

MAGIC WAND OF THE CHEMIST

Sir William Ramsey, the English chemist for several months has been visiting in the United States and has made many observations of the probable needs of the people here within the next few years.

He believes that the food of a nation is its greatest asset, and therefore he considers that the work of the synthetic chemist in aiding agriculture is most important. While the soil of the different states at present is very fertile, the time will come, he says, when it must look to the chemists for aid, as has been found in European countries.

Keystone of Modern Chemistry
"The work of the modern synthetic chemist now involves the saving of untold millions and millions of dollars to the present and future generations," said Sir William.

"Not only is it surprisingly aiding agriculture, but wonderful progress has been made quietly in industrial lines and many synthetic products of enormous commercial value and usefulness in reducing the cost of the safe are already on the market, while others are to be placed there soon.

"Syntheticism is the keynote of modern chemistry. In the past chemistry was analytical; today it is synthetic, meaning the production of natural products by chemical means.

"At the dawn of the twentieth century the world was facing a serious problem that threatened the existence of mankind in the years to come. The nitrate beds, from which came the world's supply of that fertilizer so necessary to plant life, were steadily becoming exhausted. Scientists calculated that the natural supply would last only a few years. When that supply was gone the world would be without food unless means were found for obtaining an unlimited supply of nitrate.

Supply of Nitrogen Inexhaustible
"Scientists have long known that four-fifths of the air is composed of nitrogen. Every square yard of land we find is covered with seven tons of nitrogen.

"The nitrogen in the air over a square mile, if converted into nitrate would be worth 125 million dollars and would supply the world with fertilizer for years to come.
"The production of nitrate from the air has made tremendous strides in the last five years. This work at present is carried on almost exclusively in Norway, Birkeland and Eyde, the chemists who evolved the process, have made the production of synthetic nitrate the most marvelous new industry in Norway in 10 years.

"The main process consists of burning the air, for which purpose great flaming electric arcs are used. The nitrous gases are then chemically treated until two products are given nitrate of lime and nitrate of soda.
"The Norwegian factories are able at present to produce annually, according to Dr. Eyde's estimate, 80,000 tons of nitrate of lime and 10,000 tons of nitrate of soda. Recently the factories have been producing nitrate of ammonia at the rate of 10,000 tons a year. Thirty million dollars of French capital is invested in the industry. The factories since their first operation have increased their number of workmen from 2 to 1,340 and the horse power from 25 to 200,000.

Ammonia Produced by Synthesis
"Until about three years ago the chemists were in despair at the prospect of producing ammonia from its natural elements by synthesis, and

the announcement that this has been successfully accomplished has been made only recently by Dr. H. A. Bernthsen of Germany.
"The credit for the achievement of this dream of the chemists is given to Prof. Haber of Berlin, who worked incessantly at the problem for years. He finally discovered that ammonia could be formed from nitrogen and hydrogen if the mixture were kept under constant pressure during the whole of the operation and was subjected alternately to the catalytic formation of ammonia at a high temperature, and then freed from ammonia by absorption or condensation at a low temperature.

"As to the future of the synthetically prepared ammonia and other nitrogenous substances Dr. Bernthsen and his fellow chemists in Germany believe it to be wonderfully bright. The soil of the world is being worn out by constant usage for centuries. America has not felt this change so much as Europe, but in time the soil of the eastern states will need nitrogenous manure for the growth of the crops.

A Triumph For Synthetic Rubber
"A scientific marathon, a great and fast race, in which two groups of scientists working in their laboratories on the same secret of nature resulted in the synthetic production of rubber, an event which in time to come is expected to have a wide effect on the uses of the natural product.

"England and Germany both claim the honor of this great discovery. England seems to have been the first to produce the synthetic rubber, but ed first that its product is of value Germany apparently has demonstrated commercially.

"Dr. Carl Duisberg of Germany recently exhibited in the United States two excellent specimens of synthetically prepared rubber motor car tires which, he explained, had run more than 4,000 miles, considered a healthy guarantee for any tire on the present market and yet they appeared to be just as good as new, and this notwithstanding the fact that they had been driven on heavy motor cars. The original tread had not worn off, and the only evidence of wear, in fact, was the seasoning of the original rubber color to a light brown."

Its Wonders Unlimited
According to Sir William who in his laboratory in England has made many valuable contributions to science along the lines which he has discussed with no mention of the great part which he himself has played, synthetic chemistry has been applied to the artificial production of many other natural products. In fact, there appears to be no limit to the wonders which may be performed as time goes on by the magic wand of chemistry.

Precious stones—rubies, sapphires emeralds and turquoises have been manufactured by the synthetic process and the artificial product, he says, is in every sense identical with the natural stone. The perfume industry of the world has been revolutionized by the discovery that the odor of the rose, the lily of the valley, the violet, etc., could be produced through the same marvelous agency. Similarly, science has finally dispensed with the silk worm; the production of synthetic silk of beautiful texture is another feat of the chemist and the process is being perfected every year. The manufacture of drugs invaluable to the medical world is now engrossing the synthetic chemist. There is no limit to the possibilities.

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UN SOUNDNESS AND HEREDITY

Most of the states that have stallion laws classify certain unsoundness as heritable, and will not permit stallions possessed of such unsoundness to stand for service. Many writers have drawn a sharp theoretical distinction as to the heritability of such conditions, and have spoken of a pre-disposition to the disease as the thing inherited. A careful consideration of the physiology of many unsoundnesses shows that both of these contentions are wrong in their extreme theory, unless predisposition is a remarkably elastic word. It also shows why it will never be possible to totally remove unsoundness, because it is neither in nor outside of the hereditary condition of any animal.

When a man works in the hot sun, the skin of the body adapts itself to the man's needs, and forms much more pigment, tanning the man, as it were. When a horse is trained for the race track, its muscle power adapts itself in a certain way to meet racing conditions. When a hog recovers from hog cholera, there is found in its blood certain antitoxins, which the blood has formed to adapt itself to and repulse the choleric conditions. And so it is in the case of curb. When a horse with a weakly supported hock forms this unsoundness under strain beyond its strength it simply follows the laws of adaptation illustrated in the preceding examples.

vital one in the development of every species. Those individuals that can most readily meet adverse conditions with an effective response are the ones that will survive and be the leaders of their race. Thus a definite method of response has come to meet certain conditions.

Let us return to the example of the curb. We say there are two kinds of curb, one associated with a normal conformation, which is not an unsoundness, and one found with insufficiently supported or sickle hocks, which is always an unsoundness. Why distinguish between the two? Both are results of the same more or less severe strains that have passed the limit of strength of the process, both have come about under

This law of adaptation has been a hock. Both are attempts to make up for his lack of strength by increasing the bearing surface of the joint. It is true that by so doing they stiffen the action of the horse, but strange as it may seem to one who looks on unsoundness as a disease, the hock with the curb is actually stronger than it was before the curb was formed. This does not mean that the horse is necessarily stronger but simply that the joint itself is. The horse's action and activity may be so interfered with that the added strength of the hock may not be compensated for.

What is true of curb is true of spavin, ringbone and sidebone. Eye, wind and puffed unsoundness scarcely fall in the same class, but the bone unsoundness are merely danger signals that show where the breeder has failed.

The problem then is not one of breeding this class of unsoundness out of the horse's constitution. It is to breed a horse with better mechanical strength due to more perfectly formed joints and heavier bone. It is not that we must select against unsoundness, but that we must select for mechanical efficiency. It is doubtful whether we want to get an animal free from the possibilities of developing spavin, curb and ringbone, because this method of adaptation may permit service from a horse that would be ruined forever when over strained. What we do want is an animal that has the mechanical strength from an ideal body. The stock judge and breeder is not, as many would have us think, a man expert in finding little blemishes and faults. He is the man who, looking past these, can see the mechanical perfection of everything good.—E. N. Wentworth, Iowa State College.

WHAT TO USE IN THE BATH
Hints on Keeping the Skin Healthy and Beautiful

The commonest form of the bath as a beautifier is the bran bath. This particular bath has the advantage of being inexpensive and efficient at the same time. The bran should be sewn into a neat little square sack of cheese cloth covering, and dropped into the bath when the water is run in. The water must not be too hot, or the bran will be cooked and thus rendered useless, but if warm is poured on it a creamy mass is formed, which will render the skin delightfully soft. For those who wish to be a little more elaborate there are sold at all chemists and stores little sacks of bran mixed with various perfumed herbs, according to taste,

such as violets, orris root or sun flower seed.

The milk bath is not unusual and it is claimed that it has no rival in beautifying the skin. One well known beauty in Paris is understood to use milk for her bath always, and the skin of her throat and shoulders is as creamy a white as the liquid she is supposed to bathe them with. Of course, one would not actually get right into a milk bath as one does with water. The milk is applied on wads of antiseptic cotton and the skin is dried with more of the cotton. Then, to prevent any stickiness it is rubbed gently with eau de cologne.

French women are also very partial to the use of alcohol in the bath. It is perfumed in some way with such scents as lavender or violet, and those who indulge in these baths or the bran ones use soap only once or twice a week.

Salt water bathing is probably the most bracing and the best form for the robust, but in a climate such as ours it cannot be recommended except in the hot months unless the bather is very strong. Those who are unfortunate enough to possess very irritable skins will do well to eschew sea baths altogether.

Turkish baths are much in favor with many people, though others particularly - ranch women, declare them to be harmful to the skin, and consider that those who indulge frequently in these extremes of temperature become prematurely old and injure the heart and nerves. Those who do indulge in them, however, declare that they give a delicious sensation of perfect well being and absolute cleanliness, and that one seems to take a new lease of life with every bath. Delicate people can often only enjoy a cod bath with safety after a previous application of hot air or vapor, and in such cases. Turkish and vapor baths are invaluable.

For ordinary bathing purposes most people use ammonia or borax, which not only softens the water, but is invaluable for cleansing the skin. It is necessary however, to exercise caution in the use of these two articles, for an over dose in the bath, instead of making the skin soft and supple, will harden it and make it much too dry. The best plan is to get the chemist to make up a proper mixture and put it into a marked bottle, so that the correct quantity for a certain amount of water only is used.

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stock upon which this assessment may remain unpaid on the 1st day of February 1913, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of February 1913, to pay the delinquent assessment, together with the cost of advertising and expense of sale.
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