very satisfactory and is widely used on English bicycles. Celluloid mudguards, however, must be kept adjusted properly, as they will warp out of shape in the sun. Dural (a heat-treated aluminum alloy) is by



Cyclometer and striker



Bicycle bell

far the best of the four materials. It is light, strong, stiff, and thin, and will last indefinitely.

Types of fastening for mudguards vary, the trend being toward quick-release features such as wing nuts and frame clips.

Cyclometers

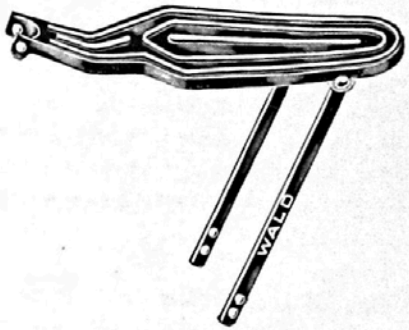
"It's nice to know how far you go." So goes the slogan of one of the leading cyclometer manufacturers. An unimportant item for around-town riding, the cyclometer assumes real significance when the cyclist takes to the road. Used with a map, a good cyclometer represents a genuine aid in touring unfamiliar country. The popular style of cyclometer consists of a "trip" meter (which can be re-set to zero) registering up to 99 miles, and a combined cumulative meter registering up to 9,999 miles. Also widely used is a simple cumulative meter, counting up to 9,999, but lacking the companion feature of the "trip" cyclometer. The counter on both types is actuated by a striking pin fastened on a wheel spoke. Being weatherproof, a cyclometer requires little care other than a drop of oil on the striker occasionally. Cyclometers are furnished in two sizes: for 26-inch diameter wheels and for 28-inch diameter wheels.

Bells and Horns

In American cycling bells and horns are chiefly confined to juvenile riders. However, warning signals on the bike have a real place for the in-town cyclists. A bell is to be recommended as being the lightest and most pleasant signal available. Horns are either physically or electrically actuated. For the touring cyclist a device of this nature is considered superfluous, but it is well to check local regulations where you stop; they might require a warning device affixed to the bike. Above all, use nothing but a pleasant-sounding device; avoid a raucous or jangling signal.

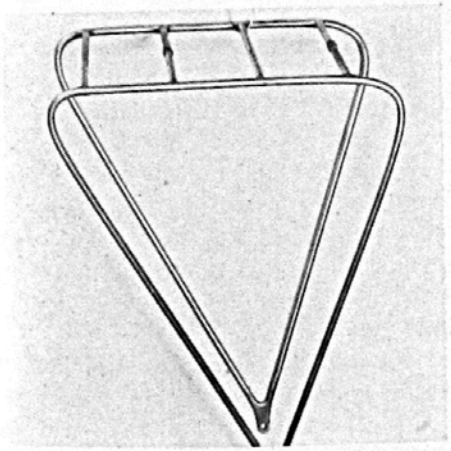
Locks

We go to considerable thought and expense in developing a riding mount with a total weight under 30 pounds, put a lock around the wheel, and consider it safe because it won't roll. But somehow, in spite of this fact, we feel much better leaving a really *locked*



Typical American-style luggage carrier

bicycle; the padlock seems to represent security. Generally in purchasing a bicycle lock, it is best to stay with the conventional form of padlock, avoiding fancy locking devices such as permanent appendages to the fork, etc. (The foregoing are not to be confused with the built-in fork lock which is furnished by a leading American manufacturer.) Again, the "about town" rider would have more use for locking devices than the tourist. A short light length of hardened steel chain is excellent for the utility cyclist who leaves his bike outside a plant or office all day. The bike is chained and locked to a fence or post, and during



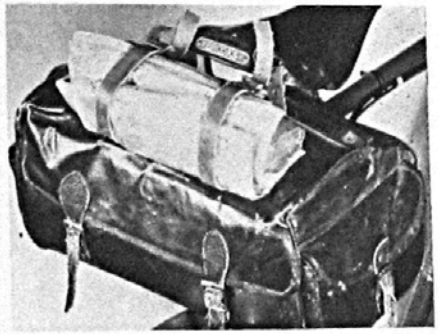
Bob Jacoby

Lightweight carrier made of aluminum tubing

off hours the chain and lock are left fastened to the post or fence.

Carriers

Extensive touring and the nature of the bundles to be carried often dictate the necessity for an alloy carrier.



Bob Jacoby

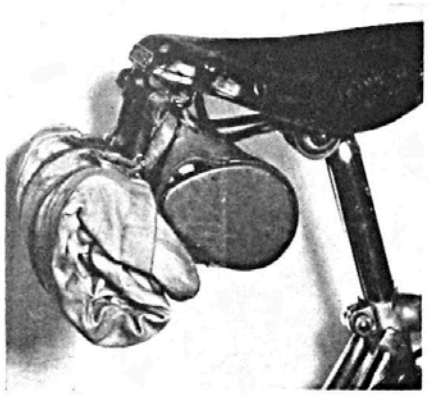
English-style touring bag (rain cape in place)

Shapes and styles of luggage-carrying racks vary considerably. Perhaps the most common American manufactured variety is the one illustrated. Often wire baskets are mounted on the front of the bicycle. This is not advisable, generally speaking, for it affects the handling of the machine. However, circumstances sometimes alter the case.

Carriers made of high-strength dural tubing are light, strong, and very desirable, but are unobtainable at present, being manufactured abroad.

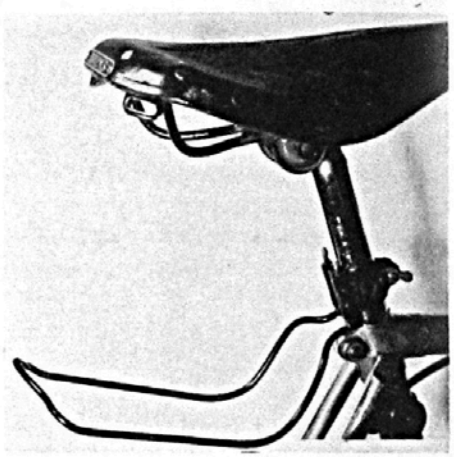
Bob Jacoby

A camera bag adapted as a saddle bag. This type of luggage is very durable.



Bob Jacoby

Straps may be used in carrying rain cape, roll, jacket, etc. This type of bag is most often used for tools.



Bob Jacoby

Wire bag support. Note that saddle has "broken in" appearance.

Luggage

To the touring cyclist a subject of never-ending discussion would be luggage bags and personal tastes as to material, size, shape, and method of suspension. Illustrated are a few of the popular styles observed in this country. A good bag is not necessarily made of high-grade leather, for the weight would become prohibitive. The majority are manufactured of a leatherette material with fiberboard lining.

The chief objection to a touring bag is the sag that develops, allowing the bag to hang on the mudguard or rub the wheel. This is particularly troublesome for anyone riding a relatively low seat. The best remedy for this condition is the so-called "bag support," of which there are many sizes and shapes. Illustrated is one of the more popular designs, resembling a miniature carrier frame.

It is well for the enthusiastic touring cyclist to own two or three sizes in touring bags in order to keep bulk to a minimum when traveling.

CHAPTER IX

How To Organize A Cycle Club

THE organization of a cycle club comes about in the same way as that of any other recreational group: a number of individuals discover they have a common interest and decide they would like to pursue their interest together. They may have become acquainted as the result of a cycle train or cycle picnic arranged by a civic group, YMCA, YWCA, or other organization interested in promoting wholesome recreation for the adult public. Or they may have become acquainted through doing business with the same dealer. Perhaps their community has no cycle clubs at all, but they have learned, through reading or through conversation with a dealer, of the success of clubs in other communities. Perhaps there are already one or more clubs in their city, but none has its headquarters conveniently near their part of the city. So they come together and decide to form a new club.

First they will want to settle upon their purpose or objective, to make sure that they all have the same objective in mind and will be satisfied with a program aimed at that objective. If their aim is the development of bicycle racers and the promotion of races, their program will of course differ radically from that of a club having the promotion of touring as its principal goal.

Next the organizers should appoint a temporary chairman and a temporary secretary, to provide leadership and to insure that adequate records of the preliminary discussions will be made. The chairman should appoint a committee who will prepare as soon as possible a tentative set of by-laws for presentation to the group at its next meeting. At that time any changes in the proposed by-laws should be made which are desired by the majority, and the by-laws can then be adopted. They should be as brief and simple as possible and yet make provision for all contingencies which it is foreseeable might confront the group in future times. (To take care of unforeseen emergencies in the future, they should include provision for their amendment.) It is suggested that the by-laws establish standard procedure for the club under the following headings: name of club and object, meetings (time, place, quorum), officers and their duties, fees, dues, and penalties, standing committees and their duties. A sample set of by-laws can be obtained by addressing the National Secretary, League of American Wheelmen, Inc., 224 North Desplaines Street, Chicago 6, Illinois.

The club will then elect officers in accordance with the by-laws.

The members will naturally feel from the beginning that their program of activity is the most important thing about the club and deserves careful attention from the start. Although the program will probably consist principally of bicycle rides, there will doubtless be supplementary social activities,

W. W. Wainwright

even in the summer, and a committee should be appointed to take charge of planning and executing the social program.

Especial care should be given to the selection of personnel for the Rides Committee, because that is the most important committee in the club. They should be members having sound judgment and common sense, as many factors must be considered in planning successful rides.

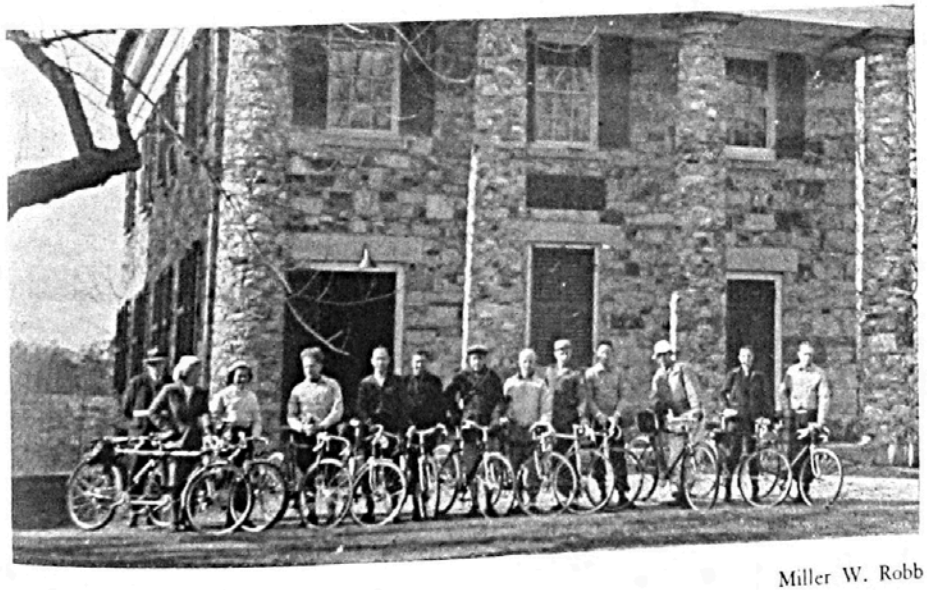
If the organizing group contains a number of inexperienced riders, the Rides Committee will find it wise to plan short and easy rides for the first weeks of the program, in order to help the new riders gain experience and to attract more members. As the club progresses it will expand its program to include more ambitious trips and to explore touring possibilities farther afield. Also, as the original members become more expert riders and novices continue to join, it may be found desirable to conduct club runs in two groups, both having the same route and destination but traveling at different speeds, so that all riders may get maximum enjoyment from their participation in the ride.

Like other sports clubs, cycle clubs soon discover that their continued success depends upon a steady, though perhaps slow, influx of new members at all times. New members bring in new ideas, new talents, new leadership material. Without a trickle of new members, a club tends to become stale and "ingrown," and may find itself doing the same rides and other activities many times over and growing tired

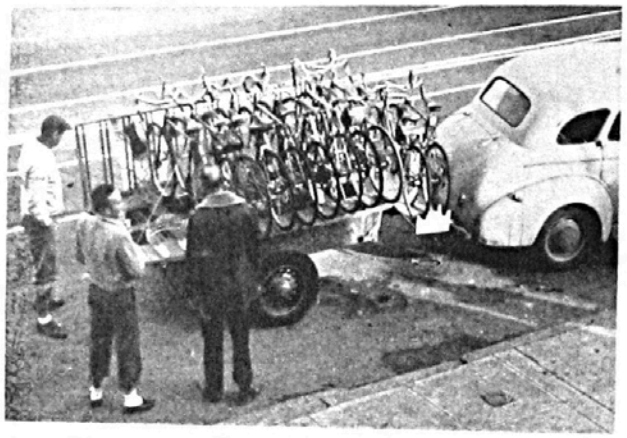
of them. Besides, every club inevitably suffers a steady draining off of its old members, through changes in family circumstances, members' moving out of town, working different hours, or finding new hobbies or sports that are more absorbing to them. For this reason every wide-awake cycle club should be on the alert constantly for good membership material. The club may prefer to do this passively, and merely make friendly advances to any new cyclists they see on the road or in bike shops; or they may wish to wage a consistently active campaign that will take them to the new people rather than wait for the new people to come to them.

Any resourceful group of cyclists will be likely to think of and try out one or more of the following methods of finding new material: running notices of club rides and other activities regularly in the local papers, free, as a club news notice; or placing a paid ad in the classified notices at frequent intervals; "tagging" parked bicycles with publicity postcards; searching bicycle license files at the police station for new names of bicycle owners of a suitable age, and sending them publicity by mail or calling upon them personally; placing "general invitation" posters in such places as YMCA's, YWCA's, bicycle dealers' shops, ice cream parlors, popular restaurants, barber shops, etc. If it is possible to obtain free newspaper publicity through a feature story on cycling or on some special event staged by the club, this should result in interesting some cyclists among the newspaper's readers. Photographs accompanying such feature stories are especially valuable. Expanded suggestions for publicity on a broader scale are given in the following chapter.

The objective of the club's officers



Miller W. Robb



Bicycle rack accommodating 12 lightweight bicycles mounted on trailer. Auto has rack holding two bicycles.

W. W. Wainwright

and of the program they put into effect during their terms of office should be to please as many of the club members as possible over as much of the season as possible. This can be accomplished only by using democratic procedures in all club functions and taking all tastes into consideration in planning rides and other activities.

Clubs usually find that if they adhere to their program once it is set up, and carry out their schedule exactly as published to members and others, they will reap the respect of the public and the trust and confidence of the members.

A well-established club, having explored all the roads within easy reach of its community, can find new scenes through the use of a trailer, supplemented, perhaps, by bicycle racks installed on individual members' automobiles. The members can then travel by auto or public transportation to a prearranged point some distance from the home city, while their bikes are being transported there together on the trailer. All of the cycling time can thus be spent in new territory, and the cyclists can return home quickly by auto from the same point at which they embarked by wheel earlier in the day. Trains and boats can also be utilized to introduce variety into the club schedule.

In parts of the country where cycling is impossible in the winter, club interest can be maintained through regular business meetings, skating parties, coasting, skiing, dances, hay or sleigh rides, and any other form of recreation which the members favor. These wintertime social activities are more easily fostered when the club has its own quarters, owned or rented, where members may come at any time for social chatter, games, parties, and business sessions directed toward planning the next season's rides. Clubs not having clubrooms will usually find it possible to meet in quarters owned by a municipal recreation department, YMCA, YWCA, or other social service organization; or the members of a small club may prefer to meet in one another's homes.

CHAPTER X

Publicity Methods

An Outline of Ways to Promote Organized Cycling—National and Local

IN the course of organizing and establishing a cycle club there must be publicity. Various methods have been tried and proved successful by both the League of American Wheelmen and its affiliated clubs. National publicity aids the organization of new clubs. In turn, club publicity and advertising promote League expansion. Although there is similarity in the national and club methods, publicity could be classified under these two headings:

1. *National, Division, and Council*

Publicity methods of these three classifications of League membership are rather limited by comparison with those of the individual clubs; nevertheless, the following methods will serve the purpose.

(a) Publish national, division, and council periodicals and distribute them to civic organizations, YMCA's, YWCA's, Chambers of Commerce, libraries, bicycle manufacturers, and dealers, in addition to the regular members.

(b) Use newspapers in national, division, and council headquarters cities. Publicize aims and ideals, notices of conventions, round-ups, and other meetings. Also utilize newspapers of convention cities.

(c) Plan special and general events: cycle trains, picnics, parades, dances. Cooperate with the American Youth Hostels and the Amateur Bicycle League of America on some. An attractive program is of prime importance. Publicize these events in League periodicals and other papers.

(d) Invite special groups to participate in the above-mentioned events; e.g., YMCA, YWCA, Boy Scouts, hiking clubs and other outdoor clubs.

(e) Cooperate with national and local safety organizations; present L. A. W. safety program.

(f) Emblems, arm bands, shirts and jackets bearing the League insignia

Courtesy H. P. Hansen

The first Midwest cycle train, Chicago, Illinois.

can be worn by the participants in any or all rides, parades, etc.

2. *Club*

Publicity of the individual clubs, to a great extent, follows the pattern of the national organization, plus several additional suggestions already proved feasible for local activity.

(a) Publish a periodical containing programs, aims, etc., and distribute it to club members, prospective members, local civic organizations like Chamber of Commerce, libraries, YMCA's, YWCA's, Boy Scouts, and local newspapers. (This eliminates a separate report on activities to the newspapers except when advance publicity is desired.)

(b) Plan a safety program; submit it to the local police department for approval. In conjunction with this, organize a junior club; plan tours for Boy Scouts and other youth groups, stressing safety.

(c) Plan special tours: cycle trains, picnics, local parades or bicycle days, social affairs in winter. Publicize all of these widely. Again, the *program* is most essential. It must contain events of interest to attract various ages of cyclists.

(d) Cooperate with other local outdoor groups: hiking clubs, skating clubs, etc.

(e) Place printed signs, containing complete club information and removable schedules, in local bike shops and other store windows, public parks, fieldhouses.

(f) Have club members wear emblems or jackets or shirts bearing the club insignia. Likewise, for special events, the club name, either painted or in decals on small wooden shingles or signs, can be attached to the bikes without much hindrance to the rider.

(g) Have regular gathering places for meetings and rides, and a permanent clubroom if possible. This is invaluable.

(h) Obtain permission of a local shop proprietor to place a bulletin board for snapshots, special items of interest, and ride schedules.

(i) Last but not least, list one or more telephone numbers in the local classified directory, where club information may be had by anyone making inquiry.

The aforesaid publicity methods will meet with success in almost any community where cycling is at all popular. As time goes on, new clubs will undoubtedly discover additional ideas on publicity to the benefit of the L.A.W. and clubs everywhere.

CHAPTER XI

Leadership Training

LEADERSHIP training is a large undertaking, but when one studies the roster of the League of American Wheelmen, he finds that many of its members are leaders in their professions. The L.A.W. has doctors, lawyers, merchants, dentists, musicians, law enforcement officers, recreation workers (to name only a few) within the organization. We should therefore be ready to take up leadership training among leaders.

Probably we all agree that leaders should possess most of the following qualifications:

Physical and nervous energy
Sense of purpose and direction
Enthusiasm
Integrity
Technical mastery
Intelligence
Friendliness and affection
Teaching skill
Stability
Faith

The nature of a potential leader's activity must be appropriate to encourage leadership into existence. It is important to grasp the implication of this truth, that it is the situation and not the person alone which allows leadership talents to function. Leaders are getting away from the old school of thought. Today a leader is doing his job when people are working toward some goal which they have come to find desirable. Modern students of leadership delve into such subjects as psychology, training and self-knowledge, training and attitudes, and how to make group objectives attractive.

The following outline may be a guide to the analysis and solution of any leader's problems. He should consider

I The situation and its problems. What is the specific question to decide?

II What factors in the situation are important and must be taken into consideration in the decision and why?

III What to do.

A. Examination of possibilities.

B. Course of action.

C. Bonds of unity.

D. What are the chief differences?

1. Facts
2. Opinion

Capable leaders examine the possibilities of any project thoroughly and set a course of action to be taken. They persuade their group to feel united for the benefit of the project and its operation. Their next move is to examine the "no's" and "yeses"; in other words, put the plain facts before the organization and then get the opinion. At this point the leaders should always have available the notes which they have gathered. After the members of the group have discussed the project in this manner, they reach a conclusion,

and in doing so they make the go-ahead decision.

IV How to do it. Now map out ways and means to put the project over. For example, if the project happens to be a membership drive, here are some suggestions for an analysis of the organization, in preparation for "selling" it to prospective members:

A. What is the stated purpose of the organization and how was it arrived at?

B. How did its members happen to organize? Was it spontaneous? How was it fostered—by outside leadership and publicity?

C. What reasons do the members mention in conversation to other people in getting them to join?

D. What means are used to interest prospective members?

E. What common interest exists in the group? How do they satisfy their interest?

F. What individual interest holds members in the group—public speaking? music? health and recreation?

G. How does the group define its personal requirements of membership? What limitations are there as to number? Are there any unwritten restrictions as to sex, race, color, creed? Are members ever dropped from the organization, and if so, for what reasons?

H. What offices do members have?

1. Name the duties and the powers.

2. Are the officers elected or appointed, and in each case by whom?

3. How long do they hold office?

4. What committees are there? What are their duties? Chart their relationship with other subgroups. Are they officially recognized? How did the present committees come to be set up and by whom? Where did the ideas come from? How were they worked out or accepted?

I. What are the activities of the membership?

1. Meetings, problems, policies.

2. What methods are used to maintain the group's morale?

J. What is the relationship of the organization to other organizations?

K. Make a chart and calendar of the organization's activities. Maintain it for a whole year, January to December. Have your chart cover each month. Include the per cent attendance at each meeting and find out what program or entertainment brings the most people out. What activities receive the most support, and how do members show their support — by attendance, participation, or response to appeals? Find out how many volunteer for service. To get a perfect case history on this chart, write down how the members showed a lack of interest. Was it by absenteeism or otherwise? Also on the chart show the number of members taking part—such as the officers and committees, the high and low members in the organization, the cliques or factions. Another good point is to watch your group at meetings, just before the meeting begins and right after it ends. Was there much sociability and what did it indicate?

L. Have the officers, committees and members look back over the year's work and measure the results of their activity.

1. Volume of work done by groups.

2. Quality and quantity of work done.

3. Stability of the organization.

a. Good findings and bad findings.

b. How many new members joined and how many members dropped out?

4. Number of complaints and grievances.

5. Last but not least, obtain the opinion of each member, stated openly.

* * * * * * * *

Much has been written about leadership and much more will be written, but there is no definite rule for being a leader. If a man is just "one of the boys," is well liked, and has a reputation for getting things done, he is a leader. But always remember this point, whenever a leader is toasted at a banquet for getting a big job done: even though he may give them no recognition, it is always the little fellows sitting out there at the tables who did the job. They are the REAL leaders.

Chapter XII

Junior Bicycle Clubs

IN addition to providing a program of recreation and exercise for its own members, an adult cycle club may wish to perform some type of community service and thus establish itself more firmly in the public eye by winning public esteem. The most natural avenue for activity of this kind is education of juvenile cyclists. They are more numerous than adult cyclists in most communities, and usually there is plenty of room for improvement in their riding. Work with juniors provides a useful outlet for the energies and talents of those members who have a particular liking for working with children.

In what ways can an adult club serve a junior club?

1. By helping them to organize as a group and to work out for themselves a suitable program of bicycle tours.

2. By teaching them (by precept, but more effectively by example) how to ride safely and sanely, observing all traffic laws and riding with proper consideration for their fellow club members and others on the road.

3. By teaching them how to treat their bicycles and keep them in good running condition; how to perform simple repair jobs.

4. By guiding them through logical steps into a wider year-round program of wholesome activities that are similar to cycling.

It appears axiomatic that if you keep a child busy with clean, wholesome activities, he will have neither time nor interest for the other kind. A child who develops a keen and sincere interest in sports will probably never lose that interest. It will always be a bulwark for him against boredom, loneliness, and bodily ills resulting from physical sluggishness.

Participation in a junior bicycle club prepares a child for good citizenship. It helps develop leadership talents. It furnishes experience in parliamentary procedure and gives youngsters a chance to express talents in music, drama, public speaking, and writing, in connection with the program of the club. All this aids in developing the personality of the individual child and drawing out his best traits while directing his energies into worthwhile channels.

Detailed suggestions for the organization and continuance of junior bicycle clubs may be obtained by addressing the National Secretary, League of American Wheelmen, Inc., 224 North Desplaines Street, Chicago 6, Illinois.

Photo by W. W. Wainwright

Chapter XIII

Bicycle Safety

It is generally recognized by cyclists familiar with statistics available from the National Safety Council and the Bicycle Institute of America that cycling is one of the safest of all sports and one of the safest forms of transportation. A comparison of fatality figures in the realm of automotive transportation with those in the field of cycling shows conclusively that it is safer to ride a bicycle than it is to ride in an automobile.

However, serious cyclists are also aware that the presence of motor vehicles on the highways in constantly increasing numbers, greater production of bicycles than ever before, and the possession of more leisure hours by most Americans will mean that we shall be confronted with a rising toll of bicycle-motor vehicle accidents—unless something is done to remove the causes of such accidents. If we wish our sport to attain the popularity it deserves, we must constantly strive to make it safer.

The Problem

This section is devoted to a presentation of facts that will serve to give the reader some idea of the serious nature of the problem we are facing. The accident statistics presented herein are all based on factual data obtained from the National Safety Council, Chicago, Illinois.

In order to comprehend fully the significance of the bicycle safety problem, one must bear in mind that it has assumed serious proportions only in the last decade and a half. One of its most alarming features has been the rapid rate at which the number of deaths resulting from bicycle-motor vehicle accidents has increased during this period. In 1941 the number of such deaths was over 150 per cent greater than in 1932. This compares with an increase of 35½ per cent for all types of motor vehicle deaths for the same period.

From 1936 through 1941 the average annual increase in the number of fatal bicycle accidents (based on the number of such accidents occurring in 1932) was 52.7 per cent, while the corresponding rate of increase in the number of all fatal motor vehicle accidents was only 18.5 per cent. In other words, bicycle fatalities were increasing at a rate almost three times as high as all types of motor vehicle fatalities in the six-year period immediately preceding our entry into the war. Based on the above average rate of increase, the toll of bicycle fatalities in 1945 would have exceeded 1,000 if the war had not intervened. However, if we use the rate of increase from 1940 to 1941 as our base, the number of bicycle deaths in 1945 would have exceeded 1,550.

In 1941, the last year before our entry into the war, approximately 910 deaths resulted from bicycle-motor vehicle accidents. But the number of

deaths alone does not indicate the true seriousness of the bicycle accident problem. If we are to comprehend fully the grave nature of it, we must consider the non-fatal accidents as well as the fatal ones. For every bicycle death reported in 1941, there were 41 injuries, many of which were serious. The total number of such injuries reported in 1941 amounted to 37,000. These facts should make us think twice before dismissing the bicycle safety problem as too unimportant to deserve our attention.

Figure 1 graphically presents the number of bicycle-motor vehicle fatalities occurring in nine selected years from 1932 through 1944. Until 1942 the trend was unmistakably upward, but after the war began it made a sharp downward curve. It would be misleading, however, to attribute the sharp drop in the number of deaths reported in 1942 and thereafter to bicycle safety activities; it was due to the war.

The graph in Figure 1 clearly shows that the bicycle accident problem was steadily growing more serious during the years preceding the war and that no satisfactory program for coping with it had yet been devised. Unless such a program is put into action soon, we may expect the number of bicycle accidents to attain and exceed the prewar level. This renewed upward trend must be nipped in the bud; now is the time to do it.

Reliable figures are not available for the number of fatalities resulting from bicycle collisions with non-motor vehicles and pedestrians, and from accidents in which the rider fell, or struck a fixed object. However, information obtained from two cities in 1939 indicates a ratio of one non-motor vehicle accident to twenty motor vehicle accidents. Taking into consideration the likelihood that there was considerable underreporting of the less severe non-motor vehicle accidents, it would be safe to assume that the number of fatalities resulting from such accidents was negligible compared to the number of those resulting from bicycle-motor vehicle collisions. Therefore, it would seem that our safety program should be aimed primarily at preventing the latter type of accident rather than the former.

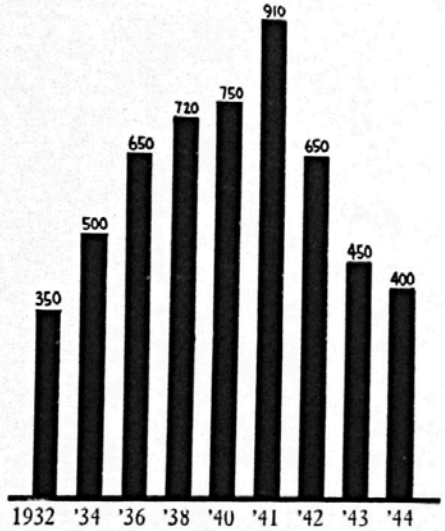


Fig. 1. Bicycle-motor vehicle deaths. Selected years from 1932-1944. Source: National Safety Council approximations based on reports from U. S. Census Bureau and city and State traffic authorities.

Table I presents some facts that should prove helpful in determining which age groups should receive special attention in any bicycle safety program. The total number of deaths and injuries resulting from bicycle-motor

Table I

AGES OF KILLED AND INJURED

BICYCLE-MOTOR VEHICLE COLLISIONS, 1941 and 1944

Age Group	Deaths: Number 1941	Deaths: Number 1944	Deaths: Percentage 1941	Deaths: Percentage 1944	Injuries: Number 1941	Injuries: Number 1944	Injuries: Percentage 1941	Injuries: Percentage 1944	Probability of Fatality 1941	Probability of Fatality 1944
All Ages	910	400	100.0	100.0	37,000	18,000	100.0	100.0	One in 41	45
0- 4	10	*	1.2	—	500	500	1.3	2.8	One in 50	—
5-14	490	250	53.8	62.5	22,000	11,000	59.5	61.1	One in 45	44
15-24	260	60	28.6	15.0	11,500	4,500	31.1	25.0	One in 44	75
			82.4	77.5			90.6	86.1		
25-44	70	30	7.6	7.5	1,500	1,000	4.0	5.5	One in 21	33
45-64	50	30	5.5	7.5	1,000	500	2.7	2.8	One in 20	17
65 and over	30	30	3.3	7.5	500	500	1.4	2.8	One in 17	17

* The available data indicate fewer than 5 deaths in this class.

Source: National Safety Council approximations based on reports from U. S. Census Bureau and City and State traffic authorities.

vehicle accidents during 1941 and 1944 has been broken down to show the spread among the various age groups. This analysis, as well as those for other years, shows clearly that the great majority of accidents involve riders in the 5 to 14 age group, that is, riders of grammar school age. The group having the next largest proportion of accidents is the 15 to 24 age group, including primarily riders of high school age. In 1941 the riders in these two groups, taken together, were involved in 82 per cent of the deaths and 91 per cent of the injuries. These facts should not be surprising, however, because the great majority of bicycle riders today are boys and girls of grammar and high school age.

With respect to the sex of those killed and injured in bicycle accidents, statistics show that the great majority of persons involved are males. In 1940, for instance, they suffered 94.2 per cent of the deaths and 87 per cent of the injuries. In 1941 the percentages were 94.4 per cent and 88 per cent respectively.

From a study of the aforementioned facts it would seem that bicycle safety education programs should be directed primarily at those riders in the 5 to 24 age group. Although it may be true that more males than females are involved in bicycle accidents, the fact remains that they are both equally susceptible to accidents, and therefore the latter group should not be neglected in any program.

Our Interest in the Problem

Before going into this problem further, it might be well to consider the following questions: Why should we as individuals be concerned with the bicycle accident problem? Why should members of the League of American Wheelmen and other cycling organizations wish to see the number of bicycle accidents reduced?

In the first place we should be concerned with the problem because of the threat it poses to the safety and well-being of our nation's children. We should take an active interest in seeing to it that our boys and girls have every opportunity to grow up to be sound, healthy men and women, and that every threat to their safety is removed. With close to 1,000 youngsters being killed in the last year before we entered World War II, and thousands of others being seriously injured as the result of bicycle accidents, we have ample reason to regard this problem with deep concern. Every young life lost or seriously impaired, regardless of the cause, is an immeasurable national loss.

To those of us who drive automobiles the bicycle accident problem should be of special concern. The presence of irresponsible and reckless young cyclists upon the streets is a very considerable annoyance and a constant danger. Not only must we exercise care over our own actions while driving, but we must also be constantly on the alert for young bicycle riders darting out of alleys, ignoring stop signs and other traffic signals, cutting in front of us unexpectedly, or riding at night without lights—just to mention a few dangerous practices. If we could be relieved of the necessity for being always on the alert for careless young cyclists, driving would be much less taxing to our nerves. Therefore, motorists especially should wish to see

young bicycle riders accept greater responsibility for keeping out of accidents. This can be achieved only by an extensive, well-planned program of safety education.

However, motorists would be benefited in still another way by the abovementioned safety program: it will tend to make the future crop of young drivers more safety-conscious, thus reducing the dangers to which older motorists are now exposed. Unfortunately, the importance of the bicycle as a medium for safety education has not been fully appreciated, and consequently a great opportunity for making many of our present motorists more safety-minded has been lost. However, this oversight need not be continued if we bring it to the attention of safety organizations and, in addition, do something to remedy the situation ourselves.

If the next generation of motorists is to be made more safety-conscious, its safety education must begin now—and what could be a better medium for carrying out this program than the bicycle? Could there be a better way to familiarize youngsters with traffic rules and regulations than by teaching them how to ride their bicycles safely in traffic? Could there be a better method for helping them to acquire the habit of respecting the rights of others and being courteous than by teaching them how to ride their bicycles in a respectable manner? And is there a better way to insure that today's boys and girls will have safe driving habits in the future than by encouraging them to acquire safe bicycle riding habits now?

Let us turn to the second question: why should members of cycling organizations wish to see the number of bicycle accidents reduced? The members of the League of American Wheelmen, above all others, should be concerned about the bicycle safety problem because they stand to lose the most if it is allowed to go unchecked. Should the number of bicycle accidents continue to mount rapidly, we may expect State and local authorities to take action to remedy the situation. Undoubtedly they would enact laws containing regulations which, in their opinion, seemed to offer the most immediate and practicable solution to the problem. But in nine cases out of ten such legislation would be prepared by individuals unfamiliar with cyclists' problems. Consequently, much of it could be expected to be detrimental to the interest of cyclists.

However, the threat of State and local authorities' taking action on their own initiative is remote. The real threat lies in the possibility that the motor clubs and other groups representing motorists will seize upon the opportunity offered by the bicycle accident problem to secure the complete ban of cyclists from all major highways. Although it is unlikely that this will happen in the immediate future, the presence of cycle tourists on the highways within the next three to five years can be expected to create a considerable annoyance to motorists, with the result that such action against us will become more likely. In such an event the relatively great strength of the motoring groups would overwhelm us, and thus the future of our sport would be placed in jeopardy. The only way that we can prevent such a sad state of affairs from developing is to deprive the motoring groups of the opportunity for using the bicycle accident bogey to effect our removal from the highways. This can be accomplished only if we prevent the bicycle accident problem from ever again assuming serious proportions.

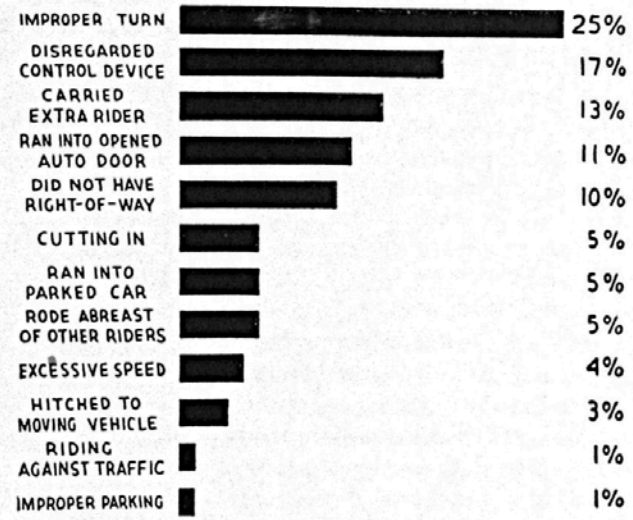


Fig. 2. Reported bicycle violations and unsafe practices. Denver, Colorado, and Springfield, Massachusetts, January 1, 1939-August 31, 1940. Courtesy National Safety Council.

Factors of the Problem

Now that the reasons underlying the necessity for solving the bicycle safety problem have been presented, the question logically arises in our minds—can the problem be solved? In order to answer this question we must first discover what causes underlie the majority of bicycle accidents and then determine whether or not they can be eliminated.

In a report made to the National Safety Council in 1940 by the cities of Denver, Colorado, and Springfield, Massachusetts, the regulations and safe practices violated by bicycle riders in 145 collisions and the percentage of each violation to the total number of violations were recorded. This report is presented in Figure 2. It may or may not be typical of the experience of other communities, but at least it gives us some indication of the unsafe practices and traffic violations that need to be corrected.

The causes of bicycle accidents as shown in Figure 2 comprise, however, only one of four main factors contributing to the increased number of bicycle-motor vehicle accidents. These four factors are: (1) degree of exposure (2) traffic conditions (3) behavior of riders (4) condition of bicycles.

Degree of exposure. Since 1932 the exposure of bicycle riders to traffic accidents has greatly increased. This trend is attributable, in the first place, to a three-fold increase in the number of bicycles in use from 1932 to 1941 and, in the second place, to a 50 per cent increase in motor vehicle mileage during the same period. (The four years 1942 through 1945 have not been taken into consideration because they do not reflect normal peacetime experience.)

In 1940, for instance, it was estimated that over 8,000,000 bicycles were in use in this country; that is, one bicycle to every four automobiles, or one to every seventeen persons. Today

the ratio of bicycles to automobiles may very likely be the same, but the latter ratio is undoubtedly smaller. However, with the resumption of bicycle and automobile production, the number of bicycles in use will increase rapidly, and motor vehicle mileage will shortly regain, and then exceed, the prewar level.

Unfortunately we have little control over this factor of the safety problem, except in so far as we can persuade cyclists to use the less heavily traveled streets in cities and the secondary roads in rural areas. Perhaps some measure of success can be achieved if organized cyclists throw their weight behind road improvement projects that will make more secondary roads suitable for bicycle touring. In this way many of the traffic hazards connected with the use of principal highways by cyclists can be avoided.

Traffic conditions. Many bicycle accidents are attributable, wholly or partially, to conditions over which cyclists have little control. These conditions are most commonly, though not exclusively, found in large and medium-sized cities where the use of streets by a large number of motor vehicles, the presence of street car tracks, the congestion of buildings, and streets with high traffic speeds create special hazards. The degree of law obedience by motorists is another important factor affecting the safety of cyclists.

The reduction or elimination of these hazards does not fall within the scope of activities of individual or organized cyclists. We cannot, for example, rip up street car tracks, tear down buildings (to eliminate blind corners), or regulate traffic so as to prevent congestion in certain areas. We cannot even throw torpedo firecrackers at the "screw-drivers" who cut us off at intersections, open their car doors in our path, or force us into the curb—because we would be thrown into jail just for trying.

However, we can lessen the importance of these traffic hazards by encouraging cyclists to exercise greater care when riding on streets with car tracks, blind corners, or other hazards. We can impress upon them the importance of avoiding, whenever possible, the use of express highways and congested streets, and stress the importance of being on the alert for screw-drivers. And we can also secure the cooperation of city traffic engineers in setting aside designated thoroughfares for the use of cyclists, should their numbers become large enough to warrant such a move.

Behavior of riders. The extent to which bicycle riders comply with traffic regulations and observe safe riding practices determines in large measure the severity of the bicycle accident problem that will be confronted. The statistics show that three out of every four riders injured in bicycle-motor vehicle collisions were violating some traffic law, while motorists are guilty of traffic violations in only 25 per cent of such collisions. Thus it is evident that bicycle riders need to accept greater responsibility for becoming familiar with, and adhering to, traffic laws and safe riding practices.

The importance of cyclists' accepting greater responsibility for keeping out of accidents cannot be overemphasized. It goes without saying that the knowledge of traffic regulations and safe riding practices is of little or no value if the person possessing such knowledge has not been convinced of the necessity for adhering to them. On the other hand, the desire to comply with the law or to observe safe practices is likewise of little value if the individual is unfamiliar with the provisions of the law or does not know how to ride safely.

But, you may ask, how are cyclists to be made to accept greater responsibility for keeping out of accidents? The answer lies in education and enforcement: education to help cyclists acquire a knowledge of traffic laws and safe riding practices, and enforcement of these laws and safe practices to encourage their observance. We should not expect this job to be easy; it will require much time and effort. Our task will be to undertake the educational phase of the program, while the enforcement phase will, of necessity, have to be left to police officials.

In addition to obeying traffic regulations and observing safe riding practices, cyclists must be able to ride skillfully if they are to avoid accidents. This ability consists primarily of being able to control one's bicycle well and also to react quickly in emergencies. It cannot be acquired overnight; it must be developed over a period of time by proper instruction, sufficient practice, and experience.

Unquestionably, one of the main factors contributing to the consistently large number of bicycle accidents in the 5 to 14 age group is the lack of riding skill; that is, the lack of proper balance, the inability to mount and dismount properly or to stop quickly, and the incapacity to think clearly and act coolly in tight situations. It is important that these and many other skills be acquired by new bicycle riders if they are to become safe riders.

Organized cyclists can be of great assistance in helping to combat this phase of the bicycle accident problem. In fact, this is the field in which we are best qualified to do a good job—if we want to! We can provide helpful instruction to new riders and aid them in developing their riding skill, while at the same time helping them to acquire a working knowledge of traffic regulations.

Fortunately, a very complete series of riding tests has been prepared by Ben W. Miller, entitled *Bicycle Safety Tests.* Copies of these tests may be obtained for a small fee from the National Safety Council, 20 North Wacker Drive, Chicago 6, Illinois. Not only have they proved to be very valuable in developing riding ability, but they have also been found to be very entertaining material for field days and round-ups. Thus, in undertaking a safety program we shall not have to start from scratch.

Condition of bicycles. Although the majority of bicycle accidents may be caused by dangerous traffic conditions, carelessness of riders, and other factors, a considerable number are caused by the use of bicycles in poor mechanical condition or improperly equipped. Statistics show that 25 per cent of bicycle-motor vehicle accidents involve defective bicycles, thus indicating that this factor is not insignificant. Some of the most common mechanical defects are the lack of good brakes (sufficient to skid the rear wheel upon a dry pave-

ment), loose chains, loose handlebars or grips, and treadless pedals. Among the equipment deficiencies most frequently noted are the lack of head lights and rear reflectors (or tail lights) for night riding and the lack of proper warning devices.

Any number of ideas for encouraging youngsters to keep their bicycles in safe running order have been tried, including the annual inspection of bicycles at the time new licenses are issued and the conducting of periodical safety inspections at schools. But most of these experiments have not been successful because they have not persuaded the youngsters to *keep* their bicycles in good condition.

It would seem that the best way to secure the cooperation of children in this respect is to create a situation in which they will feel like slackers if they do not keep their bicycles in good condition. Such a situation can be created by the organization of school and playground safety clubs, one of whose principal functions would be to conduct periodical bicycle inspections. When a bicycle is found to be defective, its owner would be given a few days in which to correct the defect. Then, if he failed to do so, he would be penalized, unless, of course, he could present a satisfactory explanation for not having his bike repaired in time. In this way the fear of being scorned by one's schoolmates could be utilized to secure the cooperation of youngsters in keeping their bicycles in safe running order.

The L. A. W. and the Bicycle Safety Problem

Now that the major causes underlying the bicycle accident problem have been considered, it should be evident that most of them can be eliminated. Therefore, if a cycling organization is willing to devote some time and effort to a safety program, it should be able to accomplish something worthwhile. In fact, its chances of success are extremely good because an organization of cyclists is the group best qualified to undertake this task. The reasons are as follows:

In the first place, experienced cyclists are more familiar than anyone else with the problems of cyclists. They have a first-hand knowledge, for instance, of the special difficulties encountered by bicycle riders when riding in traffic, and they understand the cyclist's psychology when confronted with the choice of observing or not observing traffic regulations. It seems probable that the absence of this factor in previous safety programs accounts largely for the small degree of success that has been achieved thus far in combating the bicycle accident problem.

In the second place most organized cyclists have an interest in their sport that goes much deeper than any desire for recognition. That is to say, in undertaking a safety program these persons would be motivated more by their desire to further the sport of cycling than by a selfish desire for public praise, and consequently they would put more enthusiasm into their work than the general run of individuals. Besides, their interest in cycle safety is not just a fleeting whim; it is a matter of long-run concern. If a truly effective bicycle safety program is to be established, it must be a continuous program—not a flash-in-the-pan affair as has been the practice heretofore. Since organized cyclists have a long-term interest in this problem, they would appear to be the persons best suited to undertake such a continuous safety program.

Finally, the cycling organization possesses an advantage over other civic organizations in being able to offer a combined program of safety and touring activities. This enables it to present a more attractive and interesting program to young riders, thus making it easier to get the safety material across to them. In this manner the organization member assumes the role of a fellow cyclist rather than that of a teacher, and hence is able to accomplish a great deal more than the regular safety instructor.

However, all of these advantages will avail us little if we do not have the *desire* to help solve this problem. Inasmuch as organized cyclists have lacked this desire (to any great extent) in the past, it is not inconceivable that we shall lack it in the future. But we must not remain idle much longer; we must recognize our responsibility and see our opportunity to do our share of the work in combating the bicycle accident problem.

A Suggested Safety Program

As the title of this section indicates, it does not attempt to present here a minutely detailed safety program which can be followed in every community. Nor is this program intended to be all-inclusive or serve as a pattern to be followed to the letter by all clubs. It is aimed, rather, at presenting some of the ideas that have previously been put forward in order that readers might benefit from past experiments when they undertake to work out safety programs for their own communities. The degree of success achieved by each adult club will depend to a large extent upon how well its program deals with the problem existing in its community. It is also important that the program be flexible in order to meet new difficulties that may arise as well as to take advantage of new opportunities that may present themselves.

Safety legislation and enforcement. In recent years many States and communities have enacted legislation regulating the operation of bicycles. These fundamental regulations have become an integral part of the motor vehicle code of these States, and where properly enforced, have resulted in a reduction in the number of bicycle accidents. However, there are still many communities that have not enacted such legislation. If that should be the case in a city where a cycle club is planning to start a safety program, one of its first objectives might well be to secure the enactment of a bicycle ordinance.

Fortunately, these clubs will be spared the difficult task of drawing up ordinances for their communities because a model ordinance providing for the regulation, registration, and inspection of bicycles has already been prepared by the National Safety Council in cooperation with the National Conference on Street and Highway Safety. It is contained in Article VIII, Part I, of the Model Traffic Ordinances, copies of which may be obtained from the National Safety Council. This ordinance is in agreement

with the views held by the Safety Committee of the League of American Wheelmen, particularly with regard to riding on the right-hand side of the road, double-file riding, and the proper equipment for night riding.

It is not enough, though, to work only for the enactment of the ordinance; its proper enforcement must be encouraged and supported. A law without adequate enforcement is very little better than no law at all. Therefore, once safety legislation has been enacted, a club should not feel entitled to relax on its oars, for unless the law is properly enforced, the energy expended in effecting its passage will have been wasted.

The question will now be raised as to what penalty should be imposed upon the offenders who are apprehended by the police. In the past a number of penalties have been tried, including impounding the offender's bicycle, making him attend "safety school" (if a juvenile), and imposing a small fine (if an adult). Of course, youngsters have been the principal offenders in recent years, and consequently the most effective penalty discovered thus far has been the impounding of the violator's bicycle. However, in practice this penalty has been imposed only upon those boys and girls who have been guilty of two or more traffic violations.

Another experiment that has worked out very well in reducing the number of traffic violations by young bicycle riders has been the setting up of safety courts whose job is to try juvenile offenders and impose penalties upon them if found guilty. These safety courts are composed of boys and girls of the same age group as the offenders being tried. This arrangement not only serves to remove the feeling that punishment is being inflicted from above, but it also makes easier the task of convincing the offender that he is being penalized for his own good. In addition, the publicity given to the court's activities serves to make all young bicycle riders more safety-conscious.

Since there have been so few adult cyclists in our country in recent years, the best means for securing their adherence to traffic regulations has not been determined. Possibly the most logical penalty to impose upon adult offenders would be cash fines, although not as heavy as those imposed for automobile traffic violations. However, future experience alone can provide us with the best solution.

Program for adult cyclists.

(In order that the important features of the following sections might be set forth clearly, they are presented in outline form.)

A. Activities through club channels

1. Distributing safety rules to new members; adhering strictly to them on all rides.

2. Aiding new members to discover their proper riding position (e.g., correct saddle height, frame size, handlebar adjustment, etc.)

3. Conducting riding improvement sessions for new and old members alike (possibly making use of Ben Miller's tests).

4. Distributing to new members and publishing in local paper a map showing the best roads for cycling in the locality (i.e., those roads with the least traffic, with good surfaces, and pleasant scenery). Protected intersections with main highways might also be indicated.

5. Planning club rides to avoid, wherever possible, heavily traveled roads or congested areas.

Bicycle Owner ..... Age .....
Address ..... Boy or Girl .....
Make of Bike (Mfg. Co.) ..... Serial No. (If any) .....
Model (Trade Name) ..... Year Bought .....
Year Made (If given) ..... How long has present owner had bike .....

Rear Wheel

1. Brake needs adjustment ..... Brake holds well .....
2. Cone needs tightening ..... loosening ..... O K .....
3. Chain needs tightening ..... loosening ..... O K .....
4. Wheel needs straightening ..... O K .....
5. Spokes missing ..... If so, how many ..... O K .....
6. Tire needs repair or replacement ..... O K .....
7. Remarks .....

Front Wheel

1. Cone needs tightening ..... loosening ..... O K .....
2. Wheel needs straightening ..... O K .....
3. Spokes missing ..... If so, how many ..... O K .....
4. Tire needs repair or replacement ..... O K .....
5. Remarks .....

Handle Bars

1. Bars need tightening ..... O K .....
2. Goose neck too loose ..... O K .....
3. Bars need grips ..... O K .....
4. Remarks .....

Seat

1. Seat needs adjustment ..... repair ..... O K .....
2. Remarks .....

Crank Hanger

1. Hanger needs adjustment ..... repair ..... O K .....
2. Pedals need repair ..... replacement ..... O K .....
3. Remarks .....

Frame and Accessories

1. Frame is weak ..... needs repair ..... O K .....
2. Fenders need tightening ..... repair ..... O K .....
3. Reflector button too small ..... O K .....
4. Light. None ..... (If none, do not ride at night)
   Light needs repair ..... O K .....
5. Horn. None ..... needs repair ..... O K .....
6. Remarks .....

Fig. 3. Bicycle inspection blank used in public schools of St. Paul, Minnesota.

B. Activities through bicycle dealers and rental agencies

1. Posting safety rules (in abbreviated form) in bike shops to be seen by customers.

2. Providing rental agencies with copies of maps (mentioned in

A-4 above) to distribute to their customers.

Program for juvenile cyclists.

A. Activities through school channels

1. Cooperating with police officials in giving illustrated safety talks at schools. (For a list of available safety films, see Appendix B. Hostel movies are also available if it is desired that they be shown on the same program.)

2. Aiding school officials to organize safety clubs for the purpose of:

a. Encouraging children to learn safe riding practices and local and State traffic laws; impressing upon them the responsibilities and obligations of bicycle riders.

b. Conducting riding improvement classes and contests.

c. Conducting inspection of bicycles and encouraging their proper care (see Figure 3).

d. Organizing bicycle safety court committees to serve on the local court and to study special problems that may arise.

e. To promote interest in hosteling and cycle touring (by showing hostel movies, taking short hostel trips and if possible, by presenting talks by hostelers).

B. Activities through community organizations

1. Bureau of Recreation (during summer vacation)

a. Organizing riding ability improvement classes and conducting tests on playgrounds.

b. Planning short rides to interesting or scenic places in the locality; organizing hostel groups.

c. Aiding playground directors to plan one or two picnics during the summer months for the playground groups.

2. Boy Scouts and YMCA Clubs

a. Encouraging these groups to include bicycle safety activities in their schedules (such as riding ability contests, safety movies, and safety quizzes).

b. Helping the Scouts fulfill the requirements for their cycling merit badge.

c. Stimulating their interest in hosteling; encouraging them to take short bike trips.

C. Activities through local newspapers

1. Supplying the local newspaper with a weekly illustrated safety lesson showing:

a. Specific ways in which accidents happen.

b. Dangerous, as compared with safe, riding practices.

c. Care of bicycles.

2. Publicizing local safety activities and recognizing those boys and girls participating most actively in safety programs.

APPENDIX A

General Safety Rules for Cyclists

1. Obey all traffic regulations and control devices such as stop and go signals, stop signs, one-way streets, etc.

2. When riding at night, have a white head light in front, a red tail light and a red reflector in the rear, and wear a white shirt or jacket.

3. Have an efficient warning signal such as horn or bell. Sirens are prohibited by law.

4. Be sure your brakes are operating efficiently and keep your bicycle in perfect running order.

5. Do not carry more riders on the bicycle than the bicycle provides for, nor carry packages that prevent proper control of the bicycle.

6. Always keep to the right and ride in a straight line as close to the right-hand curb as practical. Never ride more than two abreast.

7. Do not hitch onto other vehicles.

8. Indicate your intention of turning or stopping by using the proper hand signals.

9. Do not swing out suddenly into the path of oncoming cars without looking behind you. Slow down or stop instead.

10. Slow down at all street or road intersections and look to right and left before crossing. If traffic is heavy, dismount and walk across.

11. Never squeeze into narrow spaces between cars. When drivers of cars coming from the rear sound horns, pull over to the right immediately.

12. Look out for cars pulling out of parking spaces and alleys. Keep a sharp look-out when passing parked cars for the sudden opening of car doors.

13. Avoid riding on heavily traveled streets wherever possible.

14. Be considerate of the rights of pedestrians and all others, and they will be considerate of your rights.

Duties and Equipment of Road Captains

I Suggested road captains

A. Head captain

B. Two traffic captains

C. One rear captain

II Duties of road captains

A. For all road captains

1. To meet before each ride and receive their instructions (copies of the route, etc.) from the chairman.

2. To see that all new riders observe the safety rules.

3. To see that the group stays as close together as possible.

4. To aid riders in difficulty.

Will Hahn

Fig. 4. Rest stop on a large group ride. Note that all bikes are parked safely off the highway.

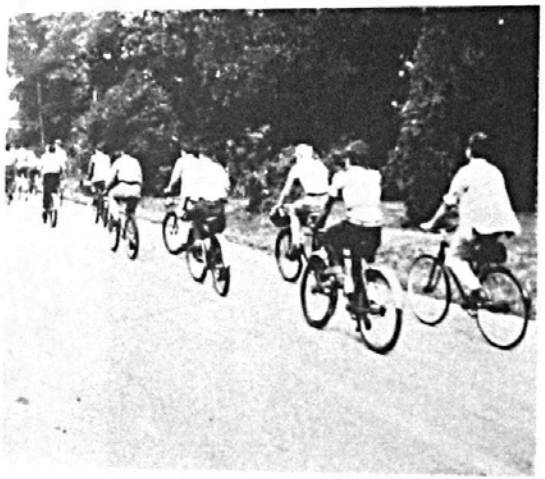
B. Head captain

1. To be in charge of the ride (to lead it, call rest stops, etc.).

2. To inform the riders, before starting, as to the route, any dangers, and how to ride safely (if the group contains beginners).

3. To inform rear captain of traffic coming toward the group.

4. To call out warning of any



Will Hahn

Fig. 5. Group of teen-age boys being led and supervised on an all-day trip by an adult club. Notice double-file order, safe distance between pairs, all riders on right side of road.

road hazard, i.e., glass, railroad tracks, holes, etc.

C. Traffic captains

1. To halt traffic at dangerous crossings.

2. To give motorists who have stopped for the cyclists a sign of appreciation.

D. Rear captain

1. To inform motorists behind the group when it is safe for them to pass and when it is not (by using hand signals).

2. To carry emergency repair equipment and a first aid kit.

III Equipment of road captains

A. Red flags (for daytime use); baton flashlights (night use).

B. Whistle (referee type).

C. Arm bands or other identification.

IV Whistle signals

A. To be used only by the head and rear captains and then only when absolutely necessary.

B. The signals:

1. Stop	1 short blast
2. Go	2 short blasts
3. Caution or slow	3 short blasts
4. Off the road!	1 long blast

Rules for Group Riding

I Formation

A. Groups ride double file at all times with the following exceptions:

1. When upon narrow heavy-traffic streets or roads with parked cars, ride single file.

2. Ride single file at narrow underpasses and bridges.

3. Ride single file in case of street repairs.

4. On hills:

a. Ride single file to crest.

b. If a person cannot ride to crest of hill, he should dismount off pavement where possible.

c. Pass on left only.

d. No "tacking" whatsoever.

(Note: When assuming single-file formation the rider on the *left* will go ahead of his partner.)

B. Groups split up while riding in city, as follows:

1. Unescorted groups are to be divided into groups of not more than twenty riders each, spaced one block apart.

2. Escorted groups are to follow instructions of the escort.

II Rules for riding

A. For night riding bicycles must be equipped with front and rear electric lights and a red rear reflector.

B. Bicycles must be equipped with a sounding device.

C. Bicycles must be equipped with brakes.

D. Keep three or four feet behind cyclist in front, both while in motion and when stopped.

E. Always keep to the right and ride in a straight line as close to the right-hand curb as practical; do not weave in and out between parked cars.

F. When riding double file, the person on the left is to maintain a distance of at least one foot between his handlebars and those of his partner.

G. Pass on left only; no cutting in.

H. Stay behind front road captain.

I. Obey road captain's directions.

III Signals, stops, and turns

A. Signals:

1. Whistle signals (for very large groups and to be used only by road captains):

a. One short blast — stop.

b. Two short blasts — go.

c. Three short blasts — warning signal (look to road captain for directions).

d. One long blast — off the road immediately.

2. Hand signals:

a. Stop — arm held straight up.

b. Go — circular motion of hand with arm held straight up.

c. Right turn — left arm held at right angle.

d. Left turn — left arm extended straight out to the left.

3. Verbal signals:

a. Stop — "Brakes!"

b. Go — "Let's go."

c. Right turn — "Right."

d. Left turn — "Left."

e. Off the road — "Off the road!"

B. Stops:

1. All traffic lights and stop signs must be observed.

2. Anticipate stop traffic lights so that sudden stops will be averted.

3. In case of change of light with part of group through, do not stop if road captains are on guard.

C. Turns:

1. Right turn—Ride as close to right curb as possible, using hand signal at same time.

2. Left turn—Pull over to center of street and make turn. Actual riding conditions will indicate whether this procedure is safe at all times.

3. U-turns—No U-turns permitted.

APPENDIX B

Bicycle Safety Movies

1. "Bicycling with Complete Safety"
Produced by Bell and Howell Company, Chicago. 1938. 10 minutes. 16 mm. sound. Intended for elementary and high schools.

2. "On Two Wheels"
Produced by Division of Public Relations, General Motors Corporation, New York. 16 and 35 mm. sound. For all schools.

3. "Points for Pedalers"
Produced by Aetna Life Affiliated Companies of Hartford, Connecticut. 11 minutes. 16 mm. sound. For clubs, churches, schools.

4. "Safety Sleuth"
Produced by Bureau of Educational Research, Ohio State University, Columbus, Ohio. 6 minutes. 16 mm. silent color film. Film may be purchased for $20.00.

CHAPTER XIV

Touring

MOST of us who enjoy cycling started with the bicycle as a form of transportation—first at play, then to and from school. As we became older, the thrill of wanderlust created a desire to tour into the country to see and enjoy the scenic beauties of the vicinity in which we live.

In most parts of the United States the highways and byways are most satisfactory for tourists awheel, and sleeping accommodations are available, so that one can easily space a ride to cover comfortably areas even hundreds of miles away.

In cycle touring, let us first consider clothing. In summer, shorts and sweater are comfortable for daytime cycling, but one should always have a jacket and head covering to put on as evening approaches, or in the event that the weather changes.

For winter cycling, ski trousers have been found most satisfactory, as they are close-fitting around the legs and afford protection from the chain, and yet are loose, roomy, and built for "give" around the seat. Any lightweight windbreaker type of jacket, fitting loosely enough to accommodate one or more shirts or sweaters underneath, is the most satisfactory garment for the upper part of the body.

Heavy socks should always be worn in any season, and one should have enough pairs to permit sufficient changes if they become wet or soiled.

There is no reason for touring cyclists to look like tramps, which they too often do, for attractive, well-matched clothing that can be easily cleaned can be obtained at reasonable prices.

One should always be sure to wear substantial underclothing, and many a tourist has found the use of suede or chamois in the crotch of the shorts or cycle trousers a most welcome addition. Underclothing should fit well, so that it will not bunch or wrinkle and cause discomfort.

Miller W. Robb

Girl wearing lightweight, all-weather jacket.

The diet of the touring cyclist is most important. One should never leave on a trip with an empty stomach, nor should one overeat. A good solid breakfast of fruit, eggs and bacon, toast and coffee would be an ideal starter. Foods like hot cakes, waffles, and other similar starchy items are filling, but they do not have the nutrient value of meat and eggs.

It is a good practice to break the ride up by eating a little every two or three hours, at least. When stopping, one should drink a hot beverage, such as tea with plenty of sugar, hot soup, or even hot water if nothing else is available. In sandwiches, meat, or eggs, one should use as much salt as is palatable. Sugar and salt replenish the same items which exercise and perspiration have removed from the system. A cyclist should drink no ice water, but must compensate in some beneficial way for the liquids used up. Carbonated drinks are very undesirable, as they tend to produce gas in the stomach.

When carrying food with you (and many experienced riders habitually carry some small snack, to guard against having to continue traveling though uncomfortably hungry), be sure that it is not of the type that will cause thirst, or repeat in the system, such as onions or garlic. Candy bars, dextrose wafers, and raisins are good energy-giving foods which can be easily carried. Be sure the candy bars do not have nuts in them, for they cause thirst.

Bob Jacoby

A canteen comes in handy when touring sparsely settled country.

Following the day's ride, one should not stuff himself, but should eat a normal dinner, not indulging in second helpings of anything. He should take a short walk to help digest the food eaten, and then retire, not sooner than one hour after dinner.

With regard to the choice of roadside restaurants, you will find that the average restaurant which has a number of trucks in front of it will be satisfac-

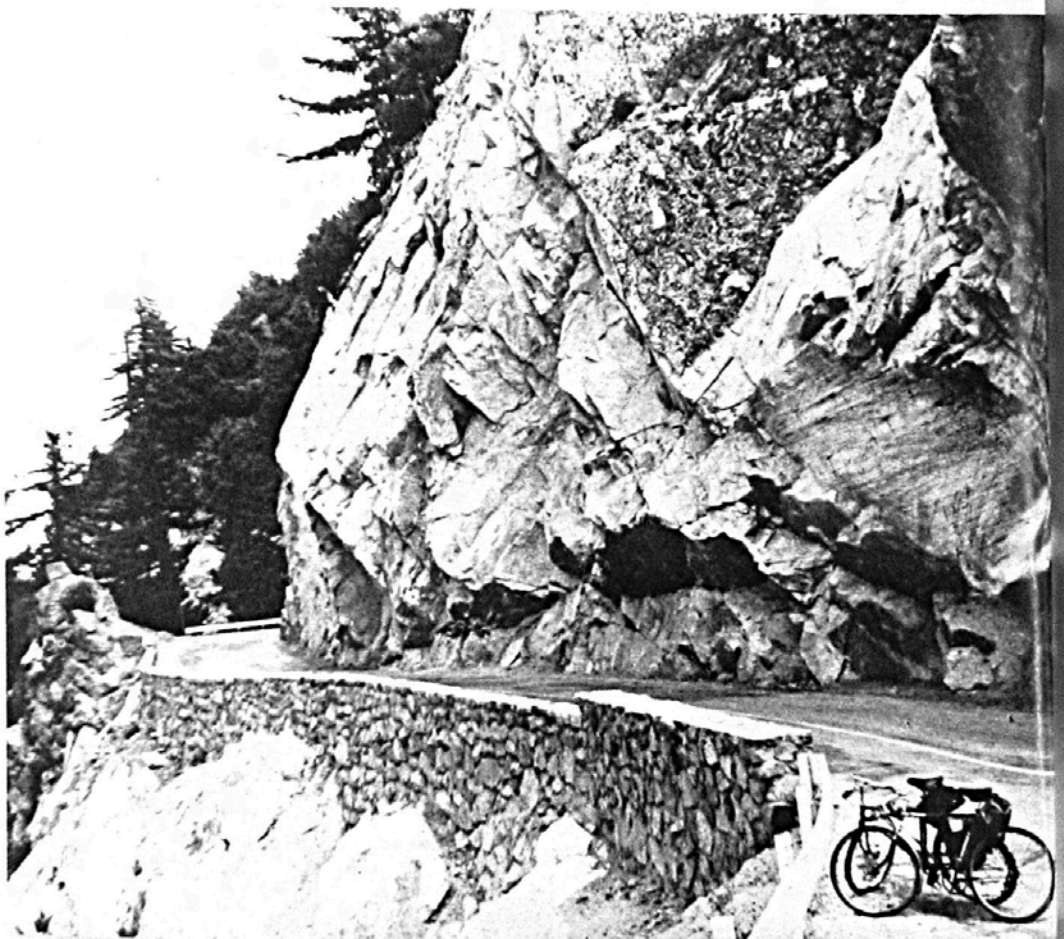
tory, because truck drivers are definite gourmets of large portions and good food.

Upon arriving at his destination, one should, as soon as possible, take a warm tub bath, using ample soap. Massage the legs with soap, following with a cold shower. If this is not possible, allow the tub water to become cold. A completely fresh change of clothes, from head to foot, should be put on.

The following may sound childish, but it is most essential that riders attend to their toilet before leaving on a tour, and make stops at clean gas stations or wayside resorts, as much poison ivy and other inconveniences are picked up as a result of too casual an attitude.

If they have never realized it before, cycle tourists soon learn how truly important regular elimination is, and particularly to anyone wishing to ride with the maximum of comfort and enjoyment. Hot water drunk immediately upon arising in the morning, and followed as soon as possible by fruit

Mary May Hesketh



or fruit juice, will be effective for most normal healthy individuals.

Although in the drier parts of our country mudguards are not necessary, for touring through most of the United States a bicycle should be equipped with guards. The rider should wear gloves, to enable him to keep his tires clean at all times, to afford a better grip on the bars, and, to a certain extent, to take away ride shock.

Regulation cycling shoes are more than worth their cost, as they are properly balanced and built so that the foot will be better held for the motions of pedaling. Toe clips should be used to keep the foot in the proper place on the pedals, and also straps, to hold the foot tight to the pedal, so that the rider not only pushes, but pulls as well. Some riders also use cleats on their shoes for additional "purchase" on the pedals.

Most experienced cycle tourists believe in the use of a small, rigid seat, such as the Brooks B-17, for even the longest cycle trips. With proper care on the average highway, sew-up tires, such as Pye and Weston or the Dunlop high pressure, can be used. The tourist must, however, always be equipped with a spare tube, spare tire, patch kit, tape, and a good pump. Also, for extended trips, the top of the handlebar should be taped, so that the rider may take a more upright position, resting his back and having a firm, more comfortable grip while in that position.

A good light locking device should be carried so that the bicycle can be parked alone, giving freedom to walk to or visit points of interest along the way. The tourist should also take a light camera, as the pictures will bring back so many pleasant memories of the trip.

Courtesy Will Hahn

Cyclists sometimes walk.

As to luggage, the popular large rectangular saddle bag should carry enough items for a short trip. Mail or parcel post can be used to supplement clothing along the way, or to send soiled articles back. Other methods of luggage-carrying are a rack over the rear wheel, or a knapsack strapped to the back. However, for more pleasant cycling, it is best to carry nothing beyond that which can be packed into an ample saddle bag. It is typical of the novice tourist to take too much luggage. He will find that every time he sets out on a trip, he will take less than he did on the previous trip. The smart beginner will try to approximate the minimum the first time he tours. (See list at the end of this chapter.)

The rider should plan his trip to make the entire day's run during sunlight hours, if possible. For protection a flashlight and clamp should be carried. The generator type of light is not necessary in most of the touring which is done in America.

Bob Jacoby

One should not plan to ride over one hundred miles on any one day, nor more than four hundred miles in any seven-day period. This will eliminate excessive fatigue and make for more thorough enjoyment.

Under present conditions it is essential to plan trips in advance and to make sure that suitable accommodations are ready for your party. It is wise to ascertain rates of the accommodations in advance, to forward a deposit of one night's rental, and to receive confirmation, so that you will be assured of the necessary housing.

Cyclists who enjoy "roughing it" and prefer to camp out of doors will be able, by reading the advertisements of equipment companies in the cycling journals, to discover where they may purchase lightweight tents or bedrolls to their liking. Riders who are thus free of all dependence on others for their lodging draw even greater dividends in health from their weeks in the open. When choosing a camping site (unless one stops at a commercial camping ground), it is best to ask first the permission of the farmer whose property you have taken a fancy to, before unloading the bikes. He is most likely to grant permission willingly, and if the campers' larder needs restocking, he will probably be able to supply good fresh foods.

A cycle tour should be arranged so that the group contains evenly-matched riders, because in order to conserve strength it is easier to keep an even pace, with the legs moving at the same speed, irrespective of terrain. If some riders are faster than others, or slower than others, it leads to speeding up or slowing down the entire group, and

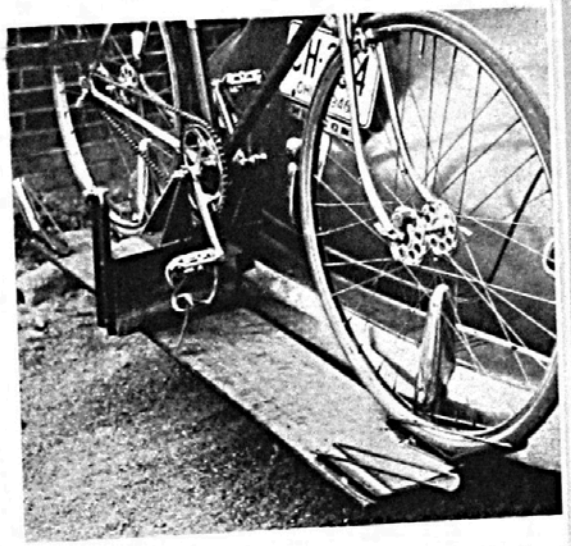
makes the trip less enjoyable for everyone.

It is important for pleasant cycling that the party be divisible by two, so that they can ride in pairs. When the group is bucking a headwind, it is advisable to form a pace-line, moving at the normal speed of the slowest person and changing pace-heads at approximately every ten minutes, with the leader going to the rear.

Unfortunately, the American has not taken the advantage of cycle touring that the European has, but in recent years, under gasoline rationing, more and more people have taken to cycling as a method of touring.

Tour trips should be definitely preplanned, taking into consideration the distance, type of highway, terrain, and places to eat and sleep. The entire trip should be completely planned in advance, with all members of the party agreeing. Then the trip can be set in an itinerary.

Don't be a martyr to the cause and be afraid to carry your wheel by other means, such as automobile or train, to the area through which you wish to cycle. Too many people bat their brains out to get to the country that they wish to cycle through, and then are unable to enjoy it when they get there. A few hours in a car or train will allow more thorough enjoyment in touring the desired area.



Walter Norris

An automobile rack designed for two bicycles.

SUGGESTED LIST OF MINIMUM ESSENTIALS FOR CYCLE TOURING

Lightweight windbreaker jacket
Long-sleeved shirt
(protection against sunburn)
Short-sleeved shirt
Slacks
Shorts
Cap or other head covering
Three pairs wool socks
Three sets of underwear
Sun glasses
Minimum toilet articles
("dime store" size where possible)
Lightweight rain cape or jacket
Comfortable riding shoes
Tire repair kit
Spare tube
Spare tire
Pump
First aid kit
Flash light or generator set

Chapter XV

Century Runs

FOR nearly a century, ever since the introduction of the bicycle to this continent, and through the many years of its development, the century run has been the hardy cyclists' test of stamina and endurance. From the length of the run—100 miles—is derived the word "century"—a century of miles which must be completed in a maximum of twelve hours; which is not required to be completed by continuous riding; and which is ridden by individuals or by groups in much the same manner as are club-sponsored rides.

The League of American Wheelmen started its recent encouragement of the century run several years ago, and the runs have increased in popularity to the point where competition has developed among clubs and individuals for the most centuries ridden in a cycling season. However, this program of the L.A.W. is by no means the first to stress century runs.

Paul Neuerberg

Convoy car following riders.

Since the '80's, when cyclists covered their century runs on high-wheeled "Ordinaries" or the new "Safeties" introduced later, century runs have been a part of the program of a number of this country's cycling organizations. Several cycling clubs take their name from the run, the most widely known of which is the Century Road Club of America, organized in 1891. Members of the League of American Wheelmen have been riding the century since the League's beginning in 1880, and from that time to the present, have toured much of this country on their runs. Consecutive centuries completed day after day in tours from coast to coast, and in cycling promotional tours through the West and other sections of the country, are recorded. Double century runs—100 miles ridden in each of two consecutive twelve-hour periods—are also on record. A recent century run held in Chicago by the L.A.W. covered the exact route run by old timers many years ago. The later group was the more fortunate; smooth pavements and highways had replaced cobblestone streets and rutted dirt roads.

A cyclist who is contemplating running over a 100-mile course should be sure of two things: that he has had

sufficient training in that season to carry him fresh over the finish line, and that his cycle is in condition for the trip. Many a group century run has been marred because a tired beginner held the entire group back, or because of mechanical trouble which could have been prevented by proper checking before the trip.

Century runs can be and are a lot of fun, and upon completion, there's satisfaction in knowing you have finished a run which is a challenge to riding ability. The competition which develops, in both number of century runs completed during a cycling season and the time required to ride a particular century route, adds sport and incentive to the run. If the route has been investigated before a trip by a group, stops can be scheduled for scenic and picnic spots along the road.

Century runs planned carefully will be a success, provided the weather man keeps his promise for a favorable day. Plan rest stops at comfortable intervals and in pleasant spots; plan your food so that carbonated beverages and heavy foods may be avoided; plan your clothing so that it will give adequate protection against the wind and sun. Plan also that someone or several in the group will carry adequate tools and first-aid equipment to meet any emergencies. And good planning will always provide for good traffic control of the group, both on the road and off. Every cycling group, whether it be two or two hundred, whether riding a century or a ten-mile trip for a picnic supper, should be properly policed by its own members. A road captain and lieutenants should be designated to be responsible for this very im-

L.A.W. pin with century bars attached.

portant factor. Their duties will include keeping the group riding compactly, yet at safe intervals, signaling for stops and turns or any other traffic action by the group; aiding motorists who meet or pass the group by signaling when it is safe to proceed; and by generally policing the group so that they will not impede traffic or bring down the wrath of motorists on their heads. Courtesy to the motorist is essential; without it the motorist cannot be expected to be aware of the cyclists' right to be on the road and enjoying the run.

The use of a convoy car can be an important factor in the safety of any medium-sized or large group touring on the highways. Located always behind the last cyclists, and perhaps bearing a warning sign on its back, the automobile can serve to notify motorists of the presence of riders ahead, and can be used as a carrier for lunches, tools, extra clothes, extra wheels, and other parts that could be handy in case of mechanical trouble. The convoy car is an all-round time saver.

The League of American Wheelmen has a system of awards for members who complete century runs. When an individual becomes a member of the League, he may purchase at cost a pin which is illustrated on these pages. Also in the illustration are some attachments to the pin; they are the century bars available upon the successful completion of every century run that a member makes. Among old timers of the League, it is not uncommon to see a string of these bars that hangs from the lapel of the coat nearly to the waist. Many newer members, since the recent encouragement of the century run by the League, boast of from ten to fifteen of these bars. They are an indication of stamina and hours of enjoyment of many century runs.

L.A.W. National Century Run Day is held annually in the spring of the year. On this day, League members throughout the country ride a century run in their particular locality, enjoying association with other L.A.W. members and the natural competition which develops among clubs as to the number of club members completing the trip.

These five simple instructions will aid you in planning your century run; and remember, don't start your trip without adequate planning if you expect a successful run.

1. Be positive that both you and your bicycle can cross the finish line in tip-top condition.
2. Investigate the route for required distance and comfortable riding.
3. Provide adequate protection for yourself against wind and sun, and stick to a cyclist's diet.
4. Provide tools and first-aid equipment for emergencies.
5. Provide proper road control of the group, and impress the group with the necessity for courtesy toward the motorist.

CHAPTER XVI

The Youth Hostels

IN many sections of the United States may be found youth hostels, which offer economical sleeping, eating, and often recreational facilities for the convenience of cyclists, hikers, and others traveling under their own power. A hostel may be located at a simple farmhouse or a school, or built especially for this purpose. Each hostel offers separate sleeping and washing facilities for boys and girls, and a common kitchen and dining room. It is supervised by kindly houseparents, at whose expense and on whose property the hostel is often built.

The American Youth Hostels, Inc., is rapidly growing in importance as one of the country's leading travel agencies. AYH is a non-profit organization designed to cultivate in people, especially youth, a love for the countryside and a better understanding of the world and its peoples. This is done by promoting the building of hostels and the encouragement of their use. National headquarters is maintained at Northfield, Massachusetts, with a branch office at 143 Lexington Avenue, New York 16, New York. National Directors are Isabel and Monroe Smith, the founders of the movement in America.

History

It was in 1910 that Richard Schirrman, a young German teacher, conceived the idea of making the countryside accessible to the school children of the great industrial centers. When appointed administrator of a museum housed in a Twelfth Century castle, he obtained permission to open some of its unoccupied rooms to school children tramping in the country. Since then, the Castel Altena has offered hospitality to more than three thousand young wanderers from every part of the globe.

The movement grew in Germany with leaps and bounds. Travelers from other lands were initiated into the simple, carefree life of the youth hosteler and were eager to transplant its benefits to their own countries.

Switzerland organized its first loop of hostels in 1924. Three years later hostels were organized by the Department of Education in Poland. The movement was taken up in Holland in 1929 by the Youth Leaders Institute. The same year saw the founding of the French Youth Hostel Association by Marc Sangnier, head of the French Catholic Peace Movement.

In 1930 St. John Catchpool followed a study of the youth hostel movement on the Continent by organizing the Youth Hostel Association of England and Wales. Its membership has reached astonishing figures. The end of 1945 showed some 200,000 members registered for the year.

Among the other countries that have adopted the movement are Austria, Czechoslovakia, the Scandinavian countries, Estonia, Finland, Latvia, Luxem-

Luella C. Schroeder

Houseparent inspecting passes of hostelers.

bourg, Belgium, Scotland, Eire and New Zealand. Canada established its first hostels in 1937, and now has a well-knit system linking the various Provinces and a national office in Toronto.

Isabel and Monroe Smith, two American teachers and youth workers, went to Europe in 1933 to make an extensive survey of youth movements there. The youth hostel movement attracted them more and more, and they returned to the United States determined to introduce it to Americans. An organization soon resulted from their efforts, with the first president being President Mary E. Woolley of Mount Holyoke College.

The first American hostel was opened in Northfield, Massachusetts, December 7, 1934. The following June, Isabel and Monroe bought a colonial house on the beautiful Main Street of Northfield, and the first official hostel in America came into being.

Use of the Hostels

A cyclist who wishes to make use of the hostels on his various trips may do so by taking out a pass from the national headquarters, the nearest hostel, or the local AYH Council office if there is one. A pass good for the calendar year costs $1.50 for a person under 21 years of age, or $2.50 if he is 21 or over.

Many of the existing hostels are more or less off the beaten path. With each pass is sent the "AYH Handbook," listing all the hostels with complete information on how to reach them and what accommodations they offer. This information is kept up to date by the issues of the quarterly *Knapsack* magazine, a pocket-size illustrated booklet that also includes accounts of travel experiences and news of forthcoming sponsored projects.

Hostelers intending to travel in other countries can obtain foreign travel stickers, addresses of hosteling organizations, specific information on suggested itineraries, etc., from the national headquarters. The AYH sponsors tours into foreign lands in normal times, as well as trips through various regions of our own country.

Most hostelers, desirous of traveling economically, do their own cooking. Others may wish to buy their suppers before reaching the hostel. In a few

Photo by Luella C. Schroeder

cases, meals may be bought at the hostel, but this should be arranged in advance and should never be taken for granted.

The cyclist will find at each hostel an assortment of cooking utensils for preparing his own meals. Very often milk and other food may be bought from the house parents, especially if the hostel is located on a farm, but this should be ascertained by a phone call before reaching the hostel. It may be found advisable to do a little shopping at the last village store on the way to the hostel.

Hostels have been established primarily to make travel possible for students and others who could not otherwise see the country. Houseparents do not make their living as such, and the low fee of 35 cents a night now universally charged in this country requires that each hosteler assume his share of responsibility for maintaining the hostels he visits. This means keeping the bunkrooms and kitchen clean and in order, and following accepted rules of behavior.

Rules are few, and are but customs universally observed by hostelers. There is no smoking nor use of alcoholic beverages at hostels. Hostelers generally arrive before dark, retire early, and leave early in the morning.

Individual Equipment

Most equipment carried by the hosteler is of his own choice, but should be kept to a minimum. Toilet articles, camera, and a change of clothing are probably necessities. The hosteler must provide his own silverware, plate, bowl, and cup. Dishes made of metal or plastic are preferable, to prevent breakage while being carried about on the bicycle. A deep plate will eliminate need of a bowl, while a collapsible metal cup may be kept in an outside pocket for use en route.

In addition to his pass and eating equipment, the hosteler must carry a sleeping sack, made from sheeting or unbleached muslin. This protects both the hosteler and the blankets furnished at the hostel and saves constant laundering. The sleeping sack may be bought from the national headquarters or may be made. It should be as wide as a single bed and about a foot longer, sewed down each side and across the bottom. It should be open on each side near the top, one end to remain long enough to fold over the pillow, the other end to be shorter and fold over the top covers about a foot. For large persons it would be wise to have a gusset in each side from the pillow to within about two feet of the bottom of the sack.

Chapter XVII

Bicycle Racing

THE tradition of racing is one of honesty, of a clean mind, a clean body, and a clean race. But this does not modify the necessity of being smart in planning the race so that you have the greatest possible energy for the sprints and for final victory.

The racer should sleep on his back, without a pillow, and by an open window. He should retire early and rise early; those who abide by this rule are faster than those who do not. The first thing in the day, one should take deep breathing exercises by an open window.

A bicycle racer should eat no breakfast, drinking only milk, chocolate, or coffee, without cream. He should eat any of the easily digestible foods—mainly meat, fish, and vegetables. One night a week he should go to bed without food. No liquids at all should be taken one hour before, during, or one hour after a meal.

After any work-out or race the rider should not eat for one hour, nor should he train for at least one hour after eating. Eliminate all sauces from food and take no potatoes, but have considerable vegetables. Eat only the crust of bread and have no desserts or sweets whatever.

One should cover the body, the arms, legs, and head, even in the warmest weather, as the sun dehydrates and takes energy from the racer. Goggles should always be worn for road racing, to protect the eyes. Gloves should be worn for additional protection and for braking.

The fit of the bicycle is very important; a bicycle too large or too small is not good. The seat should be at least three inches off the frame and at least two inches behind the hanger. In buying a bicycle, one should get a frame which can be thus properly fitted. The bicycle should be equipped only with wood rims and sew-on tires.

When riding on a track it is the practice of many experienced racers to use an 88 gear exclusively, and when riding on the road, to use a derailleur, to take full advantage of the varying terrain, but with a small ratio of change. One should train with the *smallest* gear, to develop speed in the legs. Always train without toe clips, straps, and cleats. Every person who wishes to race should ride at least five miles each day.

In inclement weather all racers should have a set of rollers or some form of exercising cycle in the house.

While training, one should dress very warmly and travel at least forty miles before lunch on the open road. On returning, he should take a warm bath (no shower), and then in the late afternoon, train for an hour or two on a track.

People who stand at their work should cut down on their training, so

Walter Norris

that they will not be too tired at their jobs or at their training.

Many young men wear themselves out by overtraining in youth. No one should ride over sixty miles a day before he is sixteen years of age.

The racer should analyze the race and budget his energy, so that the course can be covered in a minimum period of time, taking only that into consideration. One theory of racing which has been proved good through experience is: go out in front and stay there—tire the others out.

Race your own race; pay no attention to the others. If you know your ability, you will finish as well as your strength and ability will permit.

Racing is fun. Sprinting and distance races make for strong bodies and strong friendships among those who ride.

CHAPTER XVIII

An Introduction to Bicycle Polo

OF all the new sports, bicycle polo is of particular interest for us to study, not solely because it is allied with the bicycle, but rather for its own individuality.

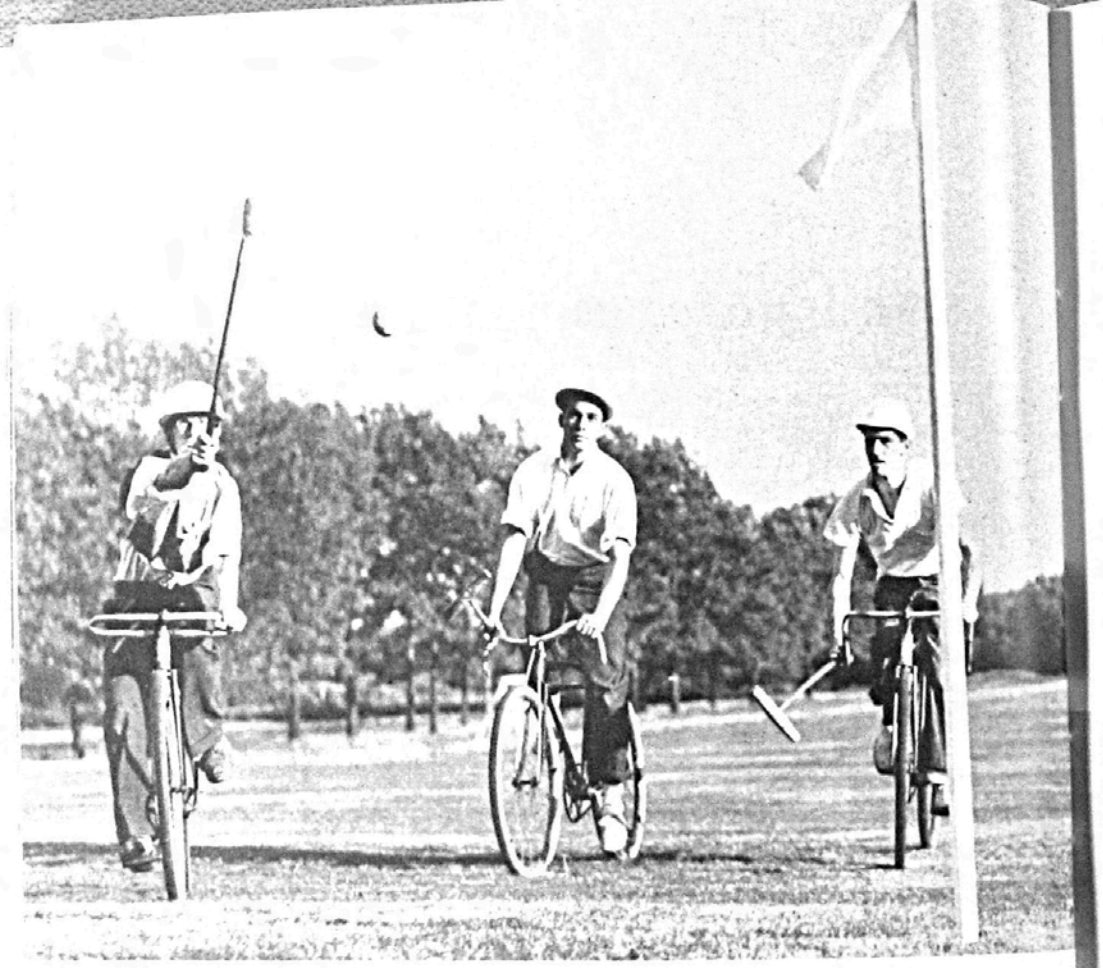
The inception of the game of polo dates back through many millenniums of colorful development. Beginning with the cultures of Asia there are many interesting accounts of polo. The poet and artist of yore sang and painted the glory of this graybeard of all games. So really bicycle polo is not new, but rather is a recent offspring of the game of polo as played from the horse. Here the horse is exchanged for a sturdy bicycle, which presents a new epoch in the history of the sport. Whereas horse polo is the game of rich men, bicycle polo can be enjoyed by anyone who can afford the simple equipment required.

The development of bicycle polo has not actually gone through a cycle of steady evolution; it is still fairly young. During the last half century the game has frequently been played on a rather faddish level. It has not yet taken deep roots in the sporting life of our country. In 1897 in Milton, Massachusetts, there was formed a bicycle polo club, but slowly, with the decline in popularity of the bicycle during the first years of the century, the sport lost ground here in America. During this period there was organized at the Sheen House Club of East Sheen the first bicycle polo club in England. Before World War II England had about a thousand players and almost a hundred clubs, which shows the enthusiasm with which that country took to the sport. France, Ireland, Scotland, and Wales also have adopted bicycle polo to such an extent that the various countries compete for an International Cup. It is also widely played in India and Australia.

In the past few years the sport has been revived in the United States. In 1939 at Hamilton, Massachusetts, several young men got together and formed the Hamilton Bicycle Polo Club. From this beginning there was created the first association devoted exclusively to bicycle polo. The United States Bicycle Polo Association was formed for the purpose of developing and promoting the game and setting forth rules and regulations.

Actually bicycle polo is quite simple to play. It requires only a sturdy bicycle, polo mallet, and two willing legs to carry you around the field. The object of the game is as follows: the field (usually grass turf) is 175 yards long and 75 yards wide; within this area the two teams compete against each other; there is a goal at each end of the field, marked by posts 12 feet apart; the two teams of four players each try to hit the ball through their opponents' goal.

The hitting of the polo ball with



Courtesy Jack W. Stauffacher

A game at the Hamilton Bicycle Polo Club, South Hamilton, Massachusetts.

the mallet from a moving bicycle is a maneuver which one learns only by practice. In acquiring the skill of a finished bicycle-poloist, one must give serious consideration and study to this technique of hitting the ball. Learning to execute the strokes with complete mastery will bring the player richer enjoyment. After one has mastered the four principal strokes (offside*, forehand and backhand; nearside*, forehand and backhand), he will then be able to start playing on a team.

As mentioned before, a team is made up of four players, and each player is given a certain position to play. Nos. 1 and 2 are the Forwards, who play an offensive game. No. 3 is the pivot man, who directs the Forwards and Back. No. 4 or Back is the defensive guard, and his duty is to keep the opponents from scoring. All four players may interchange positions when called upon. The ability to ride a bicycle skillfully is of course a requisite for becoming an accomplished player.

The necessary equipment is as follows: bicycle; polo mallet, 32 inches long; helmet for protection. The best

*Offside is the right-hand; nearside is left-hand.

bicycle for the purpose is a low-priced lightweight type with a low gear, coaster brake, and rubber pedals. Mallets can be purchased specially for the game through Charles Meurisse and Company, Eight South Michigan Avenue, Chicago, Illinois. Bamboo root polo balls can also be obtained at this house.

Shorts, T-shirt, and tennis shoes are the costume best for play.

APPENDIX

Bicycle Polo Rules

(As adopted by the United States Bicycle Polo Association April 26, 1942)

Reprinted by permission of the Association.

General Rule No. 1

Bicycles

Bicycles of any type may be used.

General Rule No. 2

Ground

(a) A regulation playing field shall be 175 yards in length by 75 yards in width, preferably without board.

1. The boundaries on the sides of

Start of offside backhand.

Courtesy Jack W. Stauffacher

the playing field shall be known as the sidelines.

2. The boundaries at the ends of the field shall be known as the back lines.

3. That part of the back line between the goal posts shall be known as the goal line.

(b) The goals shall be 12 feet apart, at least six feet in height, and light enough to knock down if collided with.

General Rule No. 3
Balls

The regulation ball to be used is the official outdoor polo ball. Its size shall not exceed 3¼ inches in diameter, and the weight shall be within the limits of 4¼ to 4¾ ounces.

General Rule No. 4
Number of Players

(a) The number of players is limited to four on a side in all games and matches.

Substitutes

(b) A player may be substituted for another during a period only if the latter player, through sickness or accident, is unable to continue. In such case, the handicap of the player having the higher handicap shall be counted. Unlimited substitutions may be made between periods provided the four highest handicaps of players and substitutes be counted.

General Rule No. 5
Officials—Goal Referees, Timekeeper, Scorer

(a) There shall be a Referee whose decision shall be final.

(b) In all important matches goal referees should be appointed.

(c) An official Timekeeper and Scorer shall be employed in all games and matches.

General Rule No. 6
Maximum Duration of Play

(a) A Match shall consist of 6 periods of 7½ minutes each with intervals of three minutes after each period, and five minutes at half time.

Play Continuous

(b) Except where otherwise specified in these rules, play shall be continuous, and no time shall be taken out for a change of bicycles, unless broken. See Field Rule No. 16.

Termination of Period

(c) Each period of play except the last period shall, after the expiration of the prescribed time, terminate as soon as the ball goes out of play over the side, back or goal lines, or is in such a position that the Referee can stop the game without favoring either side. A bell shall be rung when each period has expired.

(d) If a foul is called by the Referee after the bell, the Referee's whistle terminates the period and the penalty shall be exacted at the beginning of the next period.

Deduction of Time in Case of Foul

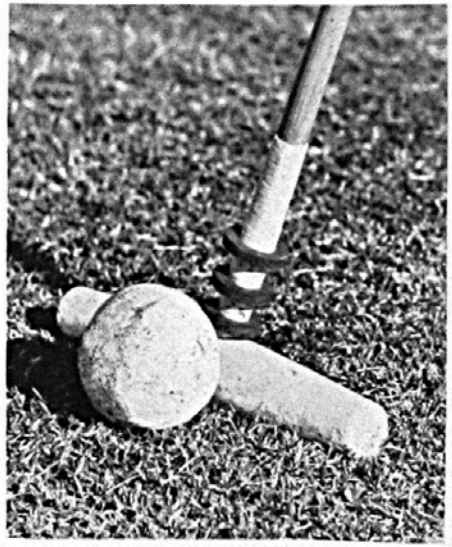
(e) When a foul is allowed by the Referee, the time shall be deducted from the period until the game starts again, and the time lost shall not be counted.

Last Period

(f) The last period shall terminate, although the ball is still in play, at the first stroke of the final bell, wherever the ball may be, except in case of a tie.

Prolongation in Case of Tie

(g) In the event of a tie, the last period shall be prolonged until the ball goes out of play or is in such a position that the Referee can stop the game without favoring either side. After an interval of five minutes, the game shall be started from where the ball went out of play and continue in periods of 7½ minutes with the usual intervals, until one side obtains a goal, which shall determine the match.



Courtesy Jack W. Stauffacher

Ball may be hit on either side of the mallet head.

General Rule No. 7
Unfinished Games

In case of a game being called on account of darkness or weather, then the Captains and Referee shall decide where and when the game shall be played out.

General Rule No. 8
Most Goals Win

The side that scores the most goals wins the game.

General Rule No. 9
Headgear

No player shall be allowed to play unless he wears a protected helmet or cap.

Field Rule No. 1
Whistle and Dead Ball

The Referee shall carry a whistle, which he shall use as required. If the Referee blows his whistle the ball is dead.

Field Rule No. 2
How Game Commences

The game begins by both teams taking their positions in the middle of the field and the Referee bowling the ball, underhand and hard, into the center of the ground between the opposing parallel ranks of players facing him, each team being on its own side of the center line. No player is to stand within five yards of the Referee.

Field Rule No. 3
Ends Changed

Ends shall be changed after every goal. After a goal has been scored the game shall be restarted from the center of the ground as in Field Rule No. 2.

Field Rule No. 4
Goals

A goal is gained when a ball passes between the goal posts and over and clear of the line. If a ball is hit above the top of the goal posts, but in the opinion of the Referee goes within the goal post area, it shall be deemed a goal.

Field Rule No. 5
Ball Hit Behind By Attacking Side

If the ball be hit behind the back line by one of the attacking side, it shall be hit in from where it crossed the line, but at least 8 feet from the goal posts.

FIELD RULE No. 6

Ball Hit Behind By Defending Side

If the ball be hit, either accidentally or intentionally, behind the back line by one of the defending side, it shall be deemed a SAFETY, and penalty 3 shall be exacted, provided the ball does not glance off another player or bicycle.

FIELD RULE No. 7

Ball Out

(a) The ball must go over and clear the boundary lines to be out.

Ball Thrown In

(b) When the ball is hit over the side lines, it must be bowled, underhand and hard, by the Referee, at the point where it went out. Teams line up as in Rule No. 2.

FIELD RULE No. 8

Ball Damaged

The Referee may stop the game for a broken or imbedded ball.

FIELD RULE No. 9

Carrying Ball Penalty 4

A player may not catch, kick or hit the ball with anything but his stick. He may block it with any part of his body. If the ball becomes lodged against a player or his bicycle in such a way that it cannot be dropped immediately, the Referee shall blow his whistle and throw the ball in at the point where it was first carried.

FIELD RULE No. 10

Crossing Penalty 2, 3, 4

At each moment of the game there shall exist a right of way. No player may cross another player who has the right of way or enter into the right of way except at such a distance as does not involve the possibility of collision or danger to either player.

Penalty 2, 3, 4

(a) The right of way gives a player the right to hit the ball on the offside of his bicycle. If he places himself so as to hit it on the nearside of his bicycle, he must give way to a player making a play that would have been without danger had he stayed on his proper side. If two players are riding from opposite directions to hit the ball each shall hit the ball on the offside of his bicycle.

Right of Way
Penalty 2, 3, 4

(b) That player has the right of way who is riding in the direction in which it was hit, on, or at the least angle to the line of the ball, except as against a player who is riding to meet the ball on the exact line of its course.

Right of Way
Penalty 2, 3, 4

(c) If two players are riding from different directions to hit the ball and a dangerous collision appears probable, the player who has the right of way must be given way to.

Riding To Meet Ball

(d) Any player who rides to meet the ball on the exact line of its course has the right of way rather than any other player riding at an angle from any direction.

(e) A player riding in the direction in which the ball is traveling, at an angle to its line, has the right of way over a player riding to meet the ball at an angle to its line, irrespective of the width of the angles.

Right of Way
Penalty 2, 3, 4

(f) Two players following the line of the ball, parallel, have the right of way over a single player coming from any direction.

(g) As regards players riding to meet the ball, that player has the right of way whose course is at the least angle to the line of the ball.

(h) No player shall be deemed to have the right of way by reason of his being the last striker, if he shall have deviated from pursuing the exact line of the ball. In such a case, the right of way shall be determined by the other paragraphs of this article.

Penalty 2, 3, 4

(i) No player may pull up or "stand" across the line of the ball if by doing so he endangers himself or a player who has the right of way.

FIELD RULE No. 11

No Riding Out
Penalty 2, 3, 4

A player may not ride off an opponent or interpose his bicycle between an opponent and the ball.

(a) If two players are riding for the ball, parallel or nearly so and in the same direction, then the ball must be left between the two.

(b) A player attempting to catch a man with the ball should approach on the side on which the opponent is carrying the ball. If he fails to do this, i.e., he comes up on the left and the opponent is carrying the ball on his right, THEN the former has no claim to the ball until the overtaking player's (bicycle's) front tire overlaps the front tire of the player in possession of the ball, at which time the ball must be left between the two players.

FIELD RULE No. 12

Hooking
Penalty 2, 3, 4

No player may hook an opponent's stick, unless he is on the same side of an opponent's bicycle as the ball, or in a direct line behind. The stick may not be hooked or struck unless an adversary is in the act of striking at the ball.

(a) No player may reach immediately over and across or under and across any part of an opponent's bicycle to strike the ball.

(b) No player may touch an adversary or his bicycle with the hand, mallet, or bicycle during play.

(c) No player may use his stick dangerously.

FIELD RULE No. 13

Penalty 4

A player requiring a mallet, bicycle, or assistance from an outside person during the game, shall ride to the end or side lines to procure it. No person may come onto the ground to assist.

FIELD RULE No. 14

Dismounted Player
Penalty 2, 3, 4

No dismounted player or no player with one or two feet touching the ground may hit ball or interfere with the game.

FIELD RULE No. 15

Intimidation
Penalty 2, 3, 4

It is not necessary to collide with a bicycle or player to be guilty of a foul. If a player compels another player who has the right of way to alter his course to avoid a collision, then he has committed a foul.

FIELD RULE No. 16

Accidents

(a) If a player falls, or in case of an accident to a player or a bicycle, which in the opinion of the Referee involves danger to the player, the Referee shall stop the game.

(b) If any part of the equipment of a bicycle is lost or broken, the player shall notify the Referee when the ball next goes out of play and the Referee shall blow his whistle and stop the game to give the player an opportunity to change the bicycle. Two minutes' time out is allowed.

(c) In case of an accident to a player, he shall have not more than 10 minutes' time out. After that time, substitution shall be made.

PENALTIES

Penalty No. 1

If in the opinion of the Referee a player commits a dangerous foul in the vicinity of goal in order to save a goal, the side fouled shall be allowed one goal and they shall be given a free hit at goal from the 30-yard line as in Penalty No. 2.

Penalty No. 2

(a) A free hit at the ball from a spot 30 yards from the goal line of the side fouling opposite the center of the goal or, if preferred, from where the foul occurred (the choice to rest with the Captain of the side fouled). All the side fouling should be behind their back line until the ball is hit or hit at, but not between the goal posts, nor, when the ball is brought into play, may any of the side ride out from between the goal posts. None of the side fouled should be nearer the goal line produced than the ball is, at the moment it is hit or hit at.

(b) In carrying out Penalty 2, if the free hit would, in the opinion of the Referee, have resulted in a goal, but is stopped by the side fouling coming out from between the goal posts or crossing the back line before the ball was struck, such shot is to count as a goal to the side fouled.

Penalty No. 3

A free hit at the ball from a spot 40 yards from the goal line of the side fouling opposite the center of the goal, none of the side fouling to be within 20 yards of the ball, the side fouled being free to place themselves on the field as they choose.

Penalty No. 4

A free hit at the ball from where it was when the foul was committed. No player (on side fouling) should be nearer than 20 yards until ball is hit.

* * *

For additional information see *Bicycle Polo, Technique and Fundamentals,* published by The Greenwood Press, 198 Warren Road, San Mateo, California, $1, or address Jack Stauffacher, United States Bicycle Polo Association, 198 Warren Road, San Mateo, California.

CHAPTER XIX

Tandem Touring

CONFIRMED tandem cyclists swear that there is nothing quite so good as this duo form of cycling. To them there is nothing more joyfully satisfying than the use of a modern tandem bicycle and the leisure to travel toward the wide open horizon. With a properly constructed, modern tandem, these happy horizons are almost everybody's choice, and the regret is that millions have never tried this treat of tandem cycling. It is a great game, and that adjective includes all the superlatives you can think of. Tandem cycling can properly be rated as the highest form of recreational happiness known, for husband and wife, brother and sister, or just boy and girl.

The tandem bicycle is perhaps the most remarkable invention in the realm of recreational transport for women who are not skilled in handling a single bicycle. On a good tandem the woman needs no supersense of balance —only that bit of help in affording some human motive power. The self-exertions of the tandem couple are scientifically applied so that both can travel with ease from four to more than five times the distance that would be possible for the average man walking. Walking is still an effort in going down steep gradients, but tandem cycling down hills is gliding paradise awheel. A good tandem breathes life and seems to carry the riders almost by magic. Except up hills and against pesky head winds, a tandem is practically no effort to propel, and riding is a sheer joy.

This, however, applies only to a tandem that is properly equipped, affords proper position for both riders, and moves in the modern manner—with the man in front, acting as sole pilot. Although in the past tandems have been made which permitted handling by either rider, it is now generally recognized that the only safe and sensible arrangement is for the person riding in front to do most of the braking, all the steering, and all the shifting of gears if the tandem is equipped with variable gears. If the tandem couple ride together a great deal, as in the case of man and wife, it is of the utmost importance that the machine be of the proper size for both, and that their positions in the saddle be correct. Then only will they be able to ride with ease and comfort the longer distances made possible by the tandem arrangement. If there is considerable difference between the height or build of the two individuals, it may be advisable to have a tandem made to order.

YOU'RE NEVER TOO OLD . . . These few words are addressed to those over forty. Why don't you take up tandem cycling? Why don't you give that car a rest now and then? You cycled years ago and enjoyed it. Re-

Courtesy *American Bicyclist*

member the happy times you had? Well, cycling has lost none of its fascination since then. It is you who have changed. Invest in the best possible tandem (it should be the very best, for it is the only mechanical thing you push, other than perhaps a lawn mower), and see for yourself. Get aboard a tandem—attired in a proper matching manner that will lend style and dignity to your riding; you will gain a lot of happiness and health.

* * * * *

Tandem Cycling for the Blind

The tandem can help to fill a most heartfelt and definite need in recreational activities at Army, Navy, and other hospitals. Exercise and recreation are combined in "tandem cycling for the blind." No one thirsts more for exercise than a blinded person. A cyclist owning a tandem is in a position to render a great service to any able-bodied blind man or woman whom he chances to meet. He can act as pilot for the blind one, guiding him in pleasant exercise through the outdoors, describing the scenes as they unfold along the road, and giving the other's morale a wonderful boost through his sense of *participation*— a feeling that comes far too infrequently to those who are without sight.

CHAPTER XX

Bicycling - A Healthful Recreation

BICYCLING, because it combines outdoor exercise with fun and companionship, offers an ideal way to gain and retain health. Bicycling can be indulged in either moderately or strenuously, according to one's physical abilities. It is impossible to become fatigued unknowingly. Cycling exercises the entire body, strengthens the heart, lungs, and other vital organs, stimulates the circulation, and relaxes the nervous system. It improves digestion and elimination, normalizes weight, and develops smooth, supple muscles. Fine physical fitness and an excellent physique result.

When weight control is a factor, the effects are gratifying. With the exception of cases caused by glandular disorders (which require the attention of a doctor), overweight is caused by overeating, or insufficient exercise, or a combination of these factors. The result of less food, more exercise, or a combination of the two, is obvious. Because of our sedentary mode of living today, probably the most prevalent factor contributing to abnormal weight is lack of sufficient outdoor exercise. A condition of underweight also may be improved by increased outdoor exercise, because fresh air and exercise are necessary for proper oxygenation of the tissues and assimilation of food.

Diet, which is of great importance at all times, should be viewed sensibly. The amount of food required varies with the individual and his occupation. An average adult of 150 pounds at ordinary activity requires about 3,000 calories in each 24 hours. The more manual his work or strenuous his exercise, the greater the requirement of calories, up to about twice the normal need. A standard portion of most common foods contains 100 calories. About 60 per cent of the total calories should be provided by protein, 30 per cent by carbohydrates, and 10 per cent by fats. The minimum daily requirements of vitamins and minerals are also important. A well-rounded diet should consist of milk and milk products, eggs, meat, fish, whole-grain cereals, fruits, and vegetables.

When starting to cycle after any period of inactivity, one should ride moderately at first, gradually increasing the distance and effort.

To receive the greatest amount of physical benefit and enjoyment with the minimum of effort and fatigue, it is essential to have proper posture, which means the correct, the most comfortable, and the easiest riding position. The correct position is obtained by placing the saddle at such a height that when the rider sits on it with both legs hanging down straight, one bare heel will lightly touch the corresponding pedal when at its lowest point. Thus, when the ball of the foot (*not* the instep) is on the pedal, there

will be a slight bend at the knee. Always ride with the ball of the foot on the pedal. It makes riding easier because the spring of the arch is used, it develops a strong, more slender ankle, and strengthens the arch of the foot. Do not move the body unnecessarily while pedaling. Of a good rider it can always be said, "Nothing moves but his legs."

The saddle tip should be directly over or a little in back of a line straight up from the cranks when in a vertical position, or placed so that the rider feels the greatest power can be exerted on the pedals from just after they leave dead center at the top until just before they reach dead center at the bottom. Usually this makes the leg (from the knee to the ankle) perpendicular when the cranks are in a horizontal position. This is the portion of the pedal revolution that allows the rider to use both weight and strength combined. For normal riding this affords a rest during the remainder of the revolution.

Rhythm, or even pedaling, should be developed. This is done by rocking the ankles, or "ankling," which is the term applied to proper pedal action. With the ball of the foot on the pedal, point the toe on the downward stroke and depress the heel on the upward revolution of the pedal. This distributes the power necessary to turn the wheels and relieves the thigh and calf muscles, increasing the power by

Warden Clark

about 25 per cent without any extra effort. Some riders are aided by toe clips, shoe cleats, and straps in exerting a continuous pressure against the pedals similar to turning a crank by hand. This is done by pushing down with one pedal and pulling up with the other simultaneously. However, the main effort should be concentrated on the down thrust.

The handlebars should be the approximate width of the rider's shoulders and adjusted to a point practically level with the saddle, so that the body leans slightly forward without excessive strain on the arms. In the correct position and with the greatest amount of pressure on the pedals, the pull on the handlebars will be like breaking a stick by holding it, then placing the foot against it and pushing.

Every rider must experiment before achieving a perfect position.

In selecting a gear it should be remembered that the higher the gear, the more effort is required, while a smaller gear requires more activity. Normal gears for men should be between 64 and 72, and for women between 56 and 64. A gear higher than one's ability warrants will cause unnecessary fatigue.

Tired persons recover more quickly from their fatigue if they retain on their bodies the clothing which they wore while becoming fatigued, than if they quickly remove their clothing and allow the air to cool their bodies too rapidly. Soldiers in the field of battle undergo the worst type of fatigue; yet because they do not have the facilities for disrobing whenever they please, their bodies cool normally and little damage results in the form of actual tissue changes and disease. The person who exercises until exhausted or overheated and then removes his clothing and allows his body to cool rapidly is the person subject to fatigue disorders. A baseball pitcher, even in the hottest of weather, will instantly don his sweater upon returning to the bench. When a football player returns from the field he puts on a bench coat. The ordinary person does neither of these; on the contrary, he will almost invariably seek a shady place to cool off or will drink cold water or other cold liquids in an effort to hasten the cooling process.

The nerve activating a muscle is susceptible to changes in temperature. This is noted by feeling stiffness in the muscle when it cools too rapidly. If a muscle is overworked and then suddenly cooled, the nerve centers in the spinal cord become congested and may react as a constitutional disorder. When a nerve center becomes congested and is not properly decongested by cooling gradually, the spinal cord cells can irritate the spinal nerves and produce inflammation and paralysis.

After exercising and creating heat in a muscle, one should gradually cool the muscle by not removing any clothing worn during the exercise until the body has adapted itself to the local atmospheric temperature.

Never take a shower or swim immediately after exercise. The body will adjust itself to atmospheric temperature in twenty minutes. Don't try to hasten the cooling process by drinking cold liquids in any form. Hot liquids are best.

Bob Jacoby

The working muscle uses tremendous amounts of sodium chloride, and therefore in hot weather salt must be used abundantly, unless the individual suffers from damaged kidneys. In that instance strenuous exercise in any form is unwise.

Vitamins and minerals are consumed when muscles are exercised. These must be kept at normal level. Early muscle fatigue is a sign of low Vitamin B content.

Correct posture raises the fatigue level, and one tires less quickly. The importance of correct posture cannot be overstressed.

Fatigue itself does not produce disease, for all people who work or play become fatigued. It is the ability to recover from fatigue that prevents disorders, or the inability to recover that produces disorders. As a cyclist, you can help yourself in this respect by watching your posture, dressing properly, and cooling slowly after exercise.

Bicycling is a fascinating sport. It is the simplest and most beneficial form of exercise and recreation. It develops a strong, healthy body and a keen, alert mind. It is one of the safest of all sports, and it's lots of fun.

Personal Notes

Personal Notes

League of American Wheelmen

INCORPORATED

224 North Desplaines Street
Chicago 6, Illinois

APPLICATION FOR MEMBERSHIP

Name ..... Are you over 16 years of age? .....

Address ..... Married ..... Single .....

Occupation ..... Place of Business .....

How long have you been cycling? .....

Have you done any cycle touring? ..... Hosteling? ..... Racing? .....

Destination and mileage of principal tours

Make of bicycle ..... Serial No. ..... License No. .....

Model ..... Other descriptions

To what bicycle clubs have you belonged? .....

(Check form of membership desired.)

..... Sustaining Membership, $5.00 or more per year.

..... Junior Membership, $1.00 for a group of 10 or more per year.
Give name of active sponsoring club.

.....

..... Individual Membership (not a member of an affiliated club)
$1.00 per year

..... Active Membership, $1.00 per year. Give name of chartered club.

.....

Signature of Applicant: .....

Membership fee must accompany this application. Amount $..... Date .....

INDEX

INDEX—Concluded

PHILLIPS

RENOWNED THE WORLD OVER

FINE

English Bicycles

FOR TOURING AND RACING

also

Caliper Brakes · Free Wheels · Fixed Sprockets
Toe Clips · Toe Straps · Front and Rear Hubs
and Other Accessories

CLOSE RATIO 3-SPEED RACING DERAILLEUR GEAR "ACE"
MADE BY CYCLO, BIRMINGHAM, ENGLAND.
—CATALOG IN PREPARATION—

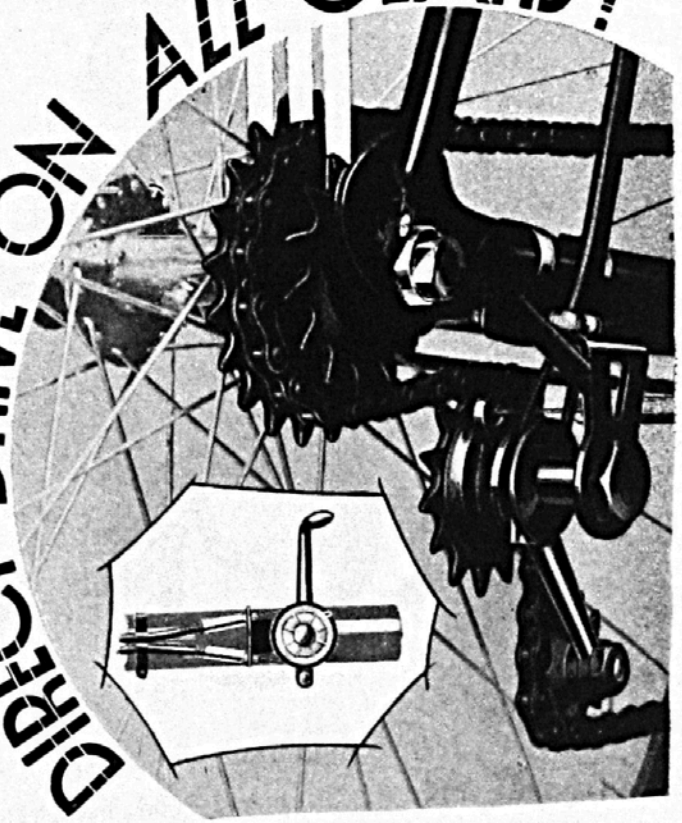
HUDSON

CYCLE EQUIPMENT CORPORATION

535 - 5th Ave. New York 17, N.Y.

CYCLO

DIRECT DRIVE ON ALL GEARS!

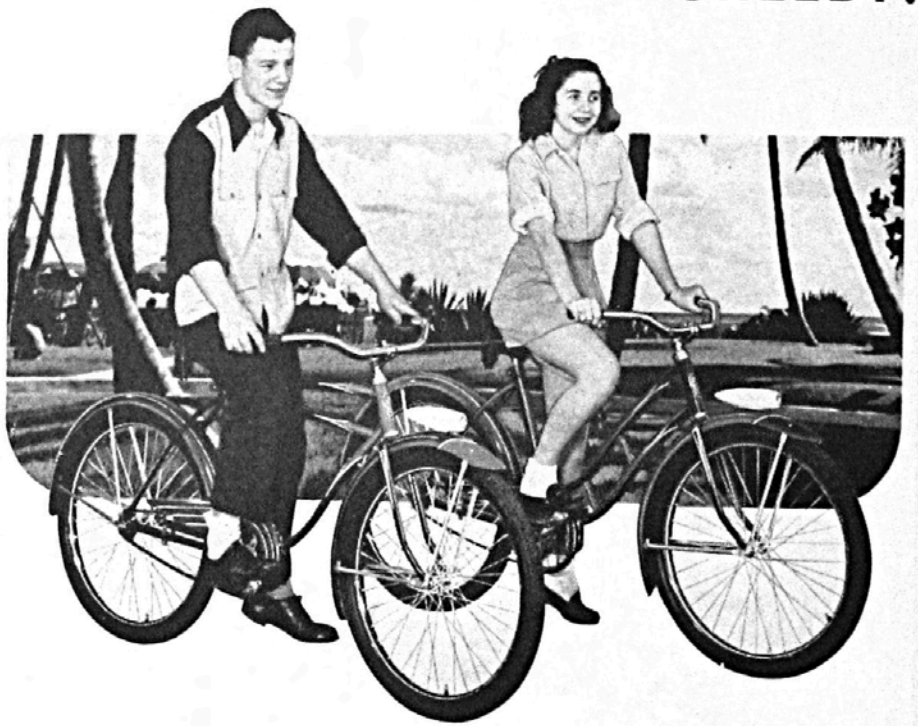


2, 3 and 4 SPEED GEARS....
....RACING ACCESSORIES
.....

HUDSON
CYCLE EQUIPMENT CORP.

535 - 5th Avenue New York 17, N.Y.

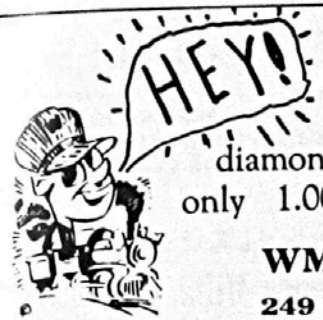
Ride Smoothly and Safely *on a* SHELBY!



TO MILLIONS, no other outdoor sport offers more fun, relaxation and good, healthful exercise than bicycling. And no other bike offers more in in-built quality, and smooth, safe, trouble-free operation than a Shelby! The Shelby Cycle Company, Shelby, Ohio.

The **SHELBY**

"America's Quality Bicycle"



ALL YOU GUYS AND GALS-
Get our special asst. of Bicycle Decals. Includes spears, names, jewels, colored diamonds and arrows -- A grand selection for only 1.00 post paid. **GET YOURS TODAY**

WM. K. WALTHERS, INC.
249 E. ERIE ST. MILWAUKEE 2, WIS.

THE HUFFMAN MANUFACTURING COMPANY

LIGHTWEIGHT BICYCLES
BUILT BY
THE MAKERS OF
DAYTON BICYCLES
SINCE 1892

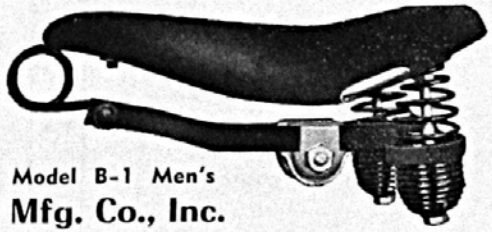
DAYTON, OHIO

J. E. BUNKER COMPANY, INC.

Northwest's Schwinn Distributor

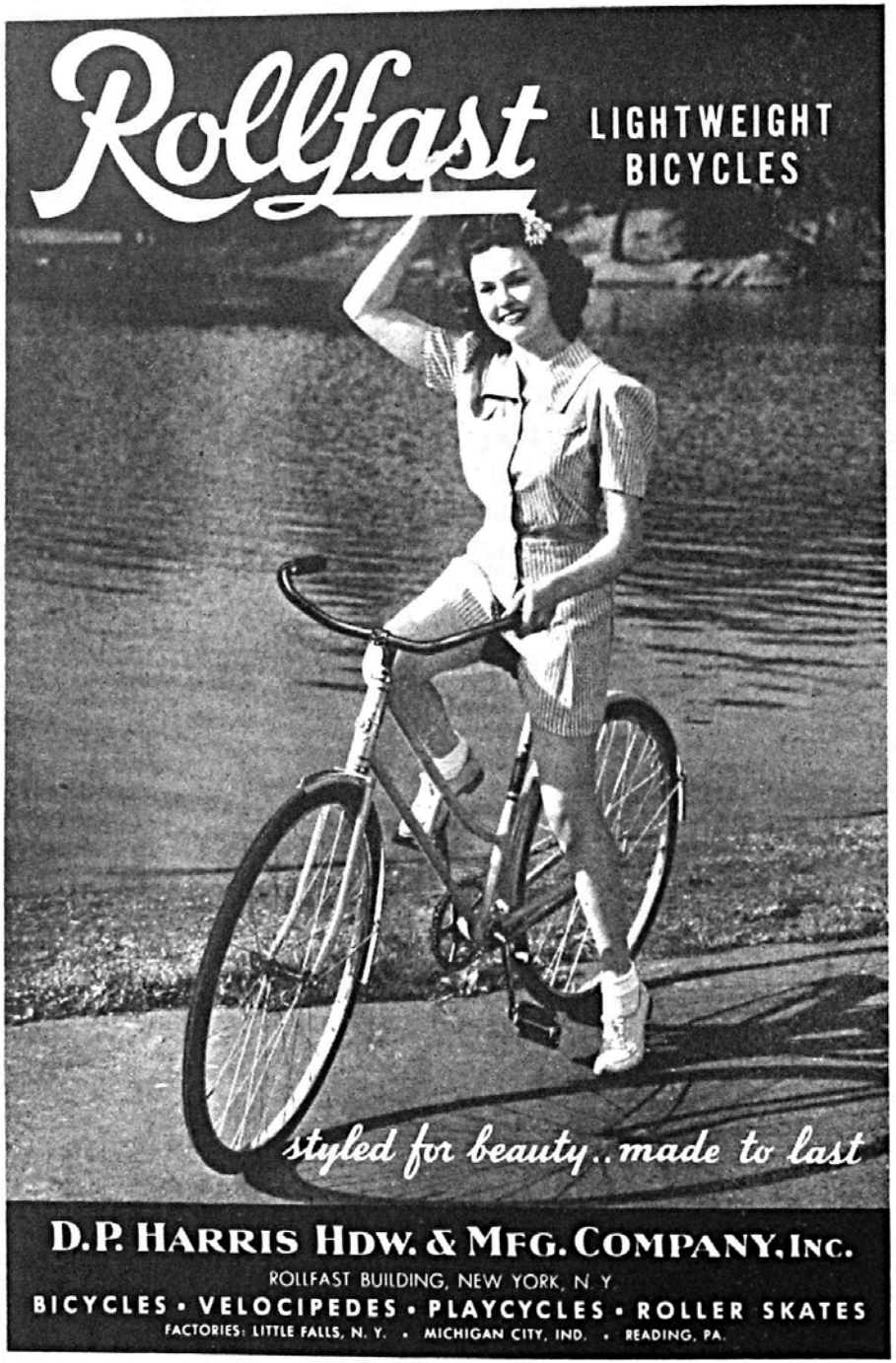
Tacoma, Washington
Portland, Oregon

MESINGER
The Top Name
To Top Off Any Bicycle



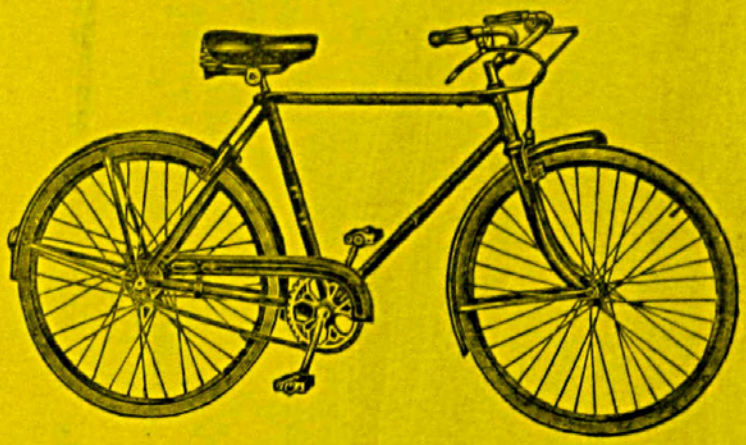
Model B-1 Men's

H. & F. MESINGER Mfg. Co., Inc.
432 Austin Place, Bronx, New York 55, N. Y.


Rollfast
LIGHTWEIGHT BICYCLES
styled for beauty.. made to last
D.P. HARRIS HDW. & MFG. COMPANY, INC.
ROLLFAST BUILDING, NEW YORK, N. Y.
BICYCLES • VELOCIPEDES • PLAYCYCLES • ROLLER SKATES
FACTORIES: LITTLE FALLS, N. Y. • MICHIGAN CITY, IND. • READING, PA.

Schwinn-Built

CONTINENTAL TOURIST



★ *America's Finest* ★

Lightweight Touring Cycle

★

SEND FOR FREE CATALOG

ARNOLD, SCHWINN & CO., 1786 N. Kildare Ave., Chicago 39, Ill.

Schwinn-Built Bicycles

For SPEED · SAFETY · EASY RIDING