

Swimming for the physically handicapped

by Jean Assimacopoulos



Greatly influenced by his father's example, Mr. Jean Assimacopoulos considers amateur sport as an essential element of the modern way of life. Although, in competition, he has not known the success his father knew between 1912 and 1924 during which time the latter had taken part three times in the Olympic Games, in swimming and water polo, he admits how much the effort demanded by sport has helped him continuously through his law studies, as well as in his career as an administrator in the World Health Organisation. When, like his father, he became a sports instructor and administrator, he very soon became dedicated to sport as an organiser. As a swimming instructor in 1938, he soon understood how sport, particularly swimming, allows the physically handicapped to discover a new incentive in life. Since that time he has continued to dedicate himself to this cause, notably within the Sport Handicap Genève organisation.

We would like to thank Mr. Jean Assimacopoulos for allowing us to print a study, which, he says modestly, is intended to be completed by others.

Our sports friends have given their consent to publish photographs to illustrate this study, with the hope that this will prove useful to other handicapped people.

Introduction

Since 1965, when we became responsible for swimming at Sport Handicap Genève, we have been vainly searching for documentation in French on swimming for the physically handicapped. Having still found nothing after nine years, we have decided to write these few pages to help other swimming instructors dealing with the physically handicapped.

This publication is intended for those instructors already acquainted with the teaching of the four swimming strokes: crawl, breast-stroke back-stroke and butterfly. For this reason we are not elaborating on these swimming styles or their instruction.

It goes without saying that with the little experience we have in this domain, we have devoted only a part of our leisure time to swimming and its instruction — we have neither the intention nor the possibility of covering the subject completely; but within these pages we merely point out the little that we have learnt whilst in contact with members of *Sport Handicap*. We hope very much that this will incite others to develop and complete this subject.

Our brief knowledge has in fact been gleaned from the handicapped themselves, with the exception of a few “tricks of the trade” given to us by Mr. Macmillan during his two short visits to the Municipal Swimming Pool in

Geneva. We should like to thank him here as we view with admiration "the Halliwick" method which he devised to teach swimming to those with brain damage.

We should also like to thank the members of *Sport Handicap Genève* for all they have allowed us to learn and for the tremendous spirit which prevails in their club, and also the instructors, including those involved in other disciplines, who, since 1965, have given us much useful advice.

Our gratitude goes also to Mr. Anthony Ulrich, swimming coach of the club *Genève Natation* and of the Swiss Olympic team, for the documentation he has made available to us in preparation of this study.

Swimming as it is practised in some associations such as *Sport Handicap* has only one aim which is sporting and recreational, and not meant as physical therapy which must be carried out under medical supervision. In the following pages we thus look into swimming from the point of view of leisure.

Swimming—A favourite sport for the physically handicapped

Swimming is the favourite sport for most physically handicapped people, especially those handicapped by their legs. This is quite understandable as on solid ground these people will always have problems in moving around and they will only be able to practise sports adapted to their handicap, whereas in the water their legs are not absolutely necessary for swimming.

We shall mention two examples which we saw in our early days: In 1934, we found an American with both legs am-

putated at the top of each thigh giving demonstrations in a pool at Luna Park in Paris. Even a good swimmer with both his legs would not have been able to perform some of these feats. The announcer pointed out that this handicapped man had swum the English Channel.

At the 1936 Olympic Games in Berlin, a participant in water-polo called Holassy who had had a limb amputated below the knee, was a member of the Hungarian water-polo team holding the World Championship title.

We have known several others without the use of their legs who have swum or played water-polo with non-handicapped people and who were certainly not amongst the weakest players or swimmers in their teams.

These are the examples which later, when we at last had heated swimming pools in Geneva, encouraged us to organise proper swimming lessons through *Sport Handicap*.

Too many people are still not aware that legs are not essential in the water. Around 1935, the head of the Swiss Swimming School, Mr. Robert Wyss, taught that a strong swimmer practising the crawl, the fastest and most "economical" stroke, propelled himself along at the average rate of 85% with the arms and 15% with the legs and that this proportion progressed to 95% and 5% respectively in long distance swimming because then the legs work only to keep the body horizontal to give the least possible resistance to the water. One can therefore quite easily dispense with the 15 to 5%, provided that the body remains horizontal.

This is even more true when one swims in sea water, which is more buoyant than fresh water. John Weissmuller, the famous actor, well-known for his "Tarzan" films, who was previously

champion of the 100 and 400 metres at the Olympic Games in 1924, and the first man to swim the 100 metres in less than a minute, writes on this subject in his book:

“When I was in Honolulu and swam in that extraordinarily buoyant water I found that fast movement of the legs lifted my feet too high and that I was hitting the surface. I thus decided to reduce my movements from six times to twice, one for each arm. In such water, I found this sufficient to keep myself at a high level and I bettered the world records in the 220, 440 and 880 yards in the National Championships.”?

He adds that for the 100 yards *“this did not work so well.”*¹

Even if some trainers and swimmers of the last half of the twentieth century do not share this point of view and attach much greater importance to leg movements in the crawl, the previous theories are still valid for long distances.

Let us remember that the Australian coaches led the young swimmer, Shane Gould, to world records in 1972 for every freestyle length with two leg movements only.²

These facts prove that even someone without the use of their legs may become an excellent competitive swimmer as long as their handicap does not prevent them from keeping their body horizontal at the surface of the water, and thus meet with the least possible resistance.

Even if a handicapped person has no intention of taking up competition, he can almost always learn or relearn to swim and be sufficiently at ease in the water to take pleasure in swimming like

everyone else; his handicap very often passes unnoticed in the water and one can easily imagine the psychological satisfaction he gains from this.

Neither must it be forgotten that swimming is the sport where young people shine out, even the very young — some world records have even been gained by children of less than fifteen; it is also a sport that can be continued to advanced years. Mr. Théo Waldé, our friend from the club (*Genève Natation*) for over fifty years is a fine example of this; up to the age of 83 he continued to swim in the lake both in summer and winter. We should add that this sportsman kept himself in a remarkable physical condition through an hour's physical exercise each day.

Obviously, from the age of fifty, it is generally preferable not to make too great a physical effort in swimming sprints of 50 to 100 metres. One must swim longer distances at a more regular pace without forcing. Swimming can then be compared to cross-country skiing which becomes ski-walking or pleasure-skiing for those who have passed the age of competition.

This also applies to the physically handicapped who can swim not only from 7 to 77 years but well before and well after.

Learning to swim

The basic principles concerning the teaching of swimming to the physically handicapped are the same as those for the non-handicapped. One must first of all become acquainted with the water, and then movements are taught with modifications corresponding to the pupil's possibilities.

A) Becoming acquainted with the water

At first contact with the water, the pupil, finding himself relieved of all his artificial aids, must enter the water

¹ Quotations taken from the book “La Natation” (Swimming) by François Oppenheim, edited by “La Table Ronde”, 1964, pages 72 and 73.

² Swimming World Review, Vol. 13, No. 12, December 1972, page 24.



progressively by a stair-way if possible. It is preferable that he enters the water independently after being splashed with water. If necessary he will go down the steps into the water in a sitting position, "walking on his hands", provided he is able to and that he does not risk injuring his skin. (Paraplegics must pay particular attention to this delicate aspect of themselves.) If this is not possible, he must be carried and gently lowered into the water until the whole body is submerged up to the head, in a standing, sitting or lying down position according to the depth of the water and the convenience of the pupil. It must then be made certain that the pupil is well positioned at the base of the pool, on his feet or sitting with his hands on the bottom of the pool, or lying with his elbows on the bottom, with the shoulders and neck also in the water and only the chin upwards above the water.

In this position he must be made to take deep breaths *through the mouth*, watching that he empties his lungs well. This is very important. Everyone concerned with swimming knows the degree of importance breathing has in swimming, and this is why from the very beginning one must learn to control one's breathing and use only the mouth. It is the reverse of breathing on land. When in the water, breathing must always be *through the mouth* and never through the nose. One can well imagine how unpleasant and even dangerous it is to receive a wave in the face when about to breath through the nose. If on the other hand the wave arrives in the mouth at the moment of inhalation, it is very easy to spit out or swallow the water, as, in spite of all that is said about the water only being for external use, everyone has at some time swallowed it or spat it out.



If possible, it is better for the handicapped person to enter the water by himself.

From the outset therefore the habit of breathing through the mouth must be adopted, exhalation through the nose only being allowed occasionally to rid the nostrils of and prevent the penetration of the water. The nose clips worn by many swimmers, even in the international class, can be used to acquire this habit.

The few deep breaths taken at the beginning are aimed at relaxing the body muscles, in particular those of the chest. It has often been remarked that when the pupil enters the water for the first time, he puffs his chest out, filling his lungs with air which he will not empty completely. He merely takes short and insufficient breaths to renew the air in his lungs.

This is understandable when one thinks that at the first contact with water the body is surprised not only by the relatively cold water but above all by the weight of the latter. Near the surface, each square decimetre of the chest supports a pressure of approximately one kilogramme, totalling an appreciable weight, according to the size of the chest. It is a detail which one forgets very quickly and about which one is not even aware after a few seconds. But the beginner, entering the water for the first time puffs his chest out instinctively to combat this pressure. The few preliminary breathing exercises not only relax the beginner, but also help him lose some of the unconscious apprehension caused by the pressure of the water.

These deep breaths should not be too numerous: no more than 5 or 6, because of the risk of muscular spasm or an attack of fainting, especially for spastics.

It is above all important to *empty the lungs* completely. One must learn to *blow in the water*.

This brings us to the following exercises which have countless possibilities and may include all sorts of games,



A paraplegic beginner being placed in the water.

which have one aim, to give confidence to the beginner and teach him to *put his head in the water*.

This is essential. If a pupil claims that he should not put his head in the water on the advice of a doctor, he should not be taught to swim. In fact, this would expose him to definite danger, as whether he wants to or not, a swimmer is forced at one time or another to put his head under water, if only when a wave passes over him. These cases are rare; we have come across two and they were otherwise physically normal; they had deep perforations in the ears.

Once the beginner knows how to put his head into the water, he must learn to leave it under for 10 to 15 seconds, then to take it out and put it back under several times in a row, breathing out under water and breathing in above the water.

The time during which his head is immersed should be longer than that above the water. In other words breathing in by the mouth should be rapid and breathing out under water

should be prolonged so as to correspond with the rhythm of breathing when swimming the crawl, breast-stroke etc., and to arrive at the point where respiration becomes automatic.

It is necessary to learn to use the eyes under water, which eliminates some of the fear; while the eyes remain shut one might as well be blind.

The pupil should then be taught to float, without moving or making the slightest action, both face down in the water and on the back. At this point the instructor can determine the beginner's ability to float. The degree of this ability varies from one individual to another; lean people float less easily than plump people.

The ability to float also depends on the level of salt in the water; in his book "Des nageurs et des records" (Swimmers and records),³ François Oppenheim writes:

"A swimming pool 25 m by 12 m. 50, with an average depth of 2 metres contains 600 cubic metres of water. With 38 grammes of salt to the litre (the most frequent density on the West Mediterranean coasts) the water in a similar pool would contain more than 22 tons of salt. With 16 g. to the litre, (average density in the Baltic) the water in the pool would contain less than 10 tons of salt. One can see straight away the difference in buoyancy according to the seas."

In sea water as salty as the Mediterranean, nearly everyone can float keeping completely still provided that *they and especially their muscles are relaxed*, and their lungs full of air. On the other hand, in fresh water, where the density is slightly less, one floats less well.

The instructor himself should be able to demonstrate this floating exercise, aware of his own ability to float or balance in the water. For example, he should know where to put his hands so that his motionless and outstretched body floats horizontally, the feet remaining at the surface of the water whether floating on the back or the front. For many people the hands should be level with or behind the head, with the arms apart; otherwise, if the arms are brought back beside the body, one often finds that the legs sink down and the body slowly tilts up, even to the vertical position if one remains still for long enough. This is a question of the centre of gravity, which should be made to coincide with the centre of floatation by moving the arms so as to remain in the horizontal position.

The lungs should generally be kept full of air, as in emptying them the body slowly sinks down. Certain people, notably those with a large lung capacity may even control their level of floating in this way. The relationship between lung capacity and weight of the individual is very important in swimming. It is often this relationship which makes some people more gifted than others and allows some children to become champions.

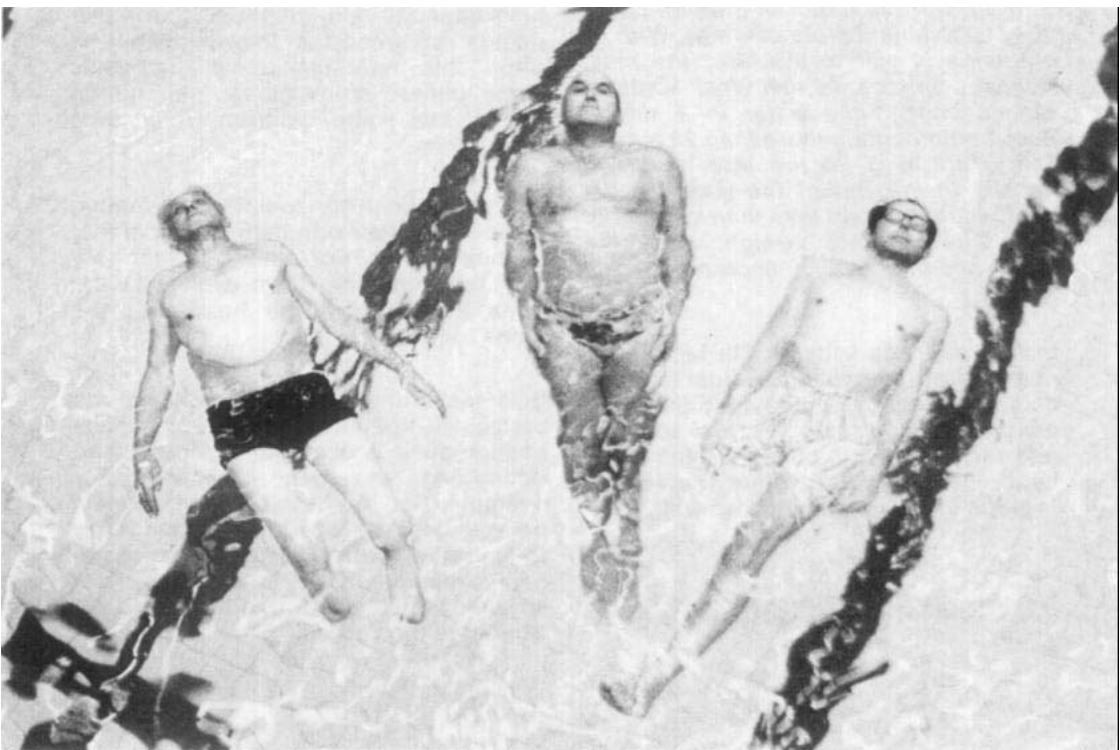
Some can float horizontally and remain motionless even with their arms parallel to their bodies. For others, in fact very few, the legs sink down even with the arms held behind the head and the lungs full of air.

It is maintained that variations in the degree of floatation in the physically handicapped is even more accentuated depending on their disability. For example, for the majority of spastic paraplegics, the legs have the tendency to sink down, while some victims of poliomyelitis, paralysed in the legs, float so well that they have difficulty in returning to the vertical.

³ François Oppenheim, "Des Nageurs et des Records", edited by 'La Table Ronde', 1961, page 303, note 20.



The ability to float by certain handicapped people is greater than that of non handicapped people whose legs drag them down.



For hemiplegics, in general the paralysed side sinks to such a degree that some are unable to float on the surface, at least at the beginning; whereas those with one or two legs amputated are able to float very much better than the non-handicapped of the same build. Most of those suffering brain damage but able to float sink immediately in the event of a spasm when the muscles contract.

Basically the pattern is the same — the part of the body which is stiff or tense sinks down. Why does a tense limb not float while the same part floats when relaxed? We have not yet found a satisfactory answer to this question.

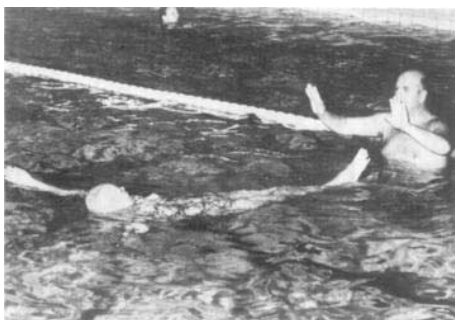
While on the subject of floatation, we should mention the fact that several coloured African children we were fortunate enough to observe, appeared to have slightly less floating ability than other children with the same disability. Our experience in this field is too limited to allow us to confirm this fact. It is just an impression which should be verified by those with the opportunity, because a positive result would have to be taken into account in swimming instruction.

When learning to float, the beginner able to stand on his feet in the water should learn to lift himself up. The classic movement for this is to bend the legs quickly, bringing the knees up next to the stomach and pushing the water with the arms and hands, straightening out the top half of the body. The same method can be used whether one is stretched out on the front or the back.

For those who cannot bend their legs because they are paralysed or their hips or knees are immobile, there is another means which consists of lying firstly on one's back, something which they should also be taught. Then, when the beginner is stretched out on his back, the arms should be brought parallel to the body and, keeping them

straight, lifted a few centimetres out of the water at the same time as the head is brought forward to look at the feet, until the face is in the water. The legs then go down and the body tilts obliquely first and then to the vertical, which allows the pupil to reassume the standing position.

How quickly one adapts to the water depends very much on the individual. Some handicapped people adapt just as quickly as the non-handicapped; for others this can take much longer. We have had members of *Sport Handicap*, beginners, who floated on their fronts and backs a few minutes after entering the water for the first time. For others time and infinite patience are needed in the many exercises and games combined with the apprenticeship of movements.



Learning to swim after amputation.

B) *The Apprenticeship of Movements*

To teach the movements, one must always start with the legs except in cases where they are completely paralysed or have been amputated. However, if the beginner is handicapped by his legs but can move them in the water, no time must be lost in teaching him how to make perfect movements of

propulsion. He must be taught simply to use his legs to keep his body horizontal, as it is largely the arms which will propel him through the water.

Then comes the apprenticeship of arm movements, which should be adapted, if necessary, to his disability. The movements affecting propulsion through the water are very varied and the most suitable type should be chosen.

At the beginning, these movements should be slow and easy allowing them to be carried out with flexibility. Then gradually, according to the progress made, the movements are elaborated, with the constant aim of obtaining greater propulsion and as great an ease as possible in the water. It is also recommended that several sorts of movements be taught so that the handicapped swimmer can also, wherever possible, change his stroke to vary the pleasure of swimming.

The instructor should be able to demonstrate the movements he sets for his pupils. He should, as far as possible, place himself at least once in the position of each of his pupils, imitating the handicap so that he can appreciate the difficulties they may encounter. Naturally, it is difficult to imitate some handicaps and impossible to imitate someone who has suffered amputation, but for the paralysed for example, he should swim without using the one or two limbs paralysed and thus discover how to swim and which movements are the easiest to use. In some cases he will be able to determine how to modify the classic movements and the different strokes, or even combine them; for example, the breast-stroke with the arms and the splashing leg movements of the crawl.

We should like to add three more remarks on the adaptation to the water and learning to swim.

When a beginner comes for the first time, one should not only observe the

extent of his handicap and examine the movements he is or is not able to do, but also note what he can already do in the water so as to adapt the teaching to his potential, using what he already knows.

Wherever possible, it should be endeavoured to suggest one or two exercises which the beginner may practise alone, but firstly in shallow water so that he is not in permanent need of the instructor.

Finally, in our opinion, floating aids should not be used until every other possibility has failed.

When the pupil knows how to swim at least 100 metres, he should be taught to jump or fall into deep water as far as his handicap allows. This will give greater confidence and ease in the water and will eliminate any fears which may remain.

Those who are able should be taught to jump and dive from the edge of the pool, in particular the diving start.

The principal physical handicaps

The descriptions of handicaps are not necessarily accurate from the medical point of view; they are sufficient for sports instructors involved with the physically handicapped.

A) Paraplegics

Paraplegia is caused by one or several injuries to the spinal cord following disease or accident. These injuries provoke paralysis and loss of feeling in the limbs. The extent to which the body is affected by paralysis depends on which section of the vertebral column is damaged, beginning with the lower limbs. If only the legs are paralysed, the term is paraplegic. If the damage lies further up the spinal cord (from the first



dorsal vertebra upwards) the four limbs may be paralysed and the term is then tetraplegic.

Paralysis may be partial (paresis) or total, spastic or limp according to the level and nature of the damage.

It is, in particular, at the moment of entry into the water that spasms may be brought on. These movements being sharp and uncontrollable, great care should be taken that the paralysed limbs do not hit the side of the pool or the steps, as paraplegics have very delicate skins and the slightest wound can take a long time to heal.



Tetraplegics will swim better on their backs as their paralysed arms prevent them from lifting their heads easily out of the water for breathing. Even for paraplegics, it is better to start by teaching them to swim on their backs using all the muscles intact in the arms and body and all the remaining strength in the impaired muscles.



Those whose arms are strong enough following successful rehabilitation or because they are not paralysed may then learn to swim on their fronts, even using the crawl which, with the advantage of lateral respiration, will promote a horizontal position more easily than the breast-stroke.



On this subject, we should mention a detail concerning the arm movements of the crawl for paraplegics. The classic arm movement of this stroke consists of passing the arm through the water. It is a propelling action which demands effort. Then the arm is to be brought forward out of the water to start the movement of propulsion again. When the arm is brought forward out of the water, it should be slightly bent and relaxed to rest the muscles, which should only be under strain during propulsion in the water. Whilst doing



A paraplegic being placed in the water having already learnt to swim.

this, the elbow should be the highest point of the arm and this naturally demands great flexibility in the shoulders. We have noticed here that most paraplegics and those handicapped by their legs develop strong muscles in the arms and shoulders through using wheel chairs or crutches, but also a consequent lack of flexibility in the shoulders. If the swimmer then brings his arm forward in a bent position, the lack of flexibility in the shoulders prevents him from having his elbow high enough and all or part of the forearm drags in the water and thus slows him down. He should therefore be taught to bring the arm forward a few centimetres above the surface of the water, relaxing the muscles by a hand movement. We should note that James E. Counsilman, the well-known American coach makes a similar recommendation in his book "The Science of Swimming" for able champions whose shoulders lack flexibility.⁴

This technique can result in making the body undulate laterally in the water and balance the paralysed legs horizontally, but has the disadvantage of slowing the swimmer down in the water. If this happens and the paraplegic is unable to correct the lateral balance easily himself, it is better to teach him to make a slight rotation of the whole body on its axis as the arm comes out of the water.

This will enable him to keep his body in the direction of his stroke. The instructor should, with his pupil, find the best solution.

As regards the legs, it is maintained that when these are rigid, they tend to sink down, while when they are flaccid, they generally float on the surface.

Naturally, the spastic swimmer must make a greater effort to remain hori-

zontal and should even make a momentary pause in his movements with the arms stretched forward in front of the head to make the legs rise again. This can be applied in the different strokes.

On the other hand, if the legs are limp, they often float so well that the paraplegic feels he must always swim on his back with his face out of the water, as when on his front, he is unable to lift his head up to breath or bring himself upright — the legs float too high and give him the impression that his head is sinking! He must then learn the method of respiration for the crawl, breathing from the side without lifting the head and turning on to the back; then bring himself upright using only his arms, as indicated previously in the last but one paragraph of the chapter "becoming acquainted with the water". It is only when he knows how to do this with ease that he will be able to swim well on his front.

We must not forget that damage to the spinal cord causes loss of feeling. Particular care should be taken that the legs do not rub against the bottom of the pool as the paraplegic has a very sensitive skin and feels no pain even when he hurts himself, and we must repeat that their injuries, even when superficial, take a long time to heal.

Once the paraplegic has learnt or relearnt to swim, it is better to make him swim out of his depth to avoid this risk. Paraplegics must naturally take the necessary precautions as regards their problems of self-control so as not to soil the water.

B) *Spina Bífida*

This is a pre-natal malformation of the lower extremity of the vertebral column and spinal cord, which manifests itself as a paralysis of the lower limbs in varying degrees and accompanied by deformity.

⁴James E. Counsilman, "The Science of Swimming". edited by Prentice Hall, 1968, page 37.

The points raised concerning swimming for paraplegics are also applicable for this handicap.

C) *Disseminated Sclerosis*

This is a disease caused by the destruction in small patches of the sheath covering the nerve fibres, leading to difficulties in transmission of the nerve influx, which has many variations according to the area affected. This disease may advance steadily, but it is more often characterised by short bursts of progression lasting a few weeks and remissions of longer duration, in some cases of several years. Certain people in whom the disease has quietened down are able to live for a very long time with partial disabilities. These disabilities may be in various forms, affecting sight, speech, the lower or upper limbs etc., and can render the limbs either spastic and stiff or limp, sometimes accompanied by loss of feeling.

Swimming can bring great pleasure to the victims of this disease, especially those who are confined to a wheel chair, and during periods of remission or abeyance. But they must be very careful not to tire themselves, and, according to current scientific knowledge, all participation in sports training or competition is not advisable.

D) *Hemiplegics*

Hemiplegia is caused by damage to the brain or spinal cord following illness (circulation troubles, infection, tumour, etc.) or by accident. Hemiplegia is characterised by spastic or rigid paralysis of only one side of the body. An arm and a leg on the same side are affected. Some hemiplegics may have difficulty in speaking.

At the beginning hemiplegics find floating very difficult; the paralysed side sinks down and even those who knew how to swim prior to their handicap have difficulty in finding the ability to float and balance in the water again. They should be made to adapt or readapt well to the water, and then movements necessary in swimming, which vary according to the degree of paralysis, should be studied with each pupil.

If the disabled side is not completely paralysed, it should be used as far as possible, if not the pupil should swim with the good side only.

It is with hemiplegics that the instructor should often try to swim imitating his pupil to determine the appropriate movements.

For example, if he swims the breast-stroke in its classic style using only one

A hemiplegic swimming the over-arm stroke.



side, pulling laterally with the arm through the water and bringing it forward under the chin, it is almost certain that he will begin to turn round in circles! If he wants to swim straight, he should make almost the reverse action, in other words draw the arm under the water in the body's axis and bring it forward slightly to the side, passing under the shoulder.

At the beginning, hemiplegics swim more easily on the back, effecting an inverted breast-stroke.

However, in our opinion the fastest stroke and certainly the least tiring for hemiplegics should be inspired by the over-arm stroke, in other words a stroke on the side, one arm passing over the water to a forward position. This was the fastest stroke in the second half of the 19th century before the trudgeon-stroke took its place and then the crawl.⁵

Hemiplegics should keep the paralysed side lowest in the water, while the able arm which effects propulsion should be brought forward over the water, thus avoiding resistance of the water against it.

While on the subject we should mention that modern swimming is a sport which, contrary to many others, has the advantage of developing the two halves of the body equally, both left and right, in a well proportioned way.

In the medley permitted in official international competitions, including the Olympic Games: crawl, back-stroke, breast-stroke and the dolphin, the left arm makes the same action as the right, and with the same strength.

This applies also to the legs, although breast-stroke swimmers rarely have an absolutely symmetric movement with the two legs. As regards crawl, which is not in fact compulsory in competitions,

but which is practised by everyone in "free-style" as it is now the fastest stroke, this must be practised with alternate breathing left and right every third stroke to be absolutely symmetrical.

This does not apply to the former strokes such as the side breast-stroke, English side-stroke, over-arm stroke and even the trudgeon of which the arm movements resemble the crawl but of which the scissor action of the legs is not symmetrical.

This drawback in asymmetric strokes becomes an advantage for those whose bodies are not equal each side, and there is no reason why hemiplegics for example should not profit by this. Swimming instructors in fact need not concern themselves with physical rehabilitation, which is the responsibility of the physiotherapists and others in the medical or paramedical professions, but they must teach their pupils to swim and then to improve their strokes in order to gain speed in the water as quickly and with as little effort as possible.

E) *Poliomyelitis*

Contagious in its initial stages, once very widespread in our regions and more commonly known as infantile paralysis, this disease attacks the nerve cells, causing a limp paralysis of the muscles.

This paralysis may be total or partial, and can damage all or part of the body, or even a small group of muscles for example those in one foot, a leg or a shoulder.

Happily, thanks to the permanent vaccination of the population, this disease has practically disappeared from our regions since 1950.

Those who are left paralysed are no longer infectious and are particularly happy when able to learn to Swim. It is

⁵ François Oppenheim, "La Natation", op. cit. pages 79-83.

on the after-effects of this disease that swimming has had the most impressive results. This is how champion Christine Caron comments in her book⁶ :

"Swimming also has miraculous effects on different diseases: poliomyelitis, scoliosis... Let us take for example a child victim of poliomyelitis. When in the water he is relieved of nine tenths of his weight and therefore can move about nine times more easily than on dry land. It is an excellent method of rehabilitation which has the advantage of pleasing and amusing sick children.

Proof of its efficiency?

At the Olympic Games in London in 1948, Bill Smith won the 400 metres free style. Ten years previously all specialists had given him up as completely immobilised: one hundred per cent polio.

Without going back so far, John Konrad, one of the greatest swimming figures, was also a former polio victim rehabilitated at the swimming pool."



John Konrads was champion in the 1500 metres Guestyle at the 1960 Olympic Games and has held 12 world records⁷.

Here we refer to champions, who, thanks to their tenacity, have completely regained the use of their muscles and are no longer handicapped.

For those who remain disabled, swimming and even competition are particularly recommended because one

must not be afraid to "force" and put into action the last ounces of strength left in a muscle.

Beginners are almost all already used to water, as they will have received this rehabilitation at hospital pools. Basically they have no difficulty in floating provided that the muscles controlling breathing have not been damaged.

The instructor should frequently be in the water with his pupils, holding their limbs gently and guiding them in order to teach the movements. Those with slight disabilities for example in one leg only can easily swim the four strokes: crawl, back-stroke, breast-stroke and even dolphin. On the other hand they cannot generally swim the former butterfly stroke which combines the leg action of the breast-stroke. This should be a forceful action to allow the two arms to come out of the water at the same time and such strength is absent. But the undulation of the body in the dolphin stroke, with vertical and simultaneous beating of the legs, can be effected with one leg.

F) Spastics

These are people who suffer from brain damage, occurring before during or shortly after birth, which causes motory and sensory disorders and upsets the physical development of the child. People suffering from motory disorders have the characteristic of contracted or limp muscles, stiff limbs, sharp, involuntary and badly coordinated movements, and sometimes problems of balance accompanied by lack of stability. The seriousness of these difficulties, which range from complete physical and mental invalidity to apparent perfect health, may be on any scale.

Some spastics have only partial hemiplegia.

One can see at once that spastics have more difficulty in learning to swim than others.

⁶ Kiki Caron, "Comme un Poisson dans l'Eau" (Like a fish in water), a Solar edition, 1970, page 207.

⁷ François Oppenheim, "Des Nageurs et des Records" (Swimmers and records), op. cit. page 207.

While adapting to the water, the spastic pupil should be taught to control his breathing and to relax the whole body. Above all the importance of breathing out should be emphasised, an exercise which should become automatic so that he exhales or blocks his breathing immediately his head goes under the water. In fact, a sharp, involuntary and uncontrollable movement can cause him to throw his face backwards or sideways in the water. We should also watch that he does not breath in water as his spasm may easily prevent him from regaining his breath, and increase his fear and tension.

Once he has learnt to float, he should be taught the flexibility of *slow* and relaxed movements.

Instructors should be particularly patient with spastics; they should be aware that a spastic needs to practise a movement over and over again, many more times than other pupils, in order to grasp the idea.

At the beginning, spastics will swim more easily on their backs, and then those who are not severely handicapped will be able to swim on their fronts.

Taking into consideration their difficulty in coordinating movements, it is better to start by teaching them the inverted breast-stroke with the arms, and a *very slow* back crawl action with the legs.

They find it easier to make the same movement with their arms simultaneously, rather than an alternating movement which they could perhaps be taught at a later stage. On the other hand, once again due to their difficulty in coordinating arms and legs, it is preferable to teach an automatic and independent leg movement, a *very slow* beating action of the back crawl. Some of the more severely handicapped pupils should first of all be taught to swim with their arms only, the legs remaining together and lying horizontally.

If the more complicated leg action of the inverted breast-stroke can be taught as a sequel, they will find it easier to effect the arm and leg movements at the same time, with a long break between each stroke, the arms at the side of the body and the legs stretched out and motionless, during which time they will slide through the water, and furthermore at which time they should learn to rest and relax; it is the same principle for all human activity; effort is followed by rest. This will be possible wherever their ability to float is good and their legs do not sink down.

Those able to learn the alternate arm action for the back crawl will have the advantage of using this stroke, which is the fastest and the least tiring.

Those able to swim on the front should for the same reasons start with the breast-stroke for the arms and a very slow crawl movement with the legs. They should not be encouraged to make too fast a leg action as for most spastics this will provoke sharp, uncontrollable movements and tension in other parts of the body. They should above all be taught to relax by making slow and large movements in a flexible manner. Whereas one can encourage a polio victim to "increase his pull" this should not be attempted with a spastic as it will only augment his disability and hinder his swimming. He should on the other hand always be encouraged by being told to make slow, large and wide movements and to breathe well.

Even for those wishing to enter competition, it is preferable to avoid sprints of 25, 50 and 100 metres. They would benefit more by being encouraged to swim longer distances and even 500 and 1000 metre tests — they will be less tense. They should also be taught to relax completely after the performance.

J. A.
(to follow)