MODULE -1
COSMETICS

THE HISTORY OF COSMETICS

The preparation and use of cosmetics dates back to earliest recorded history and most probably to prehistoric times. Its use was not limited to personal beautification- It was often intermingled with religious ritual and medical practices.

The major portion of historical information about cosmetics has come from ancient Egypt. Unguent pots and kohl (used as eye shadow) were found in the tombs of Menes (the first pharoah of the First Dynasty (300 BC). Similar evidence appeared in the tombs of Tutankhamen of the Eighteenth Dynasty (3000 BC). The kohl that was found was composed of ether, lead sulfide, malachite, copper compounds, charcoal, lampblack, or soot.

It was the responsibility of the Egyptian priests to apply cosmetics to the eyes of their idols. Egyptian women blackened their eyelids and eyelashes with kohl white applying green pigment (comprised of malachite) to the area below their eyes. Henna - a reddish brown dye extracted from the leaves of the Henna plant (Lawsonia inermis) was used to color finger, nails and the palms of the hands. Egyptian women also use wrinkle removers (made of oil, wax incense, and cypre berries), hair cosmetics, and hair restorers.

The Babylonians, dating back as far as the fifth century BC applied body perfumes, painted their faces with vermilion a white lead, and became proficient in the use of eye makeup. The ancient Greeks dyed their hair, used the root of perennial plant alkanet (which yields a red dye) to color to lips and cheeks, and applied fucus (red or purple paint obtain from rock lichen) to their faces and eyebrows.

Though their conquest of the Greeks, Egyptians, and other Eastern peoples, the Romans became familiar with the use of cosmetics. Once introduced to the art, the Romans practiced and expanded it even making use of pumice as a toothpaste Fashionable Roman women used female slaves who were skilled cosmeticians.

Little is known about the use of cosmetics after the fall of the Roman Empire. However, it is known that prior to the Renaissance soldiers and pilgrims returning from the Crusades acquainted Europeans with Eastern cosmetic practices.

The popularity of cosmetic products throughout history has been met by either adamant approval or sharp censure depending on the moral or religious climate of the times. In 1770, a bill was introduced to the British Parliament which declared that if any women used cosmetic, false hair or teeth, or other deceiving accessories to seduce a man into marriage, she would have the penalty of the law against

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witchcraft applied to her and the marriage would be declared null and void. The bill was not passed; however, it is significant to see how truly incensed some people became over the use of cosmetics.

Modern society's dependence on cosmetics is graphically demonstrated by the abundance and variety of these products each of which is represented by a multiplicity of brands on the market. Some important innovations that have amplified the cosmetic market in the last one-hundred years have been: the collapsible tube (1890s) chemicals in hair wave preparations (1920s) soapless shampoos and the cold permanent wave (1930s) the aerosol container (1940s), improved, less hazardous hair colorants and fluoride toothpaste (1950s).

Cosmetic use today is a product of the twentieth century technology explosion. The incredible number of an future potential for endless consumer products has naturally included cosmetics, and probably as long as our culture continues to grow more complex and specialized so too will the cosmetics market. The feeling of many who want to return to a more simple, pastoral natural existence is exuberantly exploited by industry, which for the past few years has created a whole market and technology predicated on making our lives more natural. The cosmetics industry of course enjoys a prominent role in the current back to nature trend. It is difficult not to laugh at the paradoxical irony of someone applying makeup to look natural but the significance of this absurdity seems to be that no matter what trend our culture finds itself enveloped in at any given future period there will probably be a commensurate reflection of that society in its ever-present cosmetic practices.

COSMETIC INDUSTRY IN INDIA

INTRODUCTION

Researchers in Anthropology, archaeology and ethnology have revealed that India and Indian women had been exposed to the use of perfumes and cosmetics prior to the 5th Century BC However, no documents can be found to this effect. But then the history of India has been carved on rock-one has only to visit the ancient temples that abound in this vast sub-continent and study the carvings at Khajuraho and Konark, the frescos at Ajanta and Ellora and note that cosmetic rituals have been in vogue in India since time immemorial. The discovery of the kohl pots (containing early from of eye make-up) in the excavations of Mohan jo Daro (circa 1350 BC) have definitely placed India among the early users of cosmetics.

The use of cosmetics in India that started as ritualistic, spread to other more temporal ends and cosmetics have been used to beautify the individual and enhance the attractiveness to members of the opposite sex. The tika or red dot on the forehead that originated as a caste symbol is today used by practically every Indian woman as a decoration, irrespective of her social status. In the early days the various creams and pastes which were required for this ritualistic cosmetology were manufactured in the kitchen by the lady of the house or her handmaids. As these products were prepared just prior to use, they did not required any specialized emulsifiers or anti-oxidants. It is true that the elegance, consistency and stability of the modern day cosmetics were lacking, but nevertheless the ancient Indian women were certainly some of the earliest users of cosmetics. The passage of time did not make an impact on the women of this country-their spiritualistic philosophy was not disturbed by the

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technological advances in the West. Even today a number of Indian women use the cream collected from the morning milk to revitalize and moisturize their faces. A very simple yet very effective eye makeup called kajal is even to day prepared by numerous modern housewives by collecting the soot from a burning wick dipped in castor oil on an upturned saucer and then converting this carbon black with a touch of camphor into a paste in pure castor oil. Not only does this kajal accentuate the oriental eye, but it is also found to be very cooling and soothing in this tropical heat.

It was only towards the beginning of the 20th Century that India was exposed to commercialized cosmetics that could be bought off the shelf. These cosmetics were mostly imported during the days of Colonial Rule. The use of imported cosmetics during the early part of this century was restricted to talcum powder, face powder and perfumes, but with the facilities for modern day travel and the effective shrinking of the globe, the Indian women have experienced the effect of modern cosmetics in their fullest range. With the rapid industrialization of the country and the rising standard of living, coupled with the fact that more and more Indian women are today seeking employment in industry and offices, it is obvious that cosmetics will find an ever-increasing market. A country with population of over 100 crores is as big a market as one could desire. It is only now with the westernization of the East that India is coming into its industrial revolution and its consequent cosmetic renaissance.

COSMETICS & TOILETRIES -MARKET

The Cosmetics Industry in India been broadly categorized to include: toiletries (talcum powder, soaps, shampoos and other hair products) with an estimated market size of over Rs.10000 crs. Decorative or Color Cosmetics (base make up, lipsticks and nail enamel) estimated at Rs.250 crs; skin care products (face and body creams, lotions, gels, etc.) estimated at Rs.500 crs; and fragrances (perfumes and deodorants) estimated at being less than Rs. 200 crs. Other interesting segmentations across these categories include Cosmetics for men and the increasing popular herbal cosmetics.

With mature Western markets seemingly stagnated their manufacturers are eagerly looking at virtually untapped markets like India, where the potential for growth is promising. The potential for growth in the Cosmetics Industry is phenomenal.

The soap segment-made up of laundry and toilet soaps are growing at 10 to 15 per cent annum. In terms of volume, the market for toilet soap is of about 450000 tones of which 60,000 tones has been covered by the premium segment. The synthetic detergent market is expected to growth at seven to eight per cent a year.

Around 37 per cent of the Indian Cosmetics market is made up of herbal creams, shampoos, lotions lipsticks, nail enamels, etc.

Perfumes for industrial purposes is a long established thriving business in India. Typical Indian fragrances are spreading far and wide in 40 countries. The turnover of all perfumes in India is around 300 crs. Nearly 40 per cent of the Industrial perfumes is used in soaps and detergents, 20 per cent each for agarbattis, cosmetics, toiletries and chewing tobacco. The rest 10 per cent is used in bathroom cleaners, hair oils, etc.
India exports cosmetics and toiletries, tooth paste, synthetic detergents, face creams, perfumes, hair

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oils, soaps, etc to countries in Middle East, South East Asia etc.

INDIAN COSMETICS & TOILETRY INDUSTRY- PRODUCTS

The personal care industry covers a plethora of products which includes;

- Soaps & Detergents
- Shampoos
- Hair Oils
- Skin care creams/lotions/powders
- Dental care products
- Nail enamel
- Lipsticks
- Deodorants & Fragrances
- Shaving Creams/After shave lotions

The Cosmetic products can be classified into popular segments and premium segments, Again, there can be classification as male toiletries and female toiletries. One more classification can be between herbal products and synthetic products.

The skin care creams/lotions can be classified into following categories;

- Cold/Winter Cream
- Moisturizing Cream
- Specialty Cream
- Cold/Winter Lotion
- Moisturizing Lotion

COSMETIC & TOILETRIES - FEATURES

BRAND RECOGNITION :- The entire industry is known more for its brands than brand owners. In other words, a strong brand equity is essential for success. The growth would be marked by consumers under the sway of Western trends, rapid globalization of fragrances, gradual elimination of small-time units/brand and constant upgradation of technology.

GROWTH RATE :- The growth rate in India is expected to be around 15 per cent, compared to five per cent in the US. There is more faster growth is specialty products; reduced perfume incorporation; reduced use of preservatives; increased percentage of special/sophisticated ingredients; additional importance to get; popularity to sun protection segment; significance to skin firming/toning/contouring; market polarization into Western and traditional and designer brands at much higher prices.

PER CAPITA POTENTIAL :- Cosmetic industry in India has enormous potential . Per capita consumption in the country is very low. There are over 300 million consumers in India. Compared to 31 million in Korea, 17 million in Taiwan and 65 million in Indonesia. The urban markets have been

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relatively stagnant but the rural markets have shown healthy growth. This has been on account of better market penetration, rising income levels, spread of education which has seen a gradual upgradation of the product quality. Increasing rural prosperity coupled with the wider media reach through television and radio has filled market growth. Despite presence of strong brands the market is extremely price sensitive.

PLAYERS-IN COSMETICS

The players in the Industry include multinational companies, Indian large companies and small scale units. Major domestic players in the personal care industry include Lakme, Ponds, Dabur, Colgate Palmolive, India Shaving Products, Hindustan Liver, Proctor & Gamble, Godrej Soaps, etc. The industry is dominated by multinationals such as Hindustan Lever, Pond's, Proctor & Gamble, J.L. Morrison, etc. Many multinationals have entered into collaboration with Indian companies to tap the vast Indian market. For instance, Yardley & Co., England, has tied up with Bond Street Perfumes and Cosmetics Ltd., Oriflame International SA, Swedish based International cosmetic group has entered into joint venture with Rollscon (India) Pvt. Ltd. To manufacture and market skin care and cosmetic products. Also Modi Revlon, the joint venture of Modi Mundi pharma, a U.K. Modi group company and Revlon International, a US based cosmetics giant have entered the fray with an entire range of cosmetics from lipsticks, nail enamel to hair care products. Another wholly owned subsidiary of Joh A Benckiser GmBh, Benckiser India, Launched its Coty Vita care" range of cosmetics.

AWARENESS & DEMAND CREATION

The much stronger audio-visual impact alongwith "Buy one, get one discount
and booking shelf space of retailers is striking at the roots of domestic manufacturers, apprehending a virtual squeeze. Retailers are getting money for displaying foreign brands. Foreign brands are known to be spending Rs. 200 crore for only launching a product even if sales don't pick up.

The cosmetic industry in general is dominated by the existing large players which includes multinational companies as well who are able to market their product by the strength of their brand names. Ultimately, it is the advertisements that finally decide the fate of a product. The big players have the financial resources to meet promotional expenses unlike the small units who gradually lose in the competition.

With the large number of products in the market at present, the consumer is in a state of confusion, unable to make the right choice, Even multinationals who provide correct and adequate information abroad, do not do so here in India. Their approach is different and their attitude towards the Indian market is also rather lackadaisical.

TERMS USED IN MAKING OF COSMETICS

Surface active agents

A surface-active agent (surfactant) is a material which, by use of this phenomenon, ahs the property of altering the surface energy of a surface with which it comes into contact. This lowering of surface energy can easily be observed in, for example, foaming, the enhanced spreading of a liquid on a solid the enhanced suspension of solid particles in a liquid medium and the formation of emulsions.

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Humectants

Humectants are hygroscopic materials that have the property of absorbing water vapour from moist air until certain degree of dilution is attained. This dilution depends on the character of the humectant used and the relative humidity of the surrounding air. Equally, aqueous solutions of humectants can reduce the rate of loss of moisture to the surrounding air until equilibrium is attained.

Humectants are added to cosmetic creams. Particularly of the oil-in-water type, to reduce drying out of such creams on exposure to air. In addition, the hygroscopic properties of the film of humectant which remains on the skin on application of the product may be an important factor in influencing the texture and condition of the skin.

A humectant helps to provide control in use by reducing the rate at which water disappears and viscosity decreases. It is believed to minimize balling and rolling of a product in use.

DRYING OUT

Drying out of a cosmetic product may occur at any time between manufacture and final use by the consumer. It is determined by the temperature of the product, its degree of exposure to air and the relative humidity of the air to which it is exposed. It is essentially a rate process which proceeds towards the equilibrium state in which the water vapour pressure of the product is equal to that of the surrounding air.
The nature of the container in which the product is packed, and particularly the means of closure, are clearly vital in preventing drying out on storage. With an efficient closure, the humectant is of less importance since there is only a small space above the product to be saturated with water vapour.

ANTISEPTICS

The term antiseptic and germicidal are predominantly used to describe Preparations applied to living tissue to prevent infection although germicidal is often applied to antibacterial soap bars. Although the term disinfectant is more correctly used to describe preparations for treatment of inanimate objects such as floors, toilets, drains and so on, the term skin disinfectant is often applied to the products used by medical and other personnel to prevent transmission of infection in hospitals, the food industry and other high risk areas.
Use of antiseptics in toilet preparations should be distinguished from use of preservatives, in that the former are expected to render the product active against micro-organisms present on the skin or scalp or in the mouth, whereas the function of preservatives (often the same antibacterial agent) is to maintain the product in a satisfactory condition during its shelf life and use.

The benefits of including antimicrobial agents in toilet preparations have in recent years been seriously questioned with the result that health and welfare authorities in many parts of the world have made recommendations or introduced laws governing the use of certain germicides. These usually limit the choice available to manufacturers, and in some cases specify the concentration considered safe. These laws and recommendations differ in different countries and moreover they are subject to change as evidence accumulates about the safety of individual antiseptics in relation to the benefits of their use. Hexachlorophene, until recently the most widely used of all germicides.

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MICROBIAL FLORA OF THE BODY

The normal flora of the body surface comprises two distinct group of organisms-the resident flora and the transient flora. Resident organisms that proliferate on the skin are mainly nonpathogenic, that is. Gram-positive staphylococci, micrococci and corynebacteria, although in moist areas such as the axilla and groin Gram-negative organisms such as acinetobacter may be present. It has been estimated that , for 35-50 per cent of the population, the resident skin flora also includes staphylococcus aureus.

It should be noted that the population of bacteria varies considerably on different parts of the body; the hair face, axilla and groin harbour the greatest numbers of organisms, whereas colonization of more exposed and dry areas such as leg, arms and hands is relatively less extensive. Most resident organisms are found on the superficial skin surface but 10-20 per cent of the total flora is concentrated in hair follicles, sebaceous glands and so on where lipid and superficial cornified epithelium make their removal difficult. It is generally accepted that skin washing is relatively ineffective in removal of resident organisms and that significant reductions in skin flora can only be achieved by application of antibacterial agents.
Fortunately the resident skin flora is predominantly of low virulence although minor skin infections, particularly pyogenic infections, are relatively common.

PRESERVATIVES

Many of the materials used in the manufacture of toilet preparations are susceptible to biological degradation by micro-organisms.

More recently there has been an increasing awareness of the problems of microbial spoilage of cosmetic and toiletry products. Formerly the emphasis was placed on loss of aesthetic appeal of the product with a consequential loss of profitability, while the health hazard to the consumer was largely ignored. Since micro-organisms are ubiquitous, the body is continually exposed to them and it therefore seemed unnecessary for toilet preparations to be sterile. Although it was accepted that products should not constitute any greater microbial hazard than that presented by the normal environment.

Normally healthy individuals have considerable resistance to infection by bacteria and fungi commonly found on their skin and in their usual environment, but in susceptible individuals, for example the newborn, the very old, those in ill health or under drug therapy, there is an increased probability of infection developing. It should be remembered that a product may contain a growing bacterial population even though there is no visible evidence of this. Such a product placed in intimate contact with the skin, particularly if it is broken or damaged, may give rise to infection.

Preservatives are, therefore, added to products for two reasons: firstly to prevent spoilage, that is to prolong the shelf-life of the product, and secondly to protect the consumer from the possibility of infection. It is recognized that products may e require protection from contamination during manufacture. Although preservation must never be used to hide bad manufacturing procedures.

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MICROBIAL METABOLISM

Micro-organisms grow and multiply by utilizing the materials in their immediate environment. In considering spoilage problems created by micro-organisms, the variety of chemical reactions they can carry out and the rate ate which these can occur must be taken into account.

Bacteria and fungi are widely distributed in nature and there are few places on or near the surface of the earth that are free from them. They occur, for example, in such unlikely places as hot mineral springs, the effluents from gas works, stagnant salt lakes and even in the essentially anhydrous environment of diesel fuel. The only places where micro-organisms are not found are those in which a sterilizing influence prevails or in the interior tissues of healthy animals and plants. In growing, bacteria and fungi can cause rapid and profound changes in their immediate environment and in the synthesis of new protoplasm many complex chemical reactions are accomplished within a remarkably short period of time. The organisms carry out these reactions by means of enzymes and some of the basic reactions that can occur are as follows;

Hydrolysis

The addition of H2O to the molecule. The next step in molecular breakdown is often thus facilitated so that molecules are split at the hydrolysed link.

Dehydration

The removal of H2O from one or more molecules

Oxidation

The removal of hydrogen or the addition of oxygen to the molecule; also a process which involves an increase in the number of positive charges on an atom, or a decrease in a number of negative charges.

Reduction

The removal of oxygen or the addition of hydrogen; the reverse reactions to those of oxidation.

Decarboxylation

The removal of CO2

Deamination

The removal of NH2

Phosphorylation

The esterification of the molecule with phosphoric acid. This is usually accomplished by the transfer of the phosphate radical from some substance other that phosphoric acid itself.

Dephosphorylation

The removal or hydrolysis of phosphoric acid from phosphorylated compounds.

EMULSIFYING AGENTS

Emulsifying agent plays a very important role in the process of emulsification. It is therefore, necessary to discuss briefly the emulsifying agents. The main object of an emulsifier is to form a condensed film around the droplets of dispersed phase. In view of this, the concentration of emulsifier should be sufficient for forming the film. This film may be monomolecular or multimolecular or made of solid particles. Different types of materials have been used as emulsifying agents.

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ANTI-OXIDANTS

Cosmetic preparations containing fats and oils particularly those have unsaturated linkage are susceptible to oxidative deterioration. Even a very small quantity of highly unsaturated ingredient is sufficient to start a typical oxidative deterioration.
The term, rancid, is used when the fats and/or oils contain sufficient amount of oxidation products which can be detected by organoleptic tests. Since the consumer applies cosmetics to body, any deterioration detectable by organoleptic tests (small, touch, etc.) will be immediately known to him. Therefore, addition of anti-oxidants is most logical solution to the problem of rancidity of fats and oils in cosmetics. Although in fats and oils, natural anti-oxidants occur (usually tocopherols) but these are destroyed during the process of refining.

It will be worthwhile to deal in brief the factors affecting rancidity.

Presence of Pro-oxidants-Some fats and oils may contain pro-oxidants or oxidizing enzymes, known as oxidizes. As soon as, favourable conditions are available, the enzymes present will become active and will cause rancidity. Favourable conditions can be provided by presence of moisture, light and oxygen.

Oxygen-unsaturated fats and oils react with atmospheric oxygen and small quantities of peroxides are formed. These peroxides destroy pro-oxidants,. If the same are present. Subsequently peroxides attack glycerides of fats and oils. Decomposition products of rancidity have autocatalytic effect. As such, deterioration, initially is slow but later, the deterioration is fast. During the decomposition process, various chemical compounds are formed e.g. alcohols, aldehydes, ketones, hydroxyl acids, lactones etc.

Moisture - Moisture attacks glycerol esters producing fatty acids, short chain fatty acids, in particular. Moisture also acts accelerator to auto-oxidation. Besides these, moisture also provides favourable atmosphere for microbial growth.

Light – It cannot be said conclusively that which wavelengths of visible light have deleterious effect on cosmetics. It seems that light does not cause oxidative reaction itself but it acts as accelerator once the oxidative reaction starts.
Heat – Heat generally accelerates reaction. The reaction that can be accelerated by heat in rancidity of fats and oils is hydrolysis of fatty acid constituents of cosmetics. Besides this, higher temperature.
External Pro-oxidants- There are a number of external pro oxidants. If these are incorporated in cosmetics these external prooxidants destroy naturally occurring pro-oxidants first and then anti oxidants which have been added in cosmetic preparation. External pro-oxidants include matals and their alloys, peroxides, oxidized fats unsaturated fatty substances and organic compounds like isosafrole, benzyl alcohol, benzaldehyde, acetophenone etc. Of the metals, copper is most effective catalytic agent. Other metals in decreasing activity order are iron, lead, zinc, tin and aluminum.
Micro-organisms- Many bacteria, moulds and yeasts grow on fatty materials. As a consequence of their growth many fatty glycerides are split into glycerol and fatty acids. Moulds like penicillia, aspergilli attack fats with carbon atoms less than 14. These moulds produce ketones.
From the foregoing account is very clear that cosmetics containing fats and oils must be preserved by adding anti-oxidants besides antimicrobial agents.

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MICROBIOLOGY, PATHOLOGY & SANITATION

INTRODUCTION

Microbiology (Gk micros small, bios life, logos science) is the science of minute organisms, invisible to the naked eye named microbes. It is the study of the laws of the life and development of micro-organisms, and also of the changes which they bring about in animal and plant organisms and in non-living matter.

Modern medical microbiology has become an extensive science. It is subdivided into bacteriology-the science of bacteria, the causative agents of a number of infectious diseases; virology the science of viruses, non-cellular living systems capable of causing infectious diseases in man; immunology the science which is concerned with the mechanisms of body protection against pathogenic micro-organisms and foreign cells and substances; mycology-the study of fungi pathogenic for man, and protozoology which deals with pathogenic, unicellular animal organisms. In addition, medical microbiology includes the study of the mechanisms of infection and the methods of specific therapy and prophylaxis of infectious diseases.

Since the conquest of outer space, space microbiology has developed and is faced with the necessity of studying the problem of life in outer space and on other planets.
Micro-organisms constitute a very antique group of living organisms which appeared on the Earth's surface almost 300 million years ago. The questions arising from the study of the origin and evolution of micro-organisms are extremely complex. Some scientists assumed that microbes were the first living organisms of the Earth. Others maintained that non-cellular forms of living matter (archebionts, photobionts, protobionts, etc.) appeared prior to the microbes. It is now generally believed that organisms evolved along the following lines: Viruses containing RNA, viruses containing DNA, mycoplasmas, chlamydias, rickettsiae, bacteria, blue-green algae, lower and higher fungi, plants, and animals.

The great majority of microbes are invisible to the naked eye. They comprise multicellular organisms (the blue-green algae, some fungi and chlamydo bacteria possibly some corynebacteria, mycobacteria, cocci),unicellular organisms (bacteria, actinomycetes, spirochaetes, and protozoa), and non-cellular organisms (viruses).

PATHOGENIC AND NONPATHOGENIC BACTERIA

There are several thousand different kinds of bacteria, but only about 100 of these can cause disease. These bacteria are said to be pathogenic, disease-producing. Nonpathogenic bacteria are harmless, and some are even useful. In nature nonpathogenic bacteria help decompose dead vegetation and animals and thus fertilize the soil. In the digestive system they help break down the food that we eat. Some are used in the treatment of sewage, and others produce some of the substances that are used by the drug industry in the perpetration of antibiotics (drugs used to kill bacteria and other disease-producing organisms).

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VIRUSES

Viruses are infectious (pathogenic) particles that are so small that they cannot be seen through an ordinary microscope. A virus is smaller than the smallest bacteria, and no one knows for sure exactly what it is. It may be living or nonliving. It may lie somewhere in the realm between living and nonliving things. Viruses cause many serious diseases such as measles, chicken pox, and polio – and are responsible even for the common cold.

Viruses cannot reproduce until they enter a living cell of an animal or plant. When the tiny particle enters a cell, some thing unusual happens the cell does not fight off the invader, but instead uses its energy to reproduce viruses until the cell itself is destroyed . It is this characteristic of viral diseases and infections that makes them so dangerous for humans and so difficult to control.

STERLIZATION AND SANITATION

There are two ways to keep the premises and its equipment clean; sterilization and sanitation. Sterilizing means that all microorganisms are destroyed. Sanitizing means that the premises and its equipment's are kept as clean and free from germs as possible. Complex equipment usually found in a doctor's office but not ordinarily found in a modern cosmetic unit is needed to sterlize tools and equipment..

STERILIZATION METHODS

If sterilizing equipment is available in the cosmetic unit, and physical sterilization is allowed by your state board, the following methods can be used;
Boiling for 20 minutes at 2120F.
Steaming under 15 pounds pressure for a minimum of 20 minutes.
Baking at 3000F for 1 hour.
Of these methods, the only sure way to kill all bacterial spores is to use the steam-pressure method.

KNOW THE FACTS ABOUT YOUR BODY

The basic unit in the human body is the cell. (Group of cells form tissues; tissues from organs; organs form body systems.) Every cell is composed of protoplasm. In order for the cells to reproduce, certain nutrients must be present in the protoplasm. These nutrients come from the foods that we eat.
For good health, you should eat foods from each of the four food groups every day: Milk and milk products; meat, fish, and eggs; bread and cereal; and fruits and vegetables.
The digestive system breaks down food into a form that can be used by the cells of the body. Digestion is aided by enzymes proteins that cause chemical changes.
Once digested, the nutrients are carried to the cells by the blood and lymph through the circulatory system.
Blood is pumped to and from the heart through the veins and arteries. Capillaries carry blood to the cells and tissues.
Blood is composed of plasma (a yellowish liquid made up of about 90 percent water) in which corpuscles (red and white blood cells,) platelets (small objects that help to clot the blood), and antibodies (substances that help to fight disease) float. Oxygen is carried to the blood by hemoglobin, a

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protein substance found in red blood cells.
Lymph is the fluid that is left after the plasma has filtered through the capillaries, Lymph vessels carry the lymph to the tissues. Lympth vessels carry the lymph to the tissues. Lymph nodes or glands are located throughout the body and help to prevent the spread of disease.
Endocrine glands are ductless glands; that is, they secrete hormones directly into the blood. The endocrine system is composed of the pituitary gland, the thyroid gland, the parathyroid glands the thymus gland, the adrenal glands, the pancreas, and the gonads.
Liquids are eliminated from the body by the kidneys and the bladder and through the sweat glands of the skin.
The respiratory system is composed of the lungs, the windpipe (trachea), and the bronchial tubes. The respiratory system brings vital oxygen into the body and carries away harmful carbon dioxide and moisture.
The skeletal system is made up of bones, cartilage, joints, and ligaments.
Bones are grouped into three categories: long flat, and irregular. They are made up of a hard outer tissue, a softer inner tissue, and periosteum, a very tough protective covering.
Cartilage is a tough, elastic tissue that is found at the ends of bones. The nose and ears are made up entirely of cartilage. Joints are the points where bones are connected or joined. Ligaments are tough bands that help the muscles to hold the bones together.
Muscles play an important part in all body systems. There are three types of muscles: voluntary, or striated; involuntary, or smooth; and cardiac. Every muscle has an origin (a more field point where it is attached to the bone), a belly (the middle section), and an insertion (a point where it is attached to a movable bone or another muscle).
The nervous system controls the body's functions. Nerve cells(neurons) differ from other cells in that they have axons and dendrites that carry impulses to and from all parts of the body.
There are two kinds of nerves: sensory nerves (that carry messages from the sense organs to the brain) and motor nerves (that carry messages from the brain to the muscles and organs).
The nervous system is divided into three parts: the central nervous system (made up of the brain and spinal cord), the autonomic nervous system (which controls the internal organs), and the peripheral nervous system (which consists of all the sensory and motor nerves that carry messages to and from the central nervous system).

SKIN

The skin is very elastic, durable, and complex. It is the largest organ of the body. It wraps the adult body in about 20 square feet of tissue that weighs about 6 or 7 pounds. On the eyelids the skin is thinner than a page of a book, but on the soles of the feet it may be ¼ inch thick.

The skin is frequently called the mirror of the body. A healthy skin is usually a sign of overall good health. On the other hand, a serious illness often shows its presence first on the surface of the skin. The study of the structure, function, and disaffect of the skin. The study of the structure, function, and disease of the skin is dermatology.

STRUCTURE OF THE SKIN

The skin has two main divisions, an outer one called the epidermis and an inner one called the dermis. There is a third layer of subcutaneous fatty tissue, but most often this is considered to be part of the dermis.

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The epidermis itself is divided into four distinct layers. These are, from top to bottom the cornified layer, the clear layer, the granular layer, and the germinative layer.

The cornified layer (stratum corneum) is the surface layer of the skin. The cells in this layer contain a hard substance called keratin, and the entire surface is covered with a thin film of oil. This layer is very tough and nearly waterproof. The top most cells are constantly being worn away and shed.

The clear layer (stratum lucidum) consists of a thin layer of small cells through which light can pass.

The granular layer (stratum granulosum) contain cells that are nearly dead. These cells look like granules and are moving toward the surface of the skin. They replace cells in the cornified layer that have been worn away.

The germinative layer (stratum germinativum) lies just above the dermis. In this layer, new cells are continually formed. Among these new cells can be found great numbers of special. Cells called melanocytes. These cells contain melanin, a brownish pigment that determines skin colour. People with fair skin have only a relatively small number of these cells, but dark skinned people have much greater numbers of them. People with little or no melanin suffer from a condition called albinism. Melanin protects the skin from the sun's ultraviolet rays. When the skin is exposed to sunlight, the melanocytes produce a greater amount of pigment for protection. This is what causes tanning.

The epidermis consists almost entirely of dead and dying cells. It has almost no blood supply, except in the deepest layer. The dermis, or true, skin is made up of many inter woven fibers that form a tough, elastic network. In the dermis are found many nerves, glands, blood vessels, and hairs. This is the thickest part of the skin and is firmly attached to the epidermis. The dermis is divided into two distinct layers the papillary layer and the reticular layer.

The papillary layer gets its name from papillae, tiny fingerlike projections that anchor the dermis to the epidermis. The papillae are well supplied with blood vessels and contain many tactile corpuscles, the nerve endings responsible for the sense of touch.

The reticular layer contains a great variety of structures . Nerves that are sensitive to cold, heat, and pain are found in this layer. These are called sensory nerves or receptors. Oil glands and sweat glands, hair follicles, and blood vessels are also found here. The blood vessels in this layer supply the skin with oxygen and nutrients.

Subcutaneous tissue consists mainly of fat and serves as a cushion between the other layers of skin and the muscles. The fats help to keep the skin smooth and can be used for energy if necessary. When this layer shrinks as we grow older, it no longer can support our skin and keep it film. The surface skin becomes loose and sags and wrinkles develop.

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FUNCTIONS OF THE SKIN

The skin has a variety of functions. The most obvious one is to serve as an enclosure for all the other organs of the body. Other functions are temperature regulation, protection, absorption, sensation, secretion, and excretion.

TEMPERATURE REGULATION :- The normal temperature of the human body 98.60F. No matter how hot or cold the air is, the skin helps to keep the temperature of our body constant. When the cells of our body break down food, heat is produced. The blood carries this heat to the skin, where evaporation of sweat cools the body. In hot weather, the sudoriferous glands (sweat glands) are very active, but in cold weather we sweat very little so that heat can be kept within the body.

PROTECTION :- As we pointed out, the skin is very tough and waterproof. This helps the skin to protect the body from harmful bacteria and to prevent the absorption of many chemical substances. Many people are allergic to chemicals in certain cosmetics, and if these substances were able to penetrate the skin, the results could be serious. Because the skin also acts as a cushion, it protects the internal tissues from minor injuries.

ABSORPTION :- Although the skin is a protective covering, some substances can penetrate it is a limited way. Included in this group are such useful substances as topical medicines and some cosmetics, such as lanolin and hormone creams.

SENSATION :- As mentioned above, the skin is well supplied with sensory nerve endings or receptors that convey messages to the brain and spinal cord. These nerve endings react to heat, cold, pain, and pressure. The skin is the principal organ of the sense of touch. Sensations such as itching, tickling, and burning result when combinations of nerve endings are stimulated. Other nerves, called motor nerves, act on tiny erector pili muscles that are attached to the hair follicles, the tubelike extensions through which hair reaches the surface of the body. This muscle can make your hair stand on end and can cause gooseflesh when you are chilled or frightened. The arrector pili muscle will be discussed in more detail in the section on the hair. A third type of nerve, the secretory nerve, affects the activity of the sweat and oil glands.

SECRETION :- The skin is well supplied with sebaceous glands (oil glands) that secrete oils that are vital to our skin. The function of secretion, then, refers to the oil glands, at least when we are speaking about the skin. The oils secreted by the sebaceous glands lubricate the skin and keep it soft and pliable. They also soften our hair. A mixture of sweat and oil makes the surface of the skin slightly acid and helps to keep bacteria from entering our body.
The oil gland itself is a tiny sac that secretes oil (really a fatty substance called sebum) through the hair follicles and onto the surface of the skin. All parts of the body are well supplied with oil glands, except for the palms and soles. Diet plays a large part in determining the amount of sebum produced by the oil glands. The wrong foods, those rich in fats, can cause your skin and hair to become too oily.

EXCRETION : Excretion refers to the removal of wastes from the body. Sweating also serves

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another purpose. Waste materials such as salt and other chemicals are removed from the body as sweat is produced.

The sudoriferous gland are composed of little coiled tubes that have their own tunnel, or duct, that runs to the surface of the skin and ends in what is called a sweat pore. These glands are numerous on the palms and soles, under the arms, and on the forehead, but they are also present on almost all parts of the body. The activity of sweat glands is controlled by the nervous system. These glands are functioning all the time in the elimination process, but they become most active when we are exercising and during warm weather. Certain drugs and emotional stress can also increase sweating.

COMMON SKIN PROBLEMS

DISORDERS OF THE OIL GLANDS :- When the oil glands secrete too much or too little sebum, a variety of skin disorders can occur.

Acne is perhaps the best known of these problems. During the teenage years, the oil glands become very active. When the pores that allow oil to reach the skin's surface become clogged, pimples can form. Sometimes these pimples go deep into the skin and can leave permanent scars. We usually think of acne as a facial condition, but it can also occur on the chest and back.

In teenagers, acne (acne simplex) is usually a temporary condition that can be helped in a variety of ways-careful cleansing of the skin with soap and water, avoiding foods that contain too much oil or fat, and using nongreasy cosmetics. Serious cases of acne (acne vulgaris), especially those that cause psychological problems for the patron, should be referred to a dermatologist.

Comedones, or blackheads, are also caused by clogged pores. Sebum hardens and forms a plug. Steaming the affected area usually helps to clear up this condition.

Milia, or whiteheads, result when sebum accumulates beneath the surface of the skin.
Steatoma or wen, is a sebaceous cyst. This is actually a tumor of the sebaceous glands that forms under the skin. Steatomas vary in size and look like smooth mounds.

Asteatosis is a disorder that occurs most frequently in older people. The sebaceous glands secrete very little sebum, or sometimes none at all, and so the skin becomes very dry and scaly.

Seborrhea is a condition caused by overactivity of the sebaceous glands. The surface of the skin becomes very oily and shiny, and if the scalp is affected, the hair becomes very oily.

DISORDERS OF THE SWEAT GLANDS

Hyperhidrosis is a condition that is marked by abnormal sweating. Normally the sweat glands become very active in hot weather in order to keep the body cool. But some people sweat a great deal even in cool weather and when they are at rest. They should consult a physician.

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Anidrosis occurs when the sweat glands stop functioning entirely. This may be caused by a fever or some other disorder. A doctor should be consulted if anidrosis occurs, because the body has lost its ability to regulate its temperature.

Bromidrosis or body odour (commonly called BO), refers to foul smelling perspiration. Actually, perspiration itself has little or no odour. The problem is caused by bacterial deposits on the skin. Good grooming habits can help to control bromidrosis.
Miliaria rubra, or prickly heat, is caused by the inflammation of the skin around the sweat pores. It usually occurs in hot weather, appears in the form of small red pimples, and is accompanied by intense itching. This condition usually disappears when the weather becomes cooler. Various powders and lotions can provide temporary relief- baking soda works well.

PSORIASIS : - Psoriasis is one of the most common skin diseases, and its cure is unknown. It generally affects adults but can also appear in children. Most frequently it is confined to the scalp region, but it can affect the elbows, knees, and lower back. Psoriasis usually takes the form of red, slightly elevated lesions, or sores, covered by silver, crusty scales. Do not worry if your patron has this problem. Psoriasis is not contagious, and you may work over it. The patron needs to keep the lesions clean, and washing the area with shampoo will not harm it. If scales are not present, and the lesions are not weeping, you may give a chemical treatment to the hair growing from that region.

ECZEMA :- The cause of eczema is unknown. It appears as dry or moist patches on the skin that can be mildly annoying or painfully irritating. Eczema should be treated only be a physician.

ALLERGIES :- People who have a severe physical reaction to a particular substance that has no effect whatsoever on most people are said to have an allergy. They are particularly sensitive to certain substances. The reaction may take the form of sneezing, breathing difficulties, itching, or rashes. Cosmetic dermatitis is the term used by dermatologists to describe allergic reactions caused by the application of cosmetics. Some chemicals will harm the skin of anyone, but here we are discussing chemical agents that cause skin problems only in certain people. These substances are called allergens. Hypoallergenic cosmetics are as free of allergens as possible.

Mild cosmetics such as soap, hair spray, perfume, and other products that have an irritating effect on the skin only at the point of contact are called weak or primary irritants. When they are washed off, these substances cause no further reaction.

Strong or secondary irritants are chemical agents that cause serious skin eruptions – blisters, oozing sores, burning sensations. These substances are usually fairly alkaline. Some of the chemicals that make a permanent change in the structure of the hair chemical curling and straightening products, hair dyes, bleaches, and depilatories can be secondary irritants.

TANNING OR SUNBURN

Exposure to the sun is not entirely harmful, but with the first warm days of summer we tend to spend too much time in the sun. The ultraviolet rays of the sun penetrate into the deeper layers of the

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epidermis or dermis, and if you are exposed too long, a severe case of sun poisoning, with its chills and nausea, can result. Another result of overexposure to sunlight is dry, leatherlike skin. The cells responsible for the elasticity of the skin become degenerated, and the skin becomes thin and wrinkled. And most important, because of the connection between exposure to the sun and skin cancer, it is wise to protect the skin as much as possible.

Until recently suntanning products, other than white zinc oxide, offered no real protection. Now however, more than 20 chemicals have been developed to prevent sunburn. These chemicals act by absorbing only the sun's harmful rays while allowing the sunbather to tan painlessly. The degree of protection is called the sun protection factor or SPF. The higher the SPF number, the more effective the product will be in screening out ultraviolet rays. A lotion or cream with an SPF of 15 or more should act as a near total sun block and prevent all tanning. An SPF of 8 to 14 offers medium protection, while an SPF of 4 or less should be used only by those who tan easily without any burning.

PIGMENTATION DEFECTS AND WRINKLES

Freckles, vitiligo, and chloasma are common pigmentation problems.

Freckles appear most often on fair skins, especially on the skin of redheads. These blotches of color result from a concentration of pigment in a small area.

Vitiligo is white blotches, usually on the arms and neck, which are caused by the caused by the absence of pigment. These stand out most clearly after exposure to sunlight, and there is little that can be done, except avoid the sun and wear clothing that covers the arms.

Chloasma is dark spots on the face, and it usually makes its first appearance on the forehead around the hairline, These blotches are frequently called liver spots, but they have nothing to do with the liver. The cause of chloasma is unknown, but the condition can be treated by a dermatologist.

Albinism is a hereditary condition that occurs in people with little or no pigment. Albinos have milky complexions, white hair, and pink or blue eyes with deep red pupils.

Pigmentation defects can also be caused by nervous tension. The blotches start small and light but enlarge when the condition causing them is not remedied. Consult a dermatologist when the symptoms first appear.

Wrinkles occur with age as the skin loses its elasticity, If these lines have a negative psychological effect, advise your patron to see a dermatologist or plastic surgeon.