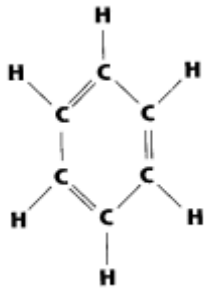
Many modern textbooks of organic chemistry use in examples the original ring formula for benzene, possibly because in recent years some doubt has been cast upon a completely even distribution of electrons in the ring. This situation is typical of a science such as chemistry, the established laws and principles of which hold fast until someone finds a weakness – an exception which, far from 'proving the rule', demands that the rule be investigated and thereafter possibly adjusted, to be altered, or even discarded in the light of new knowledge.

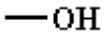
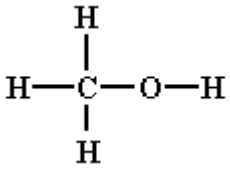
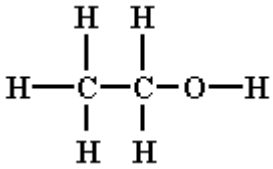
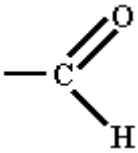
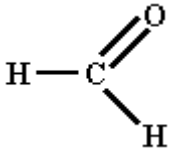
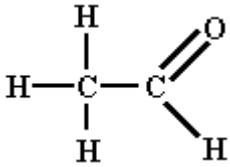
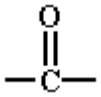
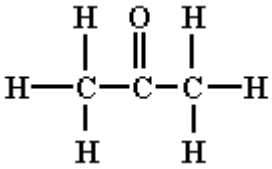
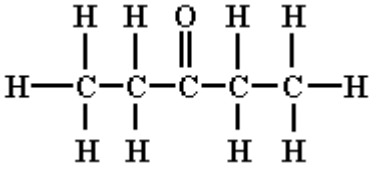
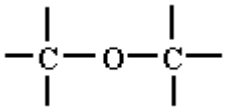
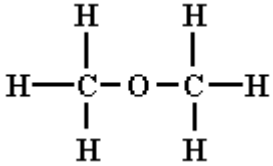
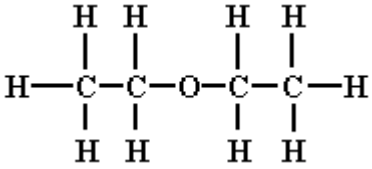
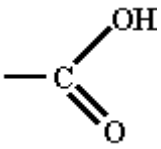
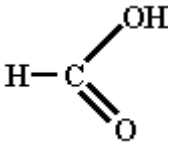
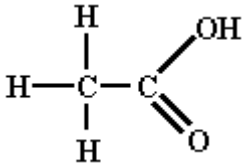
STRUCTURAL FORMULA OF BENZENE

Single bonds are represented by single lines between elements; double bonds are represented by double lines between elements.



FUNCTIONAL GROUPS

The properties of many organic compounds are related to that portion of a molecule involved in a chemical reaction. That portion is referred to as a functional group.

Name of Group	Structure	Examples of the Group in a Compound	
Hydroxyl, or alcohol group (occurs in organic compounds called alcohols)		 Methanol (methyl alcohol)	 Ethanol (ethyl alcohol)
Aldehyde group (occurs in aldehydes)		 Methanal (formaldehyde)	 Ethanal (acetaldehyde)
Carbonyll group (occurs in ketones)		 Propanone (methyl ketone)	 3-pentanone (ethyl ketone)
Ether group (occurs in ethers)		 Dimethyl ether (methyl ether)	 Diethyl ether (ethyl ether)
Carboxyll group (occurs in carboxylic acids)		 Methanoic acid (formic acid)	 Ethanoic acid (acetic acid)

Many derivatives of benzene are known in which two or more of the hydrogen atoms of the ring are substituted by other atoms or groups of atoms. There are three relative positions, which two substituents, such as methyl groups, can occupy around the ring.

BISABOLOL

Bisabolol is a natural sesquiterpene alcohol, and is known as the most effective antiphlogistic and anti-inflammatory constituent in the oil of German chamomile. Extensive pharmacological tests have shown that its action is even stronger than the effect of the hydrocarbon chamazulene, which gives chamomile oil its characteristic blue colour. The main constituents of blue chamomile are the hydrocarbons farnesene, chamazulene and, (about 50%) bisabolol.

BITTERS

A wide variety of chemicals have a bitter taste and these function together as a class, regardless of their structure. Bitters have been shown to stimulate secretion of digestive juices and to aid hepatic elimination, thus they act strongly on the entire apparatus of digestion. In addition, they irritate tissues and this causes activity. In large doses they cause irritation to the point of fever, in smaller doses they have a stimulant effect. At the turn of the century it was commonly believed that bitters were a necessary element of the diet. Bitters can easily be detected by their taste.

Bitters are a varied group of constituents linked only by their pronounced taste. The bitterness itself stimulates the secretions by the salivary glands and digestive organs. Such secretions can dramatically improve the appetite and strengthen the overall function of the digestive system. With the improved digestion and absorption of nutrients that follow, the body is nourished and strengthened. Many herbs have bitter constituents, notably wormwood and chiretta.

BIOCHEMISTRY: DR. SCHUESSLER'S TISSUE SALTS

Dr. Schuessler demonstrated by experiments that the mineral salts vitally concerned in carrying on functional activity in the cells of the human body are twelve in number, to which he gave the name of tissue cell-salts.

They are:

1. Calcarea Fluor – Fluoride of Lime.
2. Calcarea Phos – Phosphate of Lime.
3. Calcarea Sulph – Sulphate of Lime.
4. Ferrum Phos – Phosphate of Iron.
5. KaIi Mur – Chloride of Potash.
6. Kali Phos – Phosphate of Potash.
7. Kali Sulph – Sulphate of Potash.
8. Magnesia Phos – Phosphate of Magnesia.
9. Natrum Mur – Chloride of Soda.
10. Natrum Phos – Phosphate of Soda.
11. Natrum Sutph – Phosphate of Soda.
12. Silicea – Silica.

The word biochemistry is derived from the Greek word bios meaning life and chemistry; therefore its true meaning is the chemistry of life. Biochemistry is that branch of science which treats the composition of animal and vegetable matter; the process by which the various fluids and tissues are formed, the nature, cause, and correction of the abnormal condition called disease.

The 'Biochemic System of Medicine', originated by Dr. W. H. Schuessler, is a logical and natural method of healing, eminently suitable for the treatment of simple everyday ailments.

Disease is an unnatural condition and not the intention of nature. Dr. Schuessler realized that within the body itself are to be found the most potent weapons in the battle against disease and that healing should be directed towards arousing and stimulating these natural recuperative forces. The twelve biochemic remedies, or tissue salts, correspond with the principle inorganic elements found in the body. On this fundamental principle Dr. Schuessler based his carefully worked-out theories, and the results he achieved led to the formulation of his system of cellular therapeutics, to which he gave the name – biochemistry.

The body is made up of cells. Different kinds of cells build up the different tissues and organs of the body. The difference in the cells is largely determined by the kind of inorganic salts that enter into their composition. If we burn the body, or any part of it, we obtain the ashes. These are the inorganic constituents of the body, the salts of iron, magnesia, lime, etc.; which build up its tissues. Besides these inorganic salts, the body is composed of water and organic substances in the proportion of one-twentieth of inorganic salts to the remainder of water and organic matter; the latter is inert and useless in the absence of the inorganic cell salts.

Biochemical treatment uses these inorganic cell salts when they have been properly prepared for assimilation. They are then the Tissue Remedies, capable of curing every curable disease and ameliorating most incurable ones. Health is the state of the body when all the cells composing the various tissues are in a normal condition. They are kept in this state all the time they each receive the requisite quantity of the cell salt required for the building-up of the different tissues.

Disease is an altered state of the cell produced by some irregularity in the supply of the cells of one of the inorganic tissue salts. Imperfect cell action results from any irregularity, diseased tissues and organs follow, and all the phenomena of disease are developed. In order to affect a cure it is necessary to restore the normal cell growth, by furnishing an additional minimal dose of the inorganic substance whose molecular motion is disturbed and which has caused the diseased action. To do this successfully it is necessary to know what salts to use in a given situation.

By giving a tissue remedy in such a dose as can be assimilated by the growing cells, the most wonderful and speedy restoration to healthy function is brought about in every case of curable disease. All diseases that are curable are curable by means of tissue remedies properly prepared to the needs of the injured organism. To make the tissue salts it is necessary to use only the purest that it is possible to procure drugs and sugar milk. Only then through long triturating can a Schuessler remedy be made.

CAFFEINE

Caffeine, a component of popular beverages is to be found in such plants as coffee, tea, and cocoa in which it acts as a stimulant. Conversely the high concentrations of caffeine present in the developing seedlings of the coffee plant have been shown to be highly toxic and lethal to both insects and fungi. Additionally the caffeine released by the seedling apparently inhibits germination of other varieties of seeds in the coffee seedlings vicinity, This process, called allelopathy prevents the growth of competitors.

CARDIAC GLYCOSIDES

These chemicals are closely related to the saponins that also have cardiac activity, and have the ability to strengthen and regulate the beat of the heart without increasing the amount of oxygen needed by the cardiac muscles. They increase the efficiency and steadiness of the failing heart. Examples include the Foxglove, the source of the famous cardiac drug digitalis, and Lily of the Valley.

COCAINE

Cocaine comes from coca, a shrub or small tree that is indigenous to the eastern slopes of the Andes Mountains of Bolivia and Peru. Many Incas living at the high elevations of these mountains chew coca leaves to lessen hunger pangs and fatigue while working in this harsh environment. Chewing the leaves, which contain small concentrations of the drug, is relatively harmless compared with the smoking, snorting, or intravenous injection of cocaine. The habitual use of cocaine and its derivative "crack" can have devastating effects both physically and psychologically, and can lead to death. Dentists have used cocaine as a local anaesthetic; it is also used in eye surgery.

COUMARINS

The smell of newly mown hay and the vanilla-like flavour detected in some members of the clover family, including Melilot, Alfalfa, and Red Clover, indicate the presence of coumarins, which are a natural blood-thinning, anticoagulant factor. Coumarins are therefore used in conventional medicine to thin the blood.

Coumarins of different kinds are found in many plant species and have widely divergent actions. The coumarins in melilot thin the blood, while bergapten, found in celery, is used as a sunscreen.

Coumarins are types of lactones, and both are known by their common names, as the chemical name is too lengthy. They tend to end in '-in', but can also end in '-one', e.g. umbelliferone that is also known as 7-hydroxy-coumarin. Lactones and coumarins tend to have the same neuro-toxic effects as ketones, and are also known to cause skin allergies. Fortunately they exist only in small amounts in essential oils. [See also lactones]

DITERPENOID TAXOL

The diterpenoid taxol has attracted considerable attention because of its anti-cancer properties - it has been shown to shrink cancers of the ovary and the breast. At one time, the only source of taxol was the bark of the Pacific yew tree. Harvesting all of the bark from a tree yields only a very small amount of taxol [a scant 300-milligram dose from a 40-foot-tall 100-year-old tree]. Moreover, removal of the bark kills the tree. Fortunately, it has been found that extracts from the needles of the European yew tree and Taxus bushes, as well as a yew fungus, can yield taxol-like compounds. The needles can also be harvested without destroying the parent yew trees and bushes. Taxol has since been synthesized in the laboratory, but the synthesis technique remains to be refined. It will however be an expensive process and it may still be more economical to make commercial forms of taxol from natural sources.