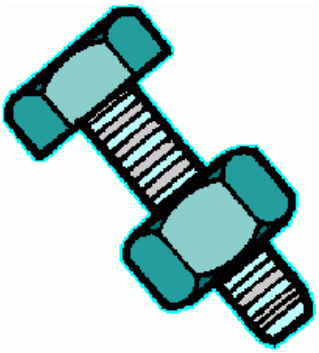
ΑΝΑΜΝΗΣΙΣ



ΜΕΡΟΣ Α

ΜΕΡΟΣ Β

Macrophages
Microphages

ΜΕΡΟΣ Γ

Composition / Animation
Schematic scenic representation

by

Dimitri Voudouris
[1961-]

2007- 2008

for

Birds
3 Actors
Audience
24 Trumpets
Paintball Guns
8 Microphones
3 Megaphones
50 Piccolo flutes
Sound Projection
Triggered lights
3 Inflatable balls with beads
Computer assisted music processing
3 Transparent screens with projectors
16 Dancers some on roller-skates and stalls
20 Children barring banners and remote control toys
Mixed choir [split in 3 groups] with short-wave receivers

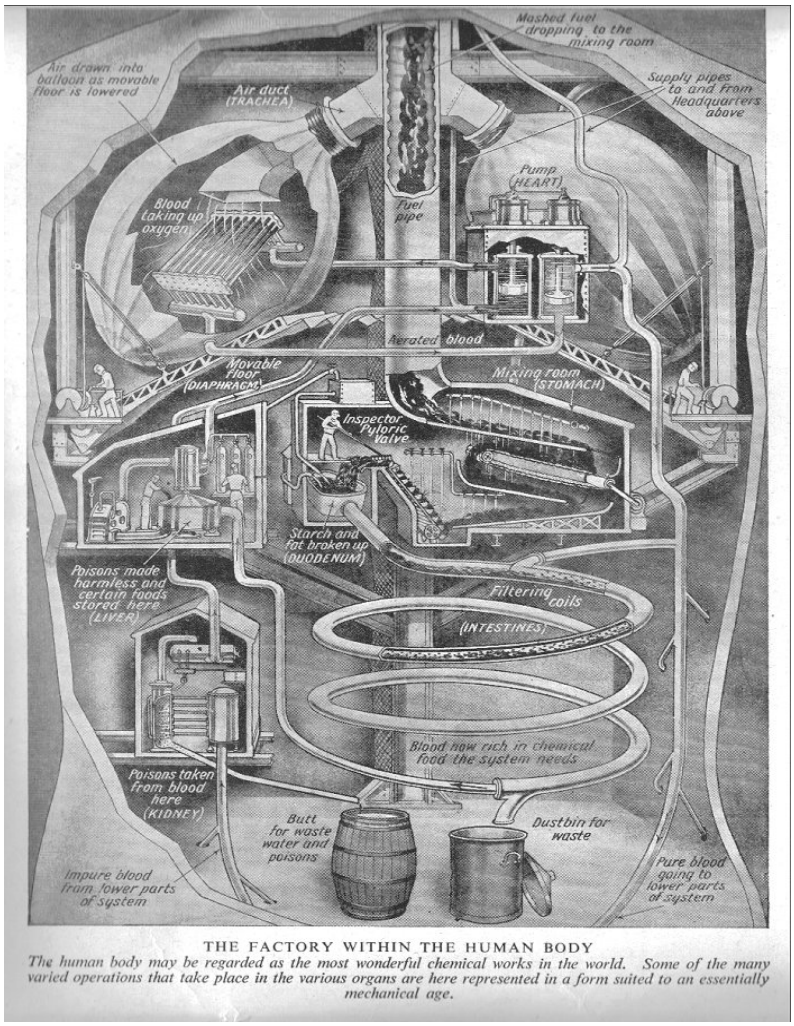
The procession takes place in an abandoned factory

INDEX **Page**

Introduction

Inside the body there is an amazing protection mechanism called the immune system. It is designed to defend against millions of bacteria, microbes, viruses, toxins and parasites that would love to invade your body. To understand the power of the immune system, all that you have to do is look at what happens to anything once it dies.

When something dies, its immune system (along with everything else) shuts down. In a matter of hours, the body is invaded by all sorts of bacteria, microbes, parasites... None of these things are able to get in when your immune system is working, but the moment your immune system stops the door is wide open. Once you die it only takes a few weeks for these organisms to completely dismantle your body and carry it away, until all that's left is a skeleton. Obviously your immune system is doing something amazing to keep all of that dismantling from happening when you are alive.



THE FACTORY WITHIN THE HUMAN BODY

The human body may be regarded as the most wonderful chemical works in the world. Some of the many varied operations that take place in the various organs are here represented in a form suited to an essentially mechanical age.

Innate Immunity

The human body has the ability to resist almost all types of organisms or toxins that tend to damage the tissues and organs.This capacity is called *immunity*. Much of the immunity is caused by a special immunity system that forms antibodies and sensitized lymphocytes that attack and destroy the specific organisms or toxins.This type of immunity is called *acquired immunity* . However, an additional portion of the immunity results from general processes rather than from processes directed at specific disease organisms.This is called innate immunity. It includes the following:

- Phagocytosis of bacteria and other invaders by white blood cells and reticuloendothelial cells.
- Destruction of organisms swallowed into the stomach by the acid secretions of the stomach and by the digestive enzymes.
- Resistance of the skin to invasion by organisms.
- Presence in the blood of special chemical compounds that attach to foreign organisms or toxins and destroy them.

This innate immunity makes the human body partially or completely resistant to some paralytic virus diseases of animals, hog cholera, cattle plague, and distemper.

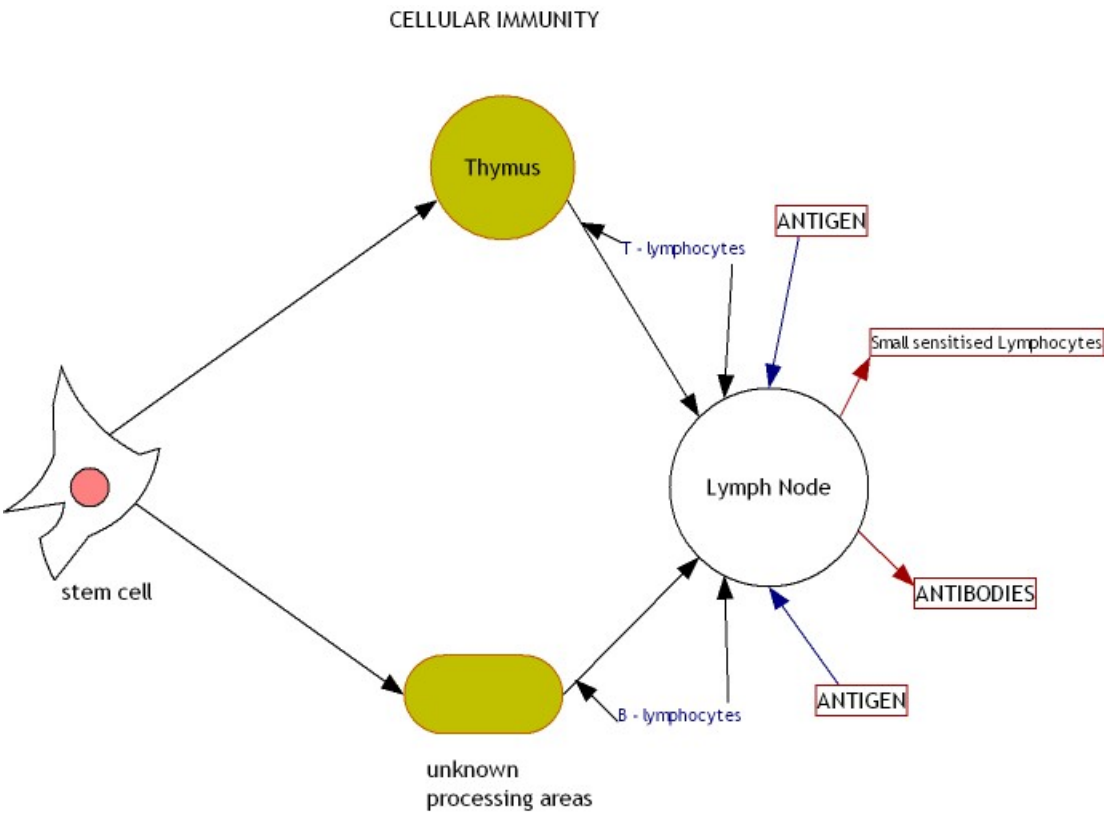
Acquired Immunity

In addition to the innate immunity the human body also has the ability to develop extremely powerful specific immunity against individual invading agents such as lethal bacteria,viruses, toxins and even foreign tissues from other animals.This is called *acquired immunity.*
This system of acquired immunity is important as a protection against invading organisms to which the body does not have innate immunity.The body does not block the invasion upon first exposure by the invader. However within a few days to a few weeks after exposure,the special immune system develops extemely powerful resistance to the invader. The resistance is highly specific for that particular invader and not for others.
Two basic types of acquired immunity are:

- Humoral immunity
- Cellular immunity

Antigens

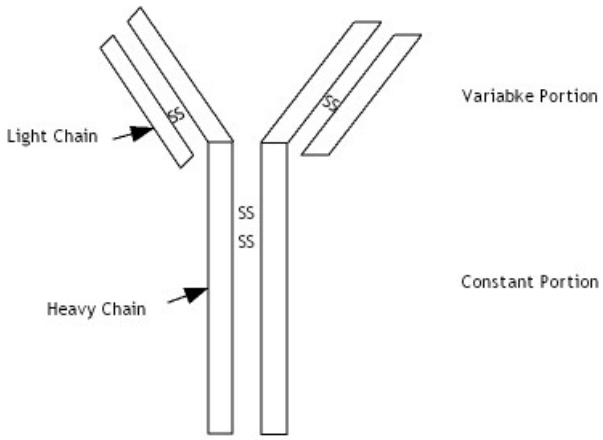
Each toxin or each type of organism contains one or more specific chemical compounds in its make-up that are different from all other compounds.In general,these are proteins,large polysaccharides,or large lipoprotein complexes, and it is they that cause the acquired immunity. These substances are called antigens. Essentialy all toxins secreted by bacteria are also proteins,large polysaccharides, or mucopolysaccharides,and they are highly antigenic.
For a substance to be antigenic it usually must have a high molecular weight, 8,000 or greater.Furthermore antigenicity depends upon regularly recurring prosthetic radicals on the surface of the large molecule, which explains why proteins and polysaccharides are almost always antigenic, for they both have this type of stereochemical characteristic.



Formation of antibodies and sensitised lymphocytes
by a lymph node in response to antigens

Specific attributes of Humoral Immunity-The Antibodies

Antibodies are formed in the plasma cells of Lymph node at a rapid rate of 2000 molecules per second for each cell.The antibodies are secreted into the the lymph and are carried to the ciculating blood.



Structure of the typical IgG antibody, showing it to be composed of the two heavy polypeptide chains and two light polypeptide chains. The antigen binds at two different sites on the variable portions of the chains

Mechanism of action of antibodies

Direct action of antibodies on invading agents

- **Agglutination**

In which the muliple antigenic agents are bound together in a lump.

- **Precipitation**

In which the complex of antigen and antibody becomes insoluble and precipitates.

- **Neutralisation**

In which the antibodies cover the toxic sites of the antigenic agent.

- **Lysis**

In which some very potent antibodies are capable of directly attacking membranes of cellular agents and thereby causing rupture of the cell.

The complement system for antibody action

- **Lysis**

The proteolytic enzymes of the complement system digest portions of the cell membrane,thus causing rupture of cellular agents such as bacteria or other types of invading cells.

- **Opsonization and phagocytosis**

The complement enzymes attack the surfaces of bacteria and other antigens, making these highly susceptible to phagocytosis by neutrophils and tissue macrophages. This process is called *opsonization.* It often enhaces the bacteria that can be destoyed many hundredfold.

- **Chemotaxis**

One or more of the complement products causes chemotaxis of neutrophils and macrophages,thus greatly enhancing the number of these phagocytes in the local region of the antigenic agent.

- **Agglutination**

The complement enzymes also change the surfaces of some of the antigenic agents so that they adhere to each other,thus causing agglutination.

- **Neutralization of viruses**

The complement enzymes frequently attack the molecular structures of viruses and thereby render them nonvirulent.

- **Inflammatory effects**

The complement products elicit a local inflammatory reaction,leading to hyperemia,coagulation of proteins in the tissues,and other aspects of the inflammation process,thus preventing movement of the invading agent through the tissues.

Activation of the Anaphylactic system by antibodies

- **Histamine**

Causes local vasodilation and increased permeability of the capillaries.

- **Slow-reacting substance of anaphylaxis**

Causes prolonged contraction of certain types of smooth muscle such as bronchi.

- **Chemotaxic factor**

Causes chemotaxis of neutrophils and macrophages into the area of antigen-antibody reaction.The chemotaxic factor,especially,causes chemotaxis of large numbers of eosinophils into the area.Eosinophils play a special role in phagocytizing the products of the antbody-antigen reactions.

- **Lysosomal enzymes**

Elicit a local inflammatory reaction.

Specific attributes of Cellular Immunity

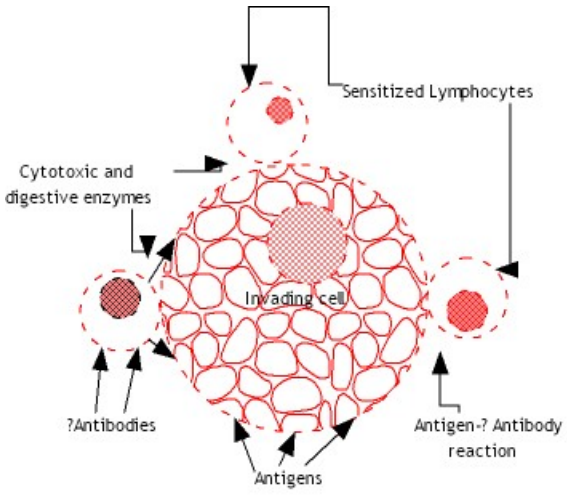
Release of sensitized lymphocytes from lymphoid tissue.
Persistance of Cellular Immunity.
Types of organisms resisted by sensitized lymphocytes.

Mechanism of action of sensitized Lymphocytes

It destoys the invader either directly or indirectly

Direct destruction of invader

The immediate effect is swelling of the sensitized lymphocyte and release of cytotoxic substances from the lymphocyte to attack the invading cell.The cytotoxic substances are lysosomal enzymes manufactured in the lymphocytes.The direct destruction of the invading cell are weak in comparison to the indirect method.



Direct destruction of an invading cell
by sensitised lymphocytes

Indirect destruction of invader

When the sensitized lymphocytes combine with their specific antigens,a number of different substances are released into the surrounding tissue.

- *Release of Transfer factor*

The sensitized lymphocyte releases a polypeptide substance called the Transfer factor.This then reacts with other small lyphocytes in the tissues that are of the nonsensitized variety.They intern take on the same characteristics as the original sensitized lymphocytes.Thus the Transfer factor recruits additional lymphocytes having the same capability for causing the same cellular immunity reaction as the original sensitized lymphocytes. Thus this effect multiplies the effect of the sensitized lymphocytes.

- *Attraction and Activation of Macrophages*

A second product of the activated sensitized lymphocyte is a macrophage chemotaxic factor that causes as many as 1000 macrophages to enter the vicinity of the activated sensitized lymphocyte. A third factor, called migration inhibition factor,then stops the migration of the macrophages once they come into the vicinity of the activated lymphocyte. A single lymphocyte can collect as many as 1000 macrophages around it. A fouth substances increases the phagocytic activity of the macrophages.Therefore the macrophages play an important role in removing the foreign antigenic invader.

Blood-brain barrier

The **blood-brain barrier** (BBB) is a membranic structure that acts primarily to protect the brain from chemicals in the blood, while still allowing essential metabolic function. It is composed of endothelial cells, which are packed very tightly in brain capillaries. This higher density restricts passage of substances from the bloodstream much more than endothelial cells in capillaries elsewhere in the body. Astrocyte cell projections called astrocytic feet (also known as "glial limitans") surround the endothelial cells of the BBB, providing biochemical support to those cells. The BBB is distinct from the similar blood-cerebrospinal fluid barrier, a function of the choroidal cells of the choroid plexus, and from the Blood retinal barrier, which can be considered a part of the whole (Eyes' retinas are extensions to CNS, and as such, this can be considered part of the BBB)

Physiology

In the rest of the body outside the brain, the walls of the capillaries (the smallest of the blood vessels) are made up of endothelial cells which are fenestrated, meaning they have small gaps called fenestrations. Soluble chemicals can pass through these gaps, from blood to tissues or from tissues into blood. However in the brain endothelial cells are packed together more tightly with what are called tight junctions. This makes the blood-brain barrier block the movement of all molecules except those that cross cell membranes by means of lipid solubility (such as oxygen, carbon dioxide, ethanol, and steroid hormones) and those that are allowed in by specific transport systems (such as sugars and some amino acids). Substances with a molecular weight higher than 500 daltons (500 u) generally cannot cross the blood-brain barrier, while smaller molecules often can. In addition, the endothelial cells metabolize certain molecules to prevent their entry into the central nervous system. For example, L-DOPA, the precursor to dopamine, can cross the BBB, whereas dopamine itself cannot. (As a result, L-DOPA is administered for dopamine deficiences (e.g., Parkinson's disease) rather than dopamine).

In addition to tight junctions acting to prevent transport in between endothelial cells, there are two mechanisms to prevent passive diffusion through the cell membranes. Glial cells surrounding capillaries in the brain pose a secondary hindrance to hydrophilic molecules, and the low concentration of interstitial proteins in the brain prevent access by hydrophilic molecules.

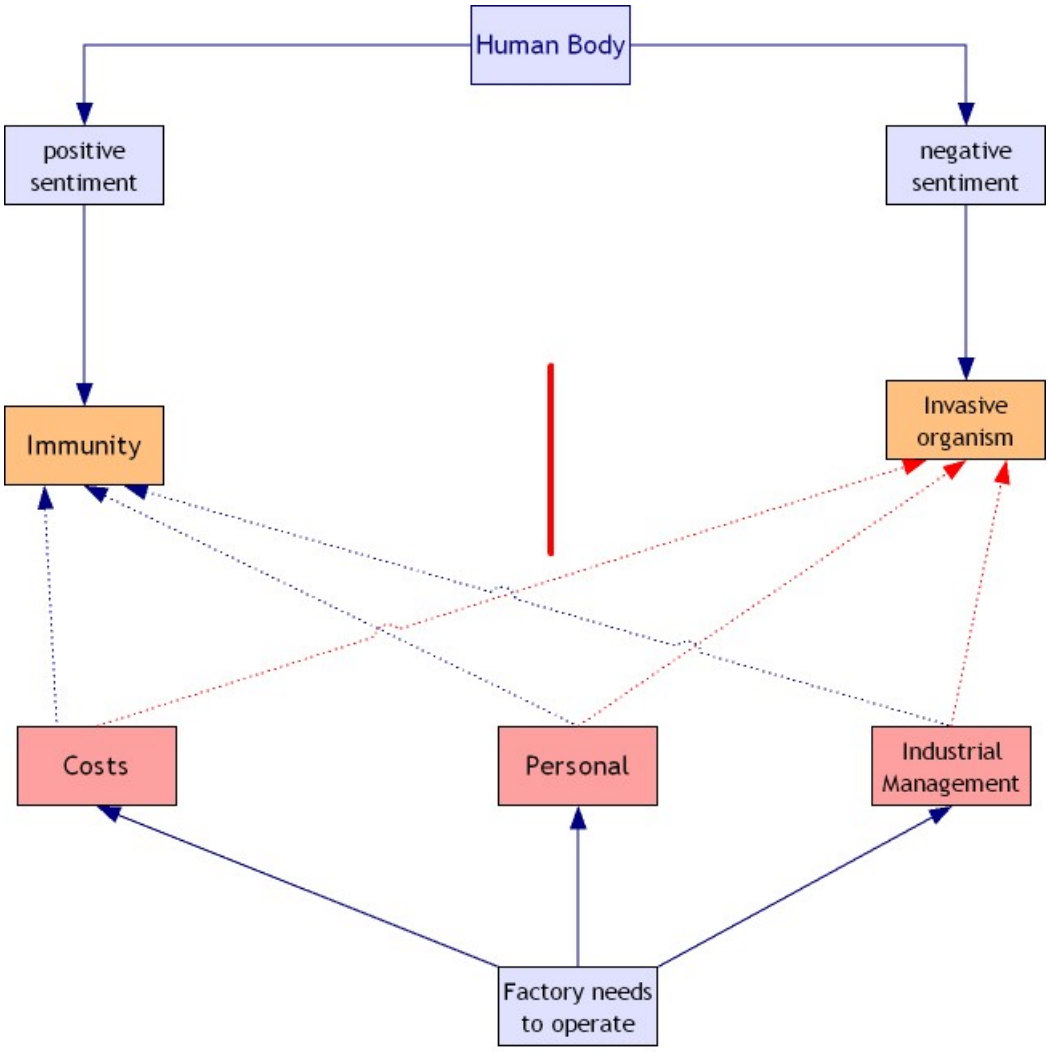
The blood-brain barrier protects the brain from the many chemicals flowing within the blood. However, many bodily functions are controlled by hormones in the blood, and while the secretion of many hormones is controlled by the brain, these hormones generally do not penetrate the brain from the blood. This would prevent the brain from directly monitoring hormone levels. In order to control the rate of hormone secretion effectively, there exist specialised sites where neurons can "sample" the composition of the circulating blood. At these sites, the blood-brain barrier is 'leaky'; these sites include three important 'circumventricular organs', the subfornical organ, the area postrema and the organum vasculosum of the lamina terminalis (OVLT).

The blood-brain barrier acts very effectively to protect the brain from many common infections. Thus, infections of the brain are very rare. However, since antibodies are too large to cross the blood-brain barrier, infections of the brain which do occur are often very serious and difficult to treat.

The Factory

Factory needs to operate

The key to a successful operation in the years ahead. Is recognition of the world as a global market and the imperative for systems integration. Changes in the marketplace as well as in technology will continue to have a great impact on operations. The manufacturing and servicing strategy will be based on an evaluation of organizational needs, continuous measuring of company strengths in design, manufacturing, marketing, finance, and human resources; and a persisting reinforcement of participative management style.

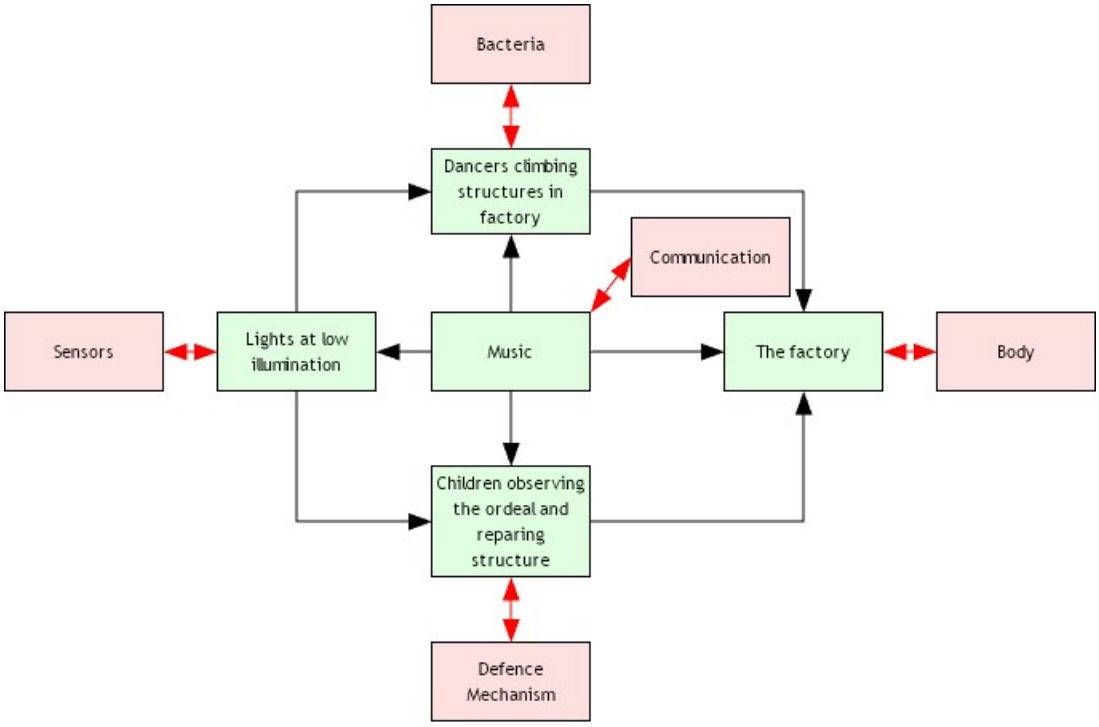


Human body versus the Factory needs to operate

In the above diagram it is noted that if the costs, personal needs, industrial management, are met this has a positive impact on the immune system which means that the factory operates well. The opposite results as the negative impact takes place boosting the invasive organisms which results in ailment or death in the human and the down fall of the factory.

ΑΝΑΜΝΗΣΙΣ is no opera. The reflection is not to be narrated or quoted, only reflected in contradictions, fragments, superimpositions, expansions and ambiguities in music. It is for the ear and the eye that can perceive these aspects, there is a fine equilibrium portrayed between the two sense organs, there is enough time within and between the different scenes that allows for an individual to see and hear.
We live in an incredibly toxic world being exposed to more deadly chemicals than at anytime in history, as well as escalating food prices and the rising energy that has created a crisis in the world.
Thus if the situation in the factory and human body is not managed properly this can result in the downfall of the two systems and visa versa is true. An ongoing relationship between the non-functional factory building and what goes on in the human body is portrayed in this study.

The sound projection is over 4 speakers.



Schematic representation via flow chart of pathways of communication between systems
Diagram 1

The scene starts with dark surroundings the lights revolve searching the interior parameters of the factory focusing indirectly on movement. Movement is noticed but it's as if there is not enough light illuminating. Dancers forever shy covering their faces with their naked bodies climb the pipes and scaffoldings of the space like scavengers, scavenging the internal structure of the factory and competing with one another. They compete with one another their presence is felt as shifting sounds are heard from their bodies as they threaten the mere existence of the deteriorating structure.
The children are repairing the affected surroundings, just like within the body leukocytes, eosinophils, neutrophils, the clotting mechanism are constantly involved in the repair work that is taking place within the body. The trumpeters are connected on the pipes and walls of the factory via their instruments without any movement.

The music composed in this section used the flute sounds of Yamaha DX7 software synthesizer FM7, processed through a modular synthesizer in Reactor 3. The work was derived for four-speaker diffusion.
The work was mapped according to the movements of the dancers in the factory; they chose to move at angles that allowed for the music to develop an amoeboid motion.
It is important to know that while working on the sounds and improving them later, I always listened to the end result loudly, and through this could constantly test the incisiveness of the synthesizer sounds.