Chapter - I

Introduction

*My element is water*

*My Weapon is my body*

*My world is Swimming*

- Martina Moravcova

*(Three time Olympic Gold Medallist swimmer)*

1.1 Introduction:

“Champions are made or born, or vice versa; these and other homilies have been offered as currency to the sporting world with little or no scientific support for their validation.”

Historically swimming is as old as ancient mythology but for practical purposes a review of progress over the last 50 years is all that is necessary. During this period methods of water progression have changed remarkably; each change in stroke has signalized by a corresponding increase in speed fifty year ago. The breast stroke was in general use for all purposes including racing. Then the over hand side stroke was discovered, and it becomes the vogue, with the result that all known speed standards where beaten. Later the trudged stroke was taken up and again new records were set up the in the early go’s the cruel stroke took front place in popular favors, and since then all speed records have been reduced to figures which would have appeared fantiastic to the old tine performer.
Thirty years ago, the topics of discussion was whether a man would ever swim 100m. Inside 60 seconds. Skeptics and there were many skeptics in those days asserted that it was beyond mans physical powers “to break the minute for the century. Now the 100m. Records stands at 47.84 Seconds on the name of P.V.D. Hoosenband of Netherland.

In these days of crowded pools and his mileage training programs, there is little time to perfect the techniques of starting, turning and finishing. Ideally swimmers should practice these techniques while swimming repeats in practice so that neither time from yardage is scarified. However cycle swimming which is necessitated by crowded pools, makes it difficult if not impossible to perform these techniques correctly.

Data gathered over several years indicate that, on the average, improved start can reduce race time in by at least one- tenth of a second.

Over the many starting styles have been used in free style butterfly and breast stroke events Initially swimmers took a starting position with arms extended backward. They soon found that they could start their body moving towards the water more quickly by swinging their arms backward (action reaction principal). Therefore they assumed a preparatory position with arms in front. They would swing the arm straight backswing start was later replaced by a circular backwing on the theory that a longer arm swing would general additional momentum and increase the distance traveled through the air.
The circular armswing (conveshal start) has now been replaced by a faster methods the grab start. The grab start was introduced by Hamauer in 1960 and has rapidly gained in popularity since that time (Hamaure 1972). Several research studies have verified that grab is faster than other methods (Jorgenson 1971), Rofter 1972, Nelson 1972, Bowers and Cavan 1995, Thorse 1975. The grab is superior because you can get your body moving toward the water faster by pulling against the starting platform.

Unfortunately dry land exercises and weight-training programs in the sport of swimming frequently focus their attention on the development of upper body strength. In accordance with the concept of specificity, much time and effort has been spent on the development of specific exercises or weight training procedure that closely mimic swimming movement. Because of this it has been suggested that swimmers, in general, lack the dynamic lower body strength needed to maximize performance in the block start and turns. This may also be because the benefits of developing explosive strength have not been properly investigated.

In competitive swimming, the fundamental goal is to cover a set distance in the least amount of time (Adrian’s Cooper, 1995). The swimming starts has been defined as including those events that takes place between the command, “take your marks” and the of beginning the first stoke (Ambruster, Allen, Billingsley, 1973).

It has been said that start times account for approximately 25% of the total time spent swimming 25 yards, 10% of the time in 50 yard
races and 5% of the time for 100 yard race. Although the time that a swimmer spends starting in an event is invariably less than they spend stroking or turning. The difference between winning and losing a race are often so small that this can be decisive (Adrian and copper, 1995). It can also be said that the technical success of the start, as with many other sports, sets the athlete up for the race too follow.

The main aim of the swimming start is to propel the swimmer away from the starting block as quickly as possible and with the greatest momentum that can be developed. Due to this the swimming block starts can be seen as an explosive event with a movement pattern which requires high force production over a short period of time.

There have been many starting styles used in past years. The circular backswing method has how been replaced by the grab start. Shins Groppel (1984) reported that in the early 1970’s the conventional arm swing start lost its popularity to the grab start. The grab start technique is performed by gripping the front edge of the starting block with the hands while in the set position. Hanauer introduced this start in the late 1960’s and although there has been some dispute, over which starting technique is most effective, the grab start is and widely used method of starting at all levels of competition.(Gairmuraes and Hay, 1995, meglischo,1993).

Plyometrics were developed in the mid 1960’s as a training method to relate muscular strength and power (Adams 1985). Although researches articles “plyometrics” some what differently,
Despains and Chevertle (1987) point put that most agree the term refers to exercises that are characterized by powerful muscular contractions in response to rapid, dynamic loading or stretching of the involved muscles. This loading or stretching of the involved muscles is an advantage of plyometric exercises in that they involve the dynamic stretch shorten cycle movement similar to those adapted in sporting action (Young 1991).

Traditionally plyometric training uses the acceleration and deceleration of the body weight as the overload in dynamic activities such as depth jumps and bounds (Thomus 1998). These activities eliminate the deceleration phase seen in traditional weight training activities or training methods. This is due to the body not having to achieve zero velocity at the end of the concentric movement. Therefore plyometrics involve the production of high forces and acceleration throughout the entire range of motion, which is again specific to most athletic movements like the swimming block start.

Another advantage is that plyometrics are also performed at higher velocities than traditional weight training methods, increasing their specificity to competitive performance (Young 1991).

Only vague records of early swimming exist but they indicate that swimming grew up with Ma from the early stages of his appearance on the Earth. When early Man needed to move on land he either walked or ran when early Man needed to move across water he probably waded, and then eventually swam by watching the example set by other primarily land based animals. The word need is used
somewhat cautiously here because there must have been long periods when the climatic conditions made it impossible for people to swim. The ability to swim, however poorly, would probably have been part of the dexterity of early hunters, and the need to hunt would certainly have been a reason to swim.

Swimming start has come along way since the bottom first entry used in 19th century. In current completive swimming the dive start is a critical component of swimming performance. This is especially true for the shorter distance where the starts has been estimated to contribute up to 30% of the total race in 50 m spirits. Numerous examples can be cited to highlights the importance of start in the men’s 50m freestyle final in Sydney Olympic games there was only 0.05 separating in 1st and 3rd place and in the same event at the 2003 world championship 0.52s separated 1st and 8th place. T he 1996 Olympic, Scott miller lost the 100m butterfly final to Dennis Pankratov by 0.28 seconds although he was already 0.40 behind at the initial 15m mark. Therefore a small improvement in the event placing despite the importance it is still common for swimmers and coaches to select their starting technique using a follow the leader approach by mimicking the technique (Dr. Aemdra little 2005) used by successfully swimmers rather using objective information. In current competitive the swimming start is critical component of swimming performance start is playing important role in competitive swimming which start is better for age group swimming? What difference in different starting style. This is area of this study also relation of explosive strength with competitive starts.
It is a combination of strength and speed abilities. It can be defined as the ability to overcome resistance with high speed (Hardayal Singh 1991).  

Explosive strength always find expression of motor movements i.e. it is form of dynamic strength. Explosive strength performance are markedly influenced by the level of motor coordination required for a movement e.g. inter and intramuscularly co-ordination as a result explosive strength is highly to the nature of a movement and for its development of specific movements or part of the movement have to be used as exercise. A high percentage of movement in sport is of explosive nature and involves overcoming of same external resistance or one’s body weight and plyometrics training.

Performance in the start is strongly related to overall swim performance. (Ross Sanders, Bonner Stephen, 2001).

**Historical aspect of swimming**

**1.2 How swimming started:**

Only vague records of early swimming exist but they indicate that swimming grew up with Man from the early stages of his appearance on the Earth. When early Man needed to move on land he either walked or ran when early Man needed to move across water he probably waded, and then eventually swam by watching the example set by other primarily land based animals. The word need is used somewhat cautiously here because there must have been long periods when the climatic conditions made it impossible for people to swim. The ability to swim, however poorly, would probably have been part
of the dexterity of early hunters, and the need to hunt would certainly have been a reason to swim.¹

How the transition was made from an activity of need to a sport and recreation of unparalleled grace and enjoyment, statistics exist but probably half the population of world can swims. Lack of written records prior to the birth of Christ make it difficult to be accurate but one would anticipate that, as swimming before this time would have been regarded as primarily a necessity, at some stage it would have been seen as a way of moving armies, both large and small, for the purpose of battle. Soldiers would have first of all been transported across water whilst holding onto their animals and later have swam themselves. In 2500 B.C. the Egyptians produced the first hieroglyphics which featured swimming. The photograph of the bas-relief shows a swimmer lying flat with one arm out in front and another behind, indicating that even almost 3500 years ago people propelled themselves in water with alternating movements.

There are indications that a form of over arm stroke was used by the Assyrians, Greeks, South Sea Island natives, North American Indians and Kaffirs of South Africa.² The North African Palace of the Nimrods holds a bas-relief created in 880 B.C. which shows a group of Assyrians swimming through a moat to escape captivity. The Museum of Antique Arts in Munich house a piece of sculpture made in 460 B.C. Which was found in perugia, Italy, and is thought to be the oldest diving figure in existence. It is some 18cm (7ins) high.³ Through these few existing links we are able to form an impression of techniques employed by swimmers – for example, the diving
figure, as you will see from the photo has adopted much the same preparatory position as a diver would today.

Many records in Europe must have been lost during the Dark Ages. This was a time of frequent and persistent plagues and swimming was discouraged because it was generally felt that this was an activity which increased the likelihood of plagues spreading. The first swimming treatise in English appeared in 1595 by Christopher Middleton who translated a Latin original completed in 1587 by Everard Digby, a Cambridge scholar. He was expelled from his Cambridge college six months later and died relatively obscurely whilst working as a country parson. Other books were written by Monsieur Thevenot in 1696 on The Art of Swimming, based on Digby’s work, and by Benjamin Franklin in 1821 when he completed.

1.3 Swimming mythology:

The mystical attitude adopted by many ancient writers, particularly the Greeks, has made it even harder to differentiate between swimming fact and fiction. There are some pieces of fiction which indicate that swimming has been held in high regard: for instance, in Persia the Goddess Anahita, the spotless one, was regarded as the course of all waters;4 Asprasus, ans Indian nymph, made her home in celestial waters; and Lakshmi, the Goddess of Wealth and Beauty. Was born from the foam and a result was given the name of Daughter of the Sea.

Greek legend would not be complete without mention of the water nymphs. Aphrodite, the Goddess of Love and Beauty and
mother of Cupid, was born from foamy waters. The Oceanids, the 3,000 daughters of Ocenus, eldest of the Titans, were born of the water as were the 200 sea nymphs known as Nereids, daughters of Nereus, Old Man of the Sea. Greek legend also records that Arethusa was startled at her bathing and ran many miles until Artemis took pity upon her and changed her into a fountain. And so the stories go on… with Greek stories finding their way into other cultures. In Jewish history, King David spied on Bathsheba at her bath and ended up securing the death in battle of her husband, Uriah, in order that he could marry her.

More often than not, the mermaid was seen as a kind of water temptress. Many of these stories found their way into the next great Civilization, the Romans, who treated bathing and swimming as two parallel activities to be encouraged. Roman baths might well have been regarded in much the same way as the public house today; they were social centers that people used daily. The Roman citizen would visit the Linoleum, sweat heavily and be scraped with a strigil blade by his slaves. Men would swim but women would bathe at home. Plato considered a man who didn’t know how to swim to be uneducated. The most cutting of insults that one Greek could deliver to another would be ‘to dismiss him as a man who neither knew how to run or swim’. Murals of ancient seimmers can be seen in a variety of place including the Vatican, Bargain and Bourbon codices, and the murals of the Tepantitila House at Toetihuacan. Near Mexico City, which depicts men splashing about in the waters of Tialocan, paradies of Tialoc the God of water. There are also mosaics at Pompeii.
1.4 The Development of Bathing and Swimming in Europe:

The Byzantine Empire developed with Constantinople at its head and this great trading city followed the Roman tradition with regard to bathing. By A.D. 430 there were 150 private baths in the city and hospitals were expected to bathe their patients twice per week. When the Empress Basilissa was married her first public engagement was to take her first public bath, an important social event for the whole country.

In Persia at this time there were 27,000 baths in the city of Baghdad. Meanwhile, the decline of the Roman Empire in Northern Europe meant that colder climates in Europe were a discouragement to swimmers, while the Middle East and Eastern Europe flourished. The nature of power is such that it is never permanent and as each great empire flourished and then floundered, so the fortunes of swimming were reflected.

1.5 Early Swimming in Britain:

Julius Caesar brought with him the first known Swimmers in Britain. Plutarch and Suetonius, who wrote biographies of Caesar, talk of his ability as a swimmer. His armies crossed rivers by swimming or an inflated skin. In the winter of 48-47 B.C. at the battle of Alexandria Caesar had to leap into the sea and swim to the safety of a nearby ship with a set of valuable documents in his hand which he kept clear of the water. The distance was thought to be approximately 300 metres. The first recorded swimming situation in British history was by Caesar in his own account of his British
campaign. He refers to a battle with English soldiers across marshes in which his centurions were forced to part swim and wade in muddy waters. Tacitus refers to the fact that by A.D. 69 the Romans were using German auxiliaries, called Batavi, who lived near the mouth of the Rhine and were noted for swimming with their horses in order not to break ranks. Under General Agricola the Roman soldiers managed to swim the Menai Straits in A.D. 78 to rout the Britons on Anglesey.

Swimming was created as a reflection of war and peace at this tie by the Romans and has continued to reflect in this way ever since: in war it was used to Make war; in peace swimming was used for recreation.

After the Roman Conquest, bathhouses were set up at Buxton, Bath and Wells. At Wroxeter, in Shrophshire, an open-air swimming pool has been identified beside the indoor public baths. But although the Romans were the first swimming pool builders in Britain, the majority of swimming was probably done in inland waterways because of the relative inaccessibility of swimming facilities for most Romans.

Swimming was seen as the epitomy of manliness and there are numerous references to the activity in records. It was also seen as a pleasurable activity, primarily for men. The Romans taught their young men to swim with the use of cork floats (an idea not revived until the twentieth century) and by laying them on a rush float to help take part of the bodyweight. At this time, swimming was not recorded
as a potential vehicle for competition or racing, although some unrecorded races may have been held across the Tiber.

The most famous swimming exploit prior to the Renaissance was recorded by Ovid at this time when Ovid in Heriodes and Virgil in Georice\textsuperscript{5} refer to Leander swimming Hellespont (Modern Dardanelle’s) to meet Hero. Swimming not for the first time was coupled with love and romance. Despite a mention from Ovid, there are no Major works on Swimming recorded by the great Roman scholars.

It is reputed that swimming races took place in Japan in 36 B.C. during the reign of Emperor Suigiu.

Swimming was a recreation carried out by many men in the Holy land in old and New Testament times; the Dead Sea is, of course, well known because of the assistance that its high salt content gives to swimmers. Despite this the Bible only contains a Few references to swimming. The book of Ezekiel refers to a ‘stream deep enough to swim in. A Jewish commander known as Jonathan swam the Jordan with his soldiers to escape the Syrians and is mentioned in the First Book of God and the more reactionary members of the clergy saw this as a sign that swimming was an undesirable activity. It wasn’t until after 1600 that the attitude of the clergy reversed itself.\textsuperscript{6} In the Acts of the Apostles Saint Paul’s shipwreck is related and during the course of they story, which takes place in the Mediterranean off Malta, some of those on board the boat swam for shore while others lung to wood and floated to the shore.
1.6 British Swimming after 1550:

A new translation into English by John Saddler in 1572, which covered all the original reference material, was written. The most important treatises written during the sixteenth century were by Richard Mulcaster in 1581, entitled positions, and The Governor by Sir Thomas Elyot in 1531. Elyot covers swimming in association with wrestling, running and riding but accords it greater coverage he notes that English gentlemen had not shown a great interest in swimming, but now was the time to do so: he sees swimming as a means of survival and also, unusually, as an aid to health. By comparison, Mulcaster’s work, which showed greater originality, felt that the benefits of health were greater that the military application of swimming. Mulcaster was Headmaster of Merchant Taylors’ school in London.

References to swimming in literature now increased: they included Spencer’s the Faerie Queene in 1596; Marlowe’s Dido, Queen of Carthage written in c! 588 (Marlowe became aware of swimming while at Carpus Chjristi, Cambridge): and Shakespeare in over a dozen of his plays.

Probably the first reference to a possible swimming race came in 1595 when Sir Hohn Packington, one of Queen Elizabeth I’s scourtiers, had a wager with three other courtiers that he could swim from Westminster to London Bridge quickest. The Squeen forbade the wager, there is further evidence that swimming was practiced at both Oxford and Cambridge during the last part of the sixteenth century.
However, this did lead to drawings and accidents and on 8 May 1571 John Whitgift, the Vice-Chancellor of Cambridge forbade any scholar from swimming in Cambridge. Anyone caught doing so would be beaten, placed in stocks or, if second offenders, lose their university place. Imagine that happening today! When Everard Digby published his important De Arte Natandi in 1587 it was partly because of the number of fellow Cambridge male students still drowning.

1.7 Swimming else where in the world:

As with swimming in our own country, lack documentation exists but it would seem that swimming was still popular in the southern part of Europe as well as in the Pacific Islands and other Traditional swimming Islands. Many countries continue to suffer from infectious diseases and illnesses and it’s our contention that during this period the ethnic problem with swimming began. Black Africans, Americans and Asians do not swim well and this is often dismissed as an inexplicable social phenomenon. But in these times of disease and plague the river or the lake-the only swimming.

Venue for these populations-spelt danger not only from infestation but also from dangerous animals such as the alligator.

Discovery and increase travel brought more people with swimming ideas to Britain and our spa facilities brought foreign visitors to Harrogate, Buxton and Bath. In addition, the relatively settled nature of Britain around 1600 compared to continous European wars encouraged these richer visitors. The spas depended on their rich
 clientele because they had their fair share of poor bathers who came to heal illnesses and injuries.

There is a number of documentary records of swimming during this time. Two more treatises were written which both devote a chapter to swimming: James Clelland’s Hero-Paideia.

1.8 The Seventeenth and eighteenth Centuries:

Institution of Young Nobleman (1607) and The complete Gentleman written by Henry Peacham in 1622 follow familiar themes. But Istinerarary, a work written by Fynes Moryson in 1617, brought a change of direction. With the world opening up to travel at this stage, he recognized the usefulness of swimming to travelers around the world, particularly those who travel on or near water.

During the seventeenth century there were some physiological arguments as to whether bathing should or should not be carried out in hot or cold water. Buron in his Anatomy of Melancholy written in 1621 doubts whether bathing in cold water is good for you, but in 1623 Bacon in his work Historia Vitae et Mortis argues to the contrary.

By 1646 swimming had moved into the scientific realms for the first time. Sir Thomas Browne in his book Pseudodoxia Epidemica looks at swimming from the viewpoint of the scientific revolution. Between 1660 and 1682 great scientific strides were made with the Royal Society discussing and publishing scientific works, which commented on swimming. One of the founder members, John Evelyn, noted in 1663 that the Royal Society had considered another
experiment in diving he also mentioned that in 1667 Charles II, who was the Society’s patron, ‘Discoursed with the about swimming.’

Another of the Society’s members, the Honorable Robert Boyle, disproved the long-held belief that West Indian Swimmers, who ere considered to be naturals at this time, could stay underwater for an hour. It had been claimed that Sicilians could stay under four times as long. His tests showed a man remaining under water with artificial supports for no more that two minutes. We still hear claims today of the vast periods of time that pearls divers are able to remain under water.

William Percey in his book of 1658,

The Complete Swimmer, recommended the skill to females for the first time and when talking about swimming on the back he comments that it is easy to splash oneself ‘at every stroke’. This is considered to be one of the first, if not the first written reference, to the word ‘stroke’. Percey’s work more or less follows Digby with few original thoughts. Melchisdech Tehevenot’s L’Art de Nager, written in Paris in 1696, is a little more original than the work of Percey. He comments: ‘It is certain that the Indians and Negroes surpass all other men in the art of swimming and diving.’ This makes a surprising comparison to modern times. thevenot’s work which copied Digby completed a full circle back into English in 1699 when it was translated as the Art of Swimming.

There appears to have been a growth in the use of artificial aids for learners. Corks and bladders were still in use but special girdles
had by now been introduced for assistance. Thevenot also describes inventions which closely resemble the swimming ring and flippers. He talks of a ‘cylindrical case made of oiled cloth, and kept open on the inside by iron rings, might be contrived as to tie round one’s waist, and fastened to keep the water out, and that alone would save from being drowned.’ The flippers were apparently made out of small planes of wood with valves.

From 1720 onwards there are increasing reference to swimming as it became more and more popular, in 1726 the famous American independence pioneer Benjamin Franklin was on a River Thames excursion when at the request of the company around him, he took off his clothes, leapt into the water and swam from Chelsea to Blackfriars. As he went, he performed tricks under the water as well as above to delight the spectators. He had learnt many of these activities by reading Thevenot. Franklin can be considered to be one of the first great, early swimming experts. He taught a number of friends to swim and was offered the opportunity of running as swim school in England by Sir William Wyndham but returned to Philadelphia because he was homesick.

His swimming repertoire was second to non. He practiced ornamental as well as synchronized swimming, experimented with types of water skis and used a more highly developed type of flipper than hitherto. (Leonardo da Vinci is reputed to have been the first person to design flippers) he also designed the first had paddles made out of two oval palettes, about 10 by 6 in (25 by 15 cm) long with a hole for the thumbs.
Franklin said: ‘In swimming, I pushed the edges of these forward and I struck the water with the flat surfaces as I drew them back. I remember I swam faster with the use of these plaetts but they fatigued my wrist. I also fitted to the soles of my feet a kind of sandals but I was not satisfied with them because I observed that the stroke is partly given by the inside of the feet and sankles and not entirely with the soles of the feet.’ It was a great pity that breaststrokers in the early 1950s had not made the same observation they may well have saved themselves a great deal of time.

1844 is a significant year as far as competitive the first known swimming bath in this country was fearless Head in North London which was built in 1743. By 1800 there were five or six pools and all had diving boards. By now ladies participated in swimming, but bathing sessions were still segregated. It was not until around the turn of the century that mixed bathing become socially acceptable. The dog paddle continued to be used and was used by Slav people in Europe, but generally most people used breaststroke and sidestroke.

In 1828 a swimming pool was created out of an artificially enclosed area known at ST George’s Pier Head in Liverpool. We know that swimming races were held in Liverpoos around the 1830s and records show that unofficial races in this country definitely go back to 1791. with the vastly increased interest in the sports, the National Swimming Society was set up in 1837 to organize reaces in London. The person responsible was Hohn Strachan.
Of years Kenworthy beat the two Ojibbeway-tribe Indians at Holborn Baths so Britain stuck with the breaststroke for another.

1.9 The Birth of Competitive Swimming:

Swimming is concerned. As sensation was caused on 2 April in London when a race took place between to North American Red Indians, called Tobacco and Flying Gul, and a breaststroke-swimming Englishman, Harold Kenworthy. The first Indian home, Flying Gull, covered the 43 f yds (39.6m) in 30 seconds.

The times reported: Their style of swimming is totally un-European. They lash the water violently with their arms like the sails of a windmill and beat downward with their feet, blowing with force and performing grotesque antics. ‘Nothing quite like it had been seen in Europe before. The most surprising aspect was that no one had ever really noticed this alternative style before, despite the world’s continued ability to travel and the greater flexibility afforded throughout the previous 200 years. It would seem that the crawl had been swum by South Sea Island native, North American Indians and Hawaiians for hundreds 40 or so years.’

The National Swimming Society now changed names a few times as various factions wrestled for supremacy in the typical manner so familiar with new and emerging sports. It first became the Associated Metropolitan Swimming Clubs (A.M.S.C.), then the London Swimming Association and on 7 January 1869 the Metropolitan Swimming Association, following a swimming congress in the German Gymnasium at Kings Cross under the presidency of
Mr. R. Ravenstein. Because this group only operated in London, membership was limited and funds small. As a result in February 1874 the name again changed to something more embracing— the Swimming Association of Great Britain (S.A.G.B.).

The Otter Swimming Club, the country’s most influential club, broke away in 1884 after further arguments and formed the Amateur Swimming Union (A.S.U.). A great struggle for supremacy took place between the A.S.U. and S.A.G.B. before they both finally dissolved to form the Amateur Swimming Association (A.S.A.) in 1886.

Horace Davenport was mainly responsible for resolving the arguments in these early years. He was president of the Swimming Association of Great Britain from 1880 to 1883 and of the renamed Amateur Swimming Association from 1890 to 1894. As well as being a diplomatic administrator, he was no mean swimmer and won the A.S.A. Championship one-mile race in 1874 and in the succeeding five years. The first winner was Tom Morris in 1869 in 27 minutes 18 seconds. The course until 1872 was from Putney aqueduct to Hammersmith Bridge on the River Thames. After that it was held in still water. Horace Davenport also won the trophy for the Lords and Commons Race outright. This long distance race was held over five or six miles in the River Thames and the trophy presented by the Members of Parliament, hence the name. Davenport won between 1877 and 1879.

Meanwhile, Australia was also rapidly developing as a swimming nation and the world’s first modern swimming
championship was organized in 1846 at the Robinson Baths in Sydney. The 440 yards (402 meters) was won by W. Redman in 8 Minute 43 seconds-just over twice the time taken in modern women’s 400-metre races.

A world Championship 100-yard (91-metre) race was then held at St. Kilda, Melbourne, on 9 February 1858. Jo Bennett from Sydney defeated Charles Stedman of England. (At this time, there was no amateur/professional distinction with prize money available and side bets in evidence.)

Only ten years later the first national record was recognized in this country by the A.M.SC. when Winston Cole swam the 100 yards in 1:15.0

Globally swimming continued to expand with the German Federation being founded in 1882, the French in 1890 and the Hungarian in 1896. The newly formed New Zealand Association (1890) cooperated with the New South Wales Association (1891) in organizing championships down under. The U.S.A. held their first championships in 1877 over one mile, the event being won by R Weissenboth. Their championships were actually organized until 1888 by the New York Athletic Club.

Interestingly, Scotland as the first country to hold a women’s championship, in 1892-a 200-yerd (183-metre) event won by E. Dobbie of Glasgow in 4 minutes 25 seconds. In Austria the First Vienna Amateur Swimming Club held two European Championship races over 60 and 50 meters and these continued annually until 1903.
Returning to developments in England, breaststroke finally started to give way in the 1840s to sidestroke. This became the popular racing style because of the greater speed attainable. In 1855 in London, C.W. Wallis demonstrated a new technique which he had observed the Australian aborigines swimming in his homeland on the Lane Cove River near Sydney. Professor Fred Beckwith employed the new single-arm sidestroke with the arm recovery over the water in winning the English Championship in 1859 and in defeating Deer-foot the Senecca Indian in a professional race in 1861. Apparently one of Beckwith’s pupils, a man called Gardener, won the championship in 1860 employing the same technique.

1.10 The Modern Area:

The next milestone for English swimming came on 11 August 1873 at the Lambeth Baths when John Trudgeon brought both arms over the water in a 160-yard (146-metre) handicap race. He kept his chest high over the water and his body flat on top. Trudgeon swung his arms alternately over the water and with each alternate arm pull he made one horizontal breaststroke kick.

Trudgeon was reputed to have learnt the stroke from the South African Kaffirs when he lived abroad. This new stroke worked well for short distances but the top middle-distance people, Tyers and Jarvis, and the professional champion Nuttall continued with single-arm over sidestroke.8

The Trudgeon stroke later became used by many people in their leisure swimming and is still employed by many a lunchtime
swimmer today. Records are unclear as to when and where Trudgeon picked up this technique. It was also recorded that he learnt the technique by watching Indians in South America during the 1880s. whichever was the case, the result was that the 100-yard (91-metre) record was reduced from about 70 to 60 seconds in a short space of time.

Tyers, who came from Manchester, began to modify the technique and was followed by many swimmers in the north of England.

Instead of drawing his knees up in Trudgeon fashion, he merely opened his legs wide and then snapped them very quickly together. The kick was made when a pulling arm was at right angles to the shoulder.

Most swimmers during the 1890s were using the single-arm-over sidestroke but both in Australia and Britain other swimmers had begun using the double-over arm. The difference between this and the single-arm movement as that the swimmer moved from the flat frontal position to the side and then back again during each over-arm cycle. The stroke later became coupled with a sidestroke leg action and has since become also known as Trudgeon (or Trudgen as his name was later misspelt).

In Australia swimming has been in evidence since Captain Cook arrived in the Sydney area but the first regular championships were. Held until 1989 at the Upper pitt street Baths, Sydney. The outstanding swimmer of the period was W.J. Paddy Gormly and
attenuation now switched to Australia where progress was being made at a greater rate than in Britain. The Americans were even further behind.

Australian swimming at this time was dominated by the Cavill family who had a tremendous influence on the world as a whole. In 1896 Percy Cavill, a left-arm-over sidestroker, won the Australian mile championship at Windsor, New South Wales, but not before his brother Arthur (or Turns as he was better known) had jumped in the water and joined in the race halfway through, thus fouling and injuring paddy Gormly. Turns was disqualified by the officials and turned professional. Competitive swimming certainly lacks that colour these days!

Their father, Frederick, was English and had established himself using Breaststroke during the 1870s before emigrating to Australia in 1878 where he built pools and taught swimming. Whilst in Australia, Cavil and his family happened to make a trip to the South Seas and noticed the natives swimming with both arms over the water. He observed that the leg kick was more of an up-and-down movement in the water and decided to try it himself. On his return to Australia he taught the stroke to his sons and in 1902 his son Richard firmly established it when he swam the 100 yards in England in 58.6 seconds. Asked to describe the stroke after the race, Richard said that it was rather like ‘crawling’ through the water and the world front crawl was born.
Another of Cavill’s sons, Syd, went to San Francisco where he taught the new stroke to J. Scott Leary who in 1904 became the first American to swim the 100 yards in 60 seconds.

Frontcraw was to be the stroke of the future. Syd Cavill claims, to have been the man who invented it and that turns, who later died, form exposure after trying to swim Seattle Harbour, was the first man to swim it in Australia. Syd Cavill also revealed in the Sydney Referee of July 1914 that on traveling to America he had stopped of in somewhere he had the hardest race of his life in Apia with a woman who swam front crawl quite naturally. Syd. Wrote home to turns telling him how the could swim just as fast using front crawl arms with his legs tied together. Turns found exactly the same thing. To prove his point Turns challenged Sid Davis to a race at the Davis’ floating baths, Bal main. There was a bet of £5 on the race with Turns having his legs tied together and side having all limbs free. Cavill won in front of a packed and highly excited house.

The name of Freddy Lane of Australia must also be identified with this period. At 18 years of age he swam the whole of the mile championship in N.S.W. with both arms over the water, the first time that this had been achieved. The famous Australian coach, Forbes Carlile, observed that Lane synchronized the beginning of each pull with the first movement of the scissor kick which only moved about fifteen inches (38 cm) laterally. This contrasted with the double-arm swimmers from northern England who were synchronizing this with the middle of the arm stroke. The two styles met one another when Lane swam against Rob Derbyshire in England. The two dead-heated
in a world record for 200 yards (183 meters) of 2 minutes 34.8 seconds. In the 1900 Paris Olympics Lane won the 200 meters proving himself to be the master of the double-over-arm stroke.

It is also in Australia that a counter-claim has been made as to who introduced the name of crawl. It is claimed that George Farmer, one of Australia’s top coacher at the time, became so excited at watching a young swimmer, Alick Wickham from the Solomon Islands, that he shouted out ‘Look at that kid crawling’. I expect we will never know which came first, although Wickham did swim the race first in 1898.

The race was now on to be the first crawler under one minute for the 100 yards. (91 metres). Freddy Lane got close when he defeated Derbyshire and Dick Cavill in 60 seconds in July 1902 in Manchester. Two weeks later Cavil swam 58.8 in a handicap race, but it was Lane who finally officially beat the minute in Leicester on 9 October 1902 with 59.6 seconds. On returning to Australia, Lane retired undefeated by Cavill but Cavill, who became known in England as ‘Splash’ Cavill because of his stroke, captured the imagination of British swimmers. It had never been established what rhythm both Wickham and Cavill, those great early frontcrawl swimmers, swam with. Carlile in his book puts the case for two, four or six leg beat kicks which we will describe later in the frontcrawl chapter.

At the 1896 Athens Olympics all the free-stylers swam with the single-arm sidestroke, but by Paris in 1900 the double-over-arm had become the fasters stroke for the sprint events. The Hungarian Zoltan
De Halmay, who was second in the 200 metres to London in 1900 Olympics independently of Australian, American and English developments. He brought two arms over and just trailed his legs.

In America Charlie Daniels, a man of powerful physique, watched what Leary, who had a leg handicap, was achieving. Daniels was the first swimmer to master the more regular six-beat kick identified with American frontcrawl. It served him well. He won four gold medals at the Olympics and reduced the world record for the 100 yards (91 meters) in 1910 to 54.8 seconds. Daniels flutter-kicked his legs six times to every two arm pulls made. The great Hawaiian, Duke Kahanamoku, first of the swimming Hollywood stars, followed Daniels by winning the 1912 Olympics, but when asked where he learnt the crawl he stated that it was by watching his fellow islanders splashing around in the water. They had indeed used the stroke for many generations.

When one looks back now, it might be difficult to understand that double-over-arm trudgen swimming didn’t die an instant death. In fact the Australians Barney Kieran and Sir Frrand Beaupaire, along with Henery Taylor From England, kept winning Olympic titles.

This technique right through to 1912. Fellow Australian Cecil Healy went on to master regular breathing instead of intermittent breathing with the new crawl stroke in 1911. In Australia the two-beat kick crawl was very much established for the sprinters. In 1920 the American Norman Ross became the first Olympic winner in a distance event not to use the trudgen kick.
The frontcrawl from here on are almost too numerous to mention – Adrew Boy Charlton, Arne Borg, Buster Crabbe, Murray Rose, the Konarads, Dawn Fraser, Shane Gould and Mark Spitz to name but a few. Of them all, Johnny Weissmuller in the 1920s and ‘30s had a greater influence than anyone else because of his size and grace in the water. He set world records in 67 different events ranging from 50 to 880 yards (45 to metres).

Weissmuller swam with his back slightly arched and a high head position in the water. His leg kick was both powerful and beautifully loose with his feet turned in, a pigeon-toed flutter. He set technical standards that everyone tried to emulate.

‘Buster’ Clarence Crabbe was important not just as the successor to Weissmuller as the film screen’s Tarzan but because he was the first exponent of the very high elbow recovery in frontcrawl. The American technique has deviated very little up to modern times. It would be true to say that the six-beat kick is a little looser and less deep and the elbow recovery less high but there was very little basic difference in technique.

The Frenchman Jean Jean Taris, who also swam at the 1928 Olympics, was important to freestyle history as the first man to breathe bilaterally in a race. Bilateral breathing is the description used for frontcrawlers when the swimmer first breathes to one side on an arm cycle and then to the opposite side on a second arm cycle. The situation therefore created is one in which a breath is taken every three arm pulls. This particularly suited Tatris who had an amazingly high
lung capacity. When measured at Sydney University in 1934 his vital capacity was measured as being 6.5 litres.

Esther won the American National 100 metres freestyle in 1939 in 1:09.0, a time. The work of Esther Williams reflected here in her role as a show business, as which was not improved on in the next six championships. Her career was interrupted by the war. She may well have won at the 1940 Olympics. Nevertheless, in that year she showed up with 75 other girls for a job as a female lead opposite Johnny weissmuller at the San Francisco World’s Aquacade. Weissmuller picked her because he was looking for a taller female.

1.11 Swimming in Japan:

The Japanese were the other major contributors to modern freestyle swimming. In the 1930s they lead world swimming, winning five out of six possible gold medals in 1932. They trained intensely – soaking up some five miles of training in two sessions each day with flexibility work thrown in. The success of the Japanese front crawl in the 1930s and again in the 1950s was partly due to their ability to tailor their swimming techniques to their physique. In the case of many of their stars this meant relatively short limbs, rounded shoulders but extremely powerful leg and calf muscles. Their head position was lower than that of Weissmuller. The hip position was also low with a very moderate bend of the knees making up a continuous six-beat action. The kick was so shallow that the feet didn’t come below the level of the knees, the lowest part of the body. But most important of all, was the fact that they were the first
swimmers to use body roll in the stroke with the shoulders following the arms in their downward movement on entry. This meant driving the arms forwards ready for the pull with very little glide or pause. It also meant that the larger muscle groups in the upper body could be employed more types quickly and effectively in their case. Fitting the stroke to the physique was to become a feature of swimming in the years ahead.

1.12 Development of Backstroke:

Backstroke was the third of the recognized strokes being included in the Olympics programme in 1908 for men and in 1924 for women. The first A.S.A. Championship was won in 1903 by William Call. During the period when trudgen was as its height backstroke mirrored this in an inverted form. The top backstrokes were using a double-arm swing with inverted breaststroke legs.

As with frontcrawl, it soon became obvious that an alternating leg action would produce faster result than an inverted action. Again the stroke developed through double arms to single and alternating arms.

Adolph keifer who won the backstroke at the 1936 Olympics was the outstanding backstroke personality of the early years. He had a low arm recovery, entered his arms wide and attempted to geep his arms straight under the water hen pulling. Many backstrokes copied him.

After the was backstroke styles began to change and as these strokes went in to the 1950s not only did it supply Britain with their
first Olympic success for 48 years in the form of Judy Grinham in 1956, the technical nature of the stroke also changed. Backstrokers started to drive their arms back deeper behind their heads on arm entry and to pull with a bend at the elbow and a rotation of the forearm at the end of the movement. Experiments took place in which the kick was dowsed in favour of the arm but the 1970s saw the return of the heavier flutter which has remained ever since.

1.13 Development of Breaststroke:

Breaststroke became a separate Olympic event in 1904 when it became obvious that crawl was so much quicker. Breaststroke was swum in the traditional manner on the breast with the hands projected directly out in front of the face and then with the hands pulled wide and round. In the 1930s some swimmers discovered that there was nothing in the rules to prevent them digging their heads on arm entry and to pull with a bend at the elbow and rotation of the forearm at the end of the movement. Experiments took into the water with a double overhead arm stroke.

This was the sign of a change in breaststroke, the first and ultimately most controversial of the racing strokes. There have been arguments on whether a swimmer ducking his head into his own bow wave is swimming underwater, how perfect the arm and leg movements should be and whether the arms can be thrown over the water in recovery.

The coach at Iowa University, U.S.A., Dave Armbruster experimented with both arms recovering over the water
simultaneously, or butterfly arms as we recognize it today. One of his swimmers, Jack Seig, moved from swimming with butterfly arms and breaststroke legs to dolphin legs. Although the experiments started in 1935, dolphin leg kick was considered to be too exhausting despite being recognized as faster. Breaststroke competitors stuck to either traditional breaststroke or butterfly arms and breaststroke legs. The latter was so successful that swimmers employing this stroke started to dominate breaststroke races.

Eventually something had to be done and after the Helsinki Olympics butterfly and breaststroke were apperarated as racing strokes; 1956 saw the first Olympic butterfly race. Meanwhile, breaststroke competitor exploited another loophole in the rules as the Japanese in particular swam for long distances underwater. Obviously this distorted the rules as it was much quicker to swim underwater.

(Breaststroke became known as the ‘silent stroke’ as a result.) In 1956 the rules were changed so that only one arm pull and one leg kick were permitted at the start of each length, and so the under water swimming faded away.

Breaststroke underwent one further change in 1961 when Dr. James Councilman of India University, and his pupil cheat Jastremski, Developed a wholesale rejig of the stroke timing. The result were amazing with Jastremski slicing over six seconds off the world 200-metre record place in hich the kick was dowsed in favour of the arm but the 1970s saw the return of the heavier flutter which has remained ever since.
Within eighteen months, Jastremski took his breath after the beginning of the arm pull instead of at the beginning of the head lift. This non-glide, high-revving stroke required the shoulders to be kept low on the surface and the leg kick to be much narrower in its circular and backward projection than before women’s breaststroke since the 1970s has been increasingly dominated by the Russians. The Americans have remained a force in men’s swimming but their success has been interspersed with various European victories.

For a time breaststrokers continued to swim quite flat on the surface with the shoulders and some swimmers also employed the tumble turn with a two-handed touch, but gradually during the 1970s the stroke came to be swum with more rise and fall. The hips have tended to make a dolphin-like movement in being coupled with this up and down movement.

Britain’s tradition of good breaststroke which started with Anita Lonsborough winning the gold medal at the Rome Olympics in 1960 continued in the 1970s with David Wilkie in 1976, Duncan Goodhew in the 1980 Olympics and Adrian Moorhouse who has been European and Commonwealth Champion. Oddly enough, all four swam with completely different techniques and it has been impossible to identify a British ‘style’ of breaststroke.

1.14 Governing bodies:

In the early years the work of the A.S.A. covered all aspects of aquatics but some people felt that lifesaving was not receiving the attention it merited and that there was too much concentration on
speed swimming. This trend of thought lead to the formation of the life saving society in 1891, later to become the Royal Life Saving Society.

The aims of the society were announced as being:

a) To promote technical education in life-saving and resuscitation of the apparently drowned.

b) To stimulate public opinion in favour of general adoption of swimming and lifesaving as a branch” of instruction in schools, colleges etc.

c) To encourage floating, diving, plunging and such other arts as would be of Assistance to a persons endeavoring to save life.

d) To arrange and promote public demonstrations, lectures and competitions and to form classes of instruction so as to bring about a widespread and thorough knowledge of the principles which underlie natation.

The great pioneers of this new movement were Archibald Sinclair and William Henry.

In 1908 the Federation International de Natation Amasteure (F.I.N.A.) was formed. It was founded in London during the Olympic Games at the instigation of George Hearn, who asked participating nations to attend a meeting to examine problems with the nature of amateurism. Eight nations attended the first meeting : Belgium, Denmark, Finland, France, Germany, Great Britain and Ireland,
Hungary and Sweden. The meeting was held at the Manchester Hotel on 14 July.

The purpose of F.I.N.A. at the time was to draw up lists of official world records, organize Olympic swimming and to make a worldwide list of laws to regulate swimming rules in competition.

The Ligue Europeans de Natation was founded in 1927, ostensibly to organize the European Championships. The Championships had been held experimentally for the first time in Budapest in 1926. Nowadays the European Swimming League is responsible to over 30 member countries for organizing the Championships plus the European Youth Championships, two European water polo competitions and a number of diving events.

1.15 Captain Matthew Webb:

A swimming history wouldn’t be complete without mention of the legendary Webb.

Captain Webb was the first person to swim the English Channel and this was arguably the most outstanding swimming achievement ever. Born in 1848, Webb earned his place in history when he stepped onto the beach at Calais on 25 August 1875 after 21 hours and 45 minutes. It wasn’t until 1923 that this feat was achieved again.

1.16 Mark Spitz:

Mark Spitz of Aerden Hills Club and Indian University is the world’s most famous swimmer since the war. He overcame the
disappointment of winning only one team gold medal, when he had been expected to win three, at the 1968 Olympics.

In one of the greatest comebacks in sport, in 1975 Spitz became the first ever performer to win seven gold medals in one Olympics. He demonstrated that supreme swimming skills, allied with determination, will win in the end. His seven gold medals were coupled with seven world records. After his amazing success, Spitz retired and, with his good looks, became one of the most commercially promoted sportsmen of all time.

1.17 Development of Swimming Mile Stones and Record ¹²:

1000 B.C. Swimming depicted on Egyptian has relief on Nagoda.

500 B.C. Egyptian develop hieroglyphics for swimming during periods of construction of the great pyramid.

880 B.C. A crawl swimming fresco in the Nimraud palace.

460 B.C. Divine sculpture excavated in Perugia Italy.

367 B.C. Plato States that Greeks who can’t swim aren’t educated.

45C B.C. Julius Ceaser, himself a swimmer, requires soldiers to be swimmers in order to join his legions.

36 B.C. Emperor Sugiv introduces swimming competitions in Japan.

200 B.C. Greek swimming medal of Aboydos.

1603 A.D. Japan starts the first National swimming organization.
1726 A.D. Benjamin Franklin Swims 31/2 miles down the River Thames demonstrating stunts and figures.

1810 A.D. Lord Byron swims the Hellespont, Japan holds first three days meet.

1826 A.D. First indoor swimming pool in England, start of present day competitions.

1869 A.D. First federation of swim clubs formed in England and first rules for amateur swimming.

1875 A.D. Captain Mathew Webb first man to swim across the English Channel first Olympic Swimming Champion – Alfred Hajos (Hungary)

1908 A.D. The FINA (International swimming Federation) formed at London. Olympics.

1912 A.D. First women’s event in the Olympics won by Fancy Durack (Australia)

1922 A.D. Johnny Weisyumuller (USA) first man to swim 100 m free style in less than one minute – 0:58.6 sec. He later won four Olympic gold medals and then turned actor, playing the role of Tarzan in numerous movies.

1962 A.D. Dawn Frazer (Australia) first women to break one minute barrier in 100 m free style – 0:59.9 sec.

1964 A.D. First Olympics at (Tokyo) timed and judged by electronic touchpad systems.
Dawn Frazer (Australia) first swimmer to win 100m free style in 3 successive Olympic Games (1956, 1960 and 1964).

Don Schollander (USA) First swimmer to win 4 Olympic gold medals in one games.

1972 A.D. Mark Spitz (USA) wins 7 Olympic gold medals, all in new world records. They are the most ever won in any one Olympic Games.

1976 A.D. Klaus Dibasi (Italy) become first diver to win Olympic gold medals in the same event (Platform) in 3 successive games (1968, 1972, 1976).

1988 A.D. Kristin Otto (East Germany) first women to win 6 gold medals in a single Olympic Games.

Gregory Lauganis (USA) gets injured on the head during diving. Events at Seoul Olympic but still wins his fourth Olympic diving gold medal.

1.18 Records of Indian Contribution and participation in Olympic games in Swimming:

1928… Amsterdam… D.Mulji- (Bengal)- swimming 1932… Los Angeles.. Nalin Chandra Malik –Swamming.

1948… London … Sachin Nag – (Bengl) – Swimming and water Polo… Jamini Das – (Bengal) – Captain – water Polo… hahar Ahir – (Bengal) – water polo … Dalip Mitra – (Bengal) – swimming and
water polo… Protip Mitra – (Bengal) – Swimming… Ajaky Chatterjee – (Bengal) – water Polo… Gora Seal – (Bengal) – water Polo… Dr. Suhas Chaterjee – (Bengal) – water Polo… Dr. Bimal Chandra – (Bengal) – Swimming… Dwarkadas Morarji – (Bombay) – swimming and water polo… Issac Manssor – (Bombay) – Swimming and Water Polo. Kanti Shah – (Bangal) – Swimming and water Polo 1-

1952… Helsinki … Sachin nag – (Bengal) – Swimming and water Polo… Biren Basak – (Bengal) – water Polo…. Kedar shaw – (Bengal) – Water Polo…. Manu Chatterjee – (Bengal) – Water Polo


Swimming – Women

… Miss Dolly Nazir – (Bombay) – Swimming

… Miss Aarti Shah – (Bengal) – Swimming

1998… Seoul : Khazan Singh Tokas (Police)


Sangeta Rani Puri–(Delhi) Swimming .
2000… Sydney : S.H. Hakimuddin –(Karnataka) –
Swimming- Men,Nisha Millet – (Karnataka)
Swimming women.

2008- Bijing : Vindhaval Khade, Maharashtra, Rehan
Pocha.

The command for all starts is competitive swimming events is
the same: “Take your marks” and gun for the freestyle. Breast stroke
and butterfly stroke the start is out of water and from a standing
position on the starting blocks.

1.19 The conventional start:

The swimmer steps forward and wraps his toes over the end of
the starting block or pool side. He positions his feet so as to be about
20 cm. (8 ins.) apart, with the knees facing forwards and bent to an
angle of about 140°. He should also lean slightly forwarded so that his
center of gravity (about 5 cm. (2 Ins.) above his belly button) is placed
perpendicular to the feet. The shoulders are curled and the back
flexed. The hands and arms are held behind so that the palms face up
towards the roof and the arms are almost straight. The hands are
positioned adjacent to the bent hips. The position of the hand is
controlled by the eyes which look about 10 m. (30 ft.) in front on the
surface of the water.

On the word ‘Go’ the swimmer swings his hands forwards in
line with the shoulders. The feet start to push and squeeze away from
the wall. As they do this the knees automatically extent. During this
period the swimmers should aim to keep his head down and to ensure
that power is transferred forwards by the arms and legs. As the center of gravity moves forwards, the swimmers may adjust his center of balance by making one forward movement with his arms, which would bring his arms level with a forward point in line with his shoulders and level with his nose. The arms are then pulled back almost to start point and then thrown out and forward again.

When the arms are thrown to a fully extended position, the elbows lock and he fingers stretch forward. The head is lowered between the arms and the ears protected by the insides of the upper arms. The head should not be kept up as this will increase resistance. The hands should attempt to make a hole for the head. The hands and arms should cut through the surface so as to drive the body in parallel with the surface, about 1 m. (3 ft.) down.

The swimmer should start swimming either by kicking and then pulling or by pulling and kicking simultaneously when the glide from the dive has slowed down to swimming speed. The position of hand at the start preparatory position can change from individual to individual. Same swimmers reason that the forwards backwards-forwards movement of arms which takes place when the hand start from behind can be reduced to backwards-forwards if the hands start from a point in-front of the body. They, therefore, position their hands diagonally in front of the shoulders. A good arm swing in the standard racing dive produces a reasonably strong transfer of momentum – move than the grab start but less than in the swing start. The period of applying the force is greater than in the latter but less than the former. Too much backward rotation can take place and the backward-
forward rotational balance can only be balanced by stopping the arm swing at approximately $45^\circ$ to the surface in diving terms, the application of force is over areas reasonably lengthy period of time.

It has been estimated that the angle of the chest to the starting platform should be about $40^\circ$.

1.20 The grab start:

The grab start has often been considered to be the fastest start of all and the effectiveness of this style of starting was brought to worldwide attention by Mark Spitz in Munich in 1972. Mark Spitz demonstrated that a swimmer doesn’t need to be extremely large to make maximum use of this start. In terms of the time of flight and the amount of time before entering the water, the grab start would appear to be the fastest start. However, it lacks the power of the conventional start and this reduces its effectiveness somewhat.

At the preparatory position the hands can be placed either outside the toes, which are wrapped over the edge of the starting block or inside the toes. This depends on individual comfort, but stability can be determined as a result. The body is bent so that the hands can reach down and wrap over the starting block and result in the legs being bent to about $120^\circ$ the weight is balanced on the balls of the fact. This preparatory position should be more stable than the conventional start as the center of gravity is lower. The body weight can be moved forward with more control.

As with the track start, the swimmer flexes the elbows at the initial movement and then straighten the arms so as to extent the
shoulders. At the same time the swimmer pulls himself forward so that the greater proportion of his bodyweight is in front of the original base of support. This comes about by learning forward can then by pulling with the arms. The time taken to actually enter the water can be short here because, like the track start, the center of gravity is relatively low and this is increased by the short radius of rotation.

The shoulders start of flex and the stomach and spine extend. The body moves in an upward curve until the lower lags are parallel with the surface of the water. The extension of the body helps to add strength to the forward movement. There is a strong force during transfer of momentum as the arms are flexed forward at the shoulder. As the arm rotate forwards the body at the shoulder. The balance between body rotates backward. The balance between the moment arms will determine the most effective angle of light through the air. There is, in effect, a very short period of time for the movement.

The body should to into the water as streamlined as possible and the angle of entry should, therefore, be between $10^0$ and $15^0$. Forward rotation continue during flight until the body is in the right entry position. On entry, the movements should be the same as the track start prior to swimming.

1.21 Rear weighted tracks stars (Slingshot):

This technique is and adapted version of the track start. Rather than placing the body weight towards the front edge of the block this technique requires the performer to lean back as much as possible, placing tension on the shoulder and the front leg. Unlike the grab or
front weighted track start, the position of the swimmers C.G. is positioned towards the rear of the blocks in the slingshot track start. This rear position equals to a much longer block time than other dive starts. This disadvantage is offset by a number of factors. Firstly, longer block time means that swimmers are able to generate greater impulse (a product of force × time) and therefore greater take of velocity. In addition, learning back means that swimmer. I can preload the muscles of the arms and shoulders. This has been shown to enhance force production capability to generate horizontal propulsion in the early part of the dive. When the swimmer is moving forward on the blocks, the legs are used to further accelerate the swimmer forward. As with the front-weighted track start, the dominant force producing leg should be positioned forward and is responsible for the greatest amount of force production.

1.22 Forward weighted track start:

Many ideas in swimming have been both borrowed from and lent to athletics. The track start is a typical example of this. As yet, it has to become widely used but a number of good swimmers have used it. The shoulder-wide apart. The hands are placed over the front of the side or starting block so that the arms face backwards.

One leg should be placed in front of the other so that the rear leg which is bent at the knees is positioned about 20 cm. (8 ins.) behind the front leg. Overall, the start now combines aspects of the grab start and track start. The head should be relaxed at the neck, which releases tension on the spine.
At the ‘Take your marks’ command, the swimmer lifts the hips so that they are higher than the shoulders. The legs don’t quite straighten. The center of the front and not the back leg. The swimmer should now breathe in ready to explode air on the gun. Obviously, the lower the center of gravity the more the body can move forward without tipping into the pool. There is too the advantage of starting never the point of entry. When the gun goes the swimmer aims to drive himself horizontally at $45^\circ$ as strongly as possible. He bends his arm at the elbows and pulls himself, down towards the water by levering on the starting lock with his hands. The arms are then thrown horizontally and the head follows the movement so as to be positioned slightly above the arms before entry to prevent the body dropping too fast and then between the arms when entering. The trunk is bent at first as the body is pulled down on the staring block and then it extends as the body straightens out. Again, as the trunk is bent move the knees bend even move and the ankles are planter flexed which sets the body up too a powerful outward thrust.

The swimmer explodes his air as the body extends completely. The rear leg is brought up so as to be adjacent with the foreleg. The body drops under the surface slightly on entry until the swimmers head directs the body back to the surface ready for swimming.

i) **Statement of the problem:**

Due to the explosive nature of the swimming block start and the movement pattern requiring the lag extensor muscles to produce fast and forceful contraction plyomeric training could be seen as a means
of developing the performance of this skill. The determination of the practical use of plyometric exercises, and their effect on a skill such as the swimming block start, could be profoundly invaluable for swimming coaches and trainers. Plyometric exercises may be incorporated justifiably, into dry land strength and conditioning programs for swimmers in the attempt to improving swimming starting ability and performance. Plyometrics could also then be foreseen as a possible means of improving swimming turn ability and performance.

“A study of starts in competitive age group swimmers and importance of explosive strength for improvement of starts.”

ii) Significance of Study:

The findings of the present study would help the Coaches, Sports trainers, Sports administrators and the Physical Educationists in their professional work.

1) Result of the study may establish the importance of explosive strength for the improvement of competitive starts.

2) The study may also reveal the best starts among four starts.

3) The study may establish the effect of explosive strength for better starting performance.
iii) Aims and Objectives of the study:

The present study has following objectives.

1) To study the effectiveness of different starts in swimming.
2) To study of effectiveness of different exercises for swimmers.
3) To study the usefulness of explosive strength for swimmers.
4) To study the effect of expositive strength of the physical fitness of swimmers.
5) To study the influence of starts on swimmers performance
6) To analyze the swimming starts and to find the best start among the four stars of swimming for age group swimmers of competitive swimming.

iv) Hypothesis of Study:

It was hypothesized that:

1) The performance of swimmers depends upon a good start.
2) The proper starts can help to improve the timing of swimmers.
3) Significant performance is expected in the experimental group.
4) Grab start is better than other starting styles in age group swimmers.
5) There would be significant changes in performance of swimming starts after training of explosive strength ability.

H₅ = M₁ # M₂
v) **Null Hypothesis**:  
There would be no significant difference in swimmers starting style after the explosive strength training program. $H_0 = M_1 = M_2$

vi) **Delimitations of the Study:**

1) The present study was delimited to only age group swimmers i.e. Under 14 years boys, under 17 years, under 19 years.

2) The present study was delimited to only swimming starts e.g. conventional start, grab start, rear waited track start, and forward weighted track start.

3) The present study was delimited to only three competitive swimming styles, free style, breast stroke and butter fly stroke

4) The present study was delimited to only 120 male age group swimmers who participating in state swimming and All India public school swimming competitions.

5) The present study was delimited to only explosive strength ability, polymeric training, and weight training.

vii) **Limitations of the Study:**

1) Participation of subjects in training as well as test is a limitation.

2) Domesticated laboratory is a limitation.

3) Some quality in community with limitation is also a limitation.

4) The social and economical conditions are also a limitation.
viii) Definition And Explanation Of Terms

The researcher has made an attempt define the terms used in this thesis.

1) Swimming Starts:

It is beginning of race of any swimming event, start of any event by position of i) Conventional start ii) Grab start iii) Rear weighted track start iv) Forward weighted track start, Rules made by FINA (Federation International De Nation Amateur).

The Start: The start in Freestyle, Breaststroke, Butterfly, and Individual Medley races shall be with a dive. On the long whistle from the referee the swimmers shall step onto the starting platform and remain there. On the starter’s command “take your marks”, they shall immediately take up a starting position with at least one foot at the front of the starting platforms. The position of the hands is not relevant. When all swimmers are stationary, the starter shall give the starting signal.

2) Explosive Strength:

It is a combination of strength and speed abilities. It can be defined as “the ability to overcome resistance with high speed” (Hardayal Singh 1991).

Explosive strength always find expression of motor movements i.e. it is form of dynamic strength, explosive strength performance are markedly influenced by the level of motor co-ordination required for a movement e. g. inter and intra muscular co-
ordination as a result explosive strength is highly to the nature of a movement and for its development of specific movements or part of the movement have to be used as exercise. A high percentage of movement in sport is of explosive nature and involves overcoming of same external resistance or one’s body weight and plyometrics training.
Reference:

1) David wilkie and Kelvin Juba, The Hand Book of Swimming 1986, PP. 5 to 13
2) David wilkie and Kelvin Juba, the Hand book of swimming 1986, PP. 5 to 13
3) David wilkie and Kelvin Juba, the Hand book of swimming 1986, PP. 5 to 13
4) David wilkie and Kelvin Juba, the Hand book of swimming 1986, PP. 5 to 13
9) Swimming Times March 1953, P. 82
10) Far From the Madding Crowd, Thomas Hardy.