

Swimming for the physically handicapped II¹

by Jean Assimacopoulos



We continue the publication of the study by Jean Assimacopoulos, the first part of which appeared in the last Olympic Review on page 140 to 154.

Our sports friends have allowed us to reproduce their photographs in the hope of helping other handicapped people. We are very grateful to them.

G) Victims of amputation

Unhappily there are all sorts of amputations: arms, legs, complete or partial, from birth or following an accident or disease.

Those who have lost both arms have the greatest disadvantages in swimming; without arms one can nevertheless swim with the legs only, but it must be on the back in order that breathing can be free. In 1966, a pretty little girl of 13, born with two very small, withered arms allowing her no propulsion in the water, swam 100 meters on her back in a 50 m Olympic pool, after only three lessons. It goes without saying that, to be at ease in the water, such handicapped people must learn to

turn over on to the front and back using only the legs. This is another exercise which the instructor should be able to demonstrate.

Those with only one or part of one arm amputated can swim much more easily. They can practise the 3 strokes: crawl, back-stroke and breast-stroke, but the over-arm stroke is the most suitable for them, if only to make their handicap practically invisible.

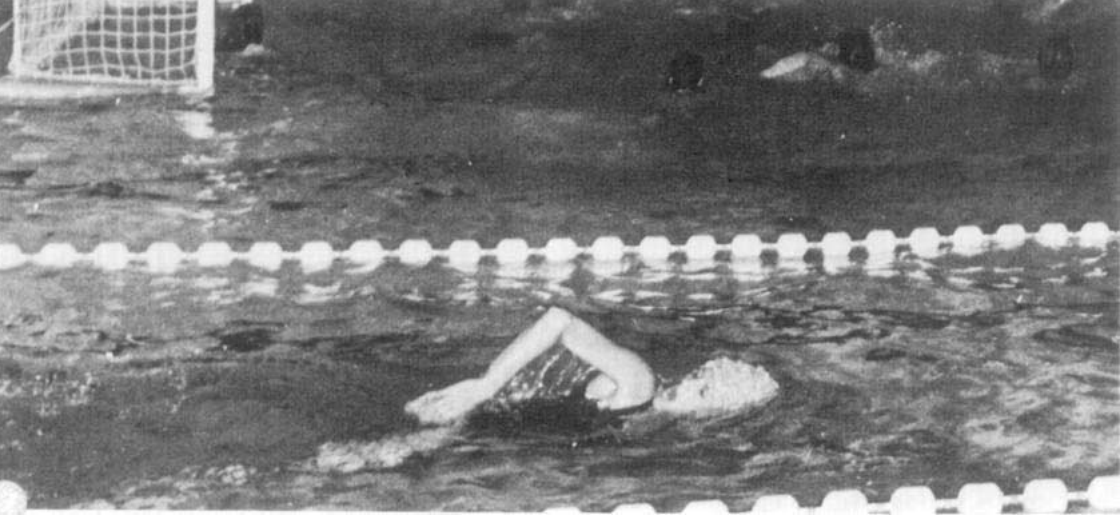
For those with leg amputations, the situation in the water is very different—they can swim with much more ease and it is an ideal sport for them.

Those with both legs amputated can swim the three strokes: crawl, back-stroke and breast-stroke without difficulty, whereas those with only one leg amputated can also swim the dolphin

¹ See Olympic Review No 76-77.

A diving start by a man who has suffered amputation.





A woman whose left leg has been amputated swimming the crawl. In the background healthy swimmers practise water-polo.

stroke, but in general not the former butterfly stroke for the reasons mentioned previously concerning polio victims.

In her excellent brochure, Elisabeth C. Trussell writes that those with both legs amputated float and swim in an upright position, which slows them down⁸. We consider this a mistake. In fact those with both legs amputated (partially or totally) under our observation float or swim horizontally with great ease. Their only and very slight defect is that in the back-stroke (back crawl) the body tends to rock slightly laterally. Their ability to float horizontally is considerably better than that of the able-bodied swimmer.

This is also true but to a lesser degree for those with one leg amputated.

If no other health problems are involved, in our opinion those with one or both legs amputated have an advantage over able-bodied swimmers as far as *long distance swimming* is concerned. In fact, whereas an able-bodied swimmer may race for a short distance swimming vigorously with both

arms and legs, it is quite different when it comes to long distances, as then the beating action of the legs must in no way detract strength from the arms or he will tire too quickly⁹. The function of legs is then no longer one of propulsion, but only of horizontal stabilisation of the body in the direction of the stroke¹⁰.

Those with leg amputations, whose ability to float horizontally is facilitated, need no strength for moving the one or two missing legs. Moreover, their arms do not have to pull the weight of these legs, hence the double economy of energy.

We should quote as examples the Hungarian, Halassy, already mentioned, who was champion of Europe in the 1500 meters in 1931, the American cripple who swam the English Channel, and the one-legged Swiss swimmer, Hans Schmidt, who in 1971 made an impressive crossing of the lakes of Zurich and Constance by the longest routes (35 and 48 km)! These examples are even more remarkable when one thinks of the physical and psychological difficulties under which victims of amputation train themselves or even arrive at the edge of the water in a swimming costume.

To show the potential of disabled people in the water, we should like to

⁸ Elisabeth C. Trussell "Guide lines for teaching the disabled to swim" edited by Swimming Teachers' Association, Neiherton Printers Ltd. Dudley, 1971, page 8.

⁹ François Oppenheim, "La Natation", op. cit. page 109.

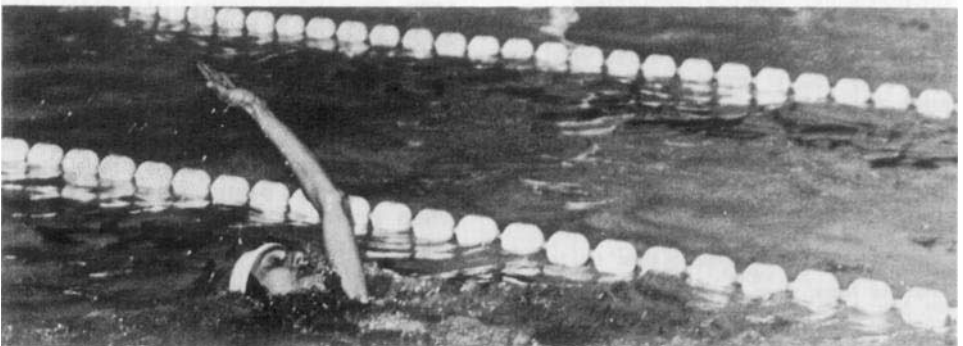
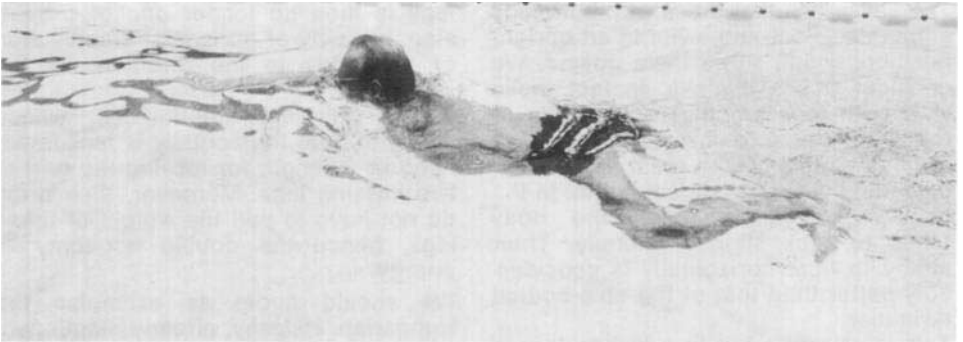
¹⁰ James E. Counsilman, "The Science of Swimming". op. cit. pages 28-30.

add two examples: that of one of our friends with amputations to the left arm and right leg, who each week regularly swims a distance of 500 to 1000 meters, and that of the Frenchman we saw in Lyons in 1968, who had suffered amputations to two legs and one arm above the elbow and who swam 50 meters in one minute seven seconds, using one arm.

There are special artificial limbs for going in the water, which are very useful on the beach, but we think that those people with amputations should first learn to swim without anything, and put these special artificial limbs on only when they are sufficiently confident in the water; we consider that it is the same for those with arm amputations, who want to put flippers on their feet to compensate for the propulsion their arms deny them.



A man with the left arm and right leg amputated while training.



A rheumatic (Bechterew's disease) while training.

H) *Rheumatics*

Hundreds of diseases which for the most part affect the joints are classed under the heading of rheumatism. For some victims, movement is recommended, for others it is better to rest the affected joints. Before rushing into swimming, the rheumatic should ask his doctor's advice. The swimmer himself should be aware of what he can and cannot do, as in certain cases he should not strain the joints and must also avoid fatigue; in other respects, he should on the contrary make his joints work to the maximum.

For example, in many cases of arthrosis of the hip, the rheumatic has difficulty in walking, and furthermore this gives him pain; walking may even have to be avoided because of the weight of the body. But, since movement of the hip should be maintained, swimming is particularly recommended.

We know of a person suffering from Bechterew for whom swimming has worked miracles. This disease is a sort of rheumatism which brings about the gradual calcification of the joints attached directly to the spine, beginning with those of the spine itself.

When our friend began to swim his whole spine including the hips was completely calcified to the extent that he could no longer sit down; his shoulders too were partially affected. Thanks to his courage, perseverance and determination, he has, in spite of his handicap, become a good long-distance swimmer capable of swimming the breast-stroke, backstroke and crawl. The following are the modifications of movements which we gradually found together.

Breast-stroke: as he cannot part his knees, his hips being firm-set, he beats his two legs simultaneously in the water, moving from the knee. It is with this stroke that he swims the slowest, as, unable to lift his head to breath (the

cervical vertebrae also being locked), he is obliged to bring himself almost vertical to take a breath. Between each stroke he takes a long, sweeping break, which allows him time to reassume the horizontal position, and during which time he moves forward by sliding motionless through the water.

Crawl: lateral respiration by rotating the whole body enables him to maintain a horizontal position in the water and thus advance well. For the arm action, he combines the technique of bringing the arms forward fairly low over the surface of the water with that of the rotation of the body previously mentioned on the subject of paraplegics.

As regards the beating action of the legs, he has adopted the action of the old Australian crawl, moving from the knee, which is effected in a four-beat kick.

Back-stroke: it is with the back-crawl that he gains the most speed and slides most easily through the water. His hands and arms go into the water only a little behind the shoulders, but effecting a pulling action up to the thigh just beneath the surface of the water.

The legs however continue to make a beating action from the knee, assuring the principal propulsion, while the foot comes up to the surface again, and a secondary propulsion with the base of the foot as it begins to go down again.

We considered it useful to give details of these modifications as they may be employed for other handicaps. Stiffness, notably in the hips, is nothing unusual, and the beating action of the old Australian crawl is highly recommended, even for just one leg where one hip only has no use in it.

Their ability permitting, rheumatics should train at least three times a week to recuperate and maintain the mobility of their joints and thus retain the possibility of swimming flexibly.

1) *The Blind*

Totally or partially blind people experience the same difficulties in swimming as in other activities.

The first thing to do is to make sure that those with damaged eyes can tolerate the disinfectant used in swimming pool water. The pupil should in this event consult his doctor on the subject, and if necessary wear swimming glasses, which have not long been in existence.

Adaptation to the water should be preceded by the blind pupil's familiarisation with the edges of the pool so that he can memorize them. He should also, by circling the pool, learn the whereabouts of different points of access, ramps, steps, ladders, etc., as well as its shape and dimensions. Instructors should also learn to guide the blind.

Adaptation to the water and apprenticeship of movements should be very gradual and follow the same principles as those for the able-bodied swimmer, but one must constantly bear in mind that the pupil cannot see and that it is useless to demonstrate what one is trying to teach him. The instructor should describe the movements to him and, if he wants to demonstrate them, place the hands of the blind pupil on his own limbs so that he can sense the movements by feeling them.

Blind people are able to swim the various strokes and even enter competition.

When swimming in open water such as a lake or the sea, they must naturally always be accompanied; on the other hand in the pools they should learn to follow the floating "water-lines", which separate swimming lanes during competitions, and count their strokes or movements so as to establish their position in relation to the length of the pool.

When swimming the breast-stroke, they have only to touch the water-line slightly with the arm, elbow or shoulder during the pulling action in order to

follow it. On the other hand, for the crawl and back-stroke, it is better to touch the line with the hand only as the latter comes out of the water following the propelling action. If one tries to locate the water-line with the hand as it enters the water in front of the head, one risks hurting the fingers, as the hand and arm are at this stage stretched out for the powerful action of propulsion, whereas when they come out of the water the hand as well as the arm are relaxed and it is then possible to gauge the line of the water painlessly by a little lateral hand movement at thigh level.

It has been noticed that it is much more difficult to swim in a straight line on one's back since the human body is designed to work in front of itself and not behind its back!

When a blind person is training for competition swimming, as well as during the competition itself, counting the movements is no longer sufficient and someone he trusts must let him know how many meters remain—5 m, 3 m, 2 m, 1 m—both for the turn and the finish. This is particularly important for the breast-stroke to avoid bumping his face against the end of the pool.

The instructor should also swim blindfold or with his eyes closed occasionally to realise and remember how difficult it is to swim in a straight line and keep one's bearings when one can't see!

Other swimmers should be warned when one or more blind people are also swimming in the pool to avoid collisions. It would be preferable for blind swimmers to adopt coloured swimming caps, yellow and black for example, as a distinctive sign, like the jackets worn by blind skiers. An agreement between the different associations and organisations for the blind and sports federations for invalids would be very useful in this respect.

J) *The Deaf*

Deaf people are hardly handicapped at all as far as swimming is concerned, and in fact it is the sport which brings them closest to the able-bodied. Indeed, merely putting one's ears in water is enough to block almost all hearing.

The deaf should however have their doctor's assurance that their deafness is not accompanied by difficulty of balance, particularly when water penetrates the ear, and that swimming is therefore not dangerous for them.

K) *Haemophiliacs*

Haemophilia is a well-known and often hereditary disease transmitted by women and affecting men. The blood of a haemophiliac does not contain the normal coagulants, and he is therefore susceptible to haemorrhages, internal haemorrhages perhaps being the most dangerous. One can easily imagine the extensive precautions a haemophiliac must take in all his daily activities.

It is of paramount importance that a specialist be present when one or several haemophiliacs are swimming. This specialist, nurse or relation, should have the knowledge and ability to take the necessary steps in the event of a haemorrhage, as this may occur in a joint following a simple but too sharp movement, without even the slightest impact.

All sharp movements are to be avoided, and swimming is consequently one of the few sports which haemophiliacs may practice. When swimming quickly the least suitable stroke for them is the breast-stroke, where the movements are sharper than those of the crawl and back stroke, especially for the knees and elbows. The dolphin and butterfly strokes are also not advisable.

Haemophiliacs should avoid short competitions but they can manage distances of a certain length, swimming flexibly and with a steady pace, after very gradual training.

Improvement and training

Swimming is one of the sports where the technique of accurate movement is of greatest importance. Indeed, there is no point in being in excellent physical condition and capable of developing the speed of movements with plenty of muscular force when the most suitable movement is not carried out in the water. Strength itself is often of little or no use and the expression "beating the air" is then very relevant.

One often sees magnificent athletes and gymnasts with projecting muscles, which they boast of as superb and proof of tremendous strength, being far outdistanced by children of 6 to 8 years who have not yet any strength, but who swim flexibly and with the appropriate movements.

The movements should therefore be improved until each person finds exactly the movement which suits him, and this applies even more to the physically handicapped.

It is also important to watch that the movements are carried out flexibly.

The principles concerning the training of physically handicapped people are the same as those for training able-bodied people, with the exceptions we have mentioned previously (spastics and haemophiliacs, etc.).

The young should be encouraged in speed once they have been made to swim longer distances of 500 meters or more, so that they acquire first of all complete ease in the water, automation of movements and the necessary endurance.

In our opinion, three things are important in becoming a champion swimmer:

1. love of the water,
2. a lot of work, in other words considerable training,
3. being gifted.

The third condition is by far the least important. It applies as much to physically handicapped as to able-bodied people.

For those who have passed the age of competition, the correct movements they will already have acquired will give them the ease of swimming long distances without tiring, and this will allow them to keep themselves in excellent physical condition for the rest of their lives. Swimming could even replace exercise by walking for some.

But one should have no illusions, for while swimming is a pleasant sport, it is also a difficult one and demands regular practice and constant training, since it requires the work of every muscle in the body.

If circumstances force a handicapped or able-bodied person to interrupt their swimming, they should start training again very gradually, and should not be discouraged to see how much swimming capability they have lost and how much effort is needed to regain it.

Organisation of a swimming lesson

A) Medical Check-up

It is essential for the physically handicapped who want to take swimming lessons to undergo a medical check-up, through which they will discover if swimming is suitable for them and what precautions if any they must take.

The instructor or club organiser must know whether the handicapped person has the doctor's permission to take part in swimming lessons or training, and a medical certificate seems the most practical solution.

But the medical check-up is important most of all for the handicapped person himself because it is to him that the doctor must indicate the nature of his handicap and what he can and cannot do. In general the handicapped person himself (or his parents if it is a child) should be able to tell and even remind the instructor who has little or

no medical knowledge, but who on very simple indications must know how to make his pupil "work" in the water.

B) Instructors

There must be sufficient instructors and assistants. In addition to instructors well acquainted with swimming, there must be assistants to bring to the edge of the water those who are incapable of moving by themselves, because it is very rare at the moment to find swimming pools designed to allow access to the water by wheel-chairs.

For certain handicapped people, assistants, who might be their relations or friends, are also necessary in the changing rooms. While many can manage by themselves, two or three assistants are often needed to move a heavily handicapped person in and out of the water. However, once in the water, if he cannot yet swim, one instructor is enough to look after him, while for those who can already swim one instructor is enough to watch and improve several swimmers at a time as for the able-bodied.

It is in the case of beginners that there should be the most instructors because of the differences in handicaps, but as soon as possible swimming instruction in small groups is advised because it thus becomes more attractive.

Ideally, instructors should remain in contact with swimming clubs of the able-bodied to keep up-to-date with developing techniques. This is also true for instructors of other disciplines practised by the handicapped. They should not however apply the techniques for the able-bodied automatically to the handicapped but see with each of their pupils if they are practical and above all be able to adapt them according to the handicap. Exchanges of experience between instructors of different clubs can be very useful in this field.



In the background: a group of handicapped people in training for a game adapted from volleyball. In the background some non-handicapped swimmers practising water-polo in the same pool.

Instructors should be very patient. They should take the necessary precautions against accidents. Let us remember that in the water, in spite of general opinion, the risk of accident is very limited and it is enough to watch the pool constantly, be ready to help those in difficulty and not let a beginner go out of his depth, that is where he cannot stand either on his feet or hands.

However, it is round the edges of the pool that care must be taken of slipping or falling on the hard surfaces which become slippery with the water and wet feet.

Particular attention must be taken of falls against the sides on entering or leaving the water. The handicapped as well as the able-bodied must be taught that if they slip on the ladder for example, they should throw themselves as far as possible away from the edge to fall into the water instead of trying to hold on. One does not risk anything when falling into deep water, but one could injure oneself when falling on the edge of a pool made of concrete or ceramic.

C) The Pools

Ideally two different pools should be used: a small one for beginners and a larger one for those who know how to swim. The graduation from the small pool to the large one when the pupil has made sufficient progress is always very encouraging. These pools should preferably have a stairway to allow the very handicapped to get in and out of the water by themselves if possible.

If the big pool is large enough, for example an Olympic pool, it is not necessary for the whole pool to be reserved for handicapped when training; it depends on how many of them there are. It can be shared between the handicapped and the able-bodied, with the swimming lanes divided according to the number of swimmers.

It is not a bad thing for handicapped swimmers to be in the same pool at the same time as other sports clubs. This can be beneficial from the point of view of social integration not only in the water, but also when meeting in the changing rooms, which is profitable for

every one and enables mutual understanding to be increased.

The handicapped can also be taught to swim in open water—in a lake or the sea—but the water must be calm and warm enough.

D) *The Temperature of the Water*

This is a controversial subject, where there are very many differing opinions. Many people stress warmer water for the handicapped than for the able-bodied.

The standards of the “Fédération Sportive Suisse des Invalides (FSSI)” for swimming pools indicate:

“For the handicapped, the ideal temperature of the water is between 26 and 30 degrees Centigrade”¹¹.

Elizabeth C. Trussell recommends the following temperatures in her manual¹²:

Beginners’ pool: about 90° Fahrenheit (32.2° C).

Large pool: about 86° Fahrenheit (30.6° C).

Mr. MacMillan, founder of the Halliwick method, when questioned by a member of. “Sports Handicap Genève” a few years ago on this subject, replied: “The ideal temperature of the water in which to teach a handicapped person to swim is the temperature of the water one has at one’s disposal. What is the point of teaching someone to swim in water of 30° C if he will never have such warm water at his disposal for swimming? He will never be able to swim! It is as simple as that.”

And Mr. MacMillan added: “We have even taught spastics to swim in water of 18° when we had no other possibility.”

We certainly laughed two years later when an instructor of a Swiss-French club told us: “Mr. MacMillan recom-

mends that the temperature of the water should be 18° C for spastics!” This is probably how legends begin!

We consider that, like any normally-built person, the physically handicapped do not like cold water and we have therefore in the past replied to handicapped swimmers who complained about the temperature of the water in the Municipal Pool in Geneva (about 25°): “If you want warm water as in a hospital swimming pool, go to a thermal cure pool or something similar. This is a pool for sportsmen and for everybody, where we practise sport and exercise for pleasure and not medical treatment.”

In our opinion, asking for warmer water for handicapped adds to the problem of their social integration. The handicapped will be persuaded that they cannot swim in the same water as the able-bodied. Moreover, as the temperature of a swimming pool is not easy to change, separate pools would have to be built for the handicapped and they would thus again be separated from everyone else. The temperature of the water must therefore be the same as for the able-bodied.

For competitions, the swimming regulation of the “Fédération Internationale de Natation Amateur (FINA)” states, regulation No. 63, Figure 11¹³:

“Temperature of the water:
+24° Centigrade minimum.
+77° Fahrenheit minimum.”

¹¹ Sport Handicap, official publication of the FSSI, 11th year, No. 4, November 1972, page 19, No. 9.

¹² Elizabeth C. Trussell, “Guidelines for teaching the disabled to swim”, op. cit. page 5.

¹³ Official Bulletin of the FINA No. 39, December 1972, page 44. This rule, adopted by the FINA Congress in 1972, is applicable from 1st March 1973 (see also page 5). The former rule, according to rule No. 63, fig. 11 of the 1969-72 FINA Manual, allows for a water temperature of 23-25° C—74.4-78° Fahrenheit.

This rule is applicable to all official international competitions throughout the world.

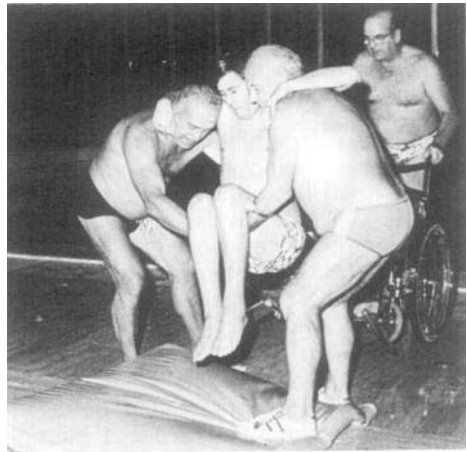
We should, however, add that the able-bodied, especially children, learn to swim more quickly in "warm" water because they are less tense than in "cold" water. This is even more noticeable with the handicapped and it is therefore better to have warmer pools for beginners, but if this is not possible the teaching of swimming should nevertheless not be abandoned. However if the beginners' pool is next to the large pool for advanced swimmers, where the water is cooler, several pupils will hesitate going into the large pool where they are out of their depth and their progress will be much slower.

We consider that most of the handicapped who at the beginning have great difficulty bearing the "colder" water of public pools accustom themselves very well to it after a somewhat long training. We have often been surprised at the extent some of the handicapped, even spastics or rheumatics, have also easily become used to the temperature of lakes in Central Europe, which is far lower than that of swimming pools. We have even seen a one-legged man take part in the Christmas Cup which is held in December every year in the lake at Geneva which is only then three to six degrees Centigrade in temperature.

Elizabeth C. Trussell writes in her manual that "the temperature of the air must be slightly lower than that of the water"¹⁴. We think, on the contrary,

A paraplegic being placed in the water by two former competitors in the Olympic Games (Water Polo): on the left, Benjamin Vessaz (1936), on the right, Fernand Moret (1924 and 7928). Once in the water, the Paraplegic swims the backstroke without help.

¹⁴ Elisabeth C. Trussell, "Guidelines for teaching the disabled to swim", op. cit. page 5 last line.



that the air should be at least two degrees warmer than the water or else one is too cold when leaving the water.

We always recommend a shower, not only before going into the water, but also a good hot shower before getting dressed. This provokes a reaction which helps those who lack movement, particularly those who are in a wheel-chair, to warm themselves up.

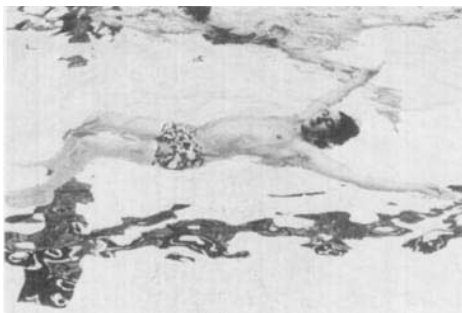
E) Equipment

Wheel-chairs and chairs which can be used in the showers should be available. A shower must be large enough for a paraplegic to transfer himself from his wheel-chair to the shower seat and the same applies for the toilets.

Wheel-trolleys are very useful for those who have had both legs amputated, as they enable them to move themselves independently.

There should if possible be a mechanical apparatus to help those in wheel-chairs in and out of the water. If there is no such apparatus there must at least be a rubber mattress to get in and out of the water the severely handicapped, especially paraplegics and tetraplegics; they must slip gently on to the mattress so as not to injure their sensitive skin on the sides of the pool.

For others, the equipment for able-bodied pupils can be used: kick boards, pull boards, etc.



"The pleasure of being equally able to partake in sport."



Conclusion

We hope that these few pages will be useful to swimming instructors for the physically handicapped and that they will encourage more handicapped people to test the pleasures of swimming, a sport which contrary to many others is without risk on condition that the rules of basic care are observed.

This physical exercise may allow them to become sportsmen like everyone else and even to take part in competition.

They will benefit not only physically from practising sport, but also and above all will obtain moral satisfaction caused by a new confidence in the water, a source of so much enjoyment!

J.A.