YOUR OWN GROWTH

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A new born baby may look defenceless but in fact it comes well equipped to cope with the demands of this new world from the moment it emerges.

The Living Cell

Every living thing on earth whether plant or animal is made up of cells from the tiniest insect to the giant Banyan tree. Some life forms like protozoans and bacteria consist of only one cell, while the human body is made up of billions of cells. But each human being too begins life as a single cell: the fertilized egg in the womb. From the fertilized egg implanted in the womb human life takes us through many rich and rewarding phases.

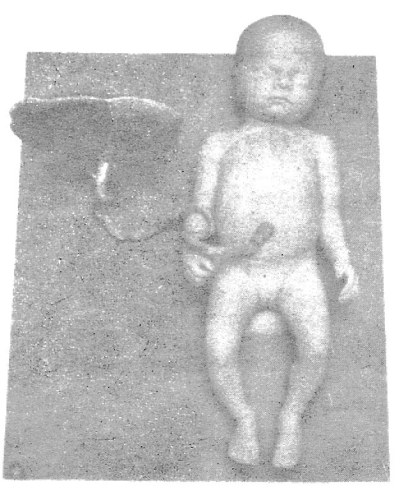
A new life begins

At one month the fertilized ovum has become a rapidly growing embryo. Only half a centimetre long, it now has a recognisable head and tail and the rudimentary heart is well developed. The embryo is attached to the mother's body by the umbilical cord. Blood, oxygen and nutrients pass from the mother to embryo, while at the same time its waste products are removed.

After six weeks we can distinguish the limb buds, short arms and legs.

By two months the embryo is

Human Foetus



recognisably human will all its fingers and toes. Only two and a half centimetres long it is now called a foetus. By the beginning of the third month the foetus can move about freely in the surrounding fluid. Muscles and nerves have developed enough to respond to bright light. All the body systems are present: it is obvious from the external sex organs whether it is a boy or girl. Over the next month the foetus will grow to nearly twelve and a half centimetres in length.

The five month foetus opens its eyes, and it kicks and movements can be felt clearly by the mother. With a stethoscope, the rapid heartbeat can be heard. The mother is now visibly pregnant. Although all the organs are present the foetus in not yet able to survive apart from its mother.

By the seventh month the foetus is fully formed in every detail, including eye lashes and finger- and toe-nails. If the foetus is born now, it will be very small weighing around 1000 grams and 30 centimetres long - but it may survive in an intensive care unit in a specialized hospital.

During the last two months of pregnancy, the foetus trebles in size while organs like the brain and lungs develop fully. At nine months the foetus is very cramped inside the mother's body. The baby is now said to be at term and is ready to lead an independent life. As soon as the baby is born the umbilical cord that has kept it alive for nine months stops transporting blood from the mother, and the infant embarks on an independent existence.

The infant

A new born baby may look defenceless but in fact it comes well equipped to cope with the demands of this new world from the moment it emerges.

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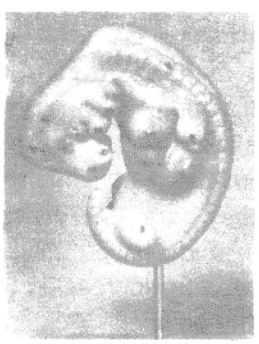
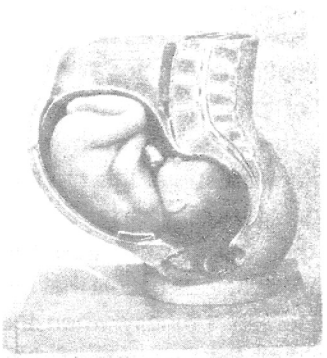
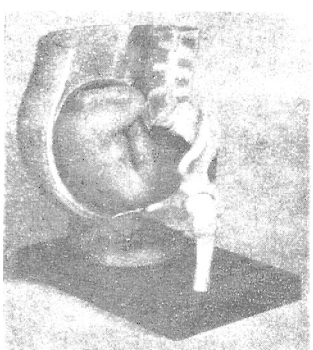
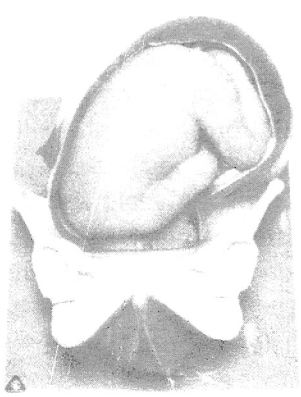
Human Birth

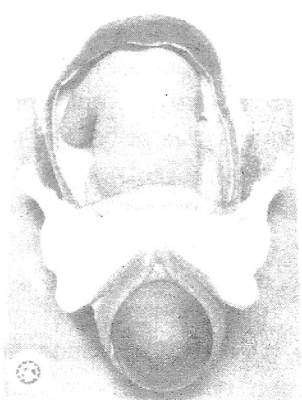


Embryo









Breastfeeding is impor tant for the new born, it provides the right balance of nutrients, and also provides immunity against infection. It also provides bonding between mother and infant. The newborn infant spends most of its time sleeping. It seems helpless but it is already learning to focus its eyes and to communicate by crying.

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The six month old infant can sit by itself and use its hands to explore, sounds like music attract its attention.

At ten months a baby recognises a growing number of faces, limbs and muscles develop and become co-ordinated and the baby starts to crawl.

At one year the baby picks up objects with thumb and finger and takes its first steps. The child of two walks, talks,feeds itself and learns to play with others.

The Adolescent

Puberty is the time when boys and girls develop sexual maturity to reproduce - to become parents. Changes in hormones, the body's chemical messenger causes the external sexual characteristics to develop.
Girls begin to mature around the age of 11 about two years earlier than boys. They grow several centimetres. Their bodies become rounded at the hips, and breasts swell as layers of fat develop under the skin; pubic hairs appear; and they start to menstruate. Boys grow suddenly after the age of 13 . Their voices break and they begin to produce semen. In a few short years young people pass from childhood to adulthood physically: emotional development usually occurs later on.

In traditional cultures puberty for both sexes mean passing f rom infantile to adult society. Often there is a ceremony, which may last a few hours to a few months. The initiation can include gruelling tests of physical endurance to mark the initiation. In some communities during this time, the young people may be taken away from their homes and taught the laws and religious beliefs that bind each society. Finally when they rejoin their families they will have the same burdens and responsibilities, which include marriage and child bearing. The demands made on young people in the Sri Lankan society are different. They will continue to live at home - no longer children - but not yet full members of a grown up world. Puberty comes late and adulthood follows quickly in traditional societies. In industrialized nations there is a long adolescence an in between time tha t can last for more than ten years. Many opposing forces that are at work during these years - forces that are often strong enough to make life a perpetual battle for adolescents and adults alike. Rapid change in hormones during adolescents produce strong emotions which are somehow difficult to cope with: passionate enthusiasm and hatred and above all the strange new feelings which accompany the dawn of sexuality.

As adolescents gain in physical maturity and increase their intellectual capabilities, they must struggle for the emotional maturity to go with them. They need to establish their independence - to make their own judgments and their own mistakes. They often choose a life style directly contrary to their parents values in order to make their voices heard. Of all the animal species on earth human beings have the longest period of early development: human young are helpless at birth: take about 13 years to reach sexual maturity; continue to grow until they are in their third decade; and have an infinite capacity for increasing their reasoning powers.

The human being

Man belongs to the class of mammals and is descended like all mammals from a tiny shrew-like animal that first appeared on earth about 200 million years ago. As time passed mammals developed into a wide variety of animals ranging from the tiny field mouse to the giant whale. After going through many stages and transitions mod-

ern man, homo sapiens sapiens, finally evolved and since his appearance on earth has come to be the dominant animal on it.

Only the first quarter of the human life span is taken up with the process of physical growth. But that is only one aspect of human development. Intellectual and psychological growth are as important a part of the mature individual as is a well developed body.

The human body

The human body is a complex organism made up of more than fifty thousand million microscopic cells. With its superior structure and mechanisms (including a massive forebrain) it gives us a far wider repertoire of skills and activities than any other creature on earth. It is very difficult to imagine what the cell - the basic building block of all living things - is really like, harder still to picture what goes on inside it. Most cells are very small - far too small to be seen with the naked eye. The largest of human cells, the egg or ovum is only pinpoint in size.

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It is only in the laboratory, using powerful microscopes, that research scientists have been able to study the minute structures of the living cell and to watch the busy goings-on within its walls. The cell is a place of great activity, like a miniature factory working 24 hours a day. Its "business" is concerned with growth, repair and reproduction.

All living things must renew themselves continuously. They do this by replacing worn out parts. In the human body some 300 million body cells die each minute, but these are soon replaced when nearby cell reproduce by the process know as mitosis. In childhood the body produces cells so rapidly that it actually grows in size; at maturity mitosis slows down. Not all body cells have the same life span: some cells survive only a few weeks, while others live for many years. Whether we are awake or asleep our body system remains active, carrying out all the routine functions which are essential to life. Expanding and contracting like a pair of bellows, the lungs of an adult human being process around 13,000 litres of air a day. The kidneys which together weigh only 300 grams cleanse the impurities from some 1500 litres of blood in the course of one day. Most tireless of all, it often seems is the heart. A powerful muscle roughly the size of its owner's fist, it pumps 12,000 litres of blood a day. More than 200 individual bones and some 650 voluntary or skeletal muscles combine to give the human body its characteristic shape and tone. Linked by strong connecting tissue-cartilage tendons and ligaments-they work together to allow an infinite range of movement from every day walking, sitting and standing to the graceful movements of a ballet dancer, or the super charged achievements of an athlete or manual worker.

After 20 years or so of growth and development the single fertilized egg has become a fully-formed adult. Even beyond this time, however certain glands as well as the nervous system continue to mature slowly.

In industrialised societies the average height of a women is 1.6 metres, for a man 1.77 metres, where nutrition and health services are not as high people do not grow as tall. Average body weight is around 54 kilograms for women and 75 kilograms for men. We all know what individuals of different sizes weigh, but what is more fascinating is to know what proportion each part of the body contributes to its overall weight. We see comparative figures based on a man of average size weighing around 73 Kgm.

The human life span in developed nations is now over 70 years due to improved living conditions and medical care. Women usually live longer than men. Although we often complain that life is too short human beings are almost the longest lived animals on earth. Only the giant tortoise at 150 years exceeds the human span. In contrast the elephant has a life span of 60 years, lion 30 years, dog 20 years, rabbit 12 years and a mosquito 1 day. Healthy development,

though among the most critical factors, is but one component of youth. The health of youth rests on a foundation of a well nourished and nurtured childhood, relatively free of serious and debilitating infections and illnesses.

Looking after your body

The normal physical growth and development of adolescence may be adversely affected by inadequate diet, untimely or inappropriate physical stress on the growing body. Diet plays an important part in maintaining good health. Junk food such as sweets, ice cream, Coca cola and chips do not contain the necessary flow of nourishing food which are required for maintaining the biological system of body structure, cell resistance and repair. The well known body building blocks are carbohydrates, protein and fats and wide range of vital substances such as vitamin and mineral elements, fibre and water.

Exercise also keeps the body fit. It makes your heart and lung muscle stronger. There are many things you can do to look after your health; visiting a dentist regularly ensures your teeth and gums are healthy. Have an optician check your eyes. Make sure you have all the necessary vaccinations against preventable diseases like tuberculosis, whooping cough, tetanus, polio.

A caring and stable home environment that encourages gradually increasing independence and sets appropriate limits will build up self esteem in the adolescent and lead to health enhancing achievements in school, at work, at sports and in new relationships. The combination of instability in the family with excessive negative pressures in the environment is more likely to lead to health damaging behaviour such as the use and abuse of tobacco, alcohol and other drugs, poor eating and oral hygiene habits, excessive risk taking on the road, at work, at home and in leisure activities, intentional violence to oneself or others and mental breakdown.

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Human numbers

While our own bodies grow and develop the human population is also on the increase. It took 1830 years for the world's population to reach 1 billion. It then took 100 years for the population to reach 2 billion (by 1930) by 1960, 30 years later the 3rd billion was reached. 15 years later in 1975 the population had grown to 4 billion, 12 years later in 1987 the world's population was 5 billion and it is predicted that by 1998 the world's population will reach 6 billion. In 1995 there will, according to the World Bank, be 512 million young people aged 15-19,262 million boys and 250 million girls, 426 million of them (83 percent) will be living in developing countries.

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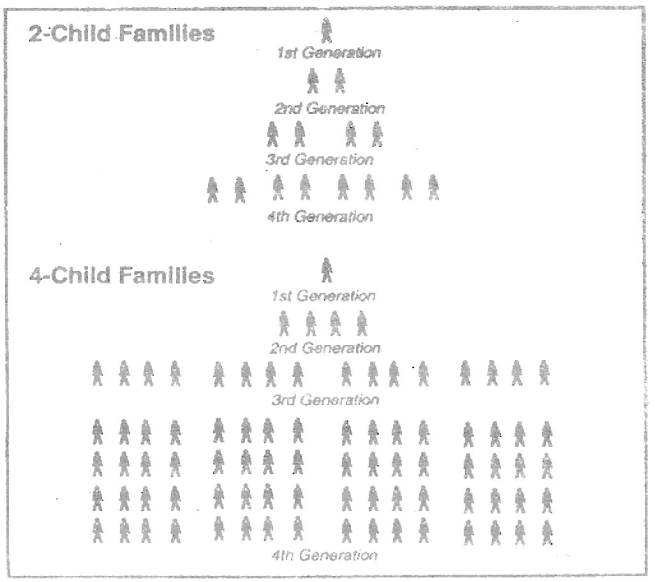
Consider the alternative consequences of a couple's fertility. If a couple had four children and these children and their own children in turn each had four children the couple would have 64 great grand children (4x4x4 = 64). If instead, this couple had only two children, and they and their children each had two children, the couple would only have 8 great grand children (2x2x2 = 8). Even small fertility differences translate into large differences within a few decades. Like compound interest applied to financial savings, high fertility rates produce ever-growing future populations.

Bigger Families Faster Population Growth

For Generation of 2-Child and 4 Child Families

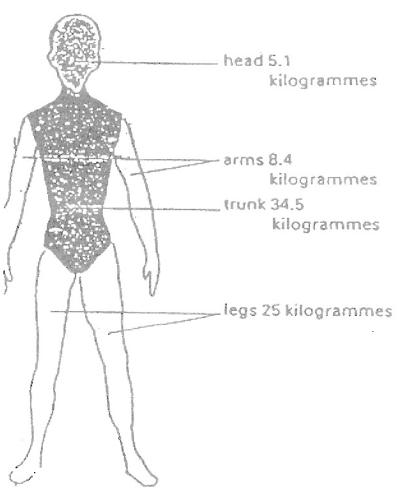


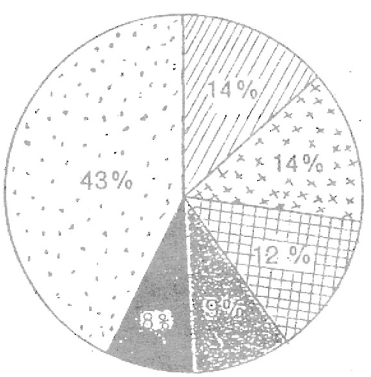
And what of the future ? Each day the world's population increases by approximately 250,000 people, and each of these people need a portion of the earth's resources for food, shelter, energy and water. In just 31 years, by the year 2025, human numbers may be 50% more than they are today- the largest population growth ever seen in so short a time. By the end of this decade, more than half of the developing countries, may be unable to feed their own population from their own lands. Nearly half of the world's people will lack sufficient fuelwood. Within three decades carbon dioxide emissions from energy use in developing countries could triple. Within about four decades readily accessible supplies of oil will be exhausted. Global warming could raise the oceans by one metre, flooding coasts and displacing millions.

We need to take care of our own growth and development, so we will become more healthy and productive adults; similarly the growth of the world's population should be taken care of so that the world will be a better place for all the youth of today and the youth of the generations to come.

WEIGHTS AND MEASURES

We all know roughly what people of different sizes weigh, but what is more fascinating is to know what proportion each part of the body contributes to its overall weight. Here (below and at right) we see comparative figures based on a man of average size, weighing around 73 kilogrammes.





muscles 31.4 kilogrammes

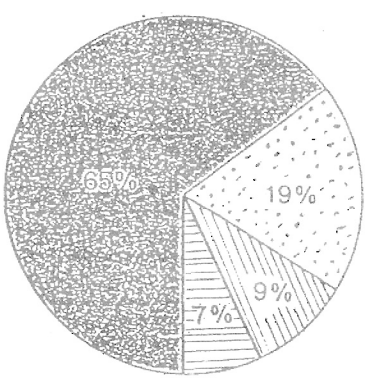
bones 10.2 kilogrammes

fat 10.2 kilogrammes

internal organs 8.7 kilogrammes

connective tissue 6.6 kilogrammes

blood 5.9 kilogrammes



A percentage breakdown of the major chemical elements of the human body gives us the following comparisons:

oxygen 47.5 kilogrammes

carbon 13.5 kilogrammes

hydrogen 6.9 kilogrammes

other elements 5.1 kilogrammes

From these calculations we can see immediately that muscle – the raw material of movement – is by far the most abundant body tissue, accounting for almost a third of our total bulk. Life-giving oxygen is the dominant element.