JBL

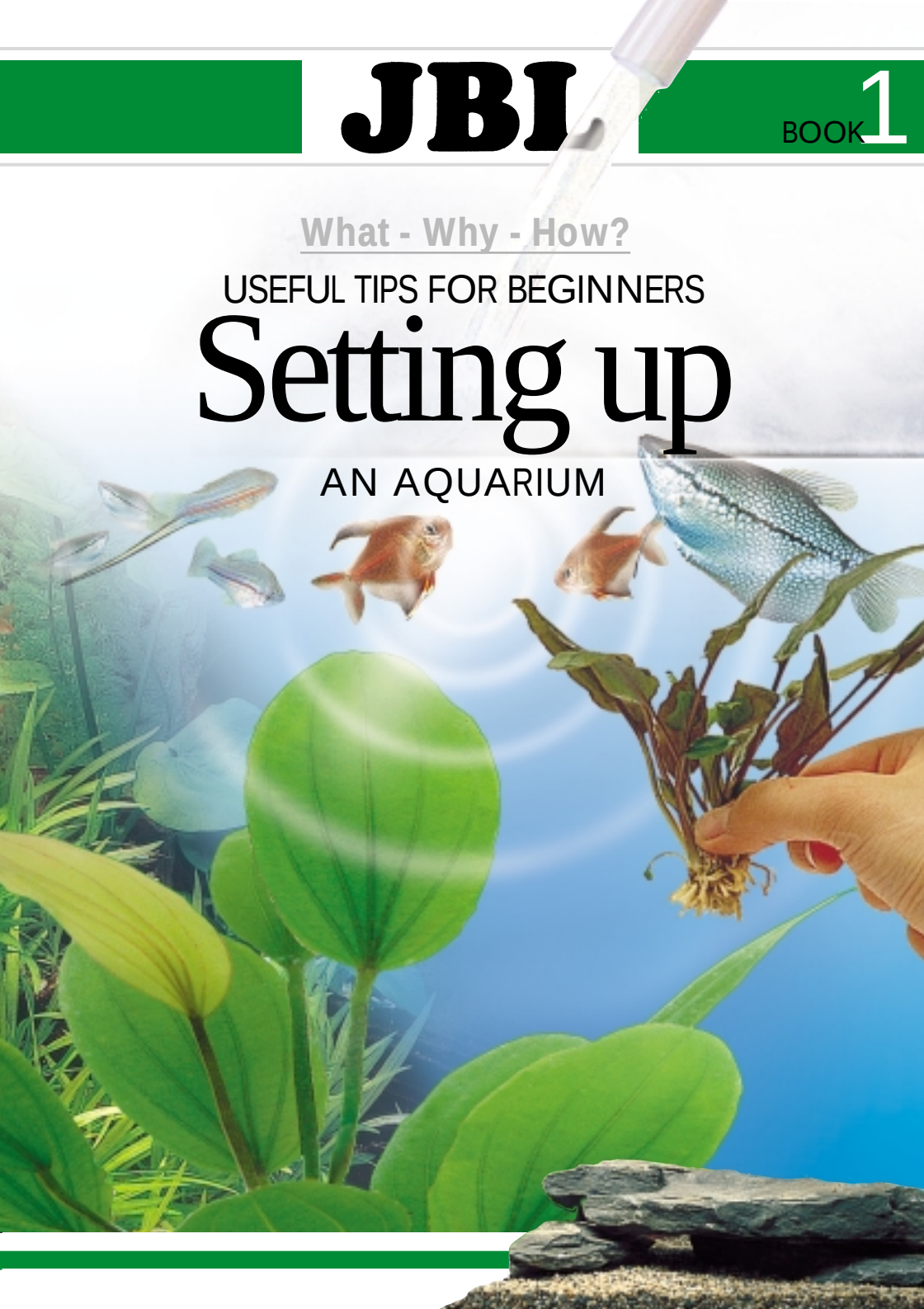
BOOK 1

What - Why - How?

USEFUL TIPS FOR BEGINNERS

Setting up

AN AQUARIUM



Ahead through research

JBL

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Published by
JBL GmbH & Co.KG
D- 67141 Neuhofen/Pfalz
www.jbl.de

3rd revised edition 2006
Texts: Dr. Rainer Keppler,
Biologe im Hause JBL
Layout: akzenta PR, D- 53797 Lohmar

1. INTRODUCTION

Latest findings show that watching an aquarium is relaxing, reduces stress and has a calming influence. It provides an opportunity to observe natural events closely, leading to greater understanding of such processes and relationships.

But an aquarium can also be quite simply beautiful and fascinating. It can be a decorative feature of a room....The list of advantages is endless. However, it is important to bear in mind that the correct care of fish and plants entails a certain amount of work, otherwise the advantages may quickly turn into disadvantages. If, for example, the aquarium should become cloudy with algae, the hobby which was started with such enthusiasm may come to a disappointing end.

This small brochure describes how you can enjoy all the advantages of an aquarium mentioned above and how the pleasure given by your small underwater world can be prolonged by providing the right care for the species of fish selected. You will soon notice symptoms of a serious case of aquarium virus infection which will probably affect you, as it has us, for the rest of your life, giving hours of pleasure.

Of course, a small brochure like this cannot provide comprehensive information. Our aim is to point you in the right direction.

For further more detailed information we recommend that you purchase one of the books listed in the bibliography.

Since an aquarium is a micro system of living creatures which react to each other, there are no simple instructions which only need to be followed for everything to work smoothly like a machine.

You will probably, sooner or later, come across problems which are not dealt with specifically in the literature available.

We therefore recommend that you exchange ideas with other enthusiasts. Your specialist aquarium supplier is certainly one person you can turn to for advice. In time, you may perhaps like to join a local aquarists' club. In heated discussions, often stretching on well into the night, you will hear how many different solutions there may be for the same problem and how each aquarium reacts differently. And that's what makes this hobby so interesting and informative!

The tips in this small brochure are intended to show you how to achieve an aquarium in which healthy plants and fish can thrive

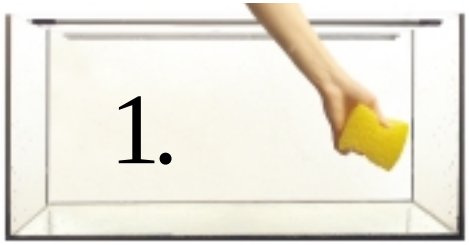
The following brief guidelines explain the main steps to be taken when setting up an aquarium. The subsequent chapters then explain each stage in closer detail.

GUIDELINES:

2. SETTING UP AN AQUARIUM

2.1 Cleaning the new aquarium

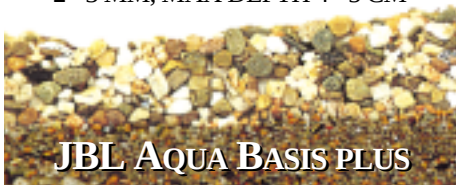
After placing the aquarium in the selected location, wash it using luke-warm tap water. Cleaning is easy with the **JBL Aquarium Sponge. Do not use detergents.**



2.2 Introducing substrate

We recommend the **JBL ProfloraStart s**et for a successful start for your new aquarium with healthy thriving aquatic plants. This set contains the basics needed for successful aquatic plant care. It consists of: **JBL AquaBasis plus**, a nutrient substrate specially developed for aquariums, **JBL Ferropol** liquid staple fertilizer to provide a regular supply of the main nutrients,

AQUARIUM GRAVEL, PARTICLE SIZE 2 - 3 MM, MAX DEPTH 4 - 5 CM



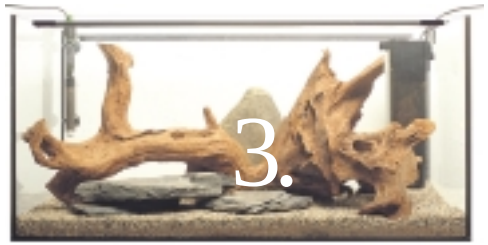
and the daily fertilizer **JBL Ferropol 24** to provide essential trace elements each day.

First you need the nutrient substrate **JBL AquaBasis plus**. The other two components will be described in more detail later. Cover the floor of the aquarium with a 2cm deep layer of this nutrient substrate.
This is then covered with a layer of washed aquarium gravel, particle size 2 - 3 mm.

Using pre-washed gravel from a specialist aquarium supplier will save you the trouble of washing the gravel.

2.3 Installing a heater and filter

Follow the manufacturer's instructions. Install the appliance at the rear of the tank



so that it can later be hidden by decorations and plants.

2.4 Decorative elements

Decorative elements such as roots and stones may now be added. Only use one sort of rock and avoid the temptation to create a rock desert! Rocks and roots should be placed on the substrate or gently bedded in the gravel.

2.5 Adding water

Now fill the aquarium with tepid tap water (25°C) until almost full. To avoid mixing the gravel layer together with the lower layer of substrate containing additives, pour the water onto a shallow saucer or glass dish placed on the floor of the aqua-

rium. Adjust the position of any decorative objects if necessary before adding **JBL Biotopol** or **JBL Tropol** to prepare the water.

2.6 Starting up the equipment

Switch on the heating and the filter and install the lighting according to manufacturer's instructions. It is advisable to connect the lighting to a time switch.

3 useful helpers to start you off on your new "aquatic hobby": JBL Denitrol adds beneficial cleansing bacteria to the aquarium water and shortens the waiting time before fish can be introduced. JBL Biotopol and JBL Aquatrop J convert tap water into the ideal environment for your fish.

2.7 Maturing

In order to help the beneficial filter bacteria become established **JBL Denitrol** containing additional beneficial bacteria should be added now and on the following 9 days.

2.8 Introducing aquarium plants

Aquarium plants may be added when the equipment is operating correctly and the first dose of **JBL Denitro**l has been added.

2.9 Introducing fish

A few days later. More on this in the chapter on fish.

3. THE AQUARIUM

3.1 Location

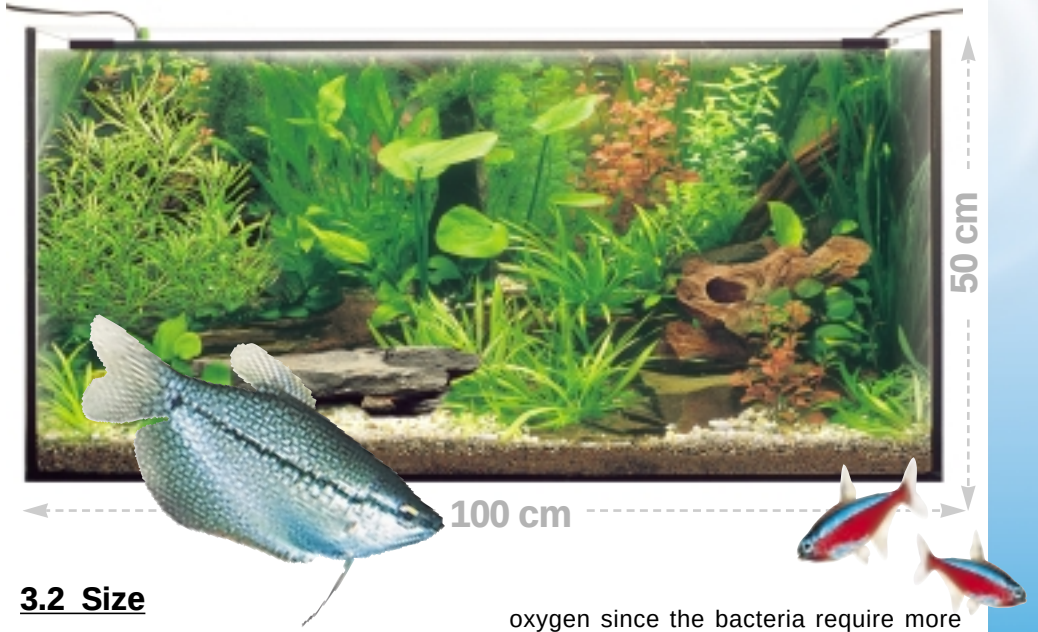
Thanks to more sophisticated modern lighting equipment, the window sill is no longer the standard location for an aquarium. Daylight, with its seasonal fluctuations, is difficult to regulate and inevitably leads to the problem of undesirable algae growth.

Select a location which is furthest from a window, where the aquarium will get as little direct daylight as possible, but can still be easily viewed from your favourite armchair.

Special aquarium lighting available from your specialist aquarium supplier provides suitable light conditions and will keep algae growth to a minimum.

A carefully sited aquarium will give your room a special "tropical" flair.

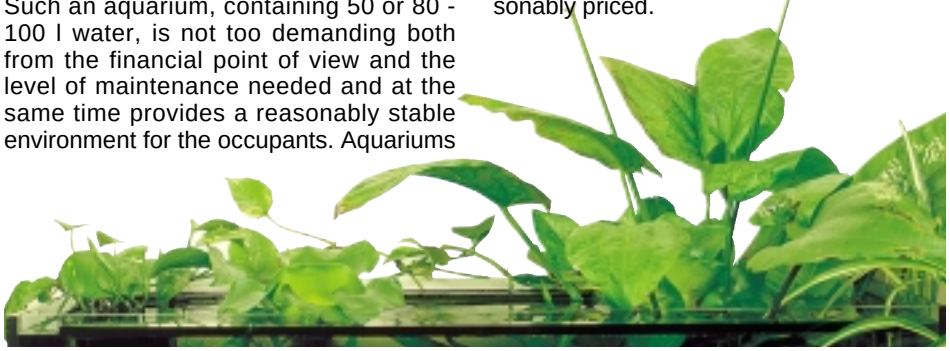
At the same time you can perhaps brighten a previously dull corner of your room. The location selected should also have an electrical power point or easy access to power. Depending on the equipment used, 3 - 4 electrical connections will be required.
There should also be sufficient space above the aquarium for you to comfortably carry out maintenance jobs (e.g. regular partial changes of aquarium water) without performing contortions.
A sufficiently sturdy piece of furniture will be required to support the aquarium. A shelf, table or something similar is adequate for a small aquarium. Larger tanks of about 80 to 100l upwards should be supported on a special tank stand available in a wide selection from specialist aquarium suppliers.
It goes without saying that the aquarium and its support must stand absolutely level (use a spirit level).
A sheet of expanded polystyrene (Polysoft), available from aquarium suppliers, should be placed between the support and the tank. This will safeguard against any unevenness and insulate the tank, preventing any loss of heat from the bottom of the tank.



3.2 Size

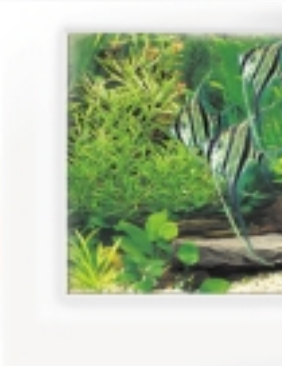
As a general rule, the conditions in a large aquarium remain more stable, as minor, unintentional lapses in maintenance do not result in an immediate catastrophe. For example, a dead fish which has gone unnoticed in a large aquarium will be disposed of by bacteria without any significant ill-effects on other occupants of the aquarium or on the quality of the water. In a small aquarium, the conversion of waste by bacteria may lead to a critical lack of oxygen since the bacteria require more oxygen for this task than is available in the aquarium.
A large aquarium will also more easily "absorb" an omitted partial change of water than a smaller aquarium.
On the other hand in terms of learning effect, starting with a small aquarium is considered to be best because mistakes are immediately and unmistakably obvious. Scrupulous maintenance is inevitably learnt.

We would like to propose a middle path, and recommend starting with an aquarium of at least 60 cm, preferably 80 cm, length. Such an aquarium, containing 50 or 80 - 100 l water, is not too demanding both from the financial point of view and the level of maintenance needed and at the same time provides a reasonably stable environment for the occupants. Aquariums of this size are often sold by aquarium suppliers as complete sets including all the necessary accessories and are very reasonably priced.



When installing an "open aquarium" under a sloping ceiling check that there is sufficient distance between the surface of the water and any lighting. Open aquariums are highly decorative and have a positive effect on the climate of a room.

3.3 CONSTRUCTION AND SHAPE



An aquarium built into a wall as a room-divider is especially eye-catching. The world of the aquarium becomes a unique experience.

Almost all tanks sold nowadays are all-glass tanks with silicone rubber adhesive. Check that the tank you select is from a manufacturer who gives a guarantee on the adhesive bonding. Such aquariums meet all the necessary criteria for safety and stability. The economical methods now used for bonding sheets of glass open up new opportunities for different shapes. Aquariums no longer have to be built in the traditional rectangular shape and the new styles can be easily integrated into modern decorating schemes.

One point which should not be forgotten when planning any ambitious "wonders" of interior design is the needs of the living creatures themselves.

Do seek the advice of your specialist retailer.

3.4 USEFUL EQUIPMENT

There are a few implements which will make the maintenance of your small underwater world much easier to carry out. These are: a clean bucket used solely for work on the aquarium and never for household cleaning. A siphoning tube about 15 - 20 mm diameter and 1.5 - 2 m long can be used to empty some of the aquarium water into the bucket during partial changes of water. A silt cover on one end of the siphoning tube has proved very useful.

AquaEx from **JBL** is a complete set comprised of silt guard and siphon tube. This set has a special valve mechanism which discharges water into the bucket without the unpleasant task of sucking it up by mouth. The set also includes two practical hose clips which can be used to attach the hose easily to the edge of the aquarium or to the bucket, preventing the hose from accidentally slipping off. **JBL AquaEx** is available in two sizes: **AquaEx 20-45** for aquariums from 20 to 45 cm high and **AquaEx 45-70** for aquariums from 45 to 70 cm high.

You will need an algae cleaner to remove unsightly deposits of algae from the front pane of the aquarium. **JBL** offers two types, the **JBL Blanki** or **Blanki Set** and **JBL Algae Magnet** in 3 different sizes.

For daily routine cleaning, we recommend a floating algae magnet, **JBL Floaty**. This has two advantages: it can be used from outside the aquarium without getting your hands wet as the cleaning section in the water is connected magnetically to the "handle" outside the aquarium.

In the event that the inner section loses contact with the outer part during over-energetic cleaning, the inner section will float to the surface and can be easily removed from the aquarium without having to "fish around" in the water.

The JBL Catch Net is a useful piece of equipment when removing fish. It is available in a range of sizes to suit every need.

JBL Blanki does an excellent job in removing stubborn algae deposits without scratching the aquarium glass.

In addition, calcium stains and grime on the outer panes of the aquarium can be removed using **JBL BioClean A**, a biological cleaner which, if it should inadvertently come into contact with the aquarium water, is not harmful to fish. All this equipment should be stored in the vicinity of the aquarium away from other household cleaning equipment.

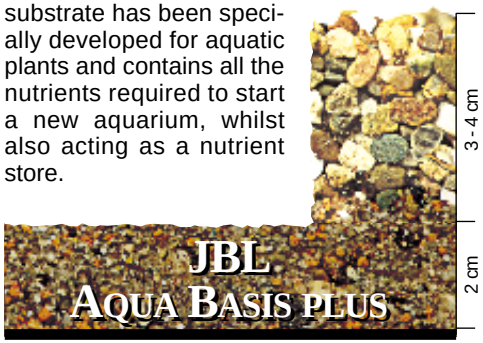
4. GROUND COVER AND DECORATIONS

Before we go into the individual topics mentioned in the brief introduction to aquarium keeping at the beginning of this brochure by starting with some suggestions on ground cover and decorations, we would like to make a few points.
Your aquarium should develop into a small water biotope which looks and behaves as naturally as possible. It is advisable, therefore, to avoid artificial-looking decorations such as plastic divers, shipwrecks or plastic plants. The needs of the fish should have priority over decorative or artistic flights of fancy.

However, there is still plenty of scope for beauty and aesthetics, as you will see as you read this brochure. If you actually tried to reproduce the natural environment of the fish as closely as possible, the result would be a more or less monotonous sight. It is more important that the habitat meets the fishes' needs i.e. fish which like to hide in plants should not be kept in an aquarium without plants, or ones which live in caves be kept in bare aquariums.

Now back to ground cover again. When you have placed your aquarium in the position chosen, briefly wash it with lukewarm tap water (without detergents). You can then start to add the substrate. This has to fulfil several functions: it provides nutrients and is an anchoring place for the aquatic plants, whilst for the fish it provides the necessary "ground under the feet".

We recommend the following layering of substrate: First place a 2cm deep layer of **JBL AquaBasis plus** on the floor of the aquarium. This nutrient substrate has been specially developed for aquatic plants and contains all the nutrients required to start a new aquarium, whilst also acting as a nutrient store.



The ground layer should be at least 4-6 cm deep for strong plant growth

JBL AquaBasis plus is part of the **JBL ProFloraStart** set described in Chapter 2, which we particularly recommended for setting up a new aquarium. Next cover this layer completely with a 3 - 4 cm layer of well-washed gravel. Using pre-washed gravel from a specialist aquarium supplier will save you the trouble of washing the gravel. We recommend using a dark coloured, round-grained gravel, particle size 2 - 3 mm. Natural decorative material, such as a few stones and one or two roots obtained from aquatic stores can now be used to create hiding places for the fish or to disguise technical equipment such as the heater and filter as much as possible.

The operation of the equipment should not be impeded in any way and the filter, where needed, should remain easily accessible for cleaning. Do not use materials which may leak any harmful substances into the water. Decorative material bought from a reputable aquarists' supplier can be safely used. This particularly applies to roots. The only wood which is suitable for an aquarium is wood which has been impregnated with humic acid, such as resinous moor wood. Do not use wood from the forest.

Savannah wood and mangrove wood has also recently become available from aquarium suppliers. Rocks and wood should be washed thoroughly under running water, scrubbing with a brush if necessary. Save yourself trouble by not boiling these objects, as is often recommended. That is completely unnecessary. To ensure that any wood used does not float when water is added weight it down with a rock.

Attractive decorations can be created using Javanese moss on tree roots. The Javanese moss is at first held in position with thin thread.

THE REAR WALL OF THE AQUARIUM

Even the most attractive aquarium decorations loose their charm if viewed against the backdrop of the living room wallpaper. Cover any of the sides of the aquarium which are not to be used for viewing with a backdrop. There are numerous aquarium backdrops available as prints on foil from aquarium suppliers. You are certain to find a motive which suits your aquarium. We recommend JBL Rear Wall Adhesive to professionally glue the rear wall to your aquarium, so that it adheres smoothly without air bubbles and can be seen to best effect. A polystyrene sheet used in addition to the backdrop will insulate against heat loss and reduce heating costs.

Stone is one of the most natural decorative elements. With a little fantasy, attractive back walls and other constructions can be created, like the "backdrop" in the photo on the right, a natural-looking setting. Let your imagination run free! The Java fern attaches its roots (rhizomes) to the rough surfaces of stones and the wood roots, forming a very natural aquarium world.

5. TECHNICAL EQUIPMENT

A certain amount of technical equipment is necessary in order to create the best possible conditions for the inhabitants of the small aquarium biotope. It is not capable of regulating and supporting itself as in nature, although operating according to the same principles. We would like to explain what you need to know about technical equipment and what equipment is needed.

5.1 Filter

A filter, as the name says, should filter something, namely the aquarium water. The removal of visible floating particles and beautifully clear aquarium water is more a welcome side-effect. The main function of an aquarium filter is not just mechanical filtering, but the disposal and conversion of invisible harmful substances by bacteria. We would like to briefly explain where these harmful substances come from and how water purification is carried out by bacteria. The excretion from the fish, uneaten food and decaying plant material are all sources of soluble waste material which can be harmful to the fish to a greater or less extent over a long period of time. Certain bacteria have become specialized in the breaking down and conversion of harmful substances into less harmful ones. The filter material of the aquarium filter provides ideal conditions for these bacteria which become established there over a period of about two weeks. More details on this are given in the following chapter and in the **JBL Brochure "What - Why - How" No. 2.**

At the beginning you need to know that there are external and internal filters. Internal filters are positioned in the aquarium, with the advantage that there no pipes containing water running outside the aquarium, which could spring a leak. On the other hand, the routine cleaning which is needed from time to time entails "splashing around" in the aquarium. We recommend the **JBL** internal filter **ProCristal 50** and **100** for standard aquariums of 60cm and 80 cm (approx. 50 and 100 l). A special feature of this filter is a pre-filter cartridge which can be cleaned or replaced regularly, protecting the actual biological filter material from undue soiling and therefore ensuring a longer working life.

Ask your specialist aquarium supplier about **JBL ProCristal** internal filters.
Air-operated internal filters are not recommended as they expel the CO_2 which is vital for plant growth (see chapter on plants).

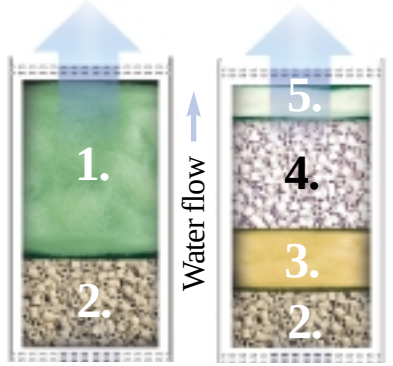
We recommend motorised external filters, e.g. from the **JBL CristalProfi** range, for larger aquariums. The filter can be conveniently positioned below or behind the aquarium, with only the less intrusive supply and siphoning tubes actually in the aquarium. In contrast to internal filters, a larger volume is available for the filter mass. Check that you buy a model in which the pipes can be prevented from slipping by screw fittings, clips or such like. Despite rumours to the contrary, pipes are part of the "living inventory" of an aquarium and always seem to change their position when you are away.

Quick-disconnect plugs with stop valves, either fitted or available as an accessory, make routine cleaning of the filter easier.

The selection of suitable filter material which would provide the ideal conditions for beneficial bacteria, as mentioned previously, is not a problem with motorised internal filters as these are supplied with ideally suited foam filter cartridges.

Well run-in aquariums and filters are characterised by crystal-clear, healthy water in which your fish display their most brilliant colours.

Many external filters e.g. **JBL CristalProfi** are supplied complete with filter material which is adequate for aquariums with normal stocking levels. If you buy a filter which does not contain filter material, we recommend the following:
small pieces of ceramic pipe (**JBL Cermec**) for the bottom layer (about 1/3 of the filter content). Almost all of the remaining filter volume should be filled with a material which gives cleansing bacteria the best possible conditions to establish colonies. A whole range of suitable materials are available. The most common is coarse foam e.g. **JBL Filterpad F15** for the **JBL CristalProfi** external filter. A mixture of coarse and fine filter floss, **JBL Symec Mix**, is also highly suitable. The non-plus ultra amongst biological filter materials are materials made of sintered glass, such as **JBL SintoMec** and **JBL Micromec**. This is topped with a final thin layer of foam (**JBL FilterPad F35**) or cotton floss, **JBL FilterPad VL** or **JBL Symec VL**. This composition can be used for filters in which the water flows from the bottom to the top. If the flow is in the opposite direction, the order of the layers is reversed, with the small ceramic pipes placed at the top. Any other filter materials such as peat or particularly activated carbon should not be used under any circumstances in the filter of a new aquarium. Later, in the course of your career as an aquarist, you will come across cases in which activated carbon is needed e.g. to filter out residues of medicines over a limited period of time. It will also be necessary from time to time to clean the filter material. Greatly reduced water flow through the filter is an indication that it needs cleaning. Remove the filter material from the filter (following the maker's instructions) and rinse under luke-warm, running water (25°C). **Do not use hot water or detergents. Do not clean too thoroughly, to avoid harming the beneficial bacteria which have settled in the filter material.**
More filters have been "cleaned to death" than have expired through lack of cleaning. After setting up an aquarium for the first time, the filter material should not be cleaned in the first 4 - 8 weeks.



1) JBL Symec XL filter floss. 2) JBL Cermec small ceramic pipes. 3) JBLSymec-Mix. 4) JBL SintoMec. 5) JBL Symec.

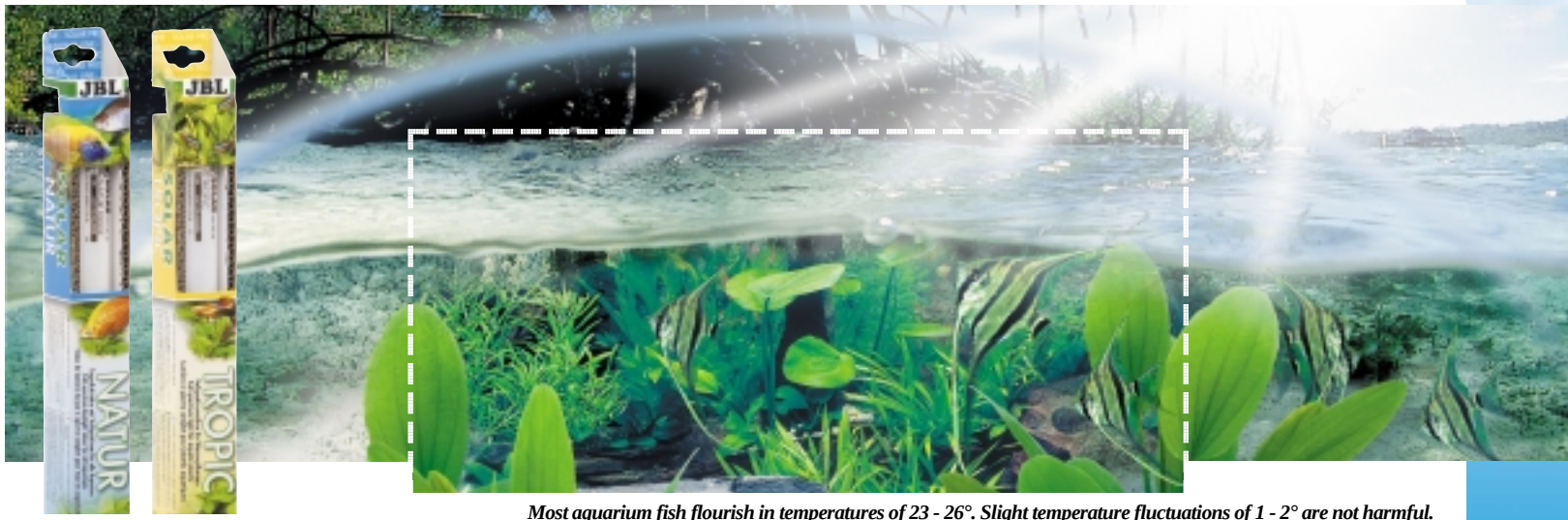
HEAT & LIGHT

5.2 Heating

Since the large majority of fish which are easy to keep and therefore suitable for a beginner's aquarium come from tropical countries, your aquarium will need a heater. A temperature of between 23 - 26°C will provide the right "working conditions" for your fish, (depending on species).
Aquarists' stores sell a variety of aquarium heaters. We recommend a rod-shaped thermostat heater. **JBL ProTemp**, available from any specialist aquarium store, is an extremely compact regulated heating rod which takes up very little room in an aquarium.
This heater is fully submersible and features a scale on which the temperature can be precisely regulated to within +/-0.5°C. For safety we recomm**end** monitoring the temperature with the **JBL Aquarium Thermometer**. As a general rule, you should allow 0.5 Watts per litre of water in a normally heated living room.
Submersible ground heating cables are also available. These can be laid in the substrate of the aquarium, providing plants with "warm feet", which encourages growth. These heating systems are comparatively expensive and we do not consider them necessary for a novice aquarium.

5.3 Lighting

Lighting not only enhances the appearance of the aquarium, it is also the source of vital energy needed by the plants to thrive and develop their full glory. At the same time the plants supply the underwater world with essential oxygen. Well-stocked aquarists' suppliers offer a wide variety of styles and configurations of aquarium lighting either as individual lamps or complete aquarium hoods.
We recommend lighting or a hood with one or more fitted fluorescent tubes to save costs. Fluorescent tubes produce the most light for the energy consumed. According to the latest findings, aquarium plants require the full natural spectrum of light in order to thrive.
JBL SOLAR full-spectrum tubes provide the right source of light for your underwater world. Full-spectrum tubes not only enable the plants in the aquarium to produce healthy growth, to the disadvantage of algae, but also show the full brilliance of the fishes natural colouring.
For hoods with only one fluorescent tube we recommend the **JBL SOLAR Tropic** light shade, as this is ideally suited to the needs of plants. If two or more fluorescent tubes can be used, we recommend a combination of **SOLAR Tropic** and **SOLAR Natur**. The SOLAR Natur tube should be installed as the front tube, as this creates an impression of depth in the aquarium.



Provide the right lighting "climate" for your fish with the JBL SOLAR Tropic and Natur fluorescent tubes.

However great the temptation might be, we strongly advise against the use of tubes which emit a more or less pink light, and which will bathe your underwater world in an unnatural candy-coloured glow. Although candy-coloured lights may be considered under the heading "a matter of taste", it has been proved that this shade of light promotes undesirable algae growth, which is exactly what should be avoided especially at the beginning. If, however, you still do not want to do without candy-coloured light, one tube in this colour can be used in a lighting system with 2 or more tubes. Further details about the use of light in the aquarium are to be found in the JBL brochure "**What – Why – How?" Book 7**. With regard to the length of time the lighting should be switched on, most aquatic plants flourish best under conditions similar to a tropical day, which is almost exactly divided into 12 hours of daylight and 12 hours darkness. Because of the angle of the sun's rays in the early morning and evening, the underwater day lasts only about 10 hours.
Aquarium lighting should therefore be switched on for 10 to 12 hours a day, at the longest. A time switch will guarantee a regular cycle, saving the fish unnecessary stress. Set the lighting times so that the fish are still active when you have time to observe them in the evenings e.g. on at 11 a.m. and off at 10 p.m.

If you send your fish "to bed" in the evening with a dimmed light (e.g. a spotlight up to 60 W), you will be able to enjoy the fascinating spectacle of the colours and behaviour of the fish.

Most aquarium fish flourish in temperatures of 23 - 26°. Slight temperature fluctuations of 1 - 2° are not harmful. Even in the natural environment, temperatures vary widely with the season.

6. WATER

THE MOST IMPORTANT FACTOR AT THE BEGINNING

The water in your aquarium, the natural element for your plants and fish, plays a vital role. On the one hand the water and its properties influences the fish and plants living in it, on the other hand the biological processes of the fish and plants have an influence on the quality of the water. For this reason we would like to explain some facts about water.

In its natural state, water contains all the substances which are essential for fish to live. Tap water, on the other hand, has to be made "fish-friendly" by the addition of JBL Biotopol.

Having filled your aquarium with tap water at the correct temperature, as explained in point 2.5 of the guidelines, the water must now be prepared ready for the fish. Tap water has been treated according to hygiene standards as drinking water for humans. The water which comes out of the tap is not the ideal habitat for fish. This can easily be remedied by adding the water preparation solution **JBL Biotopol** to the tap water.
JBL Biotopol immediately binds any chlorine and heavy metals (e.g. from copper pipes) which are toxic to fish and may be present in the water. In addition, it adds organic protective colloids needed by the fish to keep their mucous membranes healthy. These protective colloids are to be found in the water in the fishes natural environment. Hygiene standards for domestic drinking water mean that they are undesirable, and therefore have to be added to aquarium water.

Any other water preparation measures, such as softening or mixing with rainwater or distilled water, should not be carried out unless specifically recommended in later chapters. Tap water has an unvarying quality and is the best guarantee of consistent conditions in the aquarium. At a later date when you have sufficient experience in aquarium keeping you will perhaps want to keep more "demanding" fish requiring specific water preparation. At the beginning, however, you should select fish which thrive in the tap water which is easily available. Details on the requirements of fish can be found in specialist literature or by asking your specialist supplier.

If you wish to keep South American fish which prefer "black water" in your first aquarium, you will need to add JBL Tropol.

More detailed information is given in the **JBL Brochure "What - Why - How?" Book 2**.

You should, however, know a few basic facts about water chemistry.

The new lid makes precise dosing simple.

6.1 Water Hardness

You are sure to have noticed that in some areas you need a lot of soap to produce foam when washing your hands, and in other areas you need very little. Where not much soap is needed, the water is soft, and where a lot of soap is needed the water is hard. The hardness of the water is due to the water absorbing differing amounts of minerals which cause hardness as it passes through various rock layers until collecting as ground water. The degree of hardness depends on the area and composition of the rock layers. If the water flows through chalky soil, more minerals causing hardness are dissolved than if it flows through primary rock (e.g. granite etc).
Water hardness can be measured and the levels are expressed in degrees of German hardness. Hardness is classified as total hardness and carbonate hardness. There are convenient **JBL Test Sets** to measure both of these. At the beginning you need to know that carbonate hardness, caused by soluble chalk in the water, is far more important, in fact vital, for your aquarium. Carbonate hardness ensures that the pH level, which we will look at next, does not soar,

something which the fish and plants do not like at all. For this reason you should check that the carbonate hardness of the aquarium water is at least 5 German degrees, keeping it as constant as possible with regular partial changes of water. This is the only reason for any water treatment measures, which we recommend in the initial stages. Should your tap water be below 5 degrees German carbonate hardness, you should increase the hardness level to about 5 degrees with **JBL AquaDur plus**

for the well-being of your fish. It is best to do this in a separate container from which you can add water when partially changing the aquarium water. Higher levels of carbonate hardness in the tap water should simply be accepted. If the level exceeds 15 degrees, fish should be selected accordingly. Total hardness should also be accepted as it comes, do not worry about it. It only becomes important if you later decide to breed fish from extremely soft waters.

THE JBL TEST

6.2 pH levels

The pH level indicates whether a liquid reacts in an acidic, neutral or basic (alkaline) manner. The pH scale ranges from 0 (very acidic) to 14 (very alkaline), with neutral (neither acid nor alkaline) at about 7.
We are constantly confronted with the phenomenon of the pH level in our daily lives. Coca Cola, for example, has a pH level of 3. All dishes which we consider to taste good are more or less acidic. Most fishes and plants are easily and successfully kept at pH levels around neutral. One important piece of information is that, with a one point change in the pH level, the concentration of the substances which determine the pH level alters tenfold, and with a 2 point change the alteration is one hundredfold. For this reason any sudden fluctuations should be avoided. In your new aquarium the carbonate hardness regulates the pH level, ensuring that it does not sink below 7 or rise above 8 - 8.5. In the morning it will usually be about 7, and about 8 in the evening. You can measure the pH level using the **JBL pH Test Set 3.0 - 10**.

The pH level is largely determined by the interrelation of carbonate hardness and CO_2. Carbonate hardness raises the pH level to a certain extent, whereas CO_2 lowers it. If the two balance each other, the level is around the neutral point, 7. Plants extract CO_2 from the water through assimilation, causing the pH level to gradually rise towards 8. If required, the level can be increased to above 8 by switching off the lighting. Airstones should not be installed on any account as they force CO_2 out of the water, raising the pH level.
If you wish to spend more money on the well-being of your fish, you can provide an additional source of CO_2 for you aquarium with the **JBL PROFLORA CO2 Set**. This allows the pH level to be constantly maintained at 7, the most beneficial level, and the plants are supplied with the essential nutrient, CO_2. This widens the range of plants which can be selected. More on this in the chapter on plants.

6.3 Nitrite

Nitrite is a highly toxic by-product produced during the conversion and decomposition of the fishes' excrement and other organic matter by the bacteria.
As already mentioned in the chapter on filters, certain beneficial bacteria, also referred to as nitrifying bacteria, are responsible for this task. Unfortunately these bacteria grow and increase very slowly.

Without a "helping hand" it would take about 2 - 3 weeks for the bacteria to multiply and settle sufficiently in the filter (and in the substrate). Characteristic for these 2 - 3 weeks of development and maturing is a nitrite level which initially rises very slowly to reach a high level before gradually sinking again. Fish should not be released into the new aquarium until the nitrite level has sunk once more to below 0.2 mg/l (measured with the **JBL Nitrite Test Set**). As experience shows that this 2 - 3 week waiting time greatly tests the patience of aquarium keepers, **JBL** has developed a bacteria preparation which shortens the waiting time.
With **JBL Denitrol** you can introduce a large number of beneficial bacteria to the aquarium right from the early stages. Follow the manufacturer's instructions. In addition, you should add half a feed tablet (**JBL Novotab**) to the water on the first day to further accelerate the increase in numbers of the bacteria. As a rule, you can begin to release fish into the aquarium from the fifth day onwards. Measure the nitrite level beforehand to check that it is under 0.2 mg/l.

Nitrite levels of under 0.2 ml/l are seldom measured in thinly-stocked aquarium with healthy plant growth. The aquarium water should be checked regularly, particularly at the beginning.

6.4 Oxygen

There is always sufficient oxygen available for all inhabitants of the aquarium in well-planted aquariums with CO_2 nutrients (small bubbles of gas are a sign of adequate supplies of oxygen).

Oxygen is the elixir of life for all the living creatures in an aquarium. Fish need it to breathe, the bacteria mentioned previously need it to carry out their vital work, and the plants have to breathe oxygen at night in order to survive. Sufficient levels of oxygen are essential for a healthy aquarium. To ensure adequate supplies of oxygen, the following steps should be taken: install the internal filter with the opening for the water to flow out about 2 cm below the surface of the water so that the water flowing out does **not produce a splashing current** on the surface. The water outflow of external filters be positioned accordingly. This enables sufficient oxygen to be absorbed by the water without expelling too much CO_2.

Do not use aerators. The assimilation of the aquatic plants during the day enriches the water with biologically produced oxygen.

7. PLANTS

7.1 Why living plants?

As well as their attractive and decorative effect, healthy plants have an entirely positive influence on the aquarium biotope. In photosynthesis, a unique chemical process to which all forms of animal life on earth owe their existence (including we humans), plants use the energy of light to synthesize a major part of their own substance from water and CO_2. Oxygen is produced as a waste product, released by the aquatic plants into the surrounding water. This provides the other inhabitants of the aquarium with a convenient and effective supply of vital oxygen. Of course, this process cannot take place at night (lack of light) and the plants have to breathe normally.

Healthy plants produce far more oxygen during the day than they consume at night. Living plants also provide ideal hiding places for young fish and sites where beneficial bacteria and micro-organisms can settle. These, in turn, serve as initial sources of feed for young fish. In aquariums with healthy plant growth, the fish fall ill less frequently than otherwise. Last but not least, plants are very pleasant to look at.

7.2 What plants need to survive

Plants have some needs which have to be met, in order that the beneficial effects described above can also be enjoyed in your aquarium.
You will find this easy using **JBL products** and bearing in mind the following tips.
Light is the source of energy which plants need for photosynthesis. This energy source can be supplied by a lighting system from an aquarists' store. Tips on the type of lighting and duration are given in the chapter on lighting.

Air root systems of indoor plants (e.g. philodendron) trailed into the aquarium will form a dense network, providing hiding places for the fish and absorbing harmful substances.

In evolutionary terms, plants are our oldest relatives, appearing on the planet over 40 million years ago. Plants produce many of the basic biological components of life. We probably sense this when we are unable to resist the fascination of a "green aquarium".

Remember to change fluorescent strips after a year, replacing them with ones of the same colour, even if they appear to be intact.
The most important nutrient required by plants is CO_2. A CO_2 nutrient unit such as **JBL PROFLORA CO_2** Set will provide this nutrient in an easily accessible form. Note that the aquarium should be at least 30 cm deep, which is normally the case for aquariums over 60 cm long. If this set proves too expensive at the beginning, careful selection of the types of plant will be adequate. In such as case it is important that

the low levels of CO_2 in the water are not reduced further by airstones or splashing filter return tubes.

Other important factors are the supply of mineral nutrients and trace elements from the ground-covering material and water. The ground cover should be made up of two layers as explained in the chapter on ground cover. The lower layer, with its reserves of nutrients carefully balanced to meet the needs of aquatic plants (**JBL AquaBasis Plus**), nourishes the plants through the roots. The upper layer of pre-washed aquarium gravel should have a particle size of 2 - 3 mm to ensure adequate circulation of the ground water.

Weekly supplements of **JBL Ferropol** staple fertilizer provide the plants with all the main nutrients which are less unstable and can therefore be given as a long-term supply. Essential trace elements, which are often deficient due to their sensitive reaction to oxygen, can be given as a supplementary dose each day in the form of the daily fertilizer, **JBL Ferropol 24**. Thus the plants are supplied with all the essential nutrients needed to be absorbed through their leaves. This prevents iron deficiency. The nutrients in **Ferropol** and **Ferropol 24** are carefully balanced so that the correct levels of fertilizer can be monitored using the **JBL Iron Test Set**. After about three years the reserves of nutrients in the lower layer of substrate will have diminished. Supplies can be boosted by providing the plants with J**BL 7 Pellets** placed strategically in the gravel. **JB**L offers a convenient starter set, **JBL ProFloraStart**, containing the three fertilizers described above, guaranteeing healthy plant growth from the outset: a carefully balanced nutrient substrate **JBL AquaBasis plu**s, the staple fertilizer **JBL Ferropol** and the daily fertilizer **JBL Ferropol 24**. These three products also constitute steps 1 – 3 of the new **JBL 7 Step Concept** for perfect aquatic plants which is described in more detail in Brochure No. 6 "Plant care".

A Dutch plant aquarium requires a great deal of time and skill. You should have some degree of experience before embarking on an aquarium like this one.

7.3 Selecting the plants

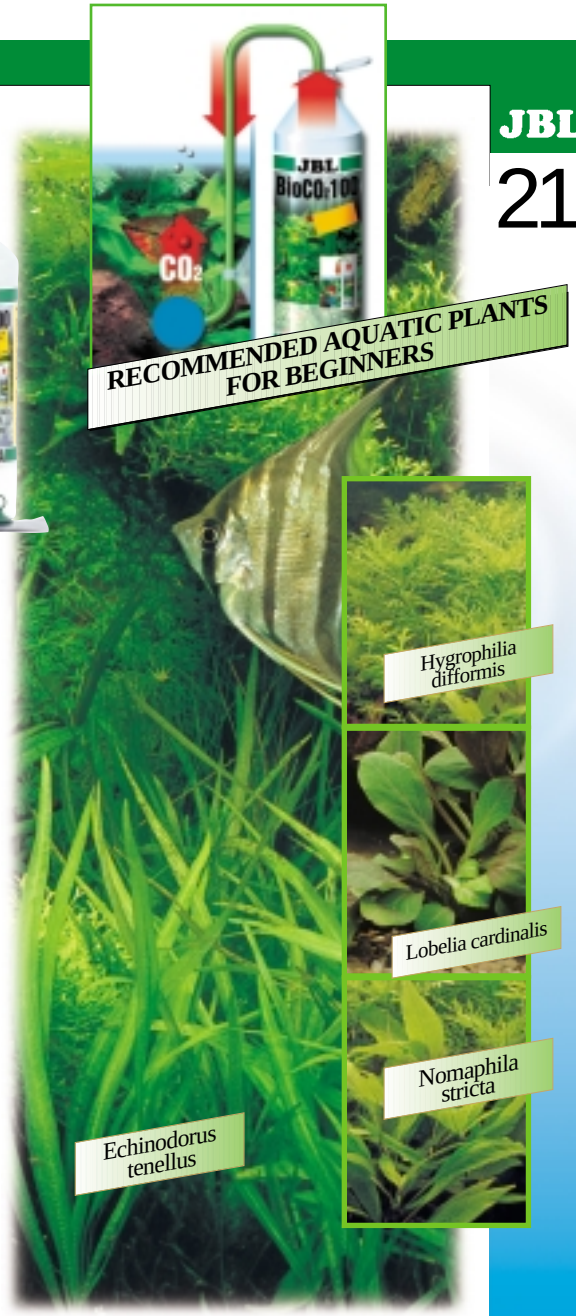
Before you begin selecting the plants for your new aquarium you have to decide whether the aquarium should be fitted with a CO_2 nutrient unit. If you wish to start without a CO_2 nutrient unit, you should limit your selection of plants to ones which are slow-growing. Fast-growing plants with a higher consumption of CO_2 would rapidly drive the pH levels up to 8. When purchasing plants, ask specifically for slow-growing plants which are easy to keep.

A good choice would be Cryptocoryne wendtii or affinis from the large family of Cryptocoryne or smaller species from the family of Echinodorus amazonicus.

The JBL BioCO$_2$ Set 100 provides aquariums of up to 100 l with an economical supply of CO_2, produced biologically by micro-organisms.

Ask your specialist supplier to show you slow-growing varieties which are easy to care for. If you decide to install a CO_2 nutrient unit from the beginning, you can choose from the full range and decorative variety of the aquatic plants stocked by aquarists' stores. With adequate supplies of the main nutrient, CO_2, both fast and slow-growing plants will thrive.

In either case, whether with or without CO_2, you should not skimp on plants at the beginning. Sparsely planted aquariums suffer far more from undesirable growths of algae. Select plants so that the aquarium presents a well-designed scene with visually pleasing appearance. Select plants for the background which grow up to the surface of the water. Medium-sized plants are suitable for the middle, with miniature species in the foreground. Long-stemmed plants and smaller foreground varieties are more effective planted together in larger groups in an appropriate space in the aquarium. Particularly attractive specimen plants can form a decorative feature.



Unfortunately, certain species of terrestrial plants with particularly decorative leaves are frequently "drowned" and forced into the role of aquatic plants. If any so-called "aquatic" plant with attractive red or white stripped leaves should remind you of house plants, do not buy it!

Such plants may be capable of surviving for a surprisingly long period of time underwater, however they are slowly but surely dying and polluting the water.
It's all a matter of supply and demand....

7.4 Planting

There are a few points to notice before planting the aquatic plants you have purchased from your aquarists' store. The aquarium should be filled with water at the correct temperature and the hardware (filter, lighting, heating) be operating correctly. Remove all metal ties, plastic pots, rock-wool and anything else attached to the lower end of the plants.

Trimming the roots and planting

Using sharp scissors, trim about 1/3 of the roots of rosette-shaped plants. Remove any rotten or dead leaves. Long-stemmed plants are usually sold with few, if any, roots. Remove only dead leaves or stems.

Before planting you should have some idea of how you wish to arrange the plants. It is helpful to draw a plan. Use the variety of shapes and colours available to form contrasts rather than a monotonous uniformity. Plants with feathery leaves are most effective near broad-leaved plants, light green next to dark green etc. Always arrange long-stemmed plants and miniature rosette plants in groups. Now, roll up your sleeves and off you go!

Carefully bed the ends of long-stemmed plants in the gravel. Plant the roots of rosette-shaped varieties deeper in the gravel, carefully pulling the plant out again until the junction between the roots and the leaves is level with the surface of the gravel. The plants need a lot of rest after planting to become established and acclimatised to conditions in the aquarium.

Fast-growing floating plants extract a lot of harmful substances from the water, particularly in the initial stages, look very attractive with their dense network of roots and are an ideal refuge for many fish. Of course, they have to be "harvested" after a time to allow more light into the aquarium.

7.5 Algae

Undesirable algae growth is the main cause of people abandoning the fascinating hobby of aquarium keeping. We would like to explain what steps you can take right from the beginning to prevent this happening to you. Algae are plants too and therefore need the same nutrients and environment as other aquatic plants. And another point: a little algae here and there is no cause for concern, it is an integral part of an aquarium. **No aquarium is ever completely free of algae!** But on the other hand there should not be too much algae either.

The more nutrients that are absorbed by healthy aquatic plants, the harder it is for algae to flourish. Therefore, healthy plant growth is the best insurance against unwanted algae. If plant growth is disturbed e.g. by constant fiddling about in the aquarium, frequent re-siting of the plants, changes in lighting (light colour) etc., algae may take the upper hand.

As a lower life-form, algae can adapt more readily to new conditions, vigorously sprouting forth and taking advantage of the nutrients which the plants are unable to utilize because of the disturbances. There is one more thing that they love: the nutrients, nitrate and phosphate. For this reason, **JBL**'s aquatic plant food contains **neither nitrates nor phosphates** as these nutrients are provided by the metabolism of the fish.

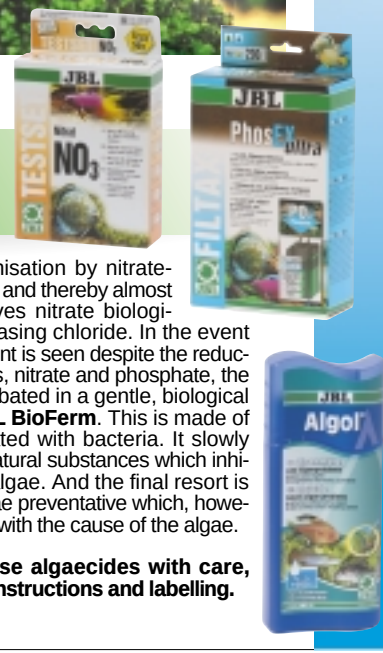
An aquarium has a high risk of algae developing during the first few weeks after it has been started up. The plants must first adapt to their new habitat and require hardly any nutrients during this time. Wait for two weeks after planting, when the plants should have begun to grow, before giving regular doses of **JBL Ferropol** or **JBL Ferrotabs**. Any growths of algae in this period should be removed.

Algae-eating fish, which should be included in the planning of the "aquarium inhabitants", play a useful role in the fight against unwanted algae. Small catfish e.g. Otocinclus or live-bearing poecilia (Mollys, Guppys, Platys) should be considered. Young fish of the Siamese barbus are insatiable consumers of algae. Unfortunately they become somewhat quarrelsome in their old age and not so fond of their "greens".

Small shrimp which tirelessly devour algae are becoming more and more common in specialist shops. Personal favourites of the author are the caridina and neocaridina species, with some very interestingly coloured breeds.

Algae-eating fish, such as these Siamese barbs, are useful helpers in the battle against unwanted algae.

MEASURES AGAINST VIGOROUS ALGAE GROWTH



Regular partial changes of water and frugal feeding prevent increases in the nitrate and phosphate levels of the water. Nitrate and phosphate levels can be reliably tested with the **JBL Nitrate Test Set** and the **JBL Phosphate Set**.

Test your tap water too. This is often the source of problems.

In order to filter phosphate and nitrate out of the aquarium water, **JBL** has developed three highly efficient special filter materials. **JBL PhosEx Ultra** binds excess phosphates quickly and reliably without releasing them again. **JBL NitratEx** is an ion-exchange resin which binds mainly nitrates and converts it to chloride. It can be regenerated using salt. **JBL BioNitratEx** is a filter material which encourages colonisation by nitrate-absorbing bacteria and thereby almost completely removes nitrate biologically, without releasing chloride. In the event that no improvement is seen despite the reduction in the nutrients, nitrate and phosphate, the algae can be combated in a gentle, biological manner using **JBL BioFerm**. This is made of barley straw, treated with bacteria. It slowly releases certain natural substances which inhibit the growth of algae. And the final resort is **JBL Algol**, an algae preventative which, however, does not deal with the cause of the algae.

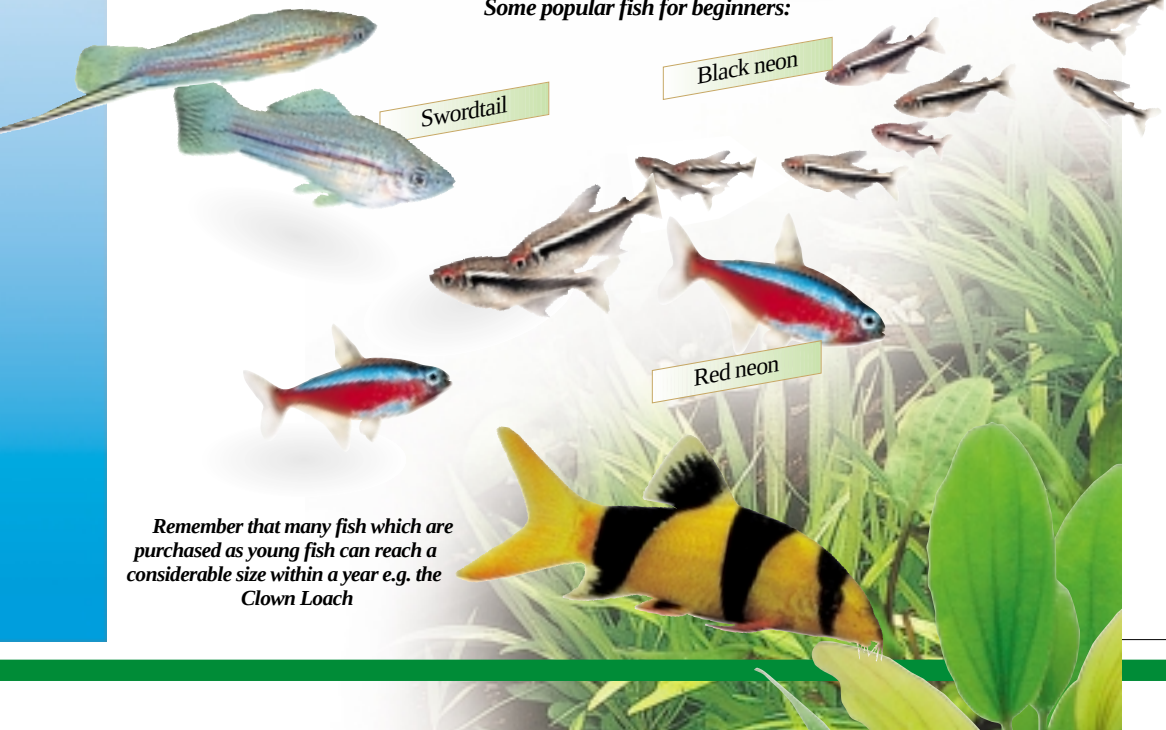
Legal caution: use algaecides with care, always read the instructions and labelling.

8. THE FISH

8.1 Selection

We wish to leave the choice of fish up to you, with the specialist advice of your aquarists' supplier. When buying fish, you should insist on species that are easy to look after, which are suited to the size of your aquarium and which are compatible. Useful fish for novices are live-bearing poecilia which help to keep down the levels of unwanted algae, as mentioned previously. These fish also have interesting breeding habits: they are live-bearing as their name says. With a little luck, you will soon be able to experience the "happy event" in your aquarium. Other fish families make interesting fish for beginners e.g. tetras, barbs or gourami. Ask for advice. Algae-eating fish, mainly from the catfish family, should be amongst your selection.

Some popular fish for beginners:



Remember that many fish which are purchased as young fish can reach a considerable size within a year e.g. the Clown Loach

8.2 How many fish?

Exercise restraint in the total number of fish. When the nitrite test gives the go-ahead, start with a few fish. After 1 - 2 weeks, when you have confirmed that everything is running smoothly, you can add a few more. This gives the filter bacteria time to adapt to the amount of waste produced by the excrement from the fish. As a general rule of thumb for the density of fish recommended for an aquarium, allow 1 cm fish per litre of water. This applies to fully grown fish. Since all fish are usually sold as young fish, you should allow enough leeway in your calculations. Ask your supplier about the final size of the fish.

Over-stocking the aquarium increases the risk of unwanted algae growth.

port bag until the volume of water in the bag has approximately doubled.

3. *Remove the transport bag from the aquarium and carefully shake the contents over a bucket into a net. Release the fish into the aquarium, Alternatively, catch them directly in the transport bag using a net.*

The transport water should be poured away.

Having bought your future charges, take the transport bag and contents home as quickly as possible. Do not shake unnecessarily and keep the bag dark (newspaper etc.) to avoid frightening the fish. If you wish to catch a fish, be calm and patient. Patience and cunning usually bring quick rewards and save damaging the aquarium decorations.

8.3 Introducing the fish

When the great day has at last arrived and you stand in front of your aquarium with your newly-acquired housemates, it is time to release them into their new home in the correct manner. The following procedure has proved successful, (you will also find these instructions on the rear of the JBL Fish Transport Bag which your aquarists' supplier may use):

1. *First switch off the lighting. Place the closed transport bag on the surface of the water and let it float there for about 15 minutes.*
2. *Open the transport bag and attach it, open, to the side of the aquarium (e.g. with a washing peg). Carefully fill water, a little at a time, from the aquarium into the open trans-*

The lighting may be switched on again one or two hours later.
Do not feed until the next day.

Add **JBL Acclimol** to the water immediately to quickly remedy any transport stresses and avoid damage to the vital mucous membranes of the fish.

JBL Acclimol, with valuable plant extracts and vitamins, strengthens the immune system of fish, reducing the risk of disease and helping the fish to acclimatise to their new surroundings.

Always add **JBL Acclimol** to the aquarium water after working in the aquarium or introducing new fish.

8.4 FEEDING THE FISH

Feeding the fish is one of the most important and pleasurable routine jobs which now links you with your aquarium.

JBL, with its varied series of feeding materials designed to meet the specific needs of the fish, ensures that your fish are always offered a wide selection of menus. Under the name, Novobel, you will find a staple food made up of over 50 raw materials, which meets the daily needs of your fish. Variety and colour is offered by the staple food Novocolor and the premium food GALA.
In addition there are many special feed sorts for the more specialized fish e.g. tablets for ground feeding fish and for plant-eaters, **NovoTa**b and **NovoFect**.

A special type of food should be mentioned: **JBL NovoPleco**. This food contains a high level of wood fibre and is absolutely vital for the popular ancistrus and other plant-eating armoured catfish.

More detailed information on feeds and nutrition is to be found in our brochure "**What - Why - How?", Book 3**.

However, we would like to give you some important tips on feeding at this point. Most beginners make the mistake of feeding too much too often. Bear in mind that fish in the wild do not always find something to eat and therefore constantly hunt for food, which can easily tempt novices to give too much food.

Since the fish you have purchased are usually young fish which are still growing, as we mentioned previously, you should scatter as much food on the surface of the water as is consumed in **2 - 3 minutes without any leftovers**. Do this three times a day. Later, when the fish are fully grown, 1 - 2 feeds per day given in the same manner will be sufficient. Allow the fish to fast for a day occasionally by giving them nothing to eat. Do not use feeding rings. These concentrate the feed in too small an area with the result that smaller and more timid fish will often have insufficient food.
Open boxes of feed should be kept in a dark, cool and dry place to prevent any deterioration in quality. As manufacturer we guarantee the freshness and vitamin content of the feeds by stamping a use-by date on the container and hermetically sealing the tubs. The vitamins and other essential ingredients in the feeds have a limited shelf life once the container has been opened. We therefore recommend that you buy feed in quantities which will be used up within 2 - 3 months. The tempting bargains of large boxes or even buckets of feed are detrimental to the health of your fish in the end.

Varied, high quality, meeting nutritional needs, you cant go wrong with the JBL food range.

All **JBL food products** are produced strictly according to need, guaranteeing that the ingredients are absolutely fresh.

Varied, according to need, high quality – you can't go wrong with the JBL food range.

8.5 FISH DISEASES

There is one unfortunate aspect of fishkeeping which we need to mention: fish can become ill.

As a rule, diseases are a sign of inadequate maintenance. Any successful treatment must therefore be followed up with a review of maintenance procedure and improvements in care.

The most common fish disease is white spot or ichthyophthirius, which can be identified by a large or small number of little white spots on the fins and body of the fish. This disease can be easily and safely remedied with **JBL Punktol**. You should always keep a bottle of this medication at home.
It should never be used as a prophylactic, but only when symptoms of the disease have been identified.

Fish diseases, such as white spot disease shown here, occur seldom if fish are kept correctly.

More details on fish diseases and their treatment can be found in our brochure

"What - Why - How?" Book 4.

9. MAINTENANCE

Since most beginners tend to work on the principle of "you can't have too much of a good thing", we would like to give a realistic view of the maintenance tasks which are necessary.

Daily:

The most important item is, of course, feeding the fish. Remember the tips given in the previous chapter.
At the same time you should use this opportunity to observe all the fish, noticing any injuries, parasitic infections or incompatibility. Do ask the advice of an experienced aquarium keeper or your specialist aquarium supplier, a beginner often tends to interpret every unfamiliar movement as a sign of illness.
Check the temperature and that other equipment is operating normally.

Once a fortnight:

The most important fortnightly maintenance task is a partial change of water, adding nutrients for the aquatic plants. Take out about 30% of the aquarium water using either a siphoning tube or **JBL AquaEx**, mentioned earlier, and replace the water with tap water at the correct temperature. When siphoning out the water you can also carefully remove any detritus you may notice. This is easy to do using **JBL AquaEx**. Take care not to plough up the gravel in the process. Remove dead plant leaves and adjust plant growth if necessary.

If the filter flow has reduced significantly, wash the filter material as described previously. Add any nutrients and water conditioner according to the amount of fresh water (**JBL Ferropol** and **JBL Biotopol**).

Since carrying full, or even overflowing, buckets of water through the house may cause some protests from your nearest and dearest, here's a tip: a long hose from the aquarium directly into the "smallest room in the house" avoids annoying puddles on your expensive living room carpet.

As required:

Remove unsightly algae growth from the inner surface of the front panes of your aquarium. The outside of the glass should also be cleaned now and then to remove any fingerprints and give a clear view of the fish. Test the aquarium water occasionally, not only as part of a partial water change, as described in this brochure, adding any nutrients or additi ves which may be lacking.

The best care you can give your aquarium is to let it grow undisturbed. Too many adjustments are often made in an aquarium, new fish or plants are added, decorations moved etc.

And now we hope you have many entertaining "fish-filled" hours of fun with your new aquarium.

10. LITERATURE

We particularly recommend this book:

Dreyer, Stephan; Keppler, Rainer:
How to have a successful aquarium,
t.f.h. publications Inc.
Franckh-Kosmos, Stuttgart 1993
(new edition in preparation)

JBL

Your specialist aquarists' retailer
will be pleased to advise you and recommend
further reading including the other

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on further topics from aquaristics

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