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The Bicycle has changed the way humans travel and recreate. The invention of the Bicycle changed the way humans travel and recreate because it has so much to offer. Ever since its beginning, the bicycle has brought countless kids to school, people to work, unhealthy to fit, and carried champions over the finish line. The first bicycle or bicycle prototype dates back to the early 19th century. Though there are some early prototypes and sketches of the groupset and shift system or frames with two wheels, the first patent of the common use bicycle belongs to German Baron Karl von Drais.

He was a civil servant to the Grand Duke of Baden, and in 1817 he invented the Laufmaschine or running machine. Nicknamed the Hobby Horse or the Draisine, it was the first successful two-wheeled, steerable, human-powered machine. Constructed with a stiff and solid wooden frame, the draisine weighed a heaving 48 pounds. This first prototype had brass bushings within the wheel bearings, iron-shod wheels, a brake on the rear-wheel, and 6 inches of trail at the front-wheel for a self-centering caster effect. This design was welcomed by mechanically minded men daring to balance and seeking adrenaline. The Draisine was not propelled by rotary cranks on a wheel or the modern chain system but rather by running, hence the name “ Running Machine.

” A rider would sit on the seat that was placed in the middle of the frame’s top tube, and push off the ground to propel themselves as if running. Several thousand copies were built and ridden primarily in Western Europe and in North America. The draisine was given the name the “ boneshaker,” because of its iron wheels and stiff frame, that’s exactly what it did. Though it was almost banned in certain regions throughout Europe because of so many

people crashing and injuring themselves, Von Drais' first draisine would inspire a metalworker to add rotary cranks and pedals to the front wheel hub and other inventors to design three-wheeled and even four-wheeled versions of the draisine. The first mechanically propelled two-wheel bicycle is believed by historians to have been built by Kirkpatrick Macmillan, a Scottish blacksmith, in 1839. A nephew later claimed that his uncle (Macmillan) developed a rear-wheel drive design similar to the transmission of a steam locomotive by using rods connected to the wheel and rear cranks.

Many similar prototypes and models based off of the original Draisine were created and mass produced, but in 1870 the Penny Farthing was invented by James Starling, known then as the father of the cycling industry. The penny farthing had one very large wheel connected to the front fork and the rotary cranks running through it. In the back was a petite wheel used for stabilization and also had a large effect on weight reduction. On these wheels were solid rubber tires with little tread. Because of its upright geometry and wheels in close proximity, the penny farthings frame was much lighter, making it easier to ride uphill and more capable of higher speeds.

But with this new position came a whole host of problems. Because of its large front wheel and high seat, when a rider would hit a bump or dip into a pothole, they were very likely to be thrown from the bars usually ending in a FOOSH injury (fall on outstretched hand), a broken collarbone, or worse. The Penny Farthings fame only lasted around two and a half decades because its dangers outweighed its strengths, but farthing racing in itself is considered to be the birth of competitive cycling as a sport. Although the penny farthing

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held popularity for a good while and was shipped all over the world, a new type of bicycle was being built, “ The Safety Bicycle.” This new bike had wheels with even diameter or one being slightly larger than the other. A bike developed by many inventors and manufacturers, it sold quickly because it fulfilled four main elements which were: Steering, Safety, Comfort, and Speed. At the same time these were in development, John Dunlop was reinventing the pneumatic air bicycle tire, which offered a smoother ride over all terrain.

Over time the Bicycle evolved to meet people’s needs and requirements while staying enjoyable for the child or adult seeking adventure. In the early 19th century, bicycles were made with a plethora of weight bearing materials such as cast iron for wheels and frames, wood for frames and handlebars, and thick rubber for tires. When the modern groupset was invented (front and rear brakes, crank and crank arm, brake calipers and levers, and front and rear derailleurs.), it was not uncommon to have bikes weighing in over 60 pounds. But around the 1930’s, bicycle manufacturers began to migrate towards steel for the frame, wheels, components, handlebars, and seat posts.

Some people still enjoy steel frames and components to this day because of their durability and style, but the main materials used today is carbon fiber and aluminum. Aluminum was a big step forward for not just bike racing, but also leisure. It is much lighter than steel and almost as strong. An alternate cheaper metal was alloy, a mixture of lightweight metals that was very similar to aluminum.

In 1986, the first carbon bike was invented by the bicycle brand Kestrel, forever changing the world of racing and bike manufacturing. Carbon carried over the strength of aluminum but was incredibly lighter. Many bicycle companies began producing frames, wheelsets, cranks and crank arms, handlebars, seat posts, and even shoes out of carbon.

One material in testing for bicycles is Graphene, Now some smaller bike companies have started 3D printing bikes using polymers for the frame, other companies offer custom built bamboo bikes, but both come with a steep price. The Bicycle has had many radical advancements since it was first invented in the early 19th century. One of the biggest being derailleurs, giving riders the capability to go faster uphill, downhill, or on difficult terrain. After the UCI (union cycliste internationale) allowed derailleurs in 1930, times decreased dramatically while speeds shot through the roof. The free wheel allowed riders to stop pedaling while the wheel was still in motion, which allowed racers to stop pedaling on descents when they were out geared anyway, and led to happier leisure riders. Pneumatic air tires also led to faster times and a smoother ride, and also inspired tubeless and clincher tires and rims. Another advancement was in the aerodynamics field.

After modern tires were invented, cyclists partnered with physicists discovered that wind makes up for 85-90% of resistance. Rims were made deeper, frames were contoured to have wind slip by, and new positions were adapted. In the early 20th century, new handlebar styles were being created for racing and leisure: Drop handlebars were designed for lengthy tours and fast road racing and offer multiple positions, aero bars were developed from bullhorn handlebars and are used for triathlons and time trials, and riser bars

were developed for the technical and rough mountain bike terrain. Disc brakes adopted from motorcycles gave cyclists a shorter stopping distance and peace of mind over cantilever style rim brakes. After many years of cyclists using shoe baskets and flat pedals, the clipless pedal was created for racing cyclists. An ironic name for a cleat that snaps into a pedal, but it gives the rider the ability to pull on the pedals, not just push which allows a rider to put more power into the bike. This was another radical invention that changed the way riders train and race, but it also changed the cycling industry. There are now companies and sub-companies built because of the clipless pedal such as Look, Speedplay, and Time among others.

The original mountain bikes were modified heavy cruiser bicycles and paper delivery bicycles used for freewheeling down mountain trails. The sport became popular in the 1970s in Northern California, the USA with riders using older single speed balloon tire bicycles to ride down rugged hillsides. Joe Breeze, a bicycle frame builder, used this idea and developed what is considered the first mountain bike. Many road bike companies soon followed with rigid mountain bikes with fat tread tires. These companies gained influences from Joe Breezer and his friends such as Gary Fisher and Tom Ritchey, but other brands contacted influences already in the cycling manufacturing world such as Keith Bontrager. The Mountain bike took off and soon people across the world were riding them for recreation and mountain bike racing was made into an Olympic sport.

Soon after, Mountain bikes adopted disc brakes and front and rear shocks from motorcycles. Many mountain bikes now are made out of carbon fiber and have many gear setups to go along with the many disciplines of offroad

racing. Professional racing has been most popular in Western Europe, centered historically in France, Spain, Italy and the Low Countries. Since the mid-1980s the sport has diversified with professional races now held on all continents of the globe. Semi-professional and amateur races are also held in many countries. In road and mountain bike racing, the winter season is used for training in tropical locations and team recruitment.

In road racing, there are The Five cobbled classics in the spring (Milan San Remo, The Tour of Flanders, Liege Bastogne Liege, Paris Roubaix, Il Lombardia) surrounded by early season gravel races and a few short one day races or short stage races. The summer season contains the three grand tours which are: Le Giro d'Italia, Le Tour de France, La Vuelta a Espana. Each of these races are 21 stages long with 2 rest days in the middle. The average length of a grand tour stage is 100 miles though the races have 2 or 3 individual and team time trials. There are many one day and weeklong races scatter shotted between each grand tour, and the world road racing championships are held at the end of the road season.

In the fall, when the road season is all wrapped up, cyclocross begins. “Cross” as it is mainly referred to starts in mid-September and stretches to mid-February. It is a mix of racing on mud, grass, sand, and gravel and also has riders get off the bike to jump small barriers or climb a hill too steep to traverse on a bike. Cross requires damp, muddy conditions, and snow can be an exciting factor. Cyclocross is a mass-start discipline and is raced on a contained track of usually about a mile or two and the number of laps is decided by the level of the racer Mountain Biking has many different disciplines like Enduro, Cross Country, and Downhill.

Enduro races feature flowy technical trails with jumps and drops and can be one-day races or stages. Cross Country is raced on fire roads and steep technical trails which suits the rider with strength and endurance on a light single suspension mountain bike. Downhill is the ultimate form of extreme mountain biking, featuring steep twisty trails riddled with high send jumps, and dangerous rock gardens. Not much mountain biking happens in the late fall or winter, but the summer season is packed with races like Red Bull Rampage, Hardline, Koldwave and Cape Epic among others.