

Things You will be Interested to Read About

How SCIENCE Has Again Disproved the Possible Magic of a "Philosopher's Stone"

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TIME was when every third savant was a dignified alchemist, and every fourth one an eminent astrologer. Those were the old days, to be sure, yet when you reflect upon the fact that the great industrial and practical sciences of chemistry and physics are the offspring of the one, and the science of astronomy the outcome of the other, you must pause not in derision, but with a spirit of homage and humility before both of those ancient and mediaeval forebears of modern knowledge.

The savants of that era held it as a sane ambition of their hopes so to conquer the baser things of the physical world that they might at will convert cheap minerals into fine gold. They held to the principle that there was an underlying agent or element in all matter with a real capacity for changing granite or tin into gold, chalk or coal into diamonds, and even death itself into life.

Golden Spur to Discovery. This philosopher's stone, this scientific talisman, this elixir of life, this source of magical wealth, was alike the aim of the alchemist and the ignis fatuus of the explorer and the adventurer. Indeed, it was a lure that actually and ultimately led to fabulous wealth for mankind, if not for the individual seekers themselves.

Not only did it lead to the discovery of America and the great western hemisphere, but this selfsame, selfish desire—scotched at by straight-laced Puritans, bigoted and intolerant der-

vishes of religion, as well as the prudens of that day—resulted not only in the establishment of religious and moral freedom, but in the creation of the sciences of chemistry, physics, electricity, agriculture and all the other wealth-creating industries of modern life.

As the great new sciences of chemistry and physics became firmly established nearly every serious-minded investigator ceased his attempt to transmute iron, zinc and the baser metals into gold or silver. The men who so continued to experiment were sent to Bedlam. In brief, they were, until five years ago, called madmen or fools.

Then, with a vengeance, there emerged again into the calcium glare of the scientific world the long-discarded principle of transmutation. The effulgence was none the less startling and blinding since it emanated from one of the greatest chemists known to experimental science, Sir William Ramsay.

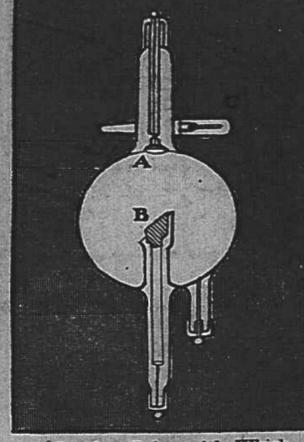
Why LEAD Cannot Be Changed Into GOLD as the Ancient Dreamers so Fondly Hoped



In Early Days the World Rang with the Adventures of Men Who Sought the Fountain of Youth and the "Philosopher's Stone."



Under the Keen Eyes of Science, Theories Do Not "Go." Facts Must Be Determined by Actual Sight and Test.



A Crookes Tube, with Which Experiments in the New "Magic" Have Been Conducted.

showed the presence of helium for two days, and, though thus exposed for weeks to the positive rays, no more was found. This also disproves transmutation from lead. Platinum, oxygen and hydrogen were similarly treated, with much the same result. Briefly, there was not a tittle of evidence in support of the transmutation of any element whatsoever.

The Chimera Revealed. From Prof. Thomson's detailed and painstaking experiments the deduction is comprehensive and inevitable that the hopes of the alchemists are just as chimerical today as they were centuries ago. The elements supposed to have been transmuted in recent years by a little band of modern chemists are, after all, gases and elements actually present, yet hitherto unaccounted for, hidden away in the interstices of the metal from which they emanate. The bombarding rays from a Crookes tube merely liberate the imprisoned elements, a power that even the greatest heat lacks.

As for the discovery by Ramsay of helium in old, worn-out Roentgen-ray bulbs, appearing only when they are heated, Prof. Thomson shows this to be due to the previous liberation of the helium, which adheres to the pores of the glass until the heat drives it off.

It is also possible that all elements are slightly radio-active, or that certain elements are driven into heavier elements during their manufacture into useful objects. Be all this as it may, the fact remains that the philosopher's stone and the transmutation hypothesis have no leg left to stand upon. Moreover, Prof. Thomson has again given pause to the radio-enthusiasts, for they, too, must rearrange their theories and their researches.

ally, up to lead and silver—to say that the laboratories were bestirred is to put it mildly, indeed.

Ramsay's Astonishing Claims.

Sir William Ramsay's position was so secure that when he gave what seemed to be indisputable evidence that lead came from lead, and that radium came from lead—it had already been proved by Rutherford and Soddy that radium breaks up into niton, helium and many other elements—when Sir William promulgated these startling discoveries it sent a cold shiver up and down the spines of all but true-hearted believers. To overthrow the results of so eminent a savant must require even, if possible, a greater investigator.

That very situation has now come to pass. Sir J. J. Thomson, who is the discoverer of those tiny corpuscles called electrons, myriads of which are contained in every atom, and who is also the Cavendish professor of

physics at Cambridge University, and the leading investigator in electricity, magnetism and light, now comes forward to deny Sir William Ramsay's conclusions unequivocally. These were based upon the presence of lines in the spectrum, a procedure known as spectrum analysis.

Sir J. J. Thomson used an entirely different method, which is much more sensitive than was Sir William's. For example, he used a glass bulb—called a Crookes tube—like those used in taking Roentgen-ray pictures. This is a vacuum tube from which all air has been exhausted. From it come negative or cathode rays and positive or anode rays. It was with the rays coming forth from the positive pole that the Cavendish professor discovered an entirely different explanation for the presence of new elements as described by his London confrere.

Sir J. J. Thomson then began to manipulate the discharge of positive rays from a large Crookes tube. It

was connected by aluminum wires with an induction electric current, when he found that a new gas, which he calls X—closely like helium—and also the gas neon appeared on the scene. There was, however, never any obvious connection between the appearance of either of these gases and the material in the Crookes tube.

Unveiling the Fallacy.

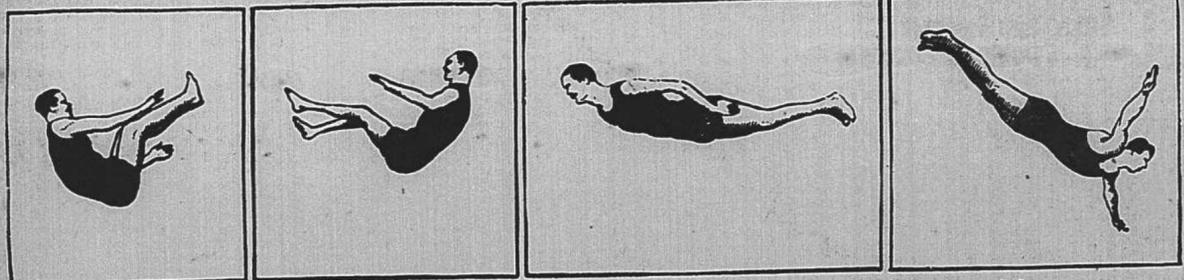
The two gases, X and neon, were neither increased nor diminished in amount, no matter whether oxygen, nitrogen, air, helium or anything else was present. Yet Sir William Ramsay had erroneously concluded that

these or similar elements were transmuted from the metals acted upon by the rays.

Prof. Thomson then ascertained that the same condition that gave rise to X also produced helium and neon. Yet his colleague, Sir William Ramsay, had overlooked the source of all of them, and attributed their origin to the heavier elements present. All of the supposedly revolutionary tests of Ramsay and his assistants were then repeated at the Cambridge physical department, with different conclusions.

A piece of lead bombarded with the positive rays from the Crookes tube

How the "HIGH DIVER" Regulates CONTROL of His BODY



From Instantaneous Photographs Showing Various Phases of a High Dive and How the Position of the Arms Automatically Helps the Regulation of the Fall and the Position at the Striking of the Water.

THE man who makes a high dive into a tank containing four feet of water gets so "geared" up to the task that it is done as "naturally as walking or sleeping," to use the expression of a veteran at the performance.

And yet it is not this confidence, this certitude that sometimes causes grievous accidents, but carelessness; for a careless walker may very readily bring injury to himself. As sleeping is not a conscious operation, one may not be careless in the sense the word as applied to the other acts, but he may be what is approaching carelessness in the acts

before sleep in what he eats, and so induce the disaster of nightmare. And right here is a curious fact, that most high divers—probably because of the fine physical condition which they are compelled to maintain—are free from violent and disturbing dreams.

In witnessing the body of the diver shooting down in a graceful slant to the water, or turning over in the air before going head-first into the flood, we have but a faint idea of the skill required to do it, despite the professional talk that would minimize it. In the first place, when a diver "takes off" he should maintain full control of his body, especially in somersaulting, for if he lose it for a brief second, and thus any part of the act is left to chance, an accident is likely

to be the result. He must at all times know where he is "at," with nothing left to mere hazard.

Our pictures are from instantaneous studies of high-diving men fish. When there is nothing solid more touching the feet, nothing to which to hold, and the body is cast free out into a void, it takes a definite concentration of mind to keep it from swinging beyond control in bewilderment or fear. These two emotions scarcely ever beset the high diver. When they do, he ceases to be a high diver, or ceases to exist.

Some of the most spectacular diving in the open has been done at Torbay, England, and the "take off" from Saddle Rock into the sea, is as thrilling a spectacle as one would wish to see in a lifetime. Some of

the most famous divers of the world have "taken off" from the rugged 50-foot eyrie.

They have gone down to the dancing, sunlit sea in the curved flight of the arrow; they have cast off from the perch horizontally and, apparently suspended in the height for a brief second, descended like a plummet. But the most beautiful exhibition was the Swedish style of diving—the swallow dive—with the hands outstretched like wings.

And when this is performed—not in electric-lighted indoors—but high-roofed by a clear blue sky, and the diver, like a swift-pinnioned bird, feels the call of the sea and gives himself boldly to the air—then you have a really beautiful, thrilling and inspiring sight!

Why SCIENCE Doubts the Effect of EXPLOSIVES on RAINFALL

DURING the first month of the present European war the rainfall in Belgium was considerably below the average. Nobody commented particularly upon it, however, farther than to remark on its effect in facilitating military operations.

Late in the fall excessive rains fell, flooding the country and rendering the operations of the armies extremely difficult. Forthwith a host of writers came to the front with articles showing that the discharge of high explosives incident to the fighting had doubtless produced the great precipitation.

They seem to have forgotten how the discharge of high explosives in the first weeks of the struggle was attended by unusually dry weather. They likewise ignored the fact that

under ordinary conditions rain falls on more than 150 days of the year in Belgium and that a season of heavy rain in the late fall is quite usual in times of profound peace.

Commenting upon these facts a scientific writer remarks that the whole argument by which people seek to substantiate the idea that rain may be caused by discharging high explosives is based upon a memory which conveniently overlooks events contradicting the idea.

There is no question but that rainfall has frequently attended or very closely followed giant outbursts of explosive force. Everybody has read of the rain on the field of Waterloo. Few veteran soldiers fail to recall that they were often drenched with rain immediately after the battles in the Civil War. Most of Americans remember rainy Independence Days. Rain, especially heavy rain, occur-

ing after a battle or on a holiday is an unpleasant experience and likely to impress the memory. Everybody forgets about pleasant weather on such occasions and the tendency is therefore to assume a casual relation between the noise of battle or of the Fourth of July and the rain, although the weather records offer no justification for such an assumption.

The records of English meteorology show that the rainfall of Essex is less by a considerable fraction than that of any other portion of the United Kingdom. Curiously enough, it is in Essex that the great guns for the army and navy are tested out. In all England there is not a section so frequently trembling to the shock of high explosives.

In point of fact, science has demonstrated conclusively that the forces which result in condensation and precipitation are all silent forces. Every

attempt to produce rain in the laboratory by explosives has failed. No such effort in the open has succeeded under conditions giving certitude.

To the scientific mind therefore, the man who proposes to produce rain by discharging high explosives in the air is on a level very little above that of the man who professes to bring rain by charms and incantations.

During the bombardment, by a combined British and French squadron, of the German positions on the Belgian coast, one British vessel is said to have fired no fewer than 1,000 lyddite and shrapnel shells. So rapid was the firing that some of the guns discharged 14 projectiles a minute.

The Primitive Methodists of England have 1189 ministers, who care for 211,648 members.

Why a GIANT Is Really BLENDED TWINS

THE occasional appearance of a human giant, so long a mystery to the scientist, is very clearly explained in some recent experiments upon the lower animals. In the Marine Biological Laboratory of Naples, Dr. Driesch, by forcing two embryos together when they were in an early stage, has succeeded in blending them perfectly. The result was a single embryo, but one of abnormally large size.

On this side of the Atlantic, at about the same time, Prof. Loeb succeeded in fusing some eggs of the

starfish. Instead of three or four clear, therefore, that the giant grows from two ova that have been accidentally fused. In this view he is really two beings in one. These have different characteristics. They may even be of different sex.

Indeed, the fact that the giant is usually below average in mental qualities is probably due to divergencies in his constituent personalities which bar high intellectual development.

WATCHING the DIGESTION of FOOD

THE latest triumph of the X-ray operator is to follow and photograph food in its course through the entire digestive tract of a human body. In the medical view this is an accomplishment of the first importance, in that it throws clear light upon some of the digestive problems that have been only vaguely understood, if understood at all. It has a special value to the surgeon, enabling him to recognize and instantly locate any obstruction to the process of digestion.

If there is some stoppage in the esophagus, for instance, the X-ray not only locates it exactly, but defines it perfectly long before it would be even suspected by the ordinary diagnostician. The exact position of the stomach is thus to be ascertained, as well as its shape and size. By following the food to the various parts of the intestines and noting the time taken, any area of obstruction

is very speedily to be discovered. A physician in describing these triumphs of X-ray exploration, refers to the popular impression that the discovery of foreign substances in the body, or fractures of the bones, are the limits of its usefulness. He affirms that these rays show the size of the heart, demonstrating whether it is dilated and if there is fluid present. They reveal any thickening in the pleura and inflammation of the lungs. Through them tuberculosis may be detected before the physician is likely to suspect its presence.

He stoutly maintains that the entire internal mechanism of the body is thus to be examined more accurately than by any other method now within reach, and ventures the assertion that no surgeon will operate and few physicians prescribe in suspected maladies of an important organ, until he has first submitted that organ to this searching photography.

Alcohol for Motors

THE unquestioned shortage of gasoline in Germany probably will lead to the universal adoption of denatured alcohol for industrial motor vehicles. For several years both France and Germany have demanded interchangeable carburetors on subsidized motor vehicles, and Prince Henry's stirring appeal of two years ago, "Germans, use benzol!" served to impress German motorists and truck users with the fact that gasoline is not the only motor fuel available.

The wisdom of the alcohol-benzol propaganda is shown at present in the European war, where Germany is able to look with unconcern upon the complete shutting off of its gasoline supplies. More than 100,000,000 gallons of denatured alcohol were ready for the motor trucks!

Puzzling ROOSTER Who Stands LIKE a MAN

YOU are here introduced to a rooster that has been characterized as "more human than Rostand's Chanticleer." He believed, from the very beginning, in holding himself upright before the world. Scientists have puzzled their brains to discover by what anatomical fantasy this proudly crested fowl was enabled to assume the posture of man.

He has the distinction of being an unparalleled freak among his kind, but it is not noticeable in the picture that he seems inclined to lower his crest because of it. "He is a barnyard contortionist," remarked a man from the city who beheld him for the first time; and yet that does not thoroughly express it; for, while the posture would indicate that the rooster is doing an anatomical "stunt," which upsets the usual order of things, he is nevertheless, merely in his natural unnatural attitude.

England is the country of the nativity of this remarkable fowl, and the man who owned the photograph from which our picture was made wrote as follows: "Here is a rooster, born and reared within a few miles of Waterford, who believes in



From a Photograph of the Rooster That "Poses."

holding himself erect. His strange carriage is not the result of an accident, as he has strutted around in this position since chickenhood. The countrywoman who reared him thought she had done a good stroke of business when she sold him to a fowl-dealer with another cockerel, without his peculiarity being discovered; but there is no doubt he would be worth a small fortune to a showman, as his appearance, as he stalks proudly around, is most laughable."

All of which shows that Rostand was not making such a baseless flight of fancy when he placed a mirth-provoking comedian in a barnyard. Now, if this bird, with his man carriage, were endowed with a parrot's faculty of speech, and, so could strut and utter pompous sayings, the money-making possibilities would be tremendous. Some wag has christened him Rostand.

A wealthy young Englishman, before going to the front, insured his life for \$1,000,000, the risk being split among several offices. The first premium was \$50,000.

The Chinese have twice sacked Moscow—once in 1287 and again in 1292.