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ARE CHEMISTS SUCCEEDING IN CREATING LIFE?

Several European chemists have succeeded in producing forms of organic matter which have brought science much closer to a solution of the chemical origin of life than has Dr. Loeb's "fatherless frog." The fatherless frog had a mother, and was therefore only of chemical percentage, while these two European scientists have produced "higher peptides" and "osmotic growths" which are of purely chemical origin.

Chemists seem generally agreed that if they can succeed in building up genuine protein out of chemical substances they will have succeeded in grappling successfully with the fundamental, perhaps the principal problem confronting them in their attempts to create organic matter. Protein is a highly complex chemical compound which forms the corner-stone so to speak, of all living vegetable and animal matter.

Synthetic chemistry, which has dealt so successfully with many difficult problems involving the building up of complex cells, as for instance in building up isopropin, the base of synthetic rubber, has not yet succeeded in creating protein. Molecules we know are composed of atoms, and atoms, which are only a short time ago were believed to be the smallest component parts of the matter are now known to be composed of electrons, which are arranged in the atoms in geometrical forms, such as cubes, tetrahedron, etc. The more complicated the geometrical forms in which these electrons are arranged the more readily will they change their position in coming in contact with other chemical substances; such a change involving a "breaking down" of the atom, of which they are the constituent parts.

Protein is so highly complex in its interior structure—its electrons moving about within its atoms on as complicated a scale as the stars and planets which compose the solar system—that it has so far eluded the modern wizardry of the chemist's creative wand.

Dr. Emil Fischer, of Germany, has succeeded in building up "higher peptides," the nearest approach to the problem yet produced. The "higher peptides" are not unlike bacteria but are not organized; they partake of the nature of ferments, which in scientific parlance are known as "enzymes." Enzymes are the active principle of yeast. They are very wonderful and very mysterious little bodies; as yet little is understood of their nature.

Science knows enzymes will perform the most marvellous tasks, tasks wholly out of proportion to their size and volume. It is due to the enzymes in yeast that bread is made, to ferment, and everyone knows that a tiny quantity of yeast is needed to raise a very large quantity of dough. Perhaps the most astonishing thing of all about the enzymes is that after performing their task they themselves are wholly unaltered as to form, size, bulk. Their mere presence, in other words causes the remarkable changes to occur which the laymen briefly classes together as "fermentation."

If two pieces of platinum are placed in an acid liquid and subjected to a strong current of electricity the platinum will be pulled to pieces and the tiny particles which remain will roll about in the liquid like a heavy cloud. If a drop of this be dropped into hydrogen peroxide the metal liquid will behave itself very much like an enzyme. It will decompose a million times its own volume of peroxide and after performing this giant's task will have retained tained its original form and chemical composition.

A French chemist, Dr. Stephane Leduc, of the University of Mantes, has produced chemical growths which he terms "osmotic growth" which, if anything, are more wonderful even than Dr. Fischer's "higher peptides." Dr. Leduc strews calcium chloride particles into a solution of alkaline carbonates, phosphates or silicates and produces growths which bear a remarkable resemblance to corals, plants, polyps and trees.

These growths, which, it must be emphasized are of pure chemical origin, are not mere forms that have crystallized into shapes resembling vegetable growths. They show all symptoms of youth, old age, decay and death. They do not grow by accretion, like crystals, but by intussusception which is the technical term for the manner in which all organic matter builds up its cellular tissue—that is grows. This means that it absorbs its nutrition like living beings, converts the nutriment thus absorbed into substances which it is able to assimilate in growing as for instance a sort of internal sap not unlike the sap of a plant or the blood of animals. Thus the phenomena of circulation is present, and to this must be added respiration.

If injury is inflicted upon an osmotic growth it repairs that injury in much the same way as the animal organism heals a wound inflicted upon it. It is able to perform periodic movements and most remarkable of all, if the weight of an osmotic growth be compared with the weight

of the seed from which it sprang, it will be found to be many times greater than that seed while the liquid in which it grew on the other hand, loses weight showing that it has been used up by the osmotic growth in process of assimilation.

Dr. Leduc does not claim that these osmotic growths are organic matter, but in view of the many points which they have in common with vegetable forms, the question arises, "if they are not vegetable forms, are they not at least an intermediate form from which vegetables can be developed?"

DOES JAPAN LEAD IN WIRELESS

Japan has taken up the matter of wireless communication with the same insight and zest that she has done in the case of most other facilities pertaining to modern progress and achievement. So rapid has been the development made by her electricians both in invention and instalment that "it is a question whether in some important respects she is not now ahead of more pretentious nations." At least such is the opinion of the editor of The Japan Magazine.

Speaking more in detail of Japanese progress in the field of wireless, this writer says that the Japanese first began to take a serious interest in the possibilities of wireless telegraphy as early as 1886; when the noted electrician, Dr. Shida, set up an apparatus of his own construction on the banks of the Sumida River, Tokyo; but his attempts to send messages across the water by means of electric waves were not wholly successful. After European scientists began to publish the results of their investigations as to the nature of electric waves, the Japanese electricians turned again to the subject, and this time with greater promise of success. Dr. Nagaoaka and Dr. Mizuno, of the Engineering Department of the Imperial University, Tokyo, now commenced an exhaustive course of investigation and experiments with some very encouraging results. In 1897 Dr. Assano, of the electrical section of the Department of Communications, Tokyo, set up a wireless telegraphic apparatus on the old forts in the Bay of Tokyo, and attempted to exchange messages with a station erected on the reclaimed land at Tsukijima, near the mouth of the Sumida River. In the meantime the great Marconi was going on with his wonderful experiments in Europe; and about 1895 he perfected his apparatus to such an extent as to have it considered a decided success, having it patented in England in 1896. Although the Marconi system was quickly taken up in Japan, the nation's own inventors and scientists did not cease their investigations and experiments, especially the electricians of the Department of Communications.

The Japanese, we are further informed, freely admit they have learned much from Marconi and other Western inventors. They have, however, perfected a system of their own.

This system, known as the Teishinsho system, is adjudged one of the most complete on record. Naturally the new invention became a matter of immense importance to the Navy; for all the navies of the world were now installing wireless telegraphic apparatus on their ships, and Japan could not afford to suffer the disadvantage of being left behind. But she did not deem it a great advantage to have just the same system as that employed in Europe. Accordingly, naval electricians got to work, and with the assistance of these connected with the Department of Communications, a special system for use in the Imperial Japanese Navy was perfected and adopted by the fleet. The code used by the Department of Communications was not regarded as guaranteeing sufficient secrecy for naval use; but the new system invented for the Navy, known as the Kaigun-sho, enables the fleet to preserve absolute secrecy as to position and message, and is believed to be more scientifically perfect than that used by any other of the world's navies. This secret system, which owes its existence and efficiency largely to Professor Kimura, was used by the Japanese Navy with telling effect during the war with Russia. Indeed, it was by this means that, unknown to the enemy, Admiral Togo was able to receive warning of the approach of the Baltic fleet and be in readiness to meet it when it came in sight, its every movement being known to him up to its appearance on the horizon. It is hardly too much to say that in that greatest sea fight of modern times, Japan owed her victory in a large measure to the perfection of her system of wireless telegraphy. This statement is made on the authority of the Japanese themselves.

The editor of the Action Free Press says: Ten years ago the Free Press editor could buy ten dozen new laid eggs with a year's subscription. Now he is able to purchase only three dozen with that dollar. Eggs have gone up but subscription remains the same. See where we stand in the matter of the high cost of living.

THE PAVEMENT

It is with a source of congratulation that the city council for 1914 has definitely moved away from the concrete pavement heresy which had a majority of followers in the council of 1913. It is nothing to the discredit of any member of the council to have changed his opinions on the subject. As a paving material, concrete is only an experiment, and many condemnatory reports have only been made public since last year's council passed the resolution in favor of its adoption. It is far more sensible for men to take a position in accordance with the light and leading of facts and full information, than to maintain a stubborn adherence to discredited opinions, merely because those opinions were at one time held, and without regard to the fact that full information was not then available. In other words, a frank avowal of change of mind is more honest and honorable than bull-headed persistence in preconceived views that have subsequently been shown to be erroneous. It has been said that the man who never changes his mind has no mind to change.

Within the next dozen years many of us will regard in a different light various questions that now seem absolutely determined. We all mulishly held our intelligence in the same old rut year after year we would never have any progress. Life itself is a continuous manifestation of changes. Unchangeableness is evidenced by fossilisation.

But to return to the subject of paving. There are two kinds of standard permanent pavement upon the desirableness of which opinion seems to be about evenly divided in the council. After having looked into the matter pretty thoroughly we have no hesitation in saying that if either of the kinds of pavement now proposed is put down, our citizens generally will be abundantly satisfied. Both have been tested under the most diverse and adverse conditions, and both have shown the most satisfactory results.

There is no perfect pavement. There is no pavement that embodies all the advantages.

The pavement that approaches the closest to perfection, we believe, that made from creosoted wood block. It is comparatively noiseless, it is yielding and elastic for the horses' feet, it is not in the least slippery, it can be torn up at any time in sections without damage, it is durable under the heaviest traffic, and resists decay. It has two disadvantages—it is extremely expensive, and its surface being somewhat rough, it is difficult to keep clean.

Sheet asphalt in its various forms is easily the most popular, and the most widely adopted of all forms of permanent paving. It has the great positive advantage of having a smooth surface that never becomes flinty. Neither does it ever wear up rough. Ruts and holes will form in time, but the plastic nature of the asphalt always remains, and there is never a disintegrated surface to afford a shelter for dirt and disease-breeding germs. It is exceedingly durable under such traffic conditions as prevail upon our main street. The initial cost is not expensive. Its clean, smooth surface always presents a neat, tidy appearance.

Its one big disadvantage is that its surface is in one solid mass and when this is once broken, to make sewer repairs for instance, it is difficult to mend the break and make it uniform with the surrounding surface. For Belleville, where our pavements are ripped up every day or two on a dozen varying pretexts, ease of repair is a most important consideration.

If the section of the council that is in favor of creosote block could carry their views into effect without causing an actual outbreak of hostilities on the part of the Front Street property owners, there would certainly be little or no dissatisfaction as far as the rest of the town is concerned.

Also it may be said that if sheet asphalt or asphaltic concrete is chosen there will also be general satisfaction.

If asphaltic material is adopted we would recommend that the street intersections, as for instance where Bridge crosses Front Street, should be paved with wood block. The least slippery material should be put down where horses and carriages have to make turns, and at these points the pavement has to be most frequently disturbed on account of underground "improvements."

We would also suggest that if a choice is to be made between sheet asphalt and asphaltic concrete, that the council first get the opinion of the city engineer at Ottawa where they have experimented very largely with both varieties of paving. As far as our own observation went while visiting that city last summer, it appeared that the asphaltic concrete that had been down for some years was showing a tendency to work up into a rough, pebbled, and uneven surface. We were also informed, though not by any city official, that sheet asphalt was now being substituted almost altogether in the construction of the new streets.

LO, THE POOR OYSTER!

It is all very well for the masculines to taunt the feminines with their incoherent sense of humanity which leads them to band themselves together to protect the horse and other domestic animals, and permits them at the same time to wink at the wicked slaughter of beautiful birds, which are the possessors of lovely tail and wing feathers. We have heard and read about all this. But what about the men who pitch the lowly lobster, whilst still alive into boiling water? And what about the suffering of the impaled fish? There are men who will tell you that a fish doesn't feel any pain when the hook is firmly fixed in its epiglottis. Of course it doesn't, or why would it dart, hither and thither with an agonized swiftness that tells its own story. We have listened to many noble returned deer hunters who have gloatingly told the story of lead pumped into an escaping deer in the woods of the north; also of deer, badly wounded, escaping into the bush to wait for that moment, when Death more merciful than man, comes to put an end to their sufferings. And we can easily hear, in imagination, a perfect shriek of laughter, when we hint that it is just possible the shell-engirdled oyster passes through the gates of suffering because of man's self-indulgence. Listen:

When the meek, retiring oyster
Is abstracted from his bed,
In a manner rather shocking,
He is very far from dead.
When we prod his private person,
(Though his heart seems still and cold)
We convulse his constitution
With an agony untold.
Now instead of adding lemon
"Twould be vastly more humane.
To anoint his tiny features
With a sprinkling of cocaine.

When we add a pinch of pepper,
Just to give the menu zest,
We envelope more in suffering,
That rends his tiny breast;
And a touch of hot tobacco
To his person, it appears
Brings a gush of untold anguish
That is far too deep for tears.
So instead of adding sauces,
That give him needless pain,
Let us spray the little fellow
With a dashlet of cocaine.

When all the evidence is in it appears that we humans are only humane in very scattered spots.

Women are always doing things in a way to make the men smile. In Paris the latest fashion decree is that the ladies wear overalls, and the dear creatures, in obedience to the decree, it is said, are wearing them, but under their own garments.

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One of our largest railway companies suggests that safety first be made a part of common school education. What boys and girls must learn to appreciate more thoroughly is their bodies and their privilege of living. Life is dear to all of us but we are reckless with it and fail to conserve it. This railroad's rational plan is to teach the pupil that he owes an obligation to society to develop into a man with all of his faculties and body trained to do the best work.

The time is not far off when the man with a body weakened by a reckless boyhood will be thought of as an offender rather than an unfortunate. Our bodies are our power plants. The energy developed there measures our ability to do things in life. We should take pride in keeping up this priceless conservation station. Safety first instruction in the schools means sounder men and women of tomorrow because it will make more careful and considerate boys and girls to-day.

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The eugenists are wonderful folks whose impressive authoritativeness does not always pan out. Here is Dr. Compton of Barnard College, New York, who might with advantage to himself be persuaded to be a little more careful of his facts when trying to persuade us of the truths of eugenics and heredity. In his recent address to the American Federation of Child Study he stated that "all the children of a brown-eyed father and a blue-eyed mother will have brown eyes without exception." Now this might possibly be all right, if, unfortunately, it doesn't happen to be wrong in many instances; because, very promptly comes a communication to an Eastern newspaper to the effect that "if this is true, then I know of one exception, for my sister, who is blue-eyed, has three children, all with blue eyes, but their father had brown eyes, and I have heard him remark that it is curious none of his children had brown eyes." To say the things are not so and to state them with impressive authority is one of the chief weapons of the eugenist. Let us hope that such a failing is not hereditary.

RADIUM EMITS INVISIBLE RAYS

A Gram is Worth a Fortune—Is Usually Separated From Pitchblend

Many persons are asking what radium really is, the general opinion being that it is a substance of extreme brilliancy and continually giving off vast amounts of heat to say nothing of sundry electric shocks and mysterious deaths every time it is approached in any other than the duly prescribed form.

However the general public have had so little opportunity to become familiar with it so that it is no wonder that the true facts concerning the mysterious substance have become stretched.

Radium gives off a certain amount of heat and there are certain experimenters who claim that there is a very feeble light emitted under certain conditions, but its great value is the invisible ray which comes from it, and by means of this invisible ray all the experiments and curative results so far attained have been performed.

Radium is combined with bromine in the form of radium bromide and in this condition is sold for about \$75 per milligram, or the one thousandth part of a gram, a gram being about the twenty-ninth part of an ounce.

The great source of radium so far has been a substance called pitchblend. Tons of this matter must be treated and sifted before the costly radium is separated. Other sources have been discovered and worked to some extent, but as there are very many other radio active substances found with the radium the refining is more difficult than with pitchblend. It might be interesting to know that the incandescent gas mantles, so freely used now, are highly radio active and if one is placed over a few coins or jewelry which are in turn resting on a photographic plate in a light-tight box, and the entire combination put aside for about a week, the plate may be developed and the images of the coins will be on the plate. The invisible rays have acted as light and this is perhaps the best way to understand the powers of radium. Of course radium is very much more active than the thorium on the mantles, but the mystery comes along when we consider that these rays apparently never stop.

MEANING OF "POT LUCK"

The Commonplace Phrase Originated in Limoges

The real origin of the word "pot luck" is unknown to most of the people who use it. In Limoges, France, however, one runs into potluck itself. In a certain corner of that quaint city of jostling roofs there is still segregated, much as if in a ghetto, a Saracen population, probably a remnant of the wave of Saracens that swept over Europe hundreds of years ago. Here they live in their crooked, narrow streets, following old customs handed down from generation to generation. There are many butcher shops in the quarter and outside of each steams a great pot of soup over a glowing brazier. In each pot stands a ladle as ancient as the pot.

When a customer comes with a penny, in goes the ladle and comes up full of savory broth and chunks of meats, odds and ends that the butcher had left over. And what comes up the customer has to take. One can imagine how anxiously the hungry urchin or the mother of seven must eye the inexorable ladle, and how a pretty girl might get another draw from the butcher's boy.

At any rate, "to take potluck" means to take what you get and say nothing, whether the pot is in Limoges or in the house of the man who eagerly invites a friend of his youth to dinner.

Fire-killed Spruce Useful

The manufacture of violins and sound boxes for talking machines offers two uses that have been found for fire-killed spruce timber, large quantities of which are found in the forests of the Rocky Mountains.

A maker of high-grade violins claims that fire-killed Englemann spruce is the best material he has ever found for the manufacture of violin tops. The value of the wood lies in its very light weight, its fine straight grain, and its freedom from resin. Wood for violin tops must be straight-grained and absolutely edge-grained; that is, cut at right angles to the annual rings, which for this use should show from twenty to thirty to the inch.

New Street Naming Scheme

Painting the names of streets on the cement curbing at corners instead of on pole supported signs is being tried by a California city.